THE MUSEUM SYSTEM AND LOCAL GOVERNMENT FOR THE DEVELOPMENT OF THE AREA.

STRATEGIC – MANAGERIAL PROFILES AND JURIDICAL REGULATION*

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1. INTRODUCTION

Although globalisation has created, on one side, positive effects on international markets, on the other hand, it has excessively arisen environment complexity levels where organisations work. The increase of mobility of goods and individuals has started competition mechanisms not only among enterprises, but also among areas that have claimed the need for finding competitive advantages in order to create value for reference stakeholders.

Even though late, also the Italian legislative system has addressed its regulation action toward a legislative simplification in which administrative procedures slowed down adjustment processes to new orientation. Those changes, which in the last years have repeated in limited times, particularly influence the demand of goods and services. At this rate, areas global competition has featured itself as a government action which is able to guarantee technological and importance services able to fully satisfy the global user.

From time immemorial, Italian territory boasts an important culture and an outstanding cultural endowment that is not always appraised, in other words it is not emphasized to the point that it can be seen as a competitive advantage for reference areas. 2007 records highlight a remarkable affluence of cultural tourism in Italy from overseas, which is specifically distributed in this way:

Table 1 – Cultural tourism in Italy

<table>
<thead>
<tr>
<th>DESTINATION</th>
<th>VISITORS</th>
<th>TAKINGS (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colosseum</td>
<td>4,441,453</td>
<td>29,730,959</td>
</tr>
<tr>
<td>Pompeii Ruins</td>
<td>2,545,232</td>
<td>20,468,198</td>
</tr>
<tr>
<td>Uffizi Museum - Florence</td>
<td>1,615,986</td>
<td>8,058,488</td>
</tr>
<tr>
<td>Florence Academy</td>
<td>1,286,798</td>
<td>6,642,398</td>
</tr>
<tr>
<td>Florence Museums and Boboli Gardens</td>
<td>776,373</td>
<td>2,405,662</td>
</tr>
<tr>
<td>The Royal Palace at Caserta</td>
<td>657,375</td>
<td>1,390,889</td>
</tr>
<tr>
<td>Villa d’Este at Tivoli</td>
<td>554,320</td>
<td>2,161,749</td>
</tr>
<tr>
<td>Egiptian Museum - Turin</td>
<td>501,568</td>
<td>1,267,098</td>
</tr>
<tr>
<td>Museum and Borghese Gallery - Rome</td>
<td>485,548</td>
<td>2,173,373</td>
</tr>
</tbody>
</table>

Source: Our elaboration on 2007 tourism and finance statistical data

Table’s data highlight how Italy attracts foreign countries; this happens because of the cultural endowments which our country boasts of. In the face of this proof, however, it comes up a negative data regarding the Italian museum customer/user’s satisfaction. Many academic, field, daily chronicle researches detect this data. This problem, therefore, does not show so

* Although this paper comes from common observations, it is to ascribe to Dr. Mirko Perano for paragraphs 2, 4, 5, and Dr. Federica Pennafina for paragraph 3.

much from the lack of cultural resources which, indeed, resulted to be numerous and
diversified, but rather from the inadequacy of services offered compared to such an
endowment which is highly requested from the global tourist. In fact, what comes up is a
museum system which is not able to fill up the existent asymmetry between requested quality
of service and user’s demand (although it is characterized by a high degree of variability). The
slowness to adjustment to this parameter makes our museums “ancient” structure where user
visit the culture without, however, finding satisfaction from the services offered. The
opportunity of increasing, however, turns out to be evident to the point to consider this
dissatisfaction a cost opportunity that weights, moreover slow down local area development
and consequently the national one.
Government area policies could have an important role in this evolutionary dynamic, and
perhaps they put the same area, to be more precise subjects that are in charge of its
administration, in a responsibility position toward the community.

2. HISTORICAL ASPECTS OF THE DEVELOPMENT OF THE MUSEUM
SYSTEM

The museum system in its most general meaning, shows a swinging historical trend the
origin of which date back to the end of the 19th century, when in the city of London the first
successful event of the modern age was organized: the Great Universal Exhibition in 1851.
The crowd which flooded into the nearby fields, was attracted not only by the plenty of goods
displayed in the Crystal Palace\(^3\), not only by its artistic production linked to the industrial
establishments existing at the time, but also by the innovative and galvanizing services which
that structure could offer: a restaurant and toilets. From then on “the art had started moving”\(^4\)
bringing to light innovations and extravagancies which up to then had been concealed.
Some years later this trend spread all over Italy, arounsing curiosity and interest which soon
caused Parliament to impose, between 1874 and 1876, after the increasing success of the
museum events at the time, an entrance fee to museums. That did not discouraged the so
curious Italian people, but even more the Minister for the Cultural Heritage of the time, Mr.
Ruggiero Bonghi, could realize that from the introduction of the entrance fee, the number of
visits to the museums had increased. So the so called famous tourniquets, that is devices for
facilitating the count of visits and takings, were set up.
Museums become more and more important as time goes by; they are defined as “the place of
forms, it represents their localization, it determines their range, it shows their size, their life
and duration, their propagation […]”, it is “an instrument which can be only directed by the
historical competence, with the help of an hermeneutic guide. After having satisfied that
absolute and imperative necessity which only the silly butlers of a nonchalant or consumer
society can neglect, the management of museums also emerges: from the social and economic
management of the virtual relationship with town and the civilized society, to the deliberate
“presence” of the old and however very modern instrument which everyday imposes itself,
still today, as one of the biggest enterprises of the social community”\(^5\).
The interconnections between politics and museum have over time danced a frantic dance of
love and hate, among privatizations sometimes criticised because of the existing peculiar

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\(^3\) The Crystal Palace was strongly wished by the prince Albert of Saxony – a famous British prince– just for this
event. One of the characteristics of this structure, which have recently inspired a lot of post-modern
constructions, besides that of being built from iron and glass, is that over the years after its inauguration in 1851,
it was disassembled in the area of South Kensington (Hyde Park), and then it was wholly reconstructed again in
another area (Levisham) in 1854.

\(^4\) EMILIANI A., (1996), “Presentazione”, in PRONTI S., Il museo tra istituzione e azienda, il sole 24 ore,
Milano.

\(^5\) EMILIANI A., (1996), above quoted, page IV.
management systems, for example, borderline between the sector of cultural services (which could have never had any income) and that of the manufacturing industry (naturally oriented to make profits). Those years showed the fallaciousness of museum privatizations which mostly ended with the loss of the specific culture of a territory.

The modern Italian museums show an endless variety of problems linked to the rigidity of their administration method which limits the decision making power of the director of the museum, then practically limiting the involvement of the personnel in the business strategy. The financial aspects also limit the Italian museum to a marketing research on the expectations of the customer/user of the museum services and the personnel, often feeling himself engaged in a monotonous routine, is very often devalued and loses any affection for his work.

Guidance sessions on the museum culture and activities arousing the old enthusiasm could certainly revive that curiosity which now seems to concern museums only for the appeal represented by those historical-cultural values which specially the Italian territory can boast.

3. IN FORCE RULES AND GOVERNMENT FORMS OF MUSEUM

Regard the juridical regulations which pertains organization and procedure of the museum functions, it is needed to premise that a museum is different from other cultural realities (theatrical, musical and/or prose ones), provide that it does not show peculiarities of a field organization (for instance we might think about the same organizations which are in charge of the activities previously mentioned); In addition, at the same time, it has a particular regulation which governs functions of which the organization is featured of, as it happens, for example, for natural parks.

Although old regulating conjectures of reference were essentially featured for the static regulation of the museum system, particularly regarding activities for acquisition, cataloguing, loan, exposition and properties safety kept in museums, only recently there has been the ratification of regulations which highlight a greater attention to managerial profiles of museum structures and the quality of service concerning to it.

Because of the numerous and heterogeneous nature of these legislative regulations, it is useful a classification of them (on the basis of the object and goal) in three fundamentals categories: I) a first group of norms allow the creation of integrative and coordination forms among museums which belong to different ownership, in particular, local and national museums, likewise the inspiring principle which deals with the coincidence between “legal ownership” and “management” of the subsidiary principle, according to the management of national museum has been moved to Regions, Provinces, and Municipal Districts. In this particular case, the Department of Cultural Properties can decide to run the great national museum network, such as elements which characterize the cultural history of a country, and give to local institution the management of service of remaining museums

In this perspective further dispositions and execution normative extended the possibility to entrust to private subjects, in particular “cultural and banking foundations, society, consortium constituted for this purpose”, the management of museum public services and, moreover, they allowed the peripheral organization of the Department of Cultural Properties to entrust to a public subject the management of properties and the connected museum services.

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6 On this point the article 150 of the act nr. 112/98 foresees the constitution a joint committee, composed by five representatives of the Department of Cultural and Environmental Properties and five representatives of territorial organizations with the task of finding museums and other national cultural properties which management is given to the State and to those which the management has been transferred for, according to the principle of subsidiarity to Regions, Provinces and Municipal Districts.
II) A second group of norms is addressed to endorse sponsorships as well as to facilitate the promotion (for instance tax breaks) and the supply of privatistic financing to museums and other cultural foundations.

A particular interest for museums is given by the regulations of non-lucrative social useful organization (ONLUS), which subjective requirements are:

a) not to have a lucrative aim
b) to carry an activity which has an effective social praiseworthy deed
c) to have an associative structure with a democratic core

It appears evident that the cultural and museum activity is fully entitled to be part of those that legitimate the institution of a non-lucrative social useful organization (for instance a foundation), which – according to the law 534/96 – could use significant national contributions and fiscal benefits that are provided for cultural institution, due that among fields where the mentioned organizations can operate there are tutelage, promotion, evaluation of historical and artistic interest things, as well as the promotion of art and culture (art. 10 l. n. 460/97).

III) A third group of norms connect with the process - which define the most recent legislation – of deep decentralization of administrative competences (from State and from Regions in favour of Municipal Districts and Provinces).

The transfer of function from centre to periphery is addressed to give to Regions - which keep, essentially, addressing, regulation and financing tasks, as well as qualitative standard decision - and to local organizations all administrative functions which pertaining the cure of targeted areas interests, except those clearly assigned to the State.

Management, valorisation, and promotion activity is articulated in the same way of normative dispositions of March the 31th 1998 nr. 112 act which “Bestow of State functions and administrative tasks to regions and local organizations because of the execution of paragraph I of March the 15th 1997 law, nr. 59”, in this distribution of competences:

– activity of promotion due to Provinces;
– activity of valorisation and management due to Municipal Districts

The latter normative has foreseen the possibility to give to local institutions the management of some national interests museums and forms of coordination among different institutional levels in order to safeguard and use cultural properties (see art.154 and 155 quoted act).

All services whose management is carried out by Municipal Districts and Provinces are defined publics under national regulations on “Local Autonomy Ordinance” - law nr. 142 of June the 8th 1990 - provided that they have as purpose properties and activities and, coevely, employ the aim to promote an economical and civil development of local communities, and realize a social aims. At this rate, we could mention public services and the majority of activities and services supplied by local territorial organization.

It comes up clearly the importance of the choice aimed to establish whether to organize a museum as “proper activity of a local organization”, to be more precise under the form

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7 It is needed to point out that the “museum subject” and “cultural properties” has not been object of decentralization, essentially because the regulation of cultural properties has been among national competence subjects (nr. 59/97 law), and also because local organization systems and regions have already received regarding competence in occasion of previous functions.

8 As service we mean “single performance or set of performances carried out in order to favour who asks for them and executed by subjects who have enough ability to satisfy received requests”. As it is stated by ANSELMI L. (1997), “I servizi pubblici di interesse nazionale in un contesto competitivo”, in Azienda pubblica, n. 3-4, p. 287. Cfr. inoltre, NORMANN (1985), La gestione strategica dei servizi, Etas libri, Milano, p. 53. Affiancando la parola “pubblico” a tale concetto si identificano “servizi che presentano l’attributo dell’elevata indispensabilità per gli utenti e rivestono interesse pubblico in quanto soddisfano bisogni largamente sentiti dalla comunità degli individui considerati sia singolarmente, sia nelle organizzazioni economiche”. PIVATO G. (1985), Le gestioni industriali produttrici dei servizi, Utet, Torino, pag. 2.
“public local service”, with the different springing consequences under the profiles of the effects and juridical reference opportunities. As a matter of fact, in case we choose the organization of a museum as form of “public local service”, the local organization has to carry out only an addressing, surveillance, programming, and controlling activity, because it has to give service management to a proper autonomous structure, whereof generally possesses the strategic control.

In particular, the service contract has to indicate service fulfilment way and length, qualitative targets, fare determination way and, therefore, all economical aspects of the relationship and rights of users, as well as checking power of the local organization. It should also perform a determining function of connecting local organization cultural policy to managerial targets of in charge subjects – inside a system – to assure field government and management.

By qualifying the management of a museum as “public local service” there is the possibility to adopt particular organizational solutions, of a privatistic nature, from which come a larger managerial agility. In particular it is possible to create:

a) A foundation that – in the specific case of the museum (for instance cultural foundation) allows the mixed participation of publics and privates subjects, allowing a privatistic action both of organizations which own museums and works exhibited and preserved in them (Provinces, Municipal Districts, Department of Cultural Properties, Religious Institutions) and in organizations and society statutely responsible to step in, even financially, in cultural and cultural properties field (credit companies, banking foundations, commercial society, international cultural foundation). Because of their nature and composition which does not allow them to rely on their proceeds, it should be given to foundations activities related to preserving museum networks that need a relevant and constant funding.

b) an institution, as instrumental organization of the local organization, provided with a distinguished juridical personality in regard to it and essentially addressed to social content services management.

c) a joint-stock company, which has to have necessarily a mixed character in the sense that local organizations has to be put side by side with private and extra-local public

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9 It detects that, despite fundamental services, it is difficult to identify strict modality of classification of public service, which at this rate can set up as “opened system” which expands or contracts, in space and time regard State orientation, and in regard interests and need of the administered community.

10 Legislator’s aim is to have a different programming and addressing activity from the management one, and to avoid that this separation could get museum management out of channel of public cultural functions. It is foreseen that the fosterage of the service could take place on the basis of an appropriate service contract, in which local organization set conditions concerning the correct function and aimed to pursue legislator’s found general targets.


12 Recently, many public organizations operating in the field of culture have changed into cultural foundations. It is possible to remember, for instance: Venice Biennial Exhibition; organizations which operate in the musical field (nr. 367/96 act), the National School of Cinema (nr. 426/97 act), the National Institute for Ancient Drama (nr. 20/98 act) etc.

13 It detects that, additionally, the foundation, operating in sectors provided by 460/97 act which contains the “Rearrangement of non-commercials local organization tributary regulation and non-lucrative social useful organizations” can use the consistent fiscal benefits. See, RIVETTI G. (2004), Onlus Autonomia e controlli, Giuffrè, Milano, pag. 3 ss., 77 ss.

14 In front of the clear separation of institution role from that of the organization, it may be possible to find a managerial responsibility, which is exclusively of competence of the institution, and a political responsibility, which directly pertain to the local organization. Additionally, it detects that for institution is foreseen an expressed territorial limit since they can run public services only in the territorial field of the organization which is the holder of the service and in the associative structure of local organization which they belong to.
associates (in other words public organization of national and regional character), or rather pertaining to territorial wards different from that where local organizations prevalence associates insist.\(^{15}\)

4. MUSEUM SYSTEM AND LOCAL GOVERNMENT IN THE AREA DEVELOPMENT

The museum system may be considered, together with other systems that produce in particular area a socio-economical value, as an unlimited source of competitive advantage and may represent a flywheel for the economical development of the same area, from a touristic perspective point of view, and as a resource attraction (human, financial, economical-productive etc…). Thanks to this particular configuration, it detects different successfully territorial realities both national and foreign which highlight a set of common features among them: a right combination of public and private participation, a high technology services offer, prominently cultural endowment of museum systems and an area government that favour territorial cultural development through specific strategic actions. On the whole, this last point turns out to be of great importance in so far as object of numerous interdisciplinary studies which, actually, result to characterize this work as well.

In virtue of the efficiency, subsidiarity principle (which we talked about above) particular competence connected to economical development policies are delegated to local organizations competence. The subsidiarity principle, in fact, is finalized to give efficient responses to the community, even in regard to public or mixed managed museum systems (respectively horizontal and vertical subsidiarity). In this sense it might be possible to consider useful that local organizations should consider without doubt museums as local services through an administration careful to adjust less bureaucratic (in virtue of the subsidiarity principle), customers/users demand of museum services. Everything considering that, although the museum may not be completely compared to the enterprise system (because of its more articulated structure), it is at least appropriate that its government (or its modus operandi in action) adjust itself to general efficiency, efficacy, cheapness criteria (always similar to a wider concept of quality) to adopt in all administrations which supply, directly or indirectly, services to the citizens.\(^{16}\) Although this principle of subsidiarity turns out to favour mainly those more virtuous administrations and careful of taking care of local evolutionary dynamics (in the sense of improving and favour the offer of service already existing), in the present reality it does not produce the expected effects.

Nowadays in Italy, the service-producing sector, with a particular reference to the cultural one, appears a system that makes understand a significant improvement possibility. The set-up picture, that in first place could highlight a point of weakness of our system, is rather to be intended as an opportunity on which is possible to create that added value which far back constitutes a cost opportunity for the community and reference areas. In the place where this cost is quantified and evaluated through targeted local government policies, it is easy to assume a background where are highlighted considerable opportunity of development which derives from competitive advantages founded on country specific levels able to create a new value for the area.

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\(^{15}\) The intrinsic reason to make appeal to this managerial form comes from the precise purpose of realizing a participation of more subjects and capitals (private and public) in the management of public services where the specification of associates is based on the ensured subsistence of common intents and interests (see art. 2247 c.c. art) with every resulting advantage connected to the use of this corporate model.

\(^{16}\) See BAGDADLI S., (1996), quoted work.

\(^{17}\) The missed takings, although on the basis of hypothesis, constitute a cost, defined by literature as cost opportunity which is not only to be considered in reference to the particular museum structure poor of services, but also on the development which the area has failed to reach because of a less developed cultural tourism.
In virtue of the rich presence on the Italian territory of unique and inimitable distinctive characters as history and cultural resources, target of entities in charge of the area administration should be that of improving at its best those points of strength through the constitution of a governed network\(^\text{18}\) of relationship that interconnects, inside a strategic dynamic\(^\text{19}\), the moment of definition of the aimed targets as well as the realization of the same ones, in order to actively involve all area territory actors both public and private, with the intention of drawing a virtuous local evolutionary path.\(^\text{20}\)

In order to favour this dynamic, it could be useful to detect a satisfactory balance between museum system quality and cultural/economical local resources valorisation\(^\text{21}\). In the matter of this latter point, it is needed to duly consider that high value of existing heritage in museums tends to attribute to local resources a cultural valence larger than the reference territorial dimension, to the point to ask wider breathing strategies. At this rate, however, it could be counterproductive to consider that a similar relevance determines a not fully use of local resources both from a managerial and organizational point of view.

When you think about it, in order to attribute functionality to the museum system intended in its complex it is needed, on one hand, to specify the role to recognize to organs in charge of area government (as source of expression of place general interests), and on the other hand to define the managerial model which is contextually more appropriate (in a picture of the offered normative option of the in force legislation) to configure and assign dynamism and efficacy to the entrepreneurial web in the pursue of targets\(^\text{22}\).

Part of the doctrine considers the "quality of service" through the attribution of an advantage and/or of a particular attention to the customer\(^\text{23}\); others, indeed, think "total quality" as vision of a system according to every individual feels in charge of the mission of being supplier of a


\(^{19}\) The strategic dynamic may be structured in logical stages, temporarily separated and set according to a rational and sequential logic of input-output: conception, definition, accomplishment and strategic surveillance. PELLICANO M., (2004), *quoted work* p. 196. This approach follows a synergic type of logic between the theoretical aspect of the Strategic Dynamic and the reticulate undertaking of a vital system. This undertaking foresees that a network is endowed with a border on which insist an operative periphery (module and connexion) and a centre. This latter may carry out a double function: pure coordination (sistemistic) or addressing and driving function (evolutionary dynamic supervisor). It is in this specific case that the centre, in reality Government Organs, profitable contributes to “change relational dynamics to generative processes of value”, it is this case specifically that the network (because endowed of a government – GOs) may be considered a vital system. GOLINELLI G. M., (2000-2005-2008), *L’approccio sistemico al governo dell’impresa*, Cedam, Padova.

\(^{20}\) This organization reality could be favoured by the creation of a relationship model which is not based on the hierarchical principle, indeed on a participative one – a reticulate type one - where every actor, holding its own autonomy, creates a social network whose strength is given by the will of reaching the final goal (in fact, the constitution of relationships is directed to the expressed target), which is supported by an high communicative intensity which constitutes the needed profile for the realization – in a positive sense – of “being in the network”. See MENEGUZZO M., RICCBONI A., SICCA L. M., “Assetti istituzionali ed organizzativi”, in AA.VV., *La gestione e la valorizzazione dei beni artistici e culturali nella prospettiva aziendale*, AIDEA, CLUEB, 1999, pag. 89, and following. See also FREY B.S., POMMERENHE W.W. (1989), *Muses and Markets. Explorations in the Economics of the Arts*, Basil Blackwell, Oxford.


service to the customer and to have the firm will to satisfy it\textsuperscript{24}. Catching sentences, \textit{slogans}, have all along characterized approaches to quality. In this matter, managerial literature gives a varied number of models endowed with a descriptive character which highlight generalization that are not always supported by suitable empirical proofs\textsuperscript{25}. In other cases, on the contrary, they show a normative and prescriptive tone both when they give guide or manuals for the application of ISO norms and when they propose the \textit{Total Quality}.

In step with the evolutionary system of the most known organizational theories – for instance the concept of \textit{one best way}\textsuperscript{26} whose development may be found in the more modern \textit{Contingency Theory}\textsuperscript{27} – even the concept of quality may be considered no longer as a unit and global paradigm rather as an aggregate of numerous units which tend to achieve significant levels of usable quality, putting emphasis before on procedural and instrumental perspectives, then on those ones related to an entrepreneurial culture and behaviours modification.

It still lacks a final consideration about relationship between the theme of quality (in its different aspects) and managerial theories which offer to system territorial government techniques and instruments able to interpret the role of quality in an intersistemic o relational level among business enterprises. Perhaps, the reality is that as far as the concept of museum services quality is concerned, considered from a socio-economical regulation point of view, there is still a lot of work to do both on the \textit{on field} aspect (improve the culture and govern orientation of museum system to quality) and on the \textit{on desk} one (implement and improve existing instruments and techniques).

The arguments so far discussed, unfortunately, are the proof of an unequivocal data which emerges from researches carried out on the field: consumers/users (national and global) of museum services are unsatisfied with the quality of services offered by Italian museums.

We cannot get out of observing that the inability to evaluate resource deflations our cultural heritage in regard to its real value; this slow down the development of single areas (and not the entire Italian system) and it negatively weighs on the Italian museums system international comparison. Similar problems could be acceptable, because they are easier to administer, if they limit themselves to create a depauperation of local cultural resources with the reference to a limited area (local or regional relapse maximum), but unfortunately this is not possible because of the generalization on a national scale. Moreover, there is to consider the ease with which the customer/user of the museum service is able to put on a comparison, in short times, similar structures (for instance museum and archaeological structures) even if in different parts of the world; globalisation’s implications, therefore, by favouring the mobility of people determine, in fact, a comparison to the detriment of those systems less organized that offer services with a less qualitative content.

5. **CONCLUSIONS**

The picture emerging from this work is clear. Our researches show either the huge cultural heritage that the Italian museum system can boast compared with abroad, or a management and an organizational approach of the museum system which does not help enhancing, but

\textsuperscript{24} The term “quality” is, perhaps, one of the larger used in the entrepreneurial and managers language, but it is also the more ambiguous and less defined. According to somebody it is simply a “well done job” while for others is the “certification”, in other words the conformity to norms and, therefore, a guarantee form of respect of a certain numbers of procedures.

\textsuperscript{25} The majority of surveys have predominantly a descriptive nature, often centred on one or few cases of success (of Total Quality or of Certification) more celebrated than inserted in a coherent theoretical picture.


rather devalues such cultural endowment. This decrease in value is also helped by the direct management by the local body which distinguishes itself for not being specialized in performing this function and that is detrimental to the services provided. A museum system is normally meant for guaranteeing high quality standards, as it is expected by the public (front office); therefore it should also guarantee an adequate quality level of the operations carried out inside it (back office). Then, how such approach could be possible without a suitable training of the individuals appointed for managing a museum with such purposes?

A direct consequence of this is a dangerous spiral which mines the Italian tourist cultural development; and that because legislative measures hardly ever regulate the management of the museum systems in a univocal, standardized way, and sometimes they are interwoven with autonomies, subsidiarities and ministerial restrictions which aim at identifying more than one subject for the management of a museum. Being the condition of the Italian museum system as that we have above explained, that is mostly characterized by museums subject to ministerial restrictions and then to a little or absolutely non flexible and non proactive management, we feel the need for definitive regulations fostering the growth of the Italian museum system and then the development of territories. Within such a scenario which imposes restrictions and rules, we should probably reinterpret the conception of network (if existing) among the actors of territories, and get it readier to accept the information coming from the market (bottom–up), more positive and proactive, according to the acquired information, towards the regulating bodies, in order to push them to issue such restricting measures and rules according to environmental changes. The following “shower” effect (top–down) would be the base for a systemic regulation producing growth opportunities for the single units inhabiting the territory and for considering, not merely the privatization of museums, even if with a controlled intervention, but the need for a managerial management of museums, appealing to the strong points and reducing the weak points.

Therefore such actors should probably consider a more managerial management of the cultural system, since that now it seems to be inadequate and is a bar for the citizens in the way of the development of their territory. As above said, the intervention of private subjects helping to change, even if with due caution, the approach method to the management of museums could be positive for measuring the satisfaction of the public about the services enjoyed.

The risks deriving from such management are caused for example by a condition in which the cultural resources concentrated essentially on museums, represent a strong and strategic factor for a territory, and for that the bodies appointed to manage them could lose their control on the resources themselves in favour of solely entrepreneurial and economic interests, then upsetting the nature of the cultural resources available. On the other hand, the opportunity of fostering the launching of economic enterprises and the inflow of private capitals could cause a substantial abdication from their institutional tasks by the representative bodies of the communities to which museums belong.

It is also necessary to consider the fundamental contribution which the entrepreneurial and managerial culture could offer to the system as regards the financial, managerial,

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28 The announcement of the institution of a general direction for museums and the will of appointing, after an international competition, a manager having the task of coordinating a project of global relaunch of the Italian museum system has been recently published (source: Il Sole 24 Ore, July 16th 2008, nr. 195). In this regard, the Ministry for the Cultural heritage and activities (Sandro Bondi) has underlined how the autonomous managements represented by Town Councils, Provincial and Regional administrations working in partnership with private subjects, will be protected, because they represent “the right instrument” for helping the Italian cultural heritage overcome its crisis and solve the problem of lack of financial resources. The reformation of the Title V of the Constitution has given the Regional Administrations a legislative power as regards the enhancement of the cultural heritage and has made it possible to gradually regulate this sector at a local level.
communication/promotional and relational aspects, with repercussions on the international markets too.
A balanced relationship between public and private bodies, an alliance and not hierarchical relationship between them should be fostered, even if the differences of purposes cannot be excluded. In such a government, therefore, a differentiation of roles should be provided, for guaranteeing a contextual coexistence of synergetic integration of purposes oriented towards a common goal. Through this network system, provided with a central management point directing and guiding the development steps, a shared mentality of proactive guidance, anticipating the changes caused by global phenomena, could emerge.
This approach aims at enhancing such competitive advantages as: the size and variety of the historical-cultural heritage of a territory, as well as the need for a higher flexibility and care for the customer’s needs, in order to reach higher quality standards of the services provided and guarantee a greater production of social-economic value fostering the development of the territories themselves.

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INTERIOR DESIGN AND LISTENING TO CUSTOMERS.
THE EXPERIENCE OF THE COOPERATIVE CREDIT BANKS IN THE
VENETO REGION

Angelo Bonfanti*

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1. Listening to customers and services in banks
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1. Listening to customers and services in banks

The changes that banks as service companies are undergoing require their top managers to rethink company strategies in terms of service quality1, so as to satisfy customers more effectively and efficiently.

In order to succeed against aggressive competitors, it is no longer sufficient to offer a service that meets the customer’s expectations. Banks, constantly aiming at attractive quality2, try more and more to differentiate themselves, ensuring the level of implicit quality and rising above expected quality, tending towards a quality that is unexpected, if not even dreamed of, by customers3.

It is certainly not easy to pursue such a strategy, since customer satisfaction is relative and inconstant: it depends on the company’s capability to solve customers’ problems and fulfill their demands, needs and wishes. This is further complicated by the fact that customers are not homogeneous and constant over time4.

It is therefore crucial to know one’s customers, that is, to gather information about their needs and preferences, motivations and buying habits, ways of thinking and behaviors. This can be

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1 Service quality is:
  - subjective: it depends on the individual and on his expectations and perceptions, it cannot be generalized (what is quality for an individual is not necessarily quality for another;
  - relative: it is what is experienced by the customer at a determined moment, under certain personal and environmental conditions;
  - multidimensional: it depends on several factors which determine expectations (for example, word-of-mouth, past experiences or others’ experiences, direct knowledge, personal needs, alternatives considered) and the customers’ perceptions (for example: technical factors, such as professionalism of the personnel, organizational skills of the company, physical environment; relational factors, linked to the relationship between customers and front office; factors related to waiting time and communication issues revealed by the company), from which quality evaluation derives.
2 For a deeper insight into expected and perceived quality, see Zeithaml et al. (1990).
3 See Kano et al. (1984).
4 On the other hand, it is also necessary to avoid creating expectations that are too high and incompatible with the company’s possibilities.

Moreover, the customer’s participation to the service production, both as producer and consumer (prosumer), influences, often unwittingly, the result of the service delivery itself, so that it is the customers who causes the quality (or non-quality) of the service. The concept of prosumer is usually traced back to Toffler (1980).
done by undertaking market researches\textsuperscript{5}, by encouraging customers to express their complaints\textsuperscript{6}, or, if possible, by developing personal and direct relationships with them.

The Cooperative Credit Banks - local banks that follow the principles of cooperation, mutuality and solidarity - pursue precisely this second strategy. The territorial links allow them to get to know customers’ names and histories, and to develop with them a relation based on reciprocal trust that, reinforced by informal relationships, grows day after day in terms of reliability and trustworthiness. The fact of being banks of proximity, both physically and relationally, allows them to know the customers’ problems and to offer personalized services.

However, it is important to think about the fact that “there can be no knowledge without listening”\textsuperscript{7}.

It is usually the front office personnel who has the opportunity to find out what the customer requires, by assessing the customer’s problems\textsuperscript{8}. The personnel should be able to understand both strong and weak signals sent by customers through verbal or non verbal communication. In addition to the professional skills related to the understanding of contents and to the technical solution of the problem, it is also necessary to develop empathy, a personal skill that allows the personnel to experience the customers’ perspectives and situations.

Listening is thus both an intellectual and an emotional act, much different from the physical act of hearing\textsuperscript{9}, which does not require a common commitment nor reciprocal understanding in order to be elaborated\textsuperscript{10}. While it is possible to hear automatically, because hearing is physiological, listening can be a matter of method, based on techniques and rules\textsuperscript{11}, which should be promoted and implemented by the top management in service companies, by requiring such skills to the front office personnel.

It could be said that listening goes through different actions, which can be attributed to the following skills:

- the ability to assess the customer’s problem through listening, observation\textsuperscript{12}, intellelctive or imaginative intuition\textsuperscript{13} and emotional perception,

\begin{itemize}
\item \textsuperscript{5} For instance, it is possible to administer questionnaires by phone, mail or face to face.
\item \textsuperscript{6} For an analysis of the reasons why customers prefer not to complain, see Bateson and Hoffman (1999). It is often useful to ask questions, as this creates a form of cooperation with customers aiming at solving their problems. See Romiti et al. (1992, pp. 47ff).
\item \textsuperscript{7} See Crozier (1989).
\item \textsuperscript{8} In this sense, listening is a voluntary, intentional, free and deliberate act. See Passerini and Tomatis (2003, p. 68).
\item \textsuperscript{9} See Passerini and Tomatis, (2003, p. 47).
\item \textsuperscript{10} See, among others, Amason (1996).
\item \textsuperscript{11} See Bone (1988) to think about and work on the ability to be careful and reduce inattention, which implies high costs; Jaoui (1990) to listen to the problem and understand the naivety of perception; Gbézo (2000) and Sclavi (2000) for some rules on the art of listening.
\item \textsuperscript{12} According to Starobinski (1975), listening starts with the look, that is, with the attempt to establish a relation with the other. It does not start through watching, which allows instead to gather images and thus information. Others claim that “they are nothing but different moments of the same process through which sociability is defined” (Bosi and Campanini, 1997).
\item \textsuperscript{13} “It is only by grasping the nature of what happens that, intuitively, I can readily understand and evaluate a fact, based on open mental schemes and without reflection. Similarly, it is only by observing a change that we can increase our ability to feel, that is, to become aware of a given situation” (Baccarani, 2005, p. 27).
\end{itemize}
- the aptitude to care about the customer, paying attention to his requests in order to understand his problem,

- the will to get involved in the search for a solution, identifying with him and being aware of the relevant services and of their advantages,

- the capacity to communicate to the customer the best possible solution, or to direct him to someone in the bank who could help him find the solution.

In order for this process (schematized in Figure 1) to take place effectively, it is necessary that both parties, producer and consumer, adopt a cooperative attitude, alternating conversation with active silence.

Figure 1: Listening and customer satisfaction

Since listening allows to get on the same wavelength as clients in order to solve their problems, any service company, including banks, has a chance to improve in terms of:
- analysis and evaluation of problems,
- efficiency, flexibility and internal management,
- communication,
- development of trust relations,
- better knowledge of clients.

14 The term used in managerial literature is “active listening”.

15 Dinouart (1995) proposes some principles for being silent and different kinds of silence.
Within the organization, the role of listener, or “sentry”\textsuperscript{16}, is assumed by the front office personnel, whose skills should be developed especially in terms of communication and interaction\textsuperscript{17}.

Still before making contact with the personnel’s politeness and helpfulness, the customer evaluates the service quality by getting in contact with the physical setting of the bank\textsuperscript{18}. As it is known, in services “everything speaks”\textsuperscript{19}: furniture and equipment, cleanliness and communication signals, quality of the air and temperature, sounds and smells, influence the quality perception of the customer.

Without getting deeper in these issues, which have already been examined in environmental psychology studies\textsuperscript{20}, this work aims to show the usefulness and the difficulty for banks’ top managers of taking care of interior design in the perspective of improving the listening to customers.

Then, taking into account the situation of the Cooperative Credit Banks of the Veneto Region, the present work proposes some typologies of banking windows - created thanks to the listening to customers - which are innovative as far as interior design and physical layout are concerned.

2. In services “everything speaks”: the communicative role of the bank’s structures

When a customer enters the bank, he directly and constantly interacts with the services on offer, evaluating the service quality through the contact with the personnel, the structure, the equipment, the layout, the design and the environment\textsuperscript{21}. He is satisfied if the company was able to:

- offer to him products or solutions adequate for his needs and expectations,
- keep to the conditions (of payment, for instance) agreed,
- supply the service with professionalism, politeness and organizational competence,
- manage waiting times adequately,
- ensure safety, reliability and privacy,
- show him care and attention as far as interaction, communication and information are concerned.

The bank should not only consider the utility content offered to the customers, but also the whole process of service usage. Moreover, with reference to the physical environment, the different needs of the front office personnel and of the customers should be taken into account.

\textsuperscript{16} See Baccarani (2007).
\textsuperscript{17} For a review of the main professional and personal skills of the front (and back) office personnel, see Barbarino, Leonard (1997, p. 82). Albrecht (1992) examines the relational mistakes that should be avoided in the relations with customers.
\textsuperscript{18} Perceptions and expectations can arise even before entering the bank, since the client can start his evaluation based on advertisement, location, accessibility, signs, building, parking space, as well as on word-of-mouth, which spreads the image and the reputation of the bank.
\textsuperscript{19} See Eiglier and Langeard (1987).
\textsuperscript{20} One of the first works on this subject is Mehrabian and Russell (1974), which illustrates the impact of the physical environment on the individual in terms of approaching or avoiding a company. Later on, a famous re-elaboration of the model has been proposed by Bitner (1992), who describes the impact of the physical characteristics of the environment (servicescape) both on customers and on front-office personnel.
\textsuperscript{21} Normann (1984) introduced the concept of “moments of truth”. In particular, Karl Albrecht considers moments of truth as “each episode whereby the customer comes into contact with any aspect of the organisation and gathers and impression of the quality of the service” (Albrecht, 1992, p. 20).
Bank workers require a satisfactory working place, where they can express their professionalism at best and where the stress caused by inadequate structures is reduced to a minimum.

Bank customers require the quick and discreet fulfillment of the routine operations and/or a personalized consultancy, possibly fast, in a quiet and discreet environment, with a pleasant and stimulating atmosphere. In fact, customers are more and more interested in the non-material aspects of banks, and design is a relevant part of these aspects.

Since the physical equipment can facilitate bank workers speaking with (and listening to) the customer, the top management should plan the physical dimension of the environment with reference to the social dimension.

Planning the interior design of a bank means not only a technical renovation, but also a new integration between form and function. It is not only an aesthetic and cultural change of the physical environment, but also an increase in the added value, which the customer can perceive at a sensorial, cognitive, emotional, relational and value level. It implies a valorization of the interior design and of the layout, that is, the setting of the equipment, furniture and routes, in order to satisfy the customer and improve the efficiency of the service offered.

Being known that in order to assist the customer effectively and efficiently it is necessary to eliminate all possible obstacles (physical, visual and auditory) that hinder communication, many banks have developed interior design projects, restructured or modernized the old offices, creating open space structures where banking windows have almost totally disappeared to leave space to counters without bulletproof glass, to facilitate a more direct contact with the customer.

In spite of the fact that contemporary tendencies in interior design tend towards minimalism, furniture and settings are more functional, accessible, comfortable and convivial, characterized by an increased attention to colors, lighting, audio and video information and signs. The aim is to create a modern, attractive and stimulating environment for the customer. Moreover, there is an attempt to increase the quality and quantity of spaces in order to adequately support the activities of intermediation, service delivery, selling of financial products and personalized assistance. On a general level, the areas dedicated to cash transactions and information are separated from the consultancy offices. Low added value services are usually automated through machines located inside or outside of the bank, often near the entrance. Paying attention to these aspects may seem elementary, but they are actually of fundamental importance in the relationships with customers.

An efficient interior design generates considerable advantages for the customer: in particular, it can reduce the time required to carry out operations, allow to get indications about the quality of the customers’ experience and increase their trust in the bank.

The bank personnel can also gain something: in particular, their vital space can be improved, they can get more satisfaction from their job and become more productive, increasing their sense of belonging to the company and their motivation.

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23 In this sense, FITZSIMMONS and FITZSIMMONS (1994) distinguish the service/product layout, typical of those services with a fixed series of operations which the client has to carry out in a sequential order, from the process layout, which includes all the activities carried out in different locations and offices, around which the customer can move freely. When realizing the first kind of layout, a service company aiming at effectiveness can create a flowchart in order to analyze the critical issues (PELLECCELLI, 1997).
24 It is useful to underline that the atmosphere thereby created cannot have the same effects on all customers. The planning should start from an analysis of the customers’ behaviors and preferences. Therefore, it is important for the bank to consider its target. In this sense, KOTLER (1974, p. 48) proposes some questions useful when developing a project for restyling the physical environment.
Interior design has always had a strategic function for every bank, which can thereby differentiate itself from the competitors, transmit a new image, sometimes creating and spreading a corporate image, and increase customer loyalty through barriers at the exit. However, despite the potential advantages, it is not easy to develop an interior design project for a bank oriented towards dialogue and listening to customers. The main obstacles are:

- **economic**, particularly related to the necessity of big investments in order to sustain the high costs of restyling, modernizing and innovating the layout,
- **technical**, linked to the limited availability of space, that has to be distributed between working space and places open to the public, to the search for flexibility and to the necessity of meeting the safety requirements and the particular construction standards imposed by architects and designers,
- **intangible**, related to the nature of the service itself, which is by definition immaterial,
- **relational**, linked to the different typologies of actors that are present in the bank, everyone with different needs and personalities,
- **cultural**, due to the lack of motivation of managers and bank workers towards restructuring that goes in this direction.

The obstacles are more difficult to overcome when the bank is characterized by a non-innovative management, skeptical towards the structural innovations that require going beyond the ordinary. In this case, it is useful to start a cultural program joining art and intelligence in order to offer a service aiming at excellence.

Among the Italian banks that started a restructuring project of the physical environment, the CCBs of the Veneto Region have developed projects for many of their branches.

### 3. The Cooperative Credit Banks in the Veneto Region and customer care centers

In the last years, many Cooperative Credit Banks have renewed their image, renovating the interior design of many of their branches in the Veneto Region area.

The most significant innovations are related to the creation of banking windows with a more innovative design both from a structural point of view (external and internal architecture and layout) and from an environmental point of view (in particular, visual, auditory and tactile stimuli through dimensions, shapes, colors, lights and temperature).

The aims that the bank top management pursues through this renovation are:

- to guarantee customers more privacy, thanks to the ad hoc glass screens that can be closed after the customer has entered the open space where the front office personnel works,
- to ensure front office personnel a more functional working space, allowing them to carry out not only cash operations but also consultancy services in privacy and safety. In this sense, it is interesting to notice how the profession of the front office personnel has changed: the role of the cashier requires more and more competences.

In particular, the glass screens are transparent, with some satin lines, so that they allow customers to see from the outside if the consultant is present and available.

In spite of the glass screens, the access to the cash area is spacious in order to allow elderly people, mothers with prams and people with disabilities to enter easily.

Between the customer and the bank personnel there can be a counter or a desk, big enough to offer a support for documents and other useful material or promotional/informative leaflets and brochures.

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25 In Italy, such architectural valorization of banks has only started in the last years, regardless of the banks dimensions. For a European perspective on bank marketing, see Scott (1995, in particular part two).

26 “A bank should not give the impression to have invested too much in furniture”, because customers feel that they have contributed to it with their savings (Baker et al., 1988, pp. 33-42).
There are also high leather stools with a soft séance, joining comfort and quickness: the customer can decide whether to sit down depending on how much time he needs for cash operations or consultancies, and stand up easily once he has finished. The comfort is thus guaranteed during the session.

This layout creates a relation on equal terms between customer and personnel: they are sitting in front of each other, at the same level and with the possibility to communicate *vis à vis*. The room’s dimensions can be defined as “customer-tailored” (as well as “personnel-tailored”), because they allow everyone to move freely around them.

The shapes used are different in order to create a harmonic environment: the room is rectangular to make the most of the space available, while furniture has rounded shapes to offer higher comfort.

As far as colors are concerned, wood-like colors are used both inside the room and in the rest of the building, since the bank wants to transmit a homely feeling and at the same time an idea of credibility and professional trustworthiness, further enhanced by a warm, pleasant lighting.

Particularly relevant for its innovative design is the Polesine Cooperative Credit Bank, situated inside a shopping center, a place characterized by a high concentration of services and located in a non-central but easily accessible area.

In this branch, the top management has implemented the banking-window model illustrated above, but it has also gone further in trying to propose an image of a bank close to the needs of people. In fact, the shopping center is a relational space, a place of socialization and communication, characterized by a multiplicity of people.

The bank is strategically positioned: in a corner between the two corridors leading to the supermarket entrance.

Starting from the outside, everyone is attracted by the structure: not only for its big horizontal neon sign that identifies the bank by its name, but also because of its unusual entrance. It is entirely open on two sides, front and left, without physical and architectural barriers at the entrance (the so-called secure portal), and without bulletproof glass, banking windows and metal-detectors, while the right side is closed by a satin glass with the CCB symbols printed in transparency.

The design of this bank is oriented towards allowing the customer to freely get in, conveying a sense of continuity with the surrounding environment of the shopping center. It is attractive and it invites customers to get it, so much that he might not even notice he has entered.

It is possible to get in with shopping trolleys (not only in the bank, but also in the banking room) and with kids, who can watch TV sitting on multicolored chairs especially designed for them, while their parents are in the banking room or in the director’s office.

The waiting time is organized also for adults, who can sit on comfortable leather sofas in front of the cash boxes, read newspapers, get information about the bank thanks to the video-walls on the bank’s side walls.

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27 The bank is in Giacciano con Baruchella, inside the shopping center “Il Faro”, and it was opened on the 2nd of June 2007. We thank Dott. Remo Previatello, General Manager of the Polesine CCB, for his helpfulness and for the time he dedicated to us during the meeting, as well as for the precious information he gave us.

28 See AA.VV. (2008). The services offered are mainly directed to the average shopping center customer, that is, to families. The consultants do not only deal with bank accounts, payments and other ordinary operations, but also offer savings and simple investments products through personalized consultancies.

29 The top management nonetheless guarantees safety thanks to the presence of hidden close-circuit television cameras.

30 About the management of the customers’ time, see Fessard (1995). With particular reference to the management of waiting times, see Maister (1984).
The shapes are mainly rounded and harmonious, the spaces limited and well organized, the colors warm (red and yellow), matching with the shopping center’s ones but just a little darker, probably to communicate more sobriety and reliability. Since the structure is open, the music and sounds of the shopping center get into the bank, but they do not interfere with the communication between customer and personnel, who are isolated from the rest of the environment thanks to the glass screens.

With reference to the low added value services\textsuperscript{31}, customers can carry out routine operations, such as cash withdrawal and deposit, through ATMs located at the entrance. Thereby, waiting times are reduced and the personnel can dedicate more time to consultancies.

As this bank is oriented towards listening to customer, there was great appreciation for the decision to keep it open on Saturdays, the day traditionally dedicated to shopping. The day of closure is Monday. Such differentiation from other bank branches and competitors is a significant element of competitive advantage, as well as a way of getting closer to the customers’ needs.

The top management also decided to offer a series of services to the shopping center’s shopkeepers, who can get specific consultancy and use ATMs, cash machines and money exchange services even when the bank is closed\textsuperscript{32}.

Not only getting in, but also getting out of the bank is easy, since there are no fixed routes to follow.

Table 1 summarizes the main design elements realized by the Polesine branch of the CCB and the aims pursue in providing services to the customer.

\textsuperscript{31} The external and internal signs of the bank are well-located and allow clients to discover and find quickly the various services.

\textsuperscript{32} During closure times, the access to the three banking rooms and to the automatic cash box is blocked through roller shutters, while it is always possible to access the ATM area, the safe-deposit boxes, the money-changer and the cash machine. Thereby, the client can dispose of the bank services at any time, thus increasing the sense of proximity.
Table 1: Structural and environmental design elements of the Polesine CCB

<table>
<thead>
<tr>
<th>Design</th>
<th>Physical and sensory elements</th>
<th>Services offered to the customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td>Central and angular position</td>
<td>Visibility and geographical proximity.</td>
</tr>
<tr>
<td>design</td>
<td>Open space structure (no barriers at the entrance) and free access with shopping trolleys and kids</td>
<td>Freedom of movement inside the bank and easy access to it.</td>
</tr>
<tr>
<td></td>
<td>Magazine racks and video-walls to entertain adults and children</td>
<td>A shorter and pleasant waiting time, during which customers can amuse and inform themselves.</td>
</tr>
<tr>
<td></td>
<td>Comfortable sofas and chairs</td>
<td>A comfortable waiting time.</td>
</tr>
<tr>
<td></td>
<td>Cash boxes with automated glass screens, spacious hall</td>
<td>Discretion and privacy, easy entrance and exit.</td>
</tr>
<tr>
<td></td>
<td>Spacious counters or desks in the banking room</td>
<td>A support for documents and other useful materials.</td>
</tr>
<tr>
<td></td>
<td>ATMs, cash machines and money exchange at the entrance</td>
<td>Less bureaucracy, shorter lines at the counters, more time for consultations, routine cash operations available 24/7.</td>
</tr>
<tr>
<td>Environmental</td>
<td>Glass screens with satin lines between the banking room and the waiting room</td>
<td>Possibility to check presence and availability of the consultant.</td>
</tr>
<tr>
<td>design</td>
<td>High leather stools with soft séance in the cash box</td>
<td>Comfort during the session.</td>
</tr>
<tr>
<td></td>
<td>Structure’s dimensions</td>
<td>Possibility to move around easily.</td>
</tr>
<tr>
<td></td>
<td>Different shapes</td>
<td>To communicate harmony and safety.</td>
</tr>
<tr>
<td></td>
<td>Warm colors</td>
<td>To transmit a homely feeling, credibility and professional trustworthiness.</td>
</tr>
<tr>
<td></td>
<td>Warm lighting</td>
<td>To suggest a warm welcome and a pleasant feeling.</td>
</tr>
<tr>
<td></td>
<td>Sounds</td>
<td>Possibility to listen to music and information during the waiting time, but quietness during the consultancy.</td>
</tr>
</tbody>
</table>

Source: Our elaborations

This bank, characterized by a modern and open environment, can be considered as an innovative approach to the “attractive bank”: customers are invited to get in even just to visit it. Many aspects create a dialogue with the customer during which it is more important to listen than to speak.

As far as customer satisfaction is concerned, the feedbacks obtained by the front office personnel and by the management have been more than positive: customers have expressed very positive judgments, mainly through informal chats, appreciating the new design and the efficiency of the service after the renovation.

The examples illustrated above show how CCBs are able to put the customer at the center, find quality in the details, improve constantly and acknowledge the value of quality even in the small things of everyday life.
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“BEYOND RETENTION” IN BANKING SERVICES

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This article discusses the findings that have emerged from the studies developed until now, in order to identify a new approach that goes beyond retention, driving us towards the so-called hyper-retention\(^1\), through the “additional” logic that calls banks to analyse what they may/have to add to and/or integrate into their performance to grow in customer retention.

Here described is both an improvement of the empirical model identified in year 2000\(^2\) (now modified in components and numbers) and an evolution of itself (with some new variables and approaches), whose realisation is based on three main lines:

- the model’s basic theoretical notions
- its test through the comparison with the existing literature
- its validation through empiric applications

Doing so, we reach another stage of the retention process, and push ourself towards an extra step to capitalize the marketing efforts due to win and maintain active customers. It has to be said, also, that this model takes inspiration from what is written about the four steps (purchase, re-purchase, retention and beyond retention) and some of the key variables, including involvement and relation.

In fact, the strain stated since now is that of realizing a model sustained by available literature but, at the same time by real and pragmatic managerial applications.

The components described in this article:

1. “C-Beyond” model (in italian Oltre)
2. Performance’s bi-directional disaggregation
3. The “information-relationship” matrix

1. **“C – Beyond” model**

Here is the effective description of the model that gives its name to the chapter and this is the visual explanation (figure 1).

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\(^1\) M.Cavallone (2000), p. 71
\(^2\) M. Cavallone, “Oltre la fidelizzazione: il marketing nell’era della complessità”, F.Angeli, 2000

As seen in the picture, it is possible to shift the model in two components, both preliminary and complementary, that identify, first of all, the cognitive aspects with the basic philosophy, i.e. aspects concerning the strategic idea that include the logic of the model structure. In the second place, the part of the “operative model” where the steps to take in order to materialize the theoretical assumptions previously explained are described.
2. “C-Beyond” model: cognitive aspects – strategic thought

The first part of our analysis takes into consideration the cognitive aspects concerning with the strategic idea of the company: a kind of common denominator on which basis the company philosophy with which to go beyond retention; inside the model are the aspects that are linked to the accomplishment of the operativity part of this model.

The first level is described by means of 6 terms whose initial letter is “C”, giving the name to the “C-beyond” model; the terms are the following:

- Compression
- Consideration
- Comprehension
- Compromises
- Conduct (behaviour)
- Consciousness

1) COMPRESSION:

The term comes from the latin verb *comprimere*, and means the shrinking of an object under the action of forces applied on its surface (from Zingarelli dictionary). In “C-Beyond” model we mean compression as, first of all, the pressures coming from time shortening: “people have no time to wait, no time to come back to the retail store, no time to explain twice what they need..” (Cavallone, 2000, p. 93).

Companies today front new competition, based on time and an ever faster changing context (Arbore and Busacca, 2007). This compression is, also, the result of the increasing diffusion of new technologies, that allowed the consistent reduction of space-time barriers (Kotler and Armstrong, 2006). All this enabled time to become incredibly important for customers: according to Pruyn and Smidts (1993), the production increase in our economy generated the new need of having more time for products “consumption”, due exactly to their contemporary abundance. From this point, companies’ imperative is to manage correctly “customer service time” (Fessard, 1995), avoiding delays or managing them with specific strategies when they happen (East, 2003): production, demand and perception management.

In conclusion, compression puts the company in front of the necessity of being quick in answering customer’s needs, because he will give extra value to the time at his disposal, making only one delay harm the whole service and consumption experience (East, 2003).

2) COMPREHENSION:

The term comes from latin *comprehendere* and means the ability to understand; it also means to include, contain and hold (Zingarelli dictionary). For a company, this means “knowing exactly and clearly who the customer is, his needs, his expectations, what is he giving attention to (key factors in the purchasing process) and what can be offered to be distinctive among the competitors and to win his preferences. (Cavallone, 2000)

Worldwide, businesses spend approximatively 20 billion dollars every year to understand their market (Ceccarelli, 2006): this is also a result of the compression explained before, as it forces them to take the right decisions in a short amount of time.

Specifically, we need to comprehend which elements cooperate with customer satisfaction and with creating positive experiences. (Eiglier et al., 2006): on a basic level this can be
obtained applying the SERVQUAL methodology\(^3\) (from Parasuraman et al., 1985); in addiction to this there are some other techniques such as the critical incident technique, useful to go more deeply into the matter (Eiglier et al., 2006).

3) CONSIDERATION

The term refers to an accurate exam, a careful and sustained observation based on thoughtful reflections, reading, etc (Zingarelli dictionary). Consideration is represented here as the real and objective acknowledgement of the importance given by the company to the client, seen not only as a contributor to sales, but also as a source of valuable information as they are the basis on which to create a specific product for him and for other customers. It is a sort of co-production of value that happens, for instance, through the involvement of some so called “lead users” when designing the product.

4) CONSCIOUSNESS

The term assumes the meaning of being informed and conscious, of being aware of a fact or a situation (Zingarelli dictionary). In “C-Beyond” model, it signifies the consumer’s discretionary power, as he is ever more aware of his rights and of his value for the company and is carefully and sophistically conscious about it. The two key words that describe consciousness are: advanced consumerism and prosumerism (Cavallone, 2000). In services marketing, and widely in an experiences sphere, the consumer represents the main junction between time of production and time of consumption, having a share in defining output quality (Cavallone, 2000, Lugli, 2005). This active collaboration given by customers goes towards an advanced prosumerism, like what happened with home banking, where the individual creates his own customized bank services by himself.

Consumerism and prosumerism are the key concepts when talking about customers aware of their rights and value, charachters pro-active in their consumption experiences and not just simple receiver of products and services. However particular attention has to be given to the evolution of the market structure because, as Ricotta (2005) states, on one hand the growth of criticality of the consumption system can be seen as positive, on the other hand this could also mean an excessive “on behalf of the customer “approach.

5) CONDUCT (Behaviour)

Conduct is the set of observable actions in an organism (Zingarelli dictionary). Today a company, seen as a living structure (Golinelli, 2000), being more and more subjected to compressions and aware consumers, has to put new attitudes in action in order to satisfy expectations.

6) COMPROMISES

The term, in latin comprimissu, means a mutual promise, the agreement between two or more people, theses, etc. that are in conflict, where both parts renounce some of their claims (Zingarelli dictionary). In “C-Beyond” model this may indicate that the consumer

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\(^3\) SERVQUAL measures both consumer’s expectations on what the company should offer and their perceptions of the effective performances of the supplier in terms of: tangible aspects, reliability, trust, empathy and ability in answering.
has to be aware of the fact that paying an extra price means also receiving an extra quality product/service/experience. When arranging its proposal to the client, the company could be unable to serve perfectly the customer: in this case it must be reached a compromise, that gives maximum satisfaction to clients without affecting economic return (Finch, 1999).

If they don’t come to this compromise, the company may encounter the “never ending retention story”, which is “offering incremental added value performance, but with reduced return” (Cavallone, 2000). This leads to a vicious circle that compromises the company’s permanence into the market, because it subtracts profit contribution from the business.

3. Bidirectional performance disaggregation

3.1 Performance “on customer” analysis

With the term “performance on customer” we mention the detection of the matters that lead the customer to prefer one product or service instead of the competitors’. The word “on” here refers to the whole of skills shown by the company in creating a more appealing offer in terms of getting next to the customer’s desires, in other words its performance ability towards (on) the client. It is a matter of highlighting through a deep analysis the Purchase Key Factors: these were described by Olson and Reynolds, 1993 as “attributes” that determined the choice of the customer; references in literature referring to “purchasing” and “creating value for the customer” can be seen as propedeutical in that phase, but up-to-date at this point.

To define the constitutive elements that lead to the purchasing choice first of all we need to distinguish two macro-categories of Purchasing Key Factors:\textsuperscript{4}: the \textbf{technical} (or performance) ones referring to the hard/rational part of the decision, connected with the performance ability of the product/service, and those that are \textbf{relational}, linked to the soft components related to relational, emotional and experience aspects (figure 2 “performance “on” customer: constitutive scheme”).

\textsuperscript{4} Olson and Reynolds suggest the difference between concrete attributes, mostly one dimensional, directly measurable and connected to the product characteristics, and the abstract attributes, mostly multidimensional, not objectively measurable and not connected to the physical characteristics of the product.
The “specific” weight of the two groups of factors varies in composition and duration; it also depends on the commodity sector involved, as also the type of customers and the current offers. In particular, in the retention phase and even more in the processes that go beyond retention, suitable performances and the technical aspects are taken for granted, while relational, experience and emotional factors are viewed with growing attention, being more related to the very moment of purchase. Through these last ones the company is able to create real involvement\(^5\) into the customer’s mind and obtain his loyalty.

Every company, basing on the specificity and the phase of retention, determines from the very start through market research (direct interviews or focus groups) the first group of technical and relational PKF, on which to frame their basic offer. In second place, before the action of delivery, they personalize and update that group of factors by customization. This can happen, for instance, through multivoting\(^6\) practices that lead to the creation of two restricted lists, containing the fundamental PKF that are subsequently mixed, with different specific weights, in the Delivered Mix submitted to the customer. In alternative, to measure the importance of those factors, conjoint analysis (Molteni and Troilo, 2003, p. 363) can be very useful.

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5 See “involvement” in the previous chapter.

6 Based on the approach of the author, multivoting process enables to reach a good level in significance as well as a simple way of implementation. In literature, the popular four methodologies to define the criteria in choosing attributes or purchase key factors are: the subjunctive, disjunctive, lexicongraphic processes and those suggested by Fishbein that can be used as an alternative to the multivoting.
The two lists here reproduced, contain some examples of PKF in the bank sector belonging to the two “technical-rational” and “relational-emotional-experience” families seen before:

**TECHNICAL-RATIONAL PURCHASE KEY FACTORS in bank sector**

Agreements
Answering/delivering speed
Answers accuracy
Conditions flexibility
Economic advantage
Extra services
Fulfilled promises
General organization
Instalments
Interlocutor know-how
Location
Merchandising
Offer clearness
Offer innovation
Opening times
Parking
Performance continuity
Price
Product choice
Quality certification
Rooms hygiene and cleanliness
Service quality*
Special offers
Specialization
Structures
Technical information
*When measured through surveys (es. SERV/QUAL).

**RELATIONAL-EMOTIONAL-EXPERIENCE PURCHASE KEY FACTORS in bank sector**

After-sales service
Collaboration with customers
Company/product image
Courtesy
Customer listening
Customization
Emotions
Friendliness
Internal climate
Kindness
Needs sensitivity
Niceness
Obtained consideration
Perceptions
Sensoriality
Service quality*
Social involvement
Trademark popularity  
Trust  
Willingness  
*Here seen as a perception of the relation between expected and effectively received.

After submitting these factors to multivoting (or following the suggested approach from conjoint analysis) the company strengthens the determinant elements focusing on the dynamic competitive advantages\(^7\) related to them, creating differentiation with competitors, is the only way to survive, develop and be successful in the present and future.

3.2 Performance “of” customer analysis

As described before, the analysis of the performance on customer helps the company to focus on the reasons, the elements and the attributes of the customer’s choice. This first step of internal analysis is fundamental to understand the lived experience in client’s choice between different commercial proposals; the research on gaps emphasizes possible differences between what has been planned and what has been delivered, always with a reciprocal look. At this point verifying the second component linked to bi-directional performance disaggregation becomes very important. Actually, together with the performance “on customer” analysis, and in particular the PKF on which competitive advantage is based, the company, followind the “beyond” model, performs this second disaggregation of performance of customer, in other words how much the client “hands-over” (the costumer contribution to the company). It’s a sort of balance that allows the evaluation of every client’s contribution, studying his personal contribution towards the company through some indexes that compare the different performances of the whole of customers. These are estimated for their single contribution in both technical and rational elements, beyond synthetic index such as Customer Lifetime Value (CLV). The analysis process in performance of customer can be outlined through the retention matrix, as seen in figure 3:

\(^7\) We here refer to the concept of “rolling competitive advantage” (Cavallone, 1990) as the ability in creating differential and dinamical-continuative competitive advantages by the company in order to detein a real leading separation from the competitors, especially in high technology sectors.
## Retention Matrix

The creation of the retention matrix takes off from the identification of the main customers for the bank, in order of importance. This ranking method seems restrictive because it often considers a one variable classification, usually the turnover, and does not take into consideration many other technical and personal relevant factors, forcing into having a short-sighted vision of performance and customers.

The Retention matrix has the purpose of giving an holistic approach to this analysis, taking into consideration technical and relational characteristics, for example those shown in figure 4:

### Table 1: Retention Matrix

<table>
<thead>
<tr>
<th>Initial customers ranking (A)</th>
<th>Total</th>
<th>Real Final Ranking (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover €</td>
<td>Profit Margin</td>
<td>Competition</td>
</tr>
<tr>
<td>1. Bleetech</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>2. K &amp; G</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>3. West Corp</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>4. Toomy’s</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>5. J.F.W.</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>6. Roading</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>7. Pro-Diesel</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>8. T.R.Trade</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>9. Maxi Press</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>10. New BC</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

**Figure 3: Retention Matrix**
The number of technical and personal factors here listed, and their own importance, depend on the company’s specific sensitivity, on the examination level, on the type of competitors and so on, and in any case, the factors choice, their number, weight and order highlights the estimation strategy or in other words the expectations in performance. For both categories a restricted number of main factors are selected, as the expression of the company’s strategic choices; the sum of these factors can be considered as a synthesis of the company’s estimation strategy.

For each of the factors found, we have to evaluate the performance of the single customer, giving a score from 1 to 10. The final evaluation derives from the addition of the performances of the single factors: we get a new customer classification in order of “importance”, usually resulting differently from the rank obtained only with the turnover analysis.

Choosing this way of classification really represents added value for the bank, meaning real consciousness about their customers group.

An advantage given by the use of this matrix is that it allows us to know the real and concrete added value delivered by each client; there’s also the possibility of customized strategies for the customer based on a well-considered mix of elements and not only on the volume and the revenue developed.

This matrix can be read even adding what comes out from both technical and personal factors and creating one classification based on the priorities and the strategy of the company.

4. “Information-relationship” matrix

We now proceed in examining the “information-relationship” matrix that materialize the last “C” of this model, at the voice Actions on Customers.

The “information-relationship” matrix is a synthetic instrument that include both the four main types of customers active on the market and the behaviours needed with every kind of client. It helps in defining the contact attitudes that lead to the fourth and most important step, that of partnership (Cavallone, 2000) with customers.

Figure 5 is created on two basic ideas, information and relationship, together with high or low quantity; mixed they identify the matrix.
From the combination of these two elements and the high and low orientation we identify 4 main categories of customers that can be orientated to: transaction, relationship, information, partnership.

The first customer typology indicates a low orientation both to relationship and information, it is located in the first square and can be identified as “transactional”; in this case customers are very careful of the economic transaction itself and they expect from the company’s performance only what is usual in the synallagmatic relationship. The information required is limited to the functional aspects (instructions and how to use the product) or to aspects related to the guarantee and the spare parts; in their relationship with the company everything is cut to the minimum in terms of personal contact.

The main incentive of this cluster is the economic aspect, being careful about bargain prices, special offers and low prices in general. Transaction’s priority is to obtain that particular object at the best economic conditions possible.

It’s easy to see that this type of customer is at the same time difficult to retain and of small interest for the company to retain too. Looking at the retention matrix seen before, we can expect, for example, that in terms of redditivity-margin the transactional customer will get low grades for his low propension to personal envolvment, spontaneous or inducted; on the contrary, operating in a switcher mode he’ll probably move from bank to bank depending on the best conditions offered to satisfy his needs. In this category, for example, can be included those customers that prefer a bargain offer, rather than being faithful to a specific bank, or the kind of customer that dedicate a lot of time to shopping, searching for the financial service (a loan, a checking account, etc) they need at the lower price.

Every customer is free to use their money and time as they prefer; from the bank’s point of view this customer may not be interesting in the short (unless they need higher volumes) and long term for a retention process; the customer will be unlikely grow in interest for information or relationship, as it has no immediate economic return.

Moving to the second square, we find the type of customer that is more interested in relationship rather than information. In this case customers appreciate the efforts made to establish some personal contact; we can see here some of the relationship marketing defined before. It seems appropriate to suggest a theorical extension of the concepts related to communication identified by Nikolasos Papavassilious and Vlasis Stathakopoulos (1997). In

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their work, the authors introduce the concept of “continuum”⁹ and state that the communication in the international marketing process happens through continuous ways that are connected to continuous processes of standardization and adaptation. At the same time, they are convinced that the relationship with the customer is created with a “cross-eyed” logic, both in quantitative and in qualitative terms. For the first one, with a continuous relationship built “ab origo”, in other words without the use of some “spot forms”, usually aimed at other commercial proposals (last minute, clean up, ante face lifting products) or at forced relationship (recall from the company to substitute some faulty pieces); on the qualitative side, customized to the customer attending to his specific needs and expectations (“unicuique suum”).

Post-sale interviews, satisfaction response form, contacts to give further information on the product or the guarantee, are some examples of those behaviours that can be seen as “cuddles” (as George refers to in his work¹⁰). It is obvious that at the same moment that the company gets in touch with the customer, it also gives information (as much as they are asked for) but the main aspect is that they create a bond between each other, with the interest in knowing opinions and in letting the customer know that the company will be there and care about him. To make this action become real it is important to have outgoing and propositive staff to follow customer management.

Customers in the third square care more about information and not so much about relationship; this type prefers having a contact with the bank with the only aim of obtaining information on how to create value from himself as a person, the service or its management. For information we mean all data that appeals as a value creator and can range from continuative to occasional, from really complete to superficial.

An example can be the financial sector, as some customers once they’ve chosen their investment, would like to receive specific information (not occasional or standard) found in specific printed reviews or sources, because they prefer to stay in touch personally. For some other customers rapidity in getting information means all, as they perceive as value added service this time reduction in giving information. Not necessarily information has to be referred to products or services supplied by the company, but can also involve the personal sphere of the customer (hobbies, interests or passions), collected in an anamnesis relational phase as “primary data” managed through a marketing database, they become real drivers of value-attribution.

It is clear that the attention given to this relationship and those for the distribution of information are retention tools.

The last square is the most longed for by the bank, as in these customers there is high interest in both relationship and information. When the client receives-perceives (and gives value too) that both his expectations in information and relationship have been completely satisfied, the concept of specific involvment¹¹ materializes and the retention steps up to the next level: partnership with the bank¹².

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⁹ Papavassilious N, Stathakopoulos (1997) “international advertising decisions concerning the creative advertising strategy and tactics can be viewed as a continuum which stretches between two polar ends, one being that of standardization the other of adaptation”.

¹⁰ R.George, “Delight Me”

¹¹ In this way involvement is materialized, examinated while examinating the delivered mix in the operative level of the “C-Beyond” model: the customer feels the company is present in an active and relational way and enriched through specific and valuable information, at the same time.

¹² More about this in the previous chapter.
5. Conclusions

“C-Beyond” model needs, to be complete, some other elements, especially on the operative side, for instance customers involvement, which have not been described in this work as more importance has been given to the “retention matrix” and the “information-relationship matrix” as basic steps to help us go beyond retention in bank services.

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Introduction

Organic farming is popularly associated with a back-to-nature movement, which often rejects modern agricultural methods out of hand (Haines, 1982). However, in its less rigorous form, low-input farming is a serious and growing effort to reduce dependence on inorganic fertilizer and chemical controls without drastically reducing the industry's capacity to feed the world's growing population. Organic farming is an approach to agriculture that emphasises environmental protection, animal welfare, sustainable resource use, and social justice objectives, utilising the market to help support those objectives and compensate for the internalisation of externalities. Organic farming relies on crop rotation, crop residues, animal manure, legumes, green manure, off-farm organic wastes, and biological pest control. These maintain soil productivity, supply nutrients controlling pests. It is defined by a principal ideological background of the farm as an organism of soil, plant, and animals interacting to maintain a stable whole (Lampkin et al., 1999). The development of organic farming is determined by diversity of players, including producers, consumers, retail chains, governments, environment etc. (Pedersen, 2003). Producers, consumers, retailers, and alternative market outlets are considered here as key stakeholders of organic farming system. Organic producers apparently base their approach on the environment, food production, farming, and society (Hermansen, 2003). They seem to see economic advantages in organic production, alongside environmental reasons and motivations (Hanson, 2003; Dabbert, 2003). Technical issues such as weed and pest control, lack of confidence in the market and access to information are considered major obstacles for most organic producers (Midmore et al., 2001). Consumers appear concerned about environmental aspects, health concerns, taste, and ethical and animal welfare issues (Gruner and Hull, 1995). However, the higher price of organic food is a major constraint on consumption (Soil Association, 2000). In the UK Supermarkets are the main channels for the public to purchase organic food. Profitability is their main motive as it must be with all their operations, but this may conflict with aspects of organic food production (Smith and Marsden, 2004). The main problem identified as affecting the UK market is the limited supply of organic produce (Mintel, 2000). Retailers try to meet the increased demand through overseas imports (The Organic Target Bill Campaign, 2001). However, this strategy may limit the real growth of the UK farms and consequently affect the growth and development of organic farming systems. It is suggested that organic food supply-chains within the UK home market consist of two major channels: 1) Local supply-chains where organic production is sold directly to consumers through farm shops, farmers’ markets, organic shops and organic co-operatives and 2) External supply-chains where organic products imported from outside including from overseas (Soil Association, 2005). Research to date regarding organic food production has focused primarily on motivations towards conversion, consumption, the benefits of the organic farming system, and its impact on public health and environment comparing with conventional farming systems (Kerselaers et al., 2007; Harker, 2004; Pederson, 2003; Hallam, 2003; Makatouni, 2001; Midmore et al., 2001).
However, producers and consumers are attracted to organic approaches because of different motivations (taste, quality, environmental safety, animal welfare, ethics, profits etc.); some are controversial (Harker, 2004; Brandt and Molgaard, 2001; Lawrence, 2005).

Development of hypothesis

In theory, the building of positive interrelationships between these stakeholders may significantly affect the growth and development of organic farming systems in the UK. Both producers and consumers can generate links between each other through for example direct sales (farmers' markets, farm shops and organic shops) where consumers have a chance of buying fresh and healthy organic products at reasonable prices (Planck, 1999; Meikle, 1999; Soil Association 1999; Trobe, 2001). Such interrelationships between producers and consumers make consumers more confident about the product because they know where and how it was produced. It is also an important kind of support to local producers since consumers are more likely to buy if the product from the UK (Hermansen, 2003; Soil Association, 2003). It is suggested that supermarkets need to encourage and support organic producers by paying them fair prices, which reflects the true cost of production. This kind of support which currently does not exist (Soil Association, 2001a) would give producers confidence in the rate of market development (Midmore et al., 2001). Additionally, organic producers find it difficult to achieve the supermarkets' grades and specifications (Steele, 1996). According to literature, the supply of organic food in the UK is still less than the potential demand and supermarkets try to meet increased demand by overseas imports (Mintel, 2000). Organic producers have failed to meet supermarkets' grades and specifications. This makes imports an essential strategy for supermarkets to meet the increased demand. However, supermarkets need to provide support to organic produce for example, by minimise their specifications in order to provide them good opportunities to access the market. Additionally, the large amounts of imports may negatively affect the environment as well as on the local market. There are demands for this to be minimised and the priority given to British suppliers (DEFRA, 2004). A key strategy may need to be reconsidered to give more support to local producers and encourage conventional farmers to convert. Alternative market outlets can provide producers with chance to sell their products at good price, which at present it is suggested supermarkets cannot provide (DEFRA, 2004). High price is a key barrier for consumers to buy organic foods and this has been considered as the main obstacles for further growth of the market (Makatouni, 2002; European Action Plan 2004).

Consumers need to be more educated about the value of organic foods, the reasons behind high prices and the impact of organic food production on health and environment. There is a significant lack of this kind of information and many consumers do not buy organic food because of lack of such information (Harper and Henson 2001; M.O.R.I 1999). Supermarkets can build an interrelationship with their consumers to provide them with such information and encourage them to buy organic products because educate consumers has the potential to win the support of more new consumers (T.N.S, 2003). In addition, building relationship between consumers and the alternative market outlets will also give consumers another alternative shopping and will have a positive impact on local economy (Lobley et al., 2005). The contribution of both supermarkets and the alternative market outlets in the home market is very important. For example, in 2005 retail sales of organic products in the UK has increased by an annual increase of 30% and retail sales through alternative market outlets increased by 11% (Soil Association, 2006). Cooperation amongst these two players will have significant effect on the development of organic market.
Interrelationships or cooperation between the key players of organic farming systems may significantly affect the organic food market in the UK and consequently the growth and development of organic farming systems as whole. Organic farming has developed at different speeds at different times because of a combination of factors including consumer demand, policy intervention and the influence of the major multiple retailers (Lobley et al., 2005). It is hypothesised that the development of organic farming sector is strongly affected by the new consumer desires and trends in consumption and by the institutional settings in which the different actors of the organic movements operate (Miele, 1999). Additionally, Dabbert et al (2002) argued that food scares and subsequent reaction of policy makers and consumers have had an even stronger effect on organic farming development.

Organic farming development can be defined as the increase in organic food consumption, local products and fewer imports, new producers convert their farms to organic, more land in conversion, expand of organic market and more understanding of the philosophy and benefits of organic food products. In the UK organic farming development means, sourcing organic produce from a very low input, reduction of food miles, eating seasonal, low CO2 emission, minimum distance, no packing involved, social benefits and keep the money local (Soil Association, pers. comm.). In conclusion, it could be said that:

"Growth and development of organic farming depends on the interrelationships between its key players"

Developing of research framework

The research conceptual framework and models are derived from the reviewed literature and help provide a critical structure for the research. The model for this research was developed based on the interrelationships among selected key stakeholders. This helps how these conceptualise interrelationships affect organic farming growth and development. Figure (1) illustrates how these factors interact with each other and how this may affect several aspects of organic farming development. The research approach is by use of an appropriate ‘conceptual framework’ and the application of multi-methods to facilitate and lead the study. The key research questions in the present work will help address some of the identified gaps.

The purpose of this research is to critically evaluate the organic food production in the UK by considering the interrelationships/interactions between range of motivations, barriers and source of information of producers, consumers, retailers and small organic processors towards organic. The impacts or influences of such interrelationships on organic farming growth and development in the UK will be assessed. The organic literature says that in order to develop organic production in the UK, there is a need for an increase in communication, cooperation and understanding between key stakeholders of the system. The current literature suggests that barriers to the development of organic agriculture in the UK can be traced to the disconnection between stakeholders. This project considers these issues by firstly developing a ‘conceptual framework’ and then interrogating the interrelationships through a multi-methods approach. This facilitated the research process to achieve the following objectives:

1. To undertake a critical review of key literature and the available information sources.
2. Assess the importance of interrelationships among key stakeholders on organic farming development.
Figure (1). A subjective assessment based on the literature review of the interrelationships among the main variables of the organic farming system and its impact on the organic farming development.

Cooperative relationship
Disconnected relationship
Similar drivers or barriers
Different drivers or barriers
Lack of information
Aspects of organic farming development

Impact of interrelationships on organic farming development

Organic Farming Development

More land in Conversion
More food Consumption
More local Products
Minimise Imports
Protect Environment
Better Education
Market Expand
Methodology

Quantitative and qualitative approaches were applied in order to achieve the above objectives. This involved an in-depth postal questionnaire survey (637 organic farmers) in different regions of England with selective follow-up telephone interviews. A series of detailed personal interviews with representatives from major supermarket chains were conducted. Face-to-face interviews were also conducted with the managers of five different types of alternative market outlets in South Yorkshire. All information on consumer perspectives and issues was collected and interrogated from the extensive available literature. Mixed methods were used to gather pertinent information, and where appropriate this was tested statistically using the Statistical Package for Social Sciences (SPSS) software. The qualitative information was analysed and interpreted. Qualitative findings of (10 interviews) were transcribed, critically analysed, triangulated, and interpreted.

For the purpose of this paper, only the perspectives of all stakeholders about the effects of interrelationships / cooperation on organic farming growth and development will be presented and discussed.

Farmers were asked their opinions about the effects of interrelationships / cooperation on organic farming growth and development. Secondly, telephone interviews were conducting with selected farmers (who had already agreed to be contacted) for more clarification about how such interrelationships affect specific aspects of organic farming development. For example, the farmers’ opinions were requested regarding the impact of the interrelationships on organic food consumption, the amount of land in conversion, and on the amount of organic local products. Seven big supermarkets (TESCO, ASDA, Sainsbury’s, Waitrose, Morrison, Marks and Spencer, and Somerfield) were chosen and contacted to gather detailed information about their motivations, the barriers and strategies for the distribution and sale of organic foods. The information desks of all the above supermarkets were contacted to arrange face-to-face interviews with their experts in this field. The questionnaires for the interviews were prepared and classified with data collected from the supermarkets into four main sections: Consumers and producers, organic food supply-chains, supermarkets and interrelationships. Structured and semi-structured interviews were chosen as appropriate methods to gather the information needed for this project.

With regard to the total amount of organic and in-conversion land across all regions of England, Yorkshire and Humberside was the region with smallest area managed as organic which accounts for 1% of total agricultural area in the county (DEFRA, 2006). This may have negative impacts on local organic food production in the region and consequently on the organic food market. In order to investigate this point, the alternative market outlets that are registered with the Soil Association (The biggest certification body in the UK) in this region were selected as a case study. The interrelationships between these outlets and consumers, producers, and supermarkets were assessed.

Documents can be treated as a source of data in their own right - in effect an alternative to questionnaires, interviews or observation (Denscombe, 1998). In-depth literature survey was conducted to underline the current knowledge and information about organic consumers. Through this, the interrelationships between consumers, producers, and retailers, and aspects of the information flow were quantified. In addition, the current surveys conducted on organic consumers were reviewed. All the gathered information was organized and coded for analysis and interpretation. It is also important to note that there were several questions addressed to
All respondents in supermarkets and alternative markets outlets. These were about consumers' motivations, obstacles, and barriers to buying organic foods. In addition, qualitative data were gathered about organic consumers during the interviews with key representatives from supermarkets, alternative market outlets, and the Soil Association. This information was coded, analysed, and interpreted. Some other data were collected by reviewing other documents such as literature, reports and journals.

All data received from organic farmers (farmers' responses) were analysed using Statistical Package for Social Sciences (SPSS) software. The data gathered from all the interviews were also coded, transcribed, and prepared for manual analysis and interpretation.

**Results**

**Interrelationships amongst organic stakeholders**

Farmers' opinions about how Organic Farming Development (OFD) was affected by the cooperation between the stakeholders were tested; the findings are presented here. Organic farmers believed that cooperation among the stakeholders is an important issue in the growth and development of organic farming systems. About 187 (81%) farmers out of 230 agreed that such relationship is important (Figure 2).

![Development of OFS as affected by cooperation between stakeholders](image)

*Figure (2) Farmers' opinion regarding the cooperation among the organic stakeholders.*

For more clarification, some farmers were selected (those who agreed to follow-up contact) and interviewed over the telephone. They were asked about how the interrelationships affect different aspects of organic farming development and what found from this as indicated below in Figure 3 About 87% (163) of organic farmers out of 188 agreed that the interrelationships between the key stakeholders have positive and significant effects on all major aspects of organic farming development.
Impact of cooperation on OFD

![Graph showing the percentage of farmers' opinions on various aspects of cooperation and OFD.]

Figure (3) Farmers' opinion regarding the impact of the cooperation among the organic stakeholders on specific aspects of organic farming growth and development.

Organic farmers were also asked whether in their opinion, the import strategies adopted by the main food supermarkets were considered a major barrier to organic farming development. About 164 (87%) farmers believed that importing is a major obstacle to the growth and development of organic farming system in the UK (Figure 4).

Effect of import strategy on OFD

![Graph showing farmers' opinions on the impact of import strategy on organic farming development.]

Figure (4) Farmers' opinion regarding the impact of import strategy on organic farming development.

In addition, consumers’ surveys highlighted some other important issues related to organic consumers such as where the consumers would buy organic food, information about the product itself, packaging etc. Consumers will support organic farmers by buying organic products. Consumers prefer to see detailed information about the product to be on the packaging. Education of consumers about organic is suggested to be a key factor in winning more new consumers. Organic consumers in Wales and the Midlands prefer to buy organic food from multiple retailers. These in South England and Northern Ireland prefer to buy organic from farmers' market. In South Yorkshire, box schemes are popular. Organic shoppers were asked whether they would prefer to buy a locally grown non-organic or an imported organic product. A clear majority of respondents would prefer to buy local...
non-organic option. The reason given was a desire to support local producers and reducing 'food miles.'

In terms of the interrelationships between organic producers, consumers, and supermarkets and its impact on organic farming growth and development, Supermarket One emphasised the importance of such interrelationships as leading to sustainability. This supermarket considered that communication with consumers is a key factor. In this respect, they try to influence consumers to understand the reasons for the relatively high prices of organic food. Representative of supermarket One indicated that “… Cooperation or good interrelationships between organic producers, consumers, and retailers are very important. ”They suggested that there is lack of understanding amongst consumers of what organic food is and so they need to be educated: “… Consumers need to be educated about organic.” Supermarket Two indicated that they try to convince consumers to buy organic by using different kinds of media.

Interrelationships between organic producers, consumers, and supermarkets are very important and may lead to increased land in conversion. Conducting regular conferences with producers and working closely with suppliers to deliver what they need and provide unparalleled services to consumers are the important objectives for supermarket Three. Taste, fat content, shelf life, good eating, and appearance are required: “…We have long tradition of working closely with our suppliers to build mutually beneficial relationships.” Developing long-term supplier relationships is a major strategy because it may leads to sustainable land conversion programmes for future supply. The representative said interrelationships are essential and must be strong and based on trust. This definitely has a positive impact on organic farming through maintaining organic food consumption, bringing in more converted land, and expanding local production. Representative of supermarket Four indicated that the interrelationships between producers, consumers, and retailers are a key issue in building trust between all partners. They considered that the current interrelationships are not so good but that will get better. It will have positive effect on the organic food market.

Similarly, all alternative market outlets emphasized the importance of interrelationships amongst all stockholders as it may leads to more understanding of the concept of organic food and that is will leads to the improvement of the home market.

Discussions

Interrelationships and triangulation

The interrelationships and cooperation between key stakeholders of organic farming are suggested as important issues in the growth and development of the UK organic sector. Here the opinions of organic farmers, supermarkets and alternative market outlets about the importance of interrelationships in organic farming development are assessed. All findings were set within the Conceptual Framework (Figure 1) to evaluate and describe these interrelationships, and to what extent they affect organic farming development.

As indicated in the results (see Figure 2), about 81% of organic farmers stated that these interrelationships are important in the growth and development of organic farming. Similar results were found by other studies (Pederson, 2003; Smith and Marsden, 2004; Infood, 1997; Soil Association, 1999). The opinions of organic farmers were also assessed in terms of the impacts of interrelationships on certain aspects of organic may lead to increased land in
conversion farming development (see Figure 3). A large proportion of organic farmers agreed about the positive impacts of such interrelationships on the aspects of organic farming development. Based on farmers' opinions, it seems that the development of organic farming may be strongly influenced by these interrelationships. Representatives of all the supermarkets also emphasised the importance of the interrelationships between stakeholders. They indicated that these interrelationships between producers, supermarkets, and consumers are essential and lead to expansion of converted land and sustainability. Supermarkets also indicated that delivering what they view as unparalleled services to their consumers could not happen without developing long-term supplier relationships. This is seems consistent with Wier and Calverley (2002) (AMS, 2006).

All representatives of alternative market outlets indicated that there are many advantages of interrelationships between the stakeholders of organic farming. According to their opinions, it leads to building relationships of trust between key stakeholders and positively affects the organic food market. The building of trust relationships based between consumers and producers through direct sale and flow of information between consumers and supermarkets are the best examples. Additionally, the Soil Association as well as the Department for the Environment, Food and Rural Affairs (DEFRA) are encouraging both consumers and producers to engage in direct sales. This may help to build long term and trust relationships between consumers and producers (Soil Association, 2006a; DEFRA, 2006).

In summary, all stakeholders have the same conclusion that the interrelationships are a key issue in organic farming growth and development. They also indicated that the interrelationships must be strong and based on trust. Nevertheless, farmers seem dissatisfied in their relationships with supermarkets. Therefore, it is concluded that the relationship between the farmers and supermarkets is not strong enough and it may classified as 'confrontational' relationship (Figure 5). This is consistent with Tate (1991) and Soil Association (2001a). The confrontational relationship between farmers and supermarkets may affect organic farming development in several ways, having negative impacts on amount of land in conversion and the amount of local products. The relationship between producers and consumers appears much better than that between producers and supermarkets.

This research concluded that producers are focusing on direct sales to consumers, and consumers are becoming more interested in seeking suppliers at farmers' markets and farm shops. These findings agreed with Hormones (2003), Makatouni (2001) and Mintel (2000). By buying locally grown produce, organic consumers felt they are providing support to local producers. However, about 70% of the British public have no idea what food the farmers in their area produce (NFU, 2000). It seems there is a gap between consumers and producers in terms of information about organic food production. Lawrence (2005) argued that supermarkets are contributing to the growing gap of knowledge in food supply by offer little to no scope for face-to-face contact or knowledge transfer between producers and consumers. This research revealed that the flow of information between consumers and producers still limited. In contrast, the Soil Association encourage producers to go to direct sales and consumers to stop eating products out of season. This strategy of the Soil Association may lead to improve the cooperative relationships between consumers and producers. Consequently, this may encourage increased organic food consumption, more local production, and better education for both consumers and producers.
According to the opinions of the managers of alternative market outlets, there are several issues related to the interrelationships between organic farmers and alternative outlets. These are:

1) Farmers and farmers' cooperatives are the main suppliers for alternative market outlets;
2) Organic farmers and alternative outlets seem to share similar motivations toward organic;
3) Organic producers appear less controlled by bureaucracy with few specifications when deal with the alternative outlets;
4) There was a direct contact and flow of information between the outlets and organic farmers.

These issues appear to be key factors in building 'collaborative relationships' between these two stakeholders (Figure 5). This may have positive impacts on expanding the local market, protecting the environment, and increasing organic food consumption. However, alternative market outlets sometimes had trouble in sourcing some organic products.

Supermarkets rely on their consumers and consider them as the main drivers of the organic food market. According to this, supermarkets tried to offer them broad choices of organic food with quality at fair prices. Results indicated that many consumers across the UK still prefer to buy organic food from supermarkets. That is possibly because of the high quality and better display of organic products at supermarkets, which make shopping more convenient for consumers (Soil Association, 2006). In addition, supermarkets try to educate consumers about organic food through conducting listening conferences and by providing consumers with information about products and markets. This kind of link (collaborative relationship) between consumers and supermarkets may lead to better education, more food consumption and expand the market. As discussed earlier, direct sales through alternative outlets offer consumers alternative shopping to supermarkets by provide them with local, fresh, and healthy food at reasonable prices with a minimum distance. This may leads to increase local co-operation, minimise food miles distance (protect environment) and building consumer confidence. These findings are in consistence with other studies (Trobe, 2001; Ross, 2000; Soil Association 1999). It could be concluded that the relationship/cooperation between consumers and alternative outlets is 'improved' and may lead to increase local organic production, amount of food consumption (Figure 5). The managers of alternative market outlets indicated that supermarkets are using their power to control market and supply chains. Similar result was found by other study (Soil Association, 2001a). They also added that supermarkets rely on imports to do good business. The managers of alternative market outlets try to provide their consumers with alternative shopping to supermarkets by offering those products that are not available in supermarkets. It seems that supermarkets are the main challenge for these outlets. FARMA (2006) argue that the alternative market outlets need to create new systems of provision bypass the supermarkets supply chain, and organise in such a way to wield sufficient power in the marketplace. It appears that the relationship between alternative market outlets and supermarkets was based on competition and may be classified as a 'disconnected relationship' or may not exist at all (Figure 5). Disconnection between these two stakeholders may negatively affect local organic production, and increase imports and environmental degradation. In contrast, several studies (Banks and Marsden, 2001; Burt and Sparks, 1997) concluded that the dominance of supermarkets resulted in the UK having the fastest growing organic market in Europe. These studies noted that organic market expansion creates more land under organic and attracts more consumers. They feel that this cannot be achieving without engaging with supermarkets who acts as a key gateway to the mass market. In reference to, the Research Framework (Figure 1) and the findings of this research, the
classification of the interrelationships among the key stakeholders and its impacts on several aspects of organic farming development are illustrated in Figure 5.

From Figure 5, it may be concluded that any growth and development in organic farming system depends mainly on the good communication, cooperation, connection and collaboration between its key stakeholders.

The research has highlighted some key issues and suggests a number of tensions that may be critical to the future development of organic farming in the UK. Some of these are in broad agreement with the published literature; others are new observations or differ from established opinions. There are interesting differences in views expressed by key stakeholders, with perhaps a degree of hypocrisy too over matters such as pricing and profits. There are also areas where initially counter opinions (for example supermarkets and alternative supply chains), where they in fact express similar concerns, notably in this case the difficulty in sourcing locally. The different groups of stakeholders all seem to be aware of the importance of partnerships or at least positive interrelationships. How they each translate this into action is of course the critical factor. Similarly, many expressed their view that ‘education’ or at least dissemination of information, was very important. Again, the content of the information, the audience to whom it is directed, and indeed the form of the dialogue become critical issues. Some stakeholders expressed opinions that the main thing was to educate the public into understanding the ‘goodness’ of organic food and the fact that it is more expensive. This assertion seems to ignore the strongly held feeling that the majority of people in the UK...
expect to pay low prices for food. So whilst education and information might influence a relatively small proportion of concerned ethical consumers, who must also be able to afford to buy at premium prices, will it really influence the wider shopper?

There also appears to be confusion for many shoppers about what is ‘organic’ and particularly so in terms of ‘local’ foods, and of ‘conservation’ or ‘environmentally-friendly’ or ‘sustainable’ products. Combined with issues of seasonality, these appear to muddy the waters for many buyers. It seems then that information or education, in terms of clear and unambiguous labelling could help some at least make a more informed decision in their shopping. This might then help the longer-term development of the organic farming sector in the UK.

Price and presentation seem also to be critical issues with a deep tension between stakeholders in terms of the domestic supply chain and that based around imports. Despite protestations from most stakeholders that price and profit are not issues, (when in fact they must be) these seem to be key barriers to consumer purchase, and to supermarkets sourcing locally. Other factors influence overall profiles and performance, but price and quality are critically important.

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THE STRATEGIC ROLE OF LOCAL BANKS’ NETWORKS FOR QUALITY STANDARDS OF CORPORATE BANKING SERVICES FOR SMEs

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Keywords: Local banks; bank network; SMEs, bank services; local development.

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Introduction

The paper introduces the analysis of corporate banking services offered by local banks to Italian SMEs and starts with the examination of the relationship between banks and enterprises and focuses on the examination of the demand side, referred to the financial practice of Italian small-medium enterprises (SMEs), and the supply side, referred to the width and the depth of corporate banking services offered by local banks. Within this framework, the first section reviews the type of relationship between local banks and small-medium firms; the centre of attention lies down on the financial models which has helped the growth of Italian entrepreneurship. The second section describes the demand of financial services of Italian SMEs and illustrates the characteristics of corporate banking in specific territorial services. The third section uses a model in order to understand the quality of corporate banking services and to identify the existence of a potential gap between the demand of different group of SMEs and the supply of local banks. The forth section hence deepens the analysis of networks, looking for organizational models capable of strengthening local banks role for territorial competitiveness. Within these, polycentric networks seem to be appropriate both for their power distribution and for their synergic use of common resources. This net characteristic is different from enterprise networks which, for competitiveness purposes usually tend towards centred networks. Moreover local bank networks seem to suite comfortably within disseminated networks of network, since every single local bank is indeed both a network knot and a social network itself within its territorial localization. The last section closes with some considerations about local bank networks in order to strength the quality of corporate banking services.

1. The relationship between local banks and SMEs

The financial relation between banks and enterprises (i.e. credit-based model) has been explained by two polar theoretical models: the “relationship-based” and the “transaction-based” (or arm’s length) form of financing.

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1 Even though this paper was written in cooperation by both authors, par.1, 2, 3 can be attributed to Michele Modina, and par. 4.1, 4.2, 4.3 to Francesco Polese.

2 The credit-based model has is counterpart in the market-based model. For a comparison between the two models and their different impact on the firms’ competitiveness please see Fabbri (1999). For Porter (1992) the credit based model is superior in supporting the firms’ long-term competitiveness because is not too much focusing on the short-term performance as the market model is.
As Elsas (2002) underlines, relationship lending is defined as a long-term implicit contract between a bank and its debtor. In this form of financing, the bank produces and accumulates private information over time through the relationship with the borrower, and uses this information in giving loans, setting loan terms and renegotiating. The repeated interaction between lender and borrower over time establishes close ties between the counterparts. Such commitment ensures potential benefits to the system such as increased credit availability and more efficient decision if borrowers face financial distress (see Sharpe, 1990; Rajan, 1992; Petersen, Rajan, 1995). At the same time, the relationship-based financing favours the return to the financier by granting her some kind of monopoly over the firm she finances, especially when the bank serve as the sole or main lender (Rajan, Zingales, 1998; 2003), and giving her some advantages in obtaining cost economy and economies of scope, which reflect in bigger operating margin or in more favourable conditions to customers.

In the arm's-length system, the loan will be contracted for a specific period, and the interest rate will be a competitive one that will compensate the lender for time and the risk of that particular loan. The more widespread financial information about the borrower let the firm to plug a wider circle of potential lenders; borrowing from “arm’s-length” lenders or multiple uninformed lenders could limit one of the costs associated to the relationship lending, i.e. the above mentioned bargaining power of the bank due to her information privilege.

The common finding in the literature agrees that small banks have a comparative advantage in relationship lending and a disadvantage in transactions-based lending. Referring to De Young, Hunter, Udell (2004), theoretical contributions and empirical evidence seems to support this view addressing that: a) there are organizational diseconomies that make it problematic for large banks to process and communicate soft information (Stein, 2002); b) the contract terms of business lending at large banks are different than at small banks (Berger, Udell, 1996); c) small banks are more likely to base loans on soft information and the strength of the relationship (Berger, Miller, Petersen, Rajan, Stein, 2005; Scott, 2004); d) and that relationship lending is inverse correlated with longer distance where hard information trumps soft information (Berger, Miller, Petersen, Rajan, Stein, 2005).

Also, there is evidence that the strong territorial presence of local banks and the behaviour of SMEs, especially the family-owned ones, drive to a more stable relationship between small lenders and borrowers. The defence of the territory where the bank operates forces the financier to support the local business and to strengthen its competitive advantage in producing and accumulating information useful in the screening and monitoring lending process. At the same time, the entrepreneur favours the creation of a privileged relation with the lender because the relationship lending seems to: a) limit the widespread of information concerning the company’s strategy and owner’s assets; b) restrict the opportunistic behaviour of lenders, especially during periods of economic instability; c) keep low the financial services’ cost, minimizing the additional cost of the multi-banking practices; d) favour the bank’s continuous assistance.

For the more common literature, the external financing of opaque small businesses can only be provided by soft information-based relationship lending and small banks are well-equipped to provide relationship lending.

However, recent studies (Berger, Rosen, Udell, 2007) show findings that are not inconsistent with the common finding in the literature, but in the meantime support the hypothesis that

\[3\] The authors claim that, as with every monopoly, the bank power over the firm being financed requires some barriers to entry due to regulation or to the "opacity" (lack of transparency) of the system.

\[4\] For more reviews of the literature on relationship lending, see Berger and Udell (1998) and Boot (2000).

\[5\] Soft information would include qualitative information about the character of the entrepreneur and the strength of the company. For relationship loans soft information is very important.

\[6\] See Baravelli (2003).
there are many transactions lending technologies that large banks may deploy in lending to opaque small businesses. These forms of financing, where soft and hard information are differently mixed, include financial statement lending, asset-based lending, small business credit scoring and leasing (Berger, Udell, 2002; Cenni, 2006). For example, in the U.S. almost the 50% of small business loans are credit-scored micro-business and are held by large banks (Strahan, Weston, 1998). With the introduction of Basel II, there will be an increase of extending credit to small businesses primarily based on the strength of the financial statements, which relies more on hard information.

The potential improvement of the transactions technologies for lending to opaque small businesses and the importance of banking industry consolidation put emphasis on the main risk of the relationship lending. As Caratelli et al. (2007) argue, the attitude of a bank to create stable and long relationship depends from her capacity to tender to the firm over the time a width, integrated, and possibly personalized, set of corporate banking services. In this framework, the supply of banking services from local banks could not rest only on the lending business, but it must cover all the financial needs of SME such as cash management, investment analysis, risk management and all the other areas connected to the main corporate finance themes. This is true especially for the growing SMEs, which ask more sophisticated services to the bank; the lack of an integrated supply from the local banks could lead to the loss of their competitive advantage in the relation with SMEs.

2. The demand and the supply of SMEs corporate banking services

2.1 The demand side
Nowadays, the Italian economic system consists of a small number of large corporations, numerous SMEs and thousand and thousand of micro-firms. Moreover, the Italian SMEs show a lack of separation between property and management; this feature marks the Italian family business and produces an important impact on managerial and financial behaviour of small-medium enterprises.

Referring to different contributions (i.e. European Commission, 2005; Unicredit, 2004), the state-of-the-art of the Italian financial structure puts in evidence that most of the SMEs use bank debt (typically short-term debt) to cover their financial needs and that the main short term funds are bank commercial loans, especially in the micro-firms. The reason of the dominance of commercial loans is principally due to the length of DSO (days sales outstanding), but also to the imperfect financial coverage of fixed assets made by SMEs. The “financial way to growth” of Italian SMEs lies in three main variables: the small size of Italian enterprises, the fiscal leverage and the firm’s capacity to create internal fund (net cash flow).

As stated in the traditional trade-off models, the chief benefit of debt is the tax advantage of interest deductibility, that reduces the cost of raise debt instead of raising equity or alternatives external funds. Following the pecking-order model of financing choice, the firms use external financing only when internal funds (net cash flow) are not sufficient. The informational asymmetries between management and investors imply that external funds are undervalued in relation to the degree of asymmetry (Myers and Majluf, 1984; Myers, 1984) and so external funds are less desirable. Therefore, the firms do not target a specific debt ratio and when they decide to use external funds, they prefer to use debt, convertible securities, and, as a last resort, equity.

According to Berger and Udell (1998), the SMEs’ pecking-order model of financing choice finds a support not only in the size of the firm, but also considering the financial growth cycle
that observes the firms’ financial in the different stages of their life (at each stage there are a different mix of soft and hard information).

Because the Italian entrepreneurial system is entering the maturity stage, someone could expect the evolution of the SME’s financial management with the growing role of capital markets and institutional investors (e.g. private equity) and a stronger integration of the financial function within the corporate organization.

However, the Italian SMEs show a gap with what diagnosed by the theoretical models. In addition to the above mentioned high debt level, there are two other highlights: the low importance of the financial function; the strong demand for traditional banking services (payment services, commercial and industrial loans) and the consequent moderate request of more sophisticated and valuable corporate banking services.

A distinctive feature of the Italian firm system, which explains the existing financial gap, is the presence of the family at the held of the company. The life cycle of the family’s founder and the nature of the liaison between the family and the internal and external environment drive the firm’s strategic growth and the adoption of more virtuous financial practices. In this framework, it is useful to reread the financial behaviour of the Italian SMEs.

A common finding in different studies put in evidence the correlation between the entrepreneurial generation and the use of innovative corporate banking services. The firms that have already crossed the generation path are searching more value added banking services. As De Vecchi stated (2007), in the family business of first or second generation it is the founder of one of his relatives who is the “de-facto” chief financial officer (CFO), sometimes supported by some consultants with more operating than strategic duties. The moderate “family CFO” knowledge of corporate finance themes often causes an inefficient financial management: the financial planning is not a priority for the firm, the investment activity is not supported by the results of the traditional capital budgeting techniques, the funding search begins only when the firm needs new money, the information system is not a pillar in the financial area, and the relationship with the bank system is not based on a strong level of communication. As the recent evidence testifies, the risk of this lack of quality in the financial management could lead the “family CFO” into the trap of exotic and risky financial instrument (e.g. credit derivatives).

The plurality of vectors (size, growth cycle, family business) makes difficult the full comprehension of the financial behaviour and practices of the Italian SMEs. In order to understand the quality and the dynamic of financial services, in the fourth chapter we will segment the SMEs in a new way that will give a strategic and technical contribution to the local banks for the development of an integrated corporate banking proposal to their corporate customers.

2.2 The supply side
Before beginning the analysis of banking service’ quality, it is important to define a local bank and the magnitude of corporate banking services.

The bank size may be the best single proxy for identifying a local bank: for many, a local bank must hold less than €1 billion in assets. The exclusive use of the size approach will fail to not well identify the complex phenomenon of local banks. The following qualitative definition captures some of characteristic of this category of financers (De Young, Hunter, Udell, 2004; Corigliano, 2006; Caratelli et al., 2007): (a) local banks derives at least half its deposits from branches located in a single county; (b) is domestically owned; (c) has a product mix that includes portfolio lending, transactions services, and insured deposits; (d) is either an independent bank, the sole bank in a one-bank holding company, or an affiliate in a multi-bank holding company comprised solely of other local banks; (e) is fully rooted in a
specific territory and operates in a community of which shares history and tradition; and (f) has a vocation to support symmetric entrepreneurship, for size and principally local-based. In most developed countries, the majority of banks continue to be small and local. But there are trends (new financial instruments, innovations in bank production processes, deregulation, advances in information technology and increased competition) that have caused the decrease of local banks’ number. For some authors (see e.g. De Young, Hunter, Udell, 2004), it is natural to wonder if the local bank business model will continue to be viable in the future. The potential declining local banking sector has serious implications for the Italian economy. As above discussed, the small business sector – an historically crucial source of innovation and new job creation – relies on small local banks for credit to which they typically offer traditional lending services.

Concerning the magnitude of corporate banking services, it is not simple to define the exact boundaries of this area because the literature gives definitions with different breadth. For the purpose of this paper, we prefer a broader definition that includes all the corporate banking services, both traditional and innovative. In this perimeter, the target areas of our quality analysis are the following:

- Payment services (payment, cash management, credit card)
- Traditional lending services (short-term and long-term commercial and industrial loans, facilitated financing)
- Advanced lending services (hot money, commercial paper)
- Asset management
- Risk management (interest, currency, commodities, insurance risks)
- Corporate finance services (M&A, LBO, turnaround)
- Merchant banking services (IPO, private equity, issues new shares)
- Structured finance services (mezzanine, project finance, subordinated debt, securitization).

All these services have some mutual and distinctive features: the demand is not elastic to the price; the brand of financial intermediaries, the capital reputation, and the positive track record play a fundamental role as the key success factors; the bank must have solid know-how and strong competences in all the corporate finance fields (e.g. corporate evaluation, risk evaluation and management, advising and consulting); for the more sophisticated services, there is a vocation to the arm’s length form of financing instead of the relationship approach.

3. The analysis of corporate banking services

The metamorphosis in the demand and supply of financial services forces to better identify some clusters of SMEs in order to exploit the opportunity, for local banks, to set a proper offer of corporate banking services. The corporate banking market consists principally of SMEs. In this market, an important niche is represented by the family business, which has a consolidate relationship with local banks. So, it is essential for the local banks to have a whole view of the SMEs financial needs in order to create a tailored set of corporate products and services. An organic range of financial services allows local banks to serve SMEs in a proper way: a cash management service for a group of family companies, a support to external growth for the more proactive firms, a holistic risk management approach for the pocket multinational SMEs.

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7 See Caselli and Gattù (2002).
In order to verify the quality of local bank SME services we use a model - based on a process described later on this paragraph and yet applied to private banking market (Modina, 2003) - to discover the presence of gap between demand and supply of banking services provided by the local banks. The approach is developed as follow: first, we select the survey areas that detect the market of corporate banking services; second, we characterize SMEs’ corporate banking needs through a new way of segmentation; third, we derive local banks’ services quality and discover potential gaps.

1. Selection of the survey areas: the detected areas are included in the above mentioned general definition of corporate banking services (i.e. payment services, traditional lending services, advanced lending services, asset management, risk management, corporate finance services, merchant banking services, structured finance services).

2. Characterization of customer target: SMEs are partitioned based on their financial needs. Starting from the segmentation suggested by Caselli and Gatti (2002), we separate SMEs market in three main clusters: traditional companies, companies in transition and complex companies. Any customer segment has his distinctive features (see Table 1) that differentiate any firm group from the other for corporate banking needs:
   - Traditional companies: they demand essentially traditionally services and generally do not request high value services. They frequently contact banks, but their relation is more low-touch (related to more transactional services) than high-touch.
   - Companies in transition: the metamorphosis they are living involves the demand of more sophisticated financial services. Generally they work with more banks (not only local) and they request for more and more high value services not only restricted to satisfy their need of funds (i.e. advising, consulting).
   - Complex companies: they usually search qualified banking partners, able to operate as specialists in addressing specific problems and to be proactive in offering high-value solutions.

Deepening the analysis of quality services, in order to build a consistent supply model, it is necessary for the local bank to discover the corporate customer target the bank could and would attend. The analysis focuses on the gap between the bank’s model supply and the services demand from traditional, in transition and complex companies.

Table 1: The features of three clusters of SMEs

<table>
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<tr>
<th>Traditional SME</th>
<th>SME in transition</th>
<th>Complex SME</th>
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<td>- Family owned, principally of first generation</td>
<td>- Family owned company in migration toward a more managerial model</td>
<td>- Managerial model (generation path concluded)</td>
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<tr>
<td>- Finance is not a primary area; the focus is on products and (less) on markets</td>
<td>- Rapid growth with change at strategic and organizational levels</td>
<td>- New and more modern relationship between ownership and management</td>
</tr>
<tr>
<td>- “Family CFO”; poor approach to financial decision, also in bank relationship</td>
<td>- Improvement in financial management</td>
<td>- Finance area has a strategic position in the company</td>
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Font: our elaboration based on Caselli and Gatti (2002)

Analyzing the segmentation outcomes, it is possible to find the priority level assigned by the three SME clusters to each corporate banking service. Quoting the outcomes on a graduate
scale (where 1 is the lowest priority and 6 the highest one) and comparing with the bank competitive advantages (the dotted line on Fig.1), it is possible to see how much the local banks corporate banking offer match with the different need of the SMEs peer group.

**Fig. 1: The analysis and demand and supply of corporate banking services in SMEs market**

The Figure shows features consistent with the common finding in literature: the local bank tends to satisfy the primary financial needs of the SMEs (payment and loan services), but it suffer a competitive disadvantage in the most profitable areas (risk and asset management, corporate and merchant banking services) where knowledge, skills and activities as advising and consulting play a key role.

If the local bank’s customer base has a majority of traditional firms, it seems that her offer is coherent with the market. However, if the main customers are transitional or complex SMEs or if the bank decided to turn her attention to the most sophisticated peer groups, it has to formulate a new strategic approach in order to enrich the corporate banking offer, adding some other high value services, where the advisor and consulting are the primary activities. The enrichment of the financial services’ range could act as a useful vehicle to keep and strengthen the relation with transitional and complex SMEs.

By mapping and monitoring the corporate financial needs, the local bank benefits a more performed valuation of the corporate portfolio risk and return and preserves a strong relationship with the successful SMEs.

In this framework, one of the most complex decisions for the bank is which organizational solutions (building in house, outsourcing, networking) is best suited to make a sustainable and convenient diversification. In the next paragraphs, we underline how the banking network could be a valuable opportunity to build a qualitative corporate banking offer.
4. Aggregating phenomena among banks

4.1 Business networks

Since many years and according to several disciplines and perspectives scholars have analyzed and deepened aggregating processes among business actors. However the topic continues to be interesting and culturally stimulating for the numerous interpretations possible due to the lack of a shared view upon its explicative variables as well as upon the basilar logics governing network evolution.

This is confirmed by the various positions assumed by researchers who have tried to highlight the benefits related to networks; some of these support how networks mitigate globalization effects, enabling competitive behavior of networks’ participants (Grandinetti, Rullani, 1996; Varaldo, 1997); others focus on better performances obtainable though common resources synergic use in networks (Valdani, Ancarani, 2000); others have pointed how enterprises aggregations facilitate the rationalization of value generation processes (Lorenzoni, Lipparrini, 1999).

We believe, anyway, that the observation of nowadays business arena shows that enterprises overcome the fear of relational risks among economic actors, despite the evident difficulties of foreseeing partners’ behaviour. This is probably due to the harsh competition that stimulates businesses to co-operate one with each other, in search of relationships and interaction more or less stable, due to an open attitude towards trust mechanism (Zand, 1972) among enterprises.

Deepening network analysis brings to the structure elements of nets; among these features we have: number of participants (affecting net dimension); density; connectivity; centrality (Freeman, 1978, 1979); structural holes (absence of direct ties); isolation (absence of ties with other networks); stability (in/out frequency); structural equivalence (homogeneity of participants; similarity of participants’ ties); property control and network control.

As far as connections are concerned, meaning ties among network nodes, it seems appropriate deepening the analysis starting from the studies on the strength of weak ties (Granovetter, 1973), that relates the strength of a tie to a combination of duration, emotional intensity, intimacy (reciprocal confidence) and reciprocal services. Within networks, in fact, the strength of these ties may lead to intense and lasting relationships, reducing cognitive distances and favouring empathy development (McAllister, 1995, Lewicki, Bunker, 1996; Hansen, 1999), enabling powerful control and liking mechanisms (Coleman, 1988).

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8 Natural trend toward aggregating phenomena characterizing entrepreneurial dynamics, stabilizing in time relations among subjects, has been the focus of studies for many years (Richardson, 1972; Burt, 1980, 1992; Johansson, Mattson, 1984, 1987; Bartlett, Ghoshal, 1990).

9 Dealing with financial performances of enterprises operating in networks realities, for instance, literature does not really agree on conferring better performances to these if compared to business acting autonomously (see Singer, D’Amato, 2006).

10 Relational trust should never absolute, or certain; it should be limited in time and in its development perspectives. Correctly Williamson (1993) highlights how a blind trust may be unwise, suggesting constant analysis and prediction of opportunistic behaviors. Differently some have observed how trust could be related to cultural and values homogeneity, correlating “characteristics and trust” (Zucker, 1986), concept which, indeed, lead us towards relational patterns closet o clan (Ouchi, 1980), within which the same value and cultural structure support and performing relations based on trust.

11 Structural equivalence is when two or more members have ties with more or less the same other members. Units who show structural equivalence, sharing the same relational pattern, may be concurrent and rivals within the same net (Burt, 1987).

12 With the term node, or knot, we may refer to every element constituting an organized network, a unit of various dimension aimed toward a goal, self organized, capable of co-operating with others and of interpreting external events, see Butera (1990), p.64.
Apart from structural and ties analysis, anyway, the principal glue, as a cohesion factor and centripetal aggregation force in networks, we can frequently identify informative and competences advantages, whereas the main difficulty may be identified in control mechanisms of complex systems (Burt, 1992). Moreover how can we dissert about control, and in general about network governance if we cannot find a stable entity to analyze? In other words net governance seems to be fostered in case of limited in/out processes pursued by business actors, minimizing spill-over risks and strengthening reciprocal trust and favouring learning processes (March, 1991).

Aggregating phenomena, anyway, demonstrate that cohesion forces often prevail, since more and more private business and public entities coexist within networks nowadays. Now lets deepen the analysis of a specific business, such as the bank sector, within which observe peculiarities and traits of aggregating phenomena, trying to judge nets capacity to enable served enterprises’ competitiveness.

4.2 Towards bank networks

Structural changes in banking sector of last decade, and still ongoing, have widened strategic and managerial options for bank operators, modifying banks and enterprises’ interactions and stimulating on one side actors’ aggregation on international scene, and on the other the valorisation of financial intermediaries on a local basis (Nardozzi, 2001).

This has created a deep differentiation in conceptual models serving financial system’s analysts when observing a global perspective or a limited and territorial scenario. In this last case, in fact, the correct interpretation tools have to be identified in order to correctly understand local financial intermediaries profiles; a more systemic view of them, in fact, seems to relate their performance both to territorial development and to local SMEs competitiveness, highlighting a strong reciprocal influence (see Zingales et al., 2004).

Moreover global competitive arena affects financial markets since SMEs need the support of local banks to face liquidity and financial pressures. How can we deny that strong corporate and big firms manage internationalization processes regardless their relative financial system’s performance and efficiency? SMEs do not have the capacity to overcome geographical limits of their banks relations, consequentially needing a constant and important support played by local banks. As stated in the former chapters, we note a strong correlation between local banks traits and local productive system: the prevalence of SMEs on a local basis stimulate the request of traditional banking services, suggesting strong interactions between local banks and SMEs based on relationship lending logics, hence designed upon iterative interactions bases on trust instead of being interpreted rigidly on convenience of single transactions (transaction lending)\(^{13}\).

It seems agreeable, in a way, that this reciprocal inference is sometimes positive, sometimes not. Anyway it is a fact, and indeed SMEs show the need of geographical proximity with their financial intermediaries, as an enabler of credit access\(^{14}\).

But what about local banks traits and organizational forms? How do they need to react to this market evolution?

The trend seems to show that, in order to compete with major banking groups local intermediaries are stimulated towards reciprocal aggregation and a different strategic positioning of minor banks. While bank groups, serving organizations that distribute their

\(^{13}\) In Italy, as well as in Norway, for instance, recent empirical data about banks-enterprises interactions show a strong orientation on relations and not on market (Carretta, Farina, Schwizer, 2006).

\(^{14}\) Petersen and Rajan (2002) observe how local banks release credit to enterprises operating within their territorial context since their monitoring and control capacity guarantees the operation, preserved by the strong knowledge on real development perspectives of the assisted enterprises.
activities internationally\textsuperscript{15}, hence operate on an international scale, smaller credit institutes are pushed into networking in search of operational diversification and the right initiatives dimension. A local bank, in this perspective, could became a single knot of a disseminated networks of local banks, who share services, homogeneous productive processes and non concurrent products, in this way reaching the critical dimension needed by the served market. “Less hierarchy, more network and relationships among credit institutes” (Mercurio, 2006), hence this organizational form seems to shop its powerful traits capable of supporting resources (mainly intangibles, such as competence and financial support) to local banks, increasing the competitiveness of every aggregated banks.

4.3 Bank networks as a polycentric net
The described aggregating process between local credit institutes, anyway, stimulates the analysis about which network form, among the numerous ones defined in literature, may show the best performance in local banks’ business. Let us clarify some of the basilar hypothesis in order to deepen the issue and identify the most suitable network structure. It seems appropriate assuming that:

- Network knots are represented by local banks or by credit institutes of minor dimension;
- Network knots should show homogeneous traits in terms of service, process, product;
- Geographical localization of network knots should be different;
- The net shouldn’t show a leader; instead it should be based upon a non hierarchical relational and interactive system.

With these premises, deepening the structural considerations given (see section 4.1), we could note several important issues:

a) dealing with network \textit{dimension}, we can observe that bank networks performance and competitiveness is not related to the number of participants;

b) network \textit{density} has to show a scarce proximity among knots, in order to minimize competitive phenomena in the net;

c) network \textit{connectivity} has to show strong reciprocal interactions, efficient dialogue and informative fluidity;

d) bank networks do not need to be \textit{centred}, which may be a potential cause of non equilibrium among net knots;\textsuperscript{16}

e) among local banks networks disseminated in different territorial areas the presence of \textit{structural holes} seems probable; still this is not at all affecting net performance;

f) network \textit{stability} facilitates common evolution mechanism. However frequent in/out processes, even though not really probable in this kind of network, does not affect network performance, since its governance is certainly distributed or attributed to a directing representation of the aggregate;

g) as far as \textit{structural equivalence} is concerned, we believe that this kind of network should be based upon homogeneous bank entities, in order to avoid tensions and pressures within the net itself;

h) in bank networks property is obviously autonomous for each bank institute, whereas the concentration of governance and control mechanism, as just observed, usually is allocated within a directing unit representative of the whole net.

\textsuperscript{15} The analysis on the redistribution of value chain on an International basis has been pursued by Porter (1986, p.43); still before Kogut (1985) had analyzed the existing relation between activities internationalization and the distribution of the value chain activities.

\textsuperscript{16} It seems appropriate to observe that commonly business network find in the centrality of their structure and governance one of the major element of their success (Polese, 2004).
Hereafter (see tab.2), we present a Table highlighting several explicative variables that we believe particularly important within bank networks, in order to decline fundamental traits supporting the competitiveness of this organisational form.

Table 2: Bank networks peculiarities and benefits

<table>
<thead>
<tr>
<th>Variable</th>
<th>Network peculiarity</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knot characteristic</td>
<td>All minor dimension banks</td>
<td>Decision power equilibrated distribution; harmonic designation of top government; net governance representativeness.</td>
</tr>
<tr>
<td>Knot traits comparison</td>
<td>Homogeneity</td>
<td>Service, product and process homogeneity renders efficient integration at a central level, rationalizing functional integration and common services, enabling major benefits of managing within the net.</td>
</tr>
<tr>
<td>Geographical localization</td>
<td>Territorial dissemination</td>
<td>Different location and market minimizes opportunistic and competitive behavior among network knots.</td>
</tr>
<tr>
<td>Centrality degree</td>
<td>Absence of leader enterprise; knots of the same dimension</td>
<td>Dimensional equilibrium among net knots enables wise power distribution.</td>
</tr>
<tr>
<td>Knots characteristics</td>
<td>Every knot is identifiable as a social net&lt;sup&gt;17&lt;/sup&gt;</td>
<td>Every bank’s relationships in their territorial market represent, combined with all other information and detections within the net, a powerful innovation enabler&lt;sup&gt;18&lt;/sup&gt;.</td>
</tr>
</tbody>
</table>

Font: our elaboration

Gradually, it seems to appear a reticular entity similar to a polycentric network<sup>19</sup>, within which every knot plays an equal role with all other bank actors with respect to top government designation, evolution processes participation, resources release. As a consequence, bank network defined upon clear associative “rules” and build with shared and participated procedures seems to represent a powerful organizational model fostering competitiveness of local banks in line with most recent theoretical models about value

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<sup>17</sup> The network shown is indeed characterized by a dense relational pattern with numerous territorial actors present in the served context. These interactions may well represent, hence, an additional network organization if interpreted in a social perspective through which we attribute to local banks the role and responsibility to support territorial development. In this articulated relational system it becomes hard to distinguish interactions with other business from interactions with clients or other stakeholders, therefore B2B, B2C and C2C logics seems to vanish giving birth to a common paradigm (Gummesson, Polese, 2008).

<sup>18</sup> “What is amazing about networks is not really the number of relationships but the chance to transfer from knot to knot specific competences fostering every unit performance and simultaneously contributing to global mission achievement”, see Barile (1994) p.75.

<sup>19</sup> Not centered networks represent decentralized and cooperating organized systems in which all actors contribute to development process with the possessed specific competence, for the whole net benefit. This process enables every single knot to reach dynamic equilibrium conditions (Nacamulli, 1989), increasing competitiveness levels.
generation and service management. Indeed it may become a vehicle of innovation, a way of strengthening competences, rationalizing production costs and innovation technology and service management, guaranteeing financial assets of single participating banks. The peculiarity of this polycentric net, since every local bank itself may be interpreted as a net due to its relationships with territorial actors, is that the emerging organizational form seems to be a network with as many centers as the participating banks, with these who are local networks as well (see Fig. 2).

Fig. 2: A polycentric network of local banks

Font: our elaboration

5. Final remarks

The polycentric network described above seems to be a powerful organizational solution for local banks, since it seems to show the following benefits:

a) systemic governance, on one side, participants autonomy on the other;

b) top government representativeness enabler;

c) efficacy in creating sense of belonging;

d) benefits of common and shared resources and services, still strategic independence left to every local bank’s property.

As above deeply analyzed the banking system’s needs perceivable by the demand side, and the mutual opportunities found in banking services offered find a synthesis in a more holistic

20 Within network systems, according to S-D Logic, value is co-produced by interaction of several parts, sharing intuitions, needs and resources (Polese, Carrubbo, 2008).

21 Innovation in credit institutes may be expressed as “an ensemble of changes in contact, selling and distribution processes and products, considered new for both the bank actor and/or for the served client, sometimes due to the fact that the relationship between the two may reveal substantial differences (Frigerio, Rajola, 2006).

22 All economic and social actors are then resource integrators, implying that the context of value creation may be intended within the logic of “networks of networks” (see FP9 of Service Dominant Logic, Vargo, Lusch, 2006), or else according with “many to many” logics (Gummesson, 2004).
analysis of local bank networks. However, these nets should attempt not only an internal dense reticular pattern (within the knots), but should go for profitable interaction with other territorial actors as well. This relational attitude of local banks networks with public entities, NGOs, local communities and others territorial actors is a way to mitigate net isolation and may reveal the best way to beat great international concurrence on a local basis.

6. References

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1. Introduction

The ability to satisfy customer’s financial needs and expectations become a fundamental variable for competition in the Italian banking system. If the banks give services in harmony with potential customer’s requests it’s acceptable to think that the banks offer services with high quality to the customers.

In the market segmentation approach, the services for “outside” targets (Omarini, 2006) are going to consider an important way to stand out from the others in the competition for a bank. In this scenario our paper wants to analyse which services the Italian banking system offers for outside targets like immigrants, housewives and temporary workers.

The analysis moves from the information available on Pattichiari website. Pattichiari was born in 2003 by the initiative of Italian Banks Association (ABI) and collects all information about the banks that adhere syndicate. Today 152 Italian banks adhere to Pattichiari and 146 certificated Italian banks can use Pattichiari brand.

For our purposes we use two kinds of information from Pattichiari website.

The first concerns the potential customers’ profile that includes variables like age, sons, type of labour and financial needs like payment services or lending services.

The second kind of information is about the supply banks services for each customer outline.

The analysis starts from the immigrant outline, considering that Italy is going to become a country with a strong attraction for a lot of immigrants come from around in the world1.

So, what are the characteristics of banking services for these particular customers?

2. Financial needs of “outside” customers

Banks usually concentrate their supply on the predetermined outlines of customers: retail market, small business, corporate lending. They don’t, often, pay attention to different corners of the markets for the reasons linked the cost-benefit analysis (Anderloni, 2003). But over the last few years competition pressure determined a new customer oriented formulation of banking management paradigm (De Luca, 1996). In this scenario it’s timely to analyse new potential targets of financial system such as “outside” customers.

With “outside” customers we identify potential customers who have specific needs that aren’t normally satisfied by banks. We define three outlines for three type of customers: immigrants, who need linked to country-out (remittances,…), housewives, who need linked to family management (bills,… ) and temporary workers, who need linked to variability of income (overdraft,… ).

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1 In the next future we will analyse other “outside” customers too.
The first outline identifies financial needs of immigrants. We are careful to the generation of immigrants who stay in the first stage of the cycle of their project in Italy (Omarini, 2006). In fact they are careful to daily payment for remittances\(^2\). They are 18-30 years old without sons and they try a labour, they prefer to access to banking services through internet point. The number of annual transactions is less than 50 operations while the average amount is less the euro 5,000. They need payment services through cash card and lending services through personal loan (Caritas-Migrantes, 2006).

The second outline is the group of housewives. Normally, the housewife is identified like a woman with an age about 30/60 years, without an independent source of income. Besides, on one hand, she bears al lot of duties such as payments of bills and rent and, on the other hand, she manages family saving.

The third outline regards to atypical workers which are characterized by irregular income. In particular, they utilize every type of banking services with relevant intensity. For this reason they utilize internet and traditional access to financial system.

### 3. Immigrants outline: data and methods

In order to define the immigrant outline, in *Pattichiari* there isn’t an explicit specific profile, so we need to do some chooses specifying age, kinds of work etc. (see Table n. 1).

#### Table n. 1 – Immigrant outline

<table>
<thead>
<tr>
<th>Characteristics of the person</th>
<th>Age</th>
<th>18-30 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sons</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td>Without labour²</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Way of services</th>
<th>Number of transactions</th>
<th>Less than 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money on deposit</td>
<td>Less than Euro 5,000</td>
<td></td>
</tr>
<tr>
<td>Channels</td>
<td>Counter and internet</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of services</th>
<th>Payment services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cash card</td>
</tr>
<tr>
<td></td>
<td>Debit card</td>
</tr>
<tr>
<td></td>
<td>No credit card</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Lending services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No overdraft</td>
</tr>
<tr>
<td></td>
<td>Personal loan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Investment services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No asset management</td>
</tr>
<tr>
<td></td>
<td>No personal management</td>
</tr>
</tbody>
</table>

Source: Authors processing on *Pattichiari* data.

On the basis of these characteristics we define the financial services described in Table n. 2.

#### Table n. 2 - Immigrant outline and relative banking services\(^4\)

<table>
<thead>
<tr>
<th>Cash management services</th>
<th>Cost of statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost of account</td>
</tr>
<tr>
<td></td>
<td>Number of transactions in the contract</td>
</tr>
<tr>
<td></td>
<td>Cost of transaction on branch</td>
</tr>
<tr>
<td></td>
<td>Cost of transaction via internet</td>
</tr>
<tr>
<td></td>
<td>Withdraw to branch</td>
</tr>
<tr>
<td></td>
<td>Cost of keeping track money to branch</td>
</tr>
<tr>
<td></td>
<td>Interest rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Payment services</th>
<th>Number of cash machines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debit card*</td>
</tr>
<tr>
<td></td>
<td>Fee for withdraw on own bank</td>
</tr>
<tr>
<td></td>
<td>Fee for withdraw on other banks</td>
</tr>
</tbody>
</table>

\(^2\) In the second step the immigrants borrow little amounts to lease or to buy home and to set up a business.

\(^3\) This characteristic depends on the fact that the labour relation is not regular in many cases.

\(^4\) Every rate in the table is an annual rate.
In detail, for cash management services we consider the cost of statement, the cost of account and the relative number of operations which are included in the buffer; consequently, the cost of each operation in any branch or via internet, the cost of withdrawn on branch and the cost of keeping track of money on branch. It’s important to note that we consider another variable that could capture immigrant attention: interest rate.

About payment services we consider debit card or the number of cash machine and fee for withdraws. Another aspect is the type of settlement of orders. We don’t consider the payment of bills and rents because the immigrant generally doesn’t live in the same place for a long time, at least, in the first stage of the cycle.

For the way of services we consider counter and internet access.

In order to analyse the supply banking services, first, we choose from the Pattichiari dataset a count for each bank: we prefer the count more simple than the other in accordance with an outline interested to basic services.

At second point, we apply a factorial analysis on dataset to eliminate redundant information.

On the principle factors deriving from the data (the first nine factors explain the 78% of the variance), we apply a classification method (K-means algorithm) (Rizzi, 1989; Fabbris, 1997).

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5 For the banks who don’t communicate this rate we consider the legal rate. For the time horizon of analyse it’s equal to 11%.

6 A lot of banks utilize IRS 1 year. It’s equal to 5.31% at 06.30.2008. A little group of banks use EURIBOR 6months that is equal to 5.211% at same date.

7 For the banks who don’t communicate the level of charge we consider Italian average.

8 For the banks who don’t communicate the premium of policy we consider the Italian average of insurance contract for this type of policy (3.5%).

9 We consider a multirisk (death, disability,...) policy.
4. Results
The results come from the output of the statistical methods application suggest to classify the banks into eight groups (Table n.3). The homogeneity in the groups is stronger than the homogeneity among the groups.

Table n. 3 – Banks groups for immigrant outline

<table>
<thead>
<tr>
<th>Group</th>
<th>Group label</th>
<th>Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>“too much expensive group”</td>
<td>B. Popolare Puglia Basilicata</td>
</tr>
<tr>
<td>2</td>
<td>“blend”</td>
<td>Bancaperta, B. Nazionale del Lavoro, Hypo Alpe Adria B. spa, IW B.</td>
</tr>
<tr>
<td>3</td>
<td>“not very good for cash management”</td>
<td>B. Piemonte</td>
</tr>
<tr>
<td></td>
<td>“intermediate charges”</td>
<td>B. Agricola Mantovana, B. Caripe spa, B. Antonveneta spa, B. Artigianato Industria e Commercio., B. CR Firenze, B. delle Marche spa, B. Credi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Popolare Crema spa, B. Popolare di Lodi spa, B. Popolare Cremona spa, B. Popolare Mantova spa, B. Popolare Milano, B. Popolare Friulana B. Sella</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Nord-Est Bovio Calderari, B. Sella spa, B. Sella Sud Arziti Galati spa, B. Valori spa, B. Toscana, B. Napoli spa, Biverbanca, Cassa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>di R. Parma Piacenza, Cassa di R. S. Miniato Carismi, Cassa di R. Venezia, Cassa di R. Bologna, Cassa di R. Lucca Pisa Livorno spa, Credem,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Credito Artigiano, Credito Siciliano, Credito Bergamasco spa, Credito valtellinese, Intesa Sanpaolo spa, UBI Banca Private I. spa</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>B. Legnano, B. Trento e Bolzano</td>
</tr>
<tr>
<td>5</td>
<td>“not very good for lending services”</td>
<td>B. Monte de’ Paschi di Siena, Fineco Bank spa</td>
</tr>
<tr>
<td>6</td>
<td>“only on-line”</td>
<td>B. Carime, B. Carige Cassa di Risparmio Genova Imperia, B. Monte Lucca, B. Adriatico, B. di Roma, B. Valle Canonica, B. Popolare Commerc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e Industria, B. Popolare di Bergamo, B. Popolare di Ancona, B. Popolare di Novara, B. Popolare Pugliese, B. Popolare Verona S. Geminiano</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S. Prospero spa, B. regionale europea, B. S. Giorgio, B. Brescia spa, B. Sicilia, Bipop Carire, Cassa di R. di Carrara, Carlo</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cassa di R. di Loreto, Cassa di R. di Fano, Cassa di R. di savona, Deutsches B. Unicredit</td>
</tr>
<tr>
<td>7</td>
<td>“not very good for lending services and remittances”</td>
<td>B. Bergamo, B. Meridiana, Veneto B. spa</td>
</tr>
</tbody>
</table>

In the first group we have only one bank. This bank offers an account with much expensive payment services and has the highest cost of account (“too much expensive group”).
In the second group we have four banks. They offer accounts without any specific characteristics. These accounts are less attractive for immigrants (“blend group”).
In the third group there is one bank that is the only bank that has a fee for withdraw on the same branches (“not very good for cash management group”).
The fourth group is the largest with 41 banks. They have an intermediate level of cost for each type of service: the fee for orders via internet, for example (“intermediate costs group”)
In the fifth group we have only two banks that is no good for lending services, in fact they have the most expensive rate for delayed payments and an high level of charge (“not very good for lending services group”). The other type of costs (charges and fees) are in line with other groups.
In the sixth group there are two banks who constraint to utilize only internet for cash management and payment needs, in fact the costs of withdraw to branch and the costs of order on branch are very expensive (“only on-line group”).
In the seventh group we have 23 banks that are less attractive than the other groups for lending services and for extra UE cash management (“not very good for lending services and remittances group”).
The last group is composed by three banks that have a high cost for remittance but they offer the highest rate of interest than all the other groups (“good for primitive investment group”).
5. Concluding remarks

The idea to analyse the peculiarities of the Italian banking system with reference to “outside” customers, it isn’t simple to carry out. We meet some difficulties to find the information for the analysis. To this point, the information available on Pattichiari website helps us, even if Pattichiari is deficient because the banks adhere to it voluntary.

As it’s observed previously, there isn’t a predefined outline for the immigrants while there are outlines i.e. for employee, professional man, young people.

Besides, we note that the banks doesn’t offer services that are specifically applied to immigrants such as loan for the travel towards own country or, simpler, an account who utilizes own language.

The results from the analysis on the available information show that the largest group of banks has intermediate charges.

We hoped on that the banks should have these characteristics:

- A low cost of account. The most important service for the immigrants is the remittance towards their country. The remittance is a simple service and consequently, not expensive for the bank;
- A low cost for internet services (cost of access, cost of transactions, cost of order). The immigrant could prefer virtual access to banking system because it assures more reserve than the other channels too.
- A low rate of interest for lending service. A low rate could be an opportunity to satisfy new and sophisticated immigrant’s financial needs.

In conclusion we consider that, at the moment, the Italian banking system isn’t careful to needs of outside customers, especially of immigrants. This could be considered a weakness in a market segmentation approach oriented to satisfy better than the competitors the potential customers.

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CORPORATE DIMENSION AND QUALITY PERFORMANCE: AN EMPIRICAL ANALYSIS FROM THE GAS DISTRIBUTION SECTOR IN ITALY

Federico Testa – Vania Vigolo

1. Introduction to the study: the gas supply sector in Italy

“Public service” is a relative concept; as it is influenced by the economic and social conditions of a specific community in a specific moment, it needs to be contextualized. Over time the term “public service” has identified different activities that responded to needs perceived as “public.” Similarly, over the years different considerations have been made about the most suitable forms of market which could guarantee the satisfaction of such needs. It is not the purpose of this paper to go through the reasons and the outcomes of such considerations. However, it might be useful to emphasize the recent development of a new approach about the possibility for public services to be delivered by companies (both public and private) in a free market regime where the market has the duty of guaranteeing the best allocative efficiency. To be effective, the liberalization process “must offer all operators, whether incumbents or new entrants, the same conditions of network access through impartial, non-discriminatory and transparent management.” In this sense, the unbundling rule establishes that “traditional operators must separate their transport/distribution operations from their supply operations … so that competition can develop.”

According to this perspective, the public decision maker must introduce forms of protection of specific social needs and regulate the market itself. In Italy this activity of regulation has drawn new attention to the debate about business concentration and company size as variables that must be taken into consideration if one intends to pursue the public interest and enhance the level of efficiency in the market. In this sense, the norms introduced by the 2007 Financial Act establish new “minimal dimensions of territorial areas” for the entrustment through public tenders of the gas distribution service. These areas should be identified according to “optimal catchment areas”, defined by the Ministers for the economic development and for regional

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1 Even if the paper was discussed together, in writing down the different parts Federico Testa contributed to paragraph 1, Vania Vigolo to paragraphs 2 and 3. Paragraph 4 was written by both Authors.
2 Full Professor of Management, University of Verona, Italy and Member of the Italian Parliament e-mail: federico.testa@univr.it
3 Lecturer on Management at the University of Verona, Italy e-mail: vania.vigolo@univr.it
4 Such needs include for example the demand for water and energy supplies, security, education, health. It is not possible to give a complete list of public utilities, seeing that they are strictly connected to the development of society; different communities might have different needs and consequently expect different services depending on their general historical, socio-economic, political and geographical context.
5 Significant interactions between economics and the quality of life are analyzed by Galbraith J.K., L’economia e la qualità della vita, Mondadori, Milano, 1971.

affairs and local autonomies, upon suggestion of the Authority for Electricity and Gas and according to the Unified Conference. In a managerial perspective, it seems useful to investigate the relationship between company size and performance, since “for researchers in the fields of finance and accounting, industrial economics and strategic management, size is considered to be a fundamental variable in explaining company performance”. On the one side, “larger companies have a greater possibility of taking advantage of scale economies and greater possibility of renegotiating with clients and suppliers”, as well as “a greater ability to cope with possible changes in market conditions”. On the other side, “increased size can also contribute to diminish company performance”. In future works it might be interesting to analyze the aspects regarding the efficiency and cost-reduction criteria, however, the purpose of this paper is to investigate the existence of a significant difference in performance between companies of various sizes according to specific service quality indicators defined by the Authority.

2. An approach to quality in the gas distribution service

Service quality has been analyzed in literature and dealt with in practice from many different perspectives: the customers', the company’s, the external assessor’s, the public Authority’s one, just to name a few. According to customers’ perspective, service quality is often described in literature as the difference between service expectations (i.e., what the service should offer) and performance perceptions, so that a positive or a negative disconfirmation of service expectations will determine customer satisfaction or dissatisfaction, respectively.

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5 Under provisions of the Decree-law 1st October 2007, n. 159, converted with amendments by the Law 29th November 2007, n. 222 and later modified by the Law 24th December 2007, n. 244.
8 The company’s perspective can include considerations about the need for quality also for the “internal customer”, i.e. the employees. “Historically, much of the academic marketing literature has tended to focus upon satisfying the needs and requirements of customers that are external to the organization. However, over recent years, some practitioners and academics alike are beginning to re-address how we do business, considering that such a customer orientation is only likely to be effective when the firm designs the necessary structures, processes and incentives to operationalize customer-oriented values. ... employees of the firm become internal customers. As with external customers, these too have requirements that need satisfying. Thus, through management satisfying the needs of internal customers, employees become more motivated and committed to the cause, which leads to external customers being well served”. Barnes B.R., Fox M.T., Morris D.S., “Exploring the Linkage between Internal Marketing, Relationship Marketing and Service Quality: a Case Study of a Consulting Organization”, Total Quality Management, Vol. 15, No. 5-6, July-August 2004, p. 593.
9 At an international level, an important role in quality assessment is played by ISO (International Organization for Standardization), the world’s largest developer and publisher of International Standards. For more information, see www.iso.org.
10 Service quality is conceptualized as “a comparison between expectations and performance”, see Parasuraman A., Zeithaml V., Berry L., “A Conceptual Model of Service Quality and Its Implication for Future Research”, Journal of Marketing, Vol. 49, Fall 1985, p. 42. Nine years after their first investigation on service quality, the Authors reiterated the concept of service quality as “the discrepancy between customers’ expectations and perceptions”. See Parasuraman A., Zeithaml V., Berry L., “Reassessment of Expectations as a Comparison
As mentioned before, public services respond to extremely important needs perceived as fundamental for the quality of life of a community. In the last decade, several social and regulation changes have determined an evolution in the concept of quality as far as public services are concerned.

Given the current fierce competition among companies, quality seems to play a key role for the obtainment of a competitive advantage. Recently, organizations, managers and academics have increasingly drawn their attention on quality determinants, considering the close relationship between quality and customer satisfaction, as well as between customer satisfaction and customer loyalty.

Since public services play a central role in determining the quality of life in a community, their level of quality can be considered as an essential factor of “social wellness”. Nevertheless, in public service organizations, quality is often an implicit attitude left to the good will of individual management and staff rather than a clear and well-defined policy pervading the whole organization.

In this sense, the Authority has tried to define specific indicators to evaluate the companies’ performance as far as public services are concerned.

In order to enhance the objectivity/impartiality of the judgment and the ex post controls, quality indicators should be the most objective and measurable possible. A useful point of reference for gas distribution service quality can be found in the indicators described in the Integrated Text of the Dispositions of the Authority (May 2007). In fact, companies must communicate to the Authority specific data on precise indicators established to the Authority itself with the aim of identifying important quality variables for the gas distribution service to citizens. These indicators can be summarized as follows: a) service safety b) service continuity c) commercial quality.

It will be useful to recall, briefly, the variables of such indicators.

a) Safety indicators:
   - annual percentage of inspected network, in high, medium and low pressure;
   - annual number of dispersions located per kilometre of inspected network;

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12 In the 90s, the evolution of the customers’ role, the gradual liberalization of the public service sector and the subsequent introduction of competition have induced public service providers to pay more attention to quality as a strategic tool to gain customers’ preferences. For recent debates about gas distribution in Italy, see Testa F., “La distribuzione di gas naturale in Italia: alcune questioni sul tappeto”, Management delle utilities, Anno 5, n. 1, Gennaio-Marzo 2007.
- annual number of dispersions located upon referral of third parties per kilometre of network
- odorisation of gas;
- intervention time after an emergency call;
- time needed to restore the safety conditions of the distribution network;
- compulsory services necessary for safety, e.g. network inspection.

b) Indicators of continuity:
- beginning, duration and end of the interruption;
- effective and conventional duration of the interruption;
- notice period before service interruption;
- number of end clients with notice period before service interruption of at least three working days;
- total conventional duration of a long interruption per thousand of end clients;
- causes of the interruptions;
- compulsory services necessary to continuity.

The indicators of the service safety and continuity seem still to privilege the point of view of efficiency rather than effectiveness\(^{15}\), focussing more on the technical-industrial aspects of the distribution system than on the quality in terms of customer satisfaction. A step forward towards efficacy is made however by

c) Indicators of commercial quality established by the Authority:
- time for estimating the cost of works;
- time for the execution of simple and complex works;
- time for activation of the supply;
- time for disactivation of the supply upon request of the end customer;
- time for reactivation of the supply after interruption for default;
- time to rectify an invoice;
- time needed to verify the measurement group and the supply pressure upon request of the end customer;
- time to answer to written complaints or written requests for information;
- punctuality in the appointments with the client;
- personalised appointments;
- calculation of the execution time of the services subject to specific and general levels of quality;

With reference to commercial quality, the Authority establishes also specific and general levels of quality to be complied with, under penalty of automatic compensation to the client by the gas distribution company. Only in the case of force majeure or causes ascribable to the client or third parties, the distribution company is not held responsible for automatic compensation.

Therefore, the qualitative approach just described comprises both a technical dimension – i.e. the activities aimed at the service security and continuity - and an interaction dimension which derives from the service encounter between the gas distribution company and its clients (e.g. when the company answers to customers’ written complaints). In order to increase the clients’ perceived quality, special attention should be paid to the “moments of truths”\(^{16}\), i.e. the occasions in which the clients come into direct contact with the service provider, either over the telephone, by (e)mail or in person. In fact, whenever the technical dimension cannot

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be easily evaluated by the client – e.g. the percentage of inspected networks or the causes of an interruption – the interaction dimension becomes a key point in the service evaluation. Commercial quality indicators are the most easily understandable by clients and therefore play an important role in customers’ appraisals because they can be evaluated without the risk of incurring into information asymmetries, i.e. “the disparity in knowledge between user and producer”. For this reason, it is extremely important for gas distribution companies to gain high performance levels in commercial quality indicators.

In this study, we will focus on such moments of interaction by analyzing the data on commercial quality performance of gas distribution companies in Italy.

3. The empirical analysis

In this section the objective, the methodology, the hypotheses and the results of the empirical analysis will be presented.

Objective

This study intends to investigate if there is a significant difference in the performance of small, medium and large gas distribution companies according to a quality perspective.

Methodology

The population includes all the Italian gas distribution companies with more than 100,000 clients, i.e. 28 companies. The whole population was analyzed, except for one supplier, the incumbent, which has far more clients than the other companies because of its former monopoly advantage. The commercial quality data of these companies are publicly available on the website of the Authority.

As shown in the following table, gas distribution companies were subdivided into 3 groups according to the number of clients. As a matter of facts, the total number of clients served can be considered an indicator of the companies’ dimension.

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17 On the role of customer participation in public service delivery, see Testa F., Ugolini M., Public services are changing: turning customer participation to better account, Proceedings from The 6th World Congress for Total Quality Management, Saint Petersburg, Russia, 20-22 June, 2001.
Table 1: Gas distribution companies in Italy

<table>
<thead>
<tr>
<th>Group 1 (100,000-199,999 clients)</th>
<th>Group 2 (200,000-499,999 clients)</th>
<th>Group 3 (500,000-1,999,999 clients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“SMALL” COMPANIES</td>
<td>“MEDIUM” COMPANIES</td>
<td>“LARGE” COMPANIES</td>
</tr>
<tr>
<td>ACAM Gas</td>
<td>Acegas Aps Spa</td>
<td>AEM Distribuzione Gas e Calore</td>
</tr>
<tr>
<td>AGSM Rete Gas srl</td>
<td>Arcalgas Progetti SpA</td>
<td>SpA</td>
</tr>
<tr>
<td>AMG Energia SpA</td>
<td>Ascopiave SpA</td>
<td>Compagnia Napoletana di</td>
</tr>
<tr>
<td>Azienda Municipale del Gas SpA</td>
<td>Azienda Energia e Servizi Torino</td>
<td>Illuminazione e Scaldamento col</td>
</tr>
<tr>
<td>Coingas SpA</td>
<td>CIGE SpA</td>
<td>Gas SpA</td>
</tr>
<tr>
<td>Consiag Reti srl</td>
<td>Eni’a SpA</td>
<td>Enel Rete Gas SpA</td>
</tr>
<tr>
<td>Edison DG SpA</td>
<td>Iride Acqua Gas</td>
<td>Hera SpA</td>
</tr>
<tr>
<td>Erogasmet SpA</td>
<td>Siciliana Gas SpA</td>
<td>Italcogim Reti Spa</td>
</tr>
<tr>
<td>GEI Gestione Energetica Impianti SpA</td>
<td>Toscana Energia SpA</td>
<td></td>
</tr>
<tr>
<td>SGR Reti SpA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thuga Laghi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thuga Mediterranea srl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thuga Padana srl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trentino Servizi SpA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tot. 14</strong></td>
<td><strong>Tot. 9</strong></td>
<td><strong>Tot. 5</strong></td>
</tr>
</tbody>
</table>

Source: our elaboration

In the course of our analysis, companies belonging to Group 1 will be referred to as “small”, companies belonging to Group 2 as “medium” and companies belonging to Group 3 as “large”.

Data about the service delivery to families (measurement group up to 6GJ) were considered for the year 2006\(^{21}\).

A t-test for independent samples was conducted to compare the mean of each group with the ones of the other groups considering some of the commercial quality indicators identified by the Authority, and more specifically:

a) indicators subject to automatic compensation in case of service inefficiency:
   - time needed to verify the measurement group;
   - time to answer to written complaints;
   - time for the execution of complex works required by clients;

b) indicators not subject to automatic compensation in case of service inefficiency:
   - time for estimating the cost of simple works;
   - time for the execution of simple works;
   - time for estimating the cost of complex works;
   - time for activation of the supply;
   - time for disactivation of the supply upon request of the end customer;
   - time for reactivation of the supply after the interruption for default.

Note that all these variables are measured in working days.

Commercial quality tries to identify significant values that can help to enhance service quality from the interaction perspective, whereas the indicators in the categories “safety” and “continuity” are overall too technical and difficult to understand for customers, that is why they were not included in this study.

\(^{21}\) The most recent data available.
**Hypotheses**

The hypotheses we formulated intend to investigate the existence of a significant difference in performance between each group, more specifically:

**H$_1$:** There is no significant difference between the performance of small and medium companies.

**H$_2$:** There is a significant difference between the performance of small and big companies.

**H$_3$:** There is no significant difference between the performance of medium and big companies.

The hypotheses were tested with a t-test for independent samples for each of the nine quality indicators mentioned before.

**Results**

The results of the analysis are shown in the following table.

Table 2: Significant differences in performance between groups of gas distribution companies

<table>
<thead>
<tr>
<th>Performance Item</th>
<th>Group 1 vs. Group 2</th>
<th>Group 1 vs. Group 3</th>
<th>Group 2 vs. Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time needed to verify the measurement group</td>
<td>-</td>
<td>significant difference</td>
<td>significant difference</td>
</tr>
<tr>
<td>Time to answer to written complaints</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time for the execution of complex works required by clients</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time for estimating the cost of simple works</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time for the execution of simple works</td>
<td>-</td>
<td>significant difference</td>
<td>-</td>
</tr>
<tr>
<td>Time for estimating the cost of complex works</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time for activation of the supply</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Time for disactivation of the supply</td>
<td>-</td>
<td>significant difference</td>
<td>-</td>
</tr>
<tr>
<td>Time for reactivation of the supply after the interruption for default</td>
<td>-</td>
<td>significant difference</td>
<td>significant difference</td>
</tr>
</tbody>
</table>

Source: our elaboration

Among the performance items not subject to automatic compensation, there is a significant difference only in the time needed to verify the measurement group between small and big companies, ie. Group 1 and Group 3 (t= -2.642; p= 0.018). The mean for small companies is 5.9 days; for large companies it is 10.7 days.

There is a significant difference for the same item also between medium and large distribution companies (t= -2.939; p= 0.012). It takes a mean of 4.6 days to medium companies to verify the measurement group, while big companies present a mean value of 10.7 days.

Note that Group 3’s performance is slightly above the standard established by the Authority (10 working days).

Among the performance indicators subject to automatic compensation, some significant differences were found between small and large gas distribution companies, more specifically:

- there is a significant difference (t= -2.272; p=0.036) as far as the time for execution of simple works is concerned (5.1 days for Group 1 and 6.5 days for Group 3);
- there is a significant difference (t= -2.384; p=0.029) as far as the time for disactivation of the supply upon request of the end customer is concerned (2.4 days for small companies and 3.3 days for large companies)
- there is a significant difference (t= -3.480; p= 0.003) between Group 1 and Group 3 also in the time for reactivation of the supply after interruption for default: the mean value for small companies is 0.6 days while for large companies it is 1.3 days.

There is a significant difference in the time for reactivation of the supply after interruption for default also between Group 2 and Group 3 (t= -2.370; p= 0.035). It takes medium-sized companies 0.7 days to reactivate the service, whereas large companies present a mean of 1.3 days.

Note that all the Groups respect the standards established by the Authority for these activities, i.e. 10 days for the execution of simple works, 5 days for the disactivation of the service and 2 days for the reactivation of the supply after interruption for default.

4. Conclusions

$H_1$ cannot be rejected. There is no significant difference between the performance of gas distribution companies belonging to Group 1 (from 100,000 to 199,999 clients) and gas distribution companies belonging to Group 2 (200,000-499,999 clients).

$H_2$ cannot be rejected only for four items out of nine. The t-test proved a significant difference between the performance of Group 1 and Group 2 in four indicators, i.e. the time needed to verify the measurement group, the time for execution of simple works, the time for disactivation of the supply upon request of the customer and the time for reactivation of the supply after interruption for default. As far as these indicators are concerned, small companies seem to have a better performance because they are able to respond to customers’ requirements in a shorter time. However, $H_2$ must be rejected for the other five items that were tested, i.e. there is no significant difference in the time to answer to written complaints, the time for the execution of complex works required by clients, the time for estimating the cost of simple works, the time for estimating the execution of complex works, the time for activation of the supply.

$H_3$ cannot be rejected, except for two items, i.e. the time needed to verify the measurement group and the time for reactivation of the supply after interruption for default. For these two quality indicators, medium-sized companies show a better performance than large companies, whereas no significant difference was found in the other indicators.

In this paper only nine items referring to commercial quality were tested, but service quality is defined also by other indicators. As previously stated, we were not interested in mere technical aspects, but rather in the items that implied a certain kind of interaction between client and distribution company or that could be easily evaluated by clients$^{22}$.

Out of these results, some considerations need to be made.

At a first glance, there does not seem to be a great difference in the performance of companies with different sizes. Maybe this fact could be traced back to the effort made by the Authority in the last years in order to improve public service quality. Competition still needs to be increased where possible and recommendations for call for tenders still need to be clearly

$^{22}$ Among service security and continuity indicators, it would have been interesting to analyze: 1) the data related to service interruption without prior notice for causes due to company and 2) the date related to the emergency service after the point of delivery of gas to customers. However, they were not included in this paper because they were not homogenous with the commercial quality data and could not be compared to them.
identified; however, the policy of this public organ seems to have led to a levelling of quality indicators among gas distribution companies.

Moreover, if we take a closer look at the results, for certain indicators small and medium-sized companies show a better performance than large companies in terms of efficiency. In fact, Group 1 does not include the smallest companies operating in the market, but only gas distribution companies with more than 100,000 clients. It would be interesting to analyze also the commercial quality performance of companies with less than 100,000 clients, but data were not available.

There are many reasons that could explain the results we obtained: first of all, gas distribution companies may attain a minimum efficient dimension below the lowest threshold considered (100,000 end customers). Secondly, small companies are probably advantaged in keeping close relationships with customers because of their local dimension and their territorial contiguity to clients, whereas large companies must deal with greater spatial distances. Moreover, large companies might not yet have completely interiorized modern technologies and models that should help improving the quality of relationships with customers.

Following these considerations, we can maintain that, according to the results of our study, there seems to be a kind of relation between corporate dimension and performance. In fact, the aim of this research was to test the significant difference in quality performance between groups of small, medium and large gas distribution companies. Further research is needed to deepen the knowledge of the nature of this relation and to see if dimension and performance are positively or negatively correlated.

If we consider the quality indicators analyzed as part of a scale that tries to describe the commercial quality of the gas distribution service, we do not reach an acceptable Cronbach alpha value. This fact may suggest that these indicators could be usefully integrated with other variables.

However, the positive aspect about these indicators is that they provide an objective basis to compare the performance of companies that differ for number of clients, geographical area and the time they have been in the market. Performance data are available for free to anyone that accesses the Authority’s web page, so that they can be used by companies for

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23 “The lowest level of production that enables to make the most of the indivisible factor and therefore to make the best use of economies of scale is usually called minimum efficient dimension or scale, whereas the level of production beyond which it is not convenient to produce is called maximum optimal dimension” (i.e. maximum efficient scale). Our translation from Panati G., Golinelli M.G., Tecnica economica industriale e commerciale, Volume Secondo, NIS, Roma 1994, p. 555. On economies of scale, see Scherer F.M., “Economies of Scale and Industrial Concentration”, in Harvey J. Goldschmid et al. (eds.), Industrial Concentration: The New Learning, Little, Brown & Co., Boston, 1974.

24 Such models constitute the bases of Customer Relationship Management. “To facilitate the management of customer relationships, software manufacturers have developed customer relationship management systems (CRMs), which are enterprise-wide applications that can provide a single view of any customer’s interactions with the company by tracking communications from both sides, recording purchases and thus developing an understanding of each customer’s preferences. Customers are being viewed more and more based on their lifetime value rather than being measured simply on the value of an individual transaction”. Fitzgibbon C., White L., “The role of attitudinal loyalty in the development of customer relationship management strategy within service firms”, Journal of Financial Services Marketing, March 2005, Vol. 9, Issue 3, pp. 214-215. The term CRM “is often used to describe technology-based customer solutions, such as sales force automation (SFA). In the academic community, the terms ‘relationship marketing’ and CRM are often used interchangeably... However, CRM is more commonly used in the context of technology solutions and has been described as ‘information-enabled relationship marketing’”. Payne A., Frow P., “A Strategic Framework for Customer Relationship Management”, Journal of Marketing, Vol. 69, Issue 4, October 2005.
benchmarking activities and by clients to compare the level of service quality they receive with the one delivered by other companies.

It would be interesting to compare these objective data with the subjective perceptions of customers. The best way to know customers’ perception is asking them, so customer satisfaction surveys should be taken into consideration by the Authority and by gas distribution companies if the aim is to enhance not just service quality, but also customer satisfaction. As a matter of fact, it is important to remember that “the difference between quality and satisfaction mirrors managerial versus customer concern; a manager and a service-providing firm tries to provide ‘high-quality’ service, and a customer experiences the service encounter and is ‘satisfied’ or not”. That is way “A firm may provide ‘high-quality’ service that nevertheless does not ‘satisfy the customer’ because the properties improved on do not matter to their customer.”

References


25 The Italian Statistic Institute (ISTAT) and the Authority are doing some research in this direction, but the data at the moment are not available to the public.


27 Ibidem.
THE APPLICATION OF QUALITY FUNCTION DEPLOYMENT IN SERVICE QUALITY MANAGEMENT

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Keywords: Customer Satisfaction, QFD, AHP, ANP, Markov Chains

1. Introduction

Nowadays consumers are more informed, more demanding and they easily change brands and companies if their requirements are not met on time and at a price they are willing to pay. Among others, delivering high service quality is considered an essential strategy for success and survival in today’s competitive environment (Zeithaml et al., 1996).

Understanding customers’ service expectations is a prerequisite for delivering superior service because they are implicit performance standards that customers use in assessing service quality (Parasuraman, 1998). Based on evidence from the PIMS research program, Buzzel and Gale (1987), reported a significant relation between relative quality -as perceived by the customers- and organizations’ profitability. Although, service quality and customer satisfaction have certain things in common, satisfaction is generally viewed as a broader concept than service quality assessment; thus, perceived service quality is a component of customer satisfaction (Lee et al., 2001). Indeed, there is a consensus in the literature that superior service quality leads to satisfied customers (Duffy and Ketchand, 1998) and to increased purchase intentions (Cronin and Taylor, 1992).

In summary, service quality is one of the most important issues in achieving comparative advantage and financial success in the service sector. A well-known technique, that is successful in designing services of high quality resulting in customer satisfaction, is Quality Function Deployment (QFD) (Stuart and Tax, 1996). The purpose of this paper is to present the benefits of applying QFD in the service sector and to investigate possible modifications of QFD so as to overcome limitations that companies faced in its implementation. The rest of the paper is structured as follows: Section 2 provides a review of the QFD technique and highlights its advantages and disadvantages. Section 3 presents quantitative techniques that can be combined with QFD so as to overcome its deficiencies. Section 4 illustrates a proposed modified QFD method with an example and finally, a brief conclusion and suggestions for future research are presented in section 5.
2. QFD in the service sector

Quality Function Deployment (QFD) is a service planning and development support method, which provides a structured way for service providers to assure quality and customer satisfaction while maintaining a sustainable competitive advantage (Akao, 1990). The goal of QFD is enhanced customer satisfaction, organizational integration of expressed customer wants and needs, and improved profitability (Griffin, 1992).

QFD is quite different from traditional quality systems which aim at minimizing negative quality such as poor service (Mazur, 1993). QFD focuses on delivering “value” by seeking out both spoken and unspoken customer needs, translating them into actionable service features and communicating them throughout an organization (Pun, Chin, Lau, 2000). It is driven by the “voice of the customer” and because of that, it helps service providers to address the gap between the specific and holistic components of customer expectations and actual service experience. In addition, it helps managers to adopt a more customer-driven perspective, pointing out the differences between what managers believe to be customer expectations and actual customer expectations. QFD is developed by a cross-functional team and it provides an excellent interdepartmental means of communication that creates a common quality focus across all functions/operations in an organization (Stuart and Tax, 1996). The unique approach of QFD is its ability to integrate customer demands with the technical aspects of a service. It helps the cross-functional team to make the key tradeoffs between the customers’ needs and the technical requirements so as to build a service of high quality. Hence, QFD is not only a methodological tool but a universal concept that provides means of translating customer requirements for each stage of service development (Chan and Wu, 2002).

A well-designed QFD process is able to link customer requirements, service specifications, target values and competitive performance into a visual planning matrix. QFD involves the construction of one or more matrices, called “quality tables”, which guide the detailed decisions that must be made throughout the service development process (Cohen, 1995). The first of these “quality tables”, called “The House of Quality (HOQ)”, is the most commonly used matrix in the QFD methodology. The traditional four-phased, manufacturing QFD methodology (Chan and Wu, 2002) is modified slightly so that it could be applied to the service industry and involves three quality matrices instead of four (Gonzalez et al., 2004; Pun et al., 2000; Stuart and Tax, 1996).

QFD has been introduced successfully to the service sector and numbers a great portion of applications. Its reported implementations are in various service areas such as education (Koksal and Egitman; 1998; Lam and Zhao, 1998), e-banking (Gonzalez et al., 2004), healthcare (Lim and Tang, 2000; Lim et al., 1999), hotels (Dube et al., 1999, Stuart and Tax, 1996), public sector (Curry and Herbert, 1998; Gerst, 2004), retail (Trappey et al., 1996; Sher, 2006), spectator event (Enriquez et al., 2004), technical library and information services (Chin et al., 2001) etc.

To a large extent, the widespread acceptance of QFD is due to its numerous benefits. Some of the most important benefits that are found in the literature are the following: Fewer design and service costs due to the reduction of irrelevant processes and fewer and earlier design changes because of the early identification of high risk areas (Gonzalez et al., 2004; Bouchereau and Rowlands, 2000); Lower cycle time and cost minimization of midcourse changes and implementation errors (Griffin, 1992; Xie et al., 2003); Fewer start-up problems and better company performance (Gonzalez et al., 2004); Improved service designs that meet or exceed customers’ expectations. Better handling of increased demand and efficient allocation of resources (Xie et al., 2003; Tan and Pawitra, 2001); Establishment and maintenance of documentation due to the fact that information is stored in the matrices so none of the details is lost over time (Griffin, 1992; Tan and Pawitra, 2001; Chan and Wu, 2002).
2002); More stable quality assurance planning and increased possibility for breakthrough innovation (Xie et al., 2003); Identification of future application opportunities and effective use of competitive information (Chan and Wu, 2002); Improved service quality because QFD helps prioritizing customer requirements in order of importance from customer viewpoint. Increased customer satisfaction due to the reason that QFD helps understanding the actual customer requirement (Han et al., 2001); Improved exchange of ideas and increased communication within the organization. QFD changes management communication patterns from “up-over-down” flows to more horizontal routes. Cross-functional team members communicate directly with one another (Griffin and Hauser, 1992; Gonzalez et al., 2004; Chan and Wu, 2002).

On the other hand, a number of problems have been reported, encountered at some stage of the implementation of QFD. More specifically, QFD limitations are: its methodology imposes the need to deal with large amounts of data gathered from customers, competitors, cross-functional teams etc; The manual input of customer survey into the HOQ is time-consuming and difficult (Bouchereau and Rowlands, 2000); The HOQ can be large and complex. It is not easy and it is time consuming to have to assess the relationships between each customer requirement and service characteristic, and the correlations among the various service characteristics (Han et al., 2001; Bouchereau and Rowlands, 2000); Setting target values in the HOQ is often imprecise (Bouchereau and Rowlands, 2000); Due to the fact that not everyone has the same perception of a particular linguistic description, the voice of the customer contains ambiguity and different meanings (Erol and Ferrell, 2003; Bouchereau and Rowlands, 2000); Due to the need to input and analyze large amounts of subjective data, bias can be easily injected into any stage of the QFD implementation and an invalid conclusion can be made; The QFD method is an ongoing process, thus errors at one stage will propagate to successive stages (Han et al., 2001; Griffin and Hauser, 1993); Strengths between relationships are sometimes ill-defined. The QFD approach uses absolute importance to identify the degree of importance for each customer and service requirement. This assumes that accurate and representative data in an absolute scale is available (Chuang, 2001). It can be difficult to translate customer demands into measurable service features. Also, QFD assumes that there exists a linear relationship between customer requirements and service attributes. Another drawback is that QFD analyses are often limited to the first HOQ, breaking the links between the three QFD phases (Chan and Wu, 2002; Bouchereau and Rowlands, 2000); QFD assumes that the customer requirements are deterministic, thus remaining unchanged over time (Xie et al., 2003). Last but not least, QFD is a qualitative method (Bouchereau and Rowlands, 2000).

These problems have prompted the need for new approaches to the application of the QFD method. As proposed in the relevant literature, the effectiveness of QFD could be improved through the utilization of quantitative techniques such as the Analytic Hierarchy Process, the Analytic Network Process and Markov Chains. The integration of qualitative QFD with quantitative methods helps to overcome previously identified shortcomings and yields greater benefits from its implementation. Efforts, also, should be made to automate the HOQ and reduce the required time to complete it.

3. Quantitative methods integrated with QFD

Customer requirements prioritization is a critical part of QFD implementation. Traditional QFD requires from customers to translate their perceptions into numerical scales, through mechanisms like the Likert scale. In this respect, customers are asked to evaluate whether a relationship is weak, moderate or strong and their answers are translated to a scale like 1-3-5, 1-4-7 or 1-5-9 (Erol and Ferrell, 2003). Then, the service features are prioritized according to their additive impact on customer requirements using a relationship matrix. But, as (Erol and
Ferrell, 2003) point out, not all the customers have the same perception of a particular linguistic description and additionally, the choice of scales can dramatically influence the outcome. However, it is common for customers to respond quite different from what they really mean and tend to rate almost everything as important. Chan and Wu (2005) underline the fact that the “voice of the customer” contains ambiguity and multiplicity of meaning.

To tackle these problems often the Analytic Hierarchy Process (AHP) method has been adopted. AHP is used in the HOQ in order to determine the intensity of the relationship between the customer requirements and the service features. AHP, initially developed by Saaty in the 70’s, is a multicriteria decision-making method that uses a hierarchy to represent a decision problem. Each element in the hierarchy is supposed to be independent, and a relative scale measurement is derived from pairwise comparisons of the elements in a level of hierarchy with respect to an element of the preceding level (Karsak et al., 2002). The advantage is that AHP takes into account subtle attribute preferences of the customer that are otherwise difficult to include (Han et al., 2001). In addition, it enables the incorporation of judgments on intangible qualitative criteria along with tangible quantitative criteria (Partovi, 2001).

Despite its numerous applications and its widespread acceptance, there are at least four issues where AHP is subject to criticism. First, it is claimed that the axiomatic foundations of AHP do not derive from a specific mathematical theory. The solution to this problem, according to Dyer (1990), is based on a synthesis of the AHP assessment methodologies with the theory of multiattribute utility method. Second, it is argued that the nine point AHP scale has some obvious shortcomings (Arbel, 1989). The exact ratio scale used in the pairwise comparisons sometimes fails to take into account the imprecision or the vagueness in the mind of respondents when they make the pairwise comparisons. Conventional AHP cannot reflect the human thinking style. In this case we may introduce concepts from fuzzy theory into the AHP. In fuzzy AHP an interval ratio scale and not a single precise value is used to describe a pairwise comparison. Third, it is argued that the form of the questions associated with AHP do not provide useful information about the decision-makers’ preferences (Watson and Freeling, 1982). And finally, it is stated that although the eigenvalue method is very elegant from the mathematical viewpoint, the priority vector derived from it can violate the condition of order preservation that is fundamental in decision aiding- an activity in which it is essential to respect values and judgments (Bana e Costa and Vansnick, 2008). An alternative approach might be the MACBETH method, introduced by Bana e Costa and Vansnick (1994). MACBETH employs a non-numerical interactive questioning procedure that compares two elements at a time, requesting only a qualitative judgment about their difference of attractiveness. As the answers are given, their consistency is verified, and a numerical scale that is representative of the decision maker’s judgments is subsequently generated and discussed (Bana e Costa and Chagas, 2004). To the best of the authors’ knowledge, an application that integrates QFD with MACBETH has not yet been established and it would be interesting to investigate its possible application, benefits and advantages when integrated in the QFD procedure.

Apart from AHP, the Analytic Network Process has been used in conjunction with QFD. The ANP generalizes the AHP by replacing hierarchies with networks. AHP employs a unidirectional hierarchical relationship among clusters, while ANP enables interrelationships not only among the clusters but also between the elements of a cluster. ANP is used in the HOQ so as to calculate the correlations between columns in the Roof matrix, and ANP’s Supermatrix is used to determine the priorities of service features. ANP exhibits some important features that promote its integration with QFD. First, in the traditional QFD approach the roof matrix correlations are employed during the post-analysis evaluation to adjust the column values. However, the use of ANP integrates the roof matrix values into the
computations, thereby reducing the amount of subjectivity present. Second, the QFD approach treats the column relationships as symmetrical reciprocal correlations. In contrast, ANP treats column correlations either symmetrically or asymmetrically as appropriate (Partovi, 2001; 2002; 2006). Finally, ANP assumes that the relationships between customer requirements and service attributes are not linear and there is inner dependence among customer needs or among service features. This perspective provides a basis to calculate to what extent a change, in one feature will affect the achievement of the others and consequently to what extent it will affect the customer. Furthermore, as Re Velle (1991) suggests, customer needs are dynamic. Under rapidly changing environments, customer opinions and requirements may alter over time. In traditional QFD, we collect customers’ voice and then ask them to rate the importance of their requirements. However, if customers are asked again after a short time to prioritize their requirements, it is possible that they will not give the same answer. Furthermore, it is very likely that earlier customer needs disappear and new are added in the list. In addition, it is difficult to conduct market surveys on a regular basis. The above problem can be solved if a markov chain model is integrated in the HOQ to monitor the trend for each customer requirement as well as for each service feature from a probabilistic viewpoint. The advantage is that the gathered information on a regular basis is typically uncertain so using markov chain model might be more appropriate to analyze customer needs and track the importance trends of service features (Wu and Shieh, 2006).

4. An illustrative example
This example presents the implementation of QFD along with the most widely used quantitative methods of AHP and ANP. Our example uses real world data from the banking sector aiming at prioritizing customer selection criteria. As mentioned earlier, AHP has been criticized by quite a few researchers regarding its utilization and limitations. This illustrative example is an opportunity to investigate the possible problems that may rise from the implementation of the modified QFD method. All relevant details are illustrated step by step in order to facilitate the understanding of the integrated QFD process in the service industry. The entire QFD process for services includes three inter-linked phases, however, due to the reason that the structures and analyzing methods of the other QFD phases are basically the same as the first one, we limit our presentation to the first HOQ.
In our example, a bank which for obvious reasons is called X, wishes to improve its commercial banking services in response to the increased competition. We utilized primary data regarding customers’ perceptions and preferences through a field survey and bank managers’ evaluations through interviews. Initially, the commercial customers are identified and categorized into seven market segments, based on their product related primary relationship with the bank. The classification of the market segments is in accordance with the annual report of the Bank of Greece (2007) and they are: Consumer Loans, Housing Loans, Other Loans, Credit Cards, Direct Access Deposits, Time Deposits Accounts, Mutual Funds Shares. The size of each market segment as a percentage of X’s total business is 16%, 17%, 8%, 7%, 26.4%, 19% and 6.6%, respectively, as shown in the second column of the HOQ (see Fig. 1 in the next page).
The inputs for the first HOQ were obtained through a market survey among bank X’s customers. A questionnaire was designed with a list of pre-defined bank selection criteria mainly identified from Anderson et al. (1976). In order to calculate the weights of the relationship matrix, the customers of each market segment were asked to compare each pair of bank selection criteria and expressed their preference by using the usual nine point AHP scale. An example of the questions posed is: How much more important is “Recommendation by friends” than “Reputation” for the market segment “Housing Loans?”; How much more
important is “Recommendation by friends” than “Service charges on checking accounts” for the market segment “Housing Loans?” etc. The same type of questions is repeated for all seven market segments.

In order to complete the roof matrix the impact of all selection criteria on every other selection criterion is evaluated. An example of the questions posed is: Given the bank selection criterion “Recommendation by friends”, which criterion, “Reputation” or “Service charges on checking accounts” contributes more to “Recommendation by friends” and by how much? etc. The same type of questions was repeated for the remaining criteria.

The market segments are shown in the first column of the HOQ, on the left side and their bank selection criteria are shown in columns 2-9 of the matrix (see Fig. 1). The remaining columns on the right represent a competitive analysis. The percentages, presented in column 10, designate the market share of X within each market segment. Columns 11 and 12 show the market share of two selected competitive banks. The cross-functional team used the information about the competitors’ market share in order to select a particular market share percentage as a future goal. This goal, indicates where bank X desires to be in the future with respect to the other competitive banks in each market segment (column 13). The ratio presented in column 14, reflects the X’s intention to improve, reduce or maintain its current position in each market segment and it is calculated by dividing X’s goal by its current position. For example, the X’s market share for the market segment “Housing Loans” is 17% and its goal is 20%, so the improvement ratio is 20/17=1.18. A ratio larger than 1.0 reflects an intention to increase market share in that particular market segment, while a ratio below 1.0 reflects a reduced interest for that segment. The weighting factor of column 15 represents the extent to which a particular market segment is important to X and it is computed for each market segment by multiplying column 1 by column 14. Finally, column 16 depicts the normalized weighting factor of each market segment. This normalized score is calculated by dividing the weighting factor of each segment by the sum of the weighting factors.

![Figure 1: The House of Quality](image-url)
The relationship matrix and the roof matrix are calculated using the Super Decisions software (www.superdecisions.com/~satty). First, we computed the weights of the relationship matrix using AHP. The integrated QFD-AHP process structures a hierarchy with 3 clusters: a goal cluster containing the goal element, which is “customer satisfaction”, a criteria cluster containing market segment elements and an alternatives cluster containing bank selection criteria elements (see Fig. 2). In particular, we used AHP in order to prioritize bank selection criteria with respect to each market segment.

After completing the relationship matrix with the importance ratings, the process moves to the phase of deriving interdependent priorities for bank selection criteria using ANP. The elements of the cluster “bank selection criteria” present inner dependencies. In figure 2, we present a snapshot of the software showing the integrated QFD-AHP-ANP model, which structures a network (the loop indicates the inner dependencies). To complete the roof matrix, the impact of all bank selection criteria on every other criterion and the influence of a bank selection criterion upon itself are also assessed (Partovi, 2001; 2002; 2006).

![Figure 2: The QFD-AHP-ANP network](image)

The procedure concludes by obtaining the ANP limiting supermatrix which shows the importance ratings of bank selection criteria. Since the initial supermatrix, appearing in figure 3, is stochastic, irreducible and acyclic, its limiting form, shown in figure 4, is stable and

![Figure 3: The Initial Supermatrix](image)
provides the results for the modified QFD model (Saaty, 1996). The limiting supermatrix’s values become the “Importances” row of the HOQ (see Fig.1).

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The results show that the most important bank selection criterion is “Service charges on checking accounts”, with a percentage priority of 21.8%. The next more important is “Parking” with 19.7% percent. The rest of the criteria in descending order of importance are the following: Location (12.2%), Interest payments on savings accounts (11.5%), Hours of operation (10.6%), Interest charges on loans (9.3%), Reputation (7.6%), Recommendation by friends (7.3%).

5. Concluding Remarks

QFD is an elegant tool that has been successfully introduced to the service sector. It offers a structured guideline for converting customers’ requirements into characteristics of new services. The main scope of this paper was to present the benefits of applying QFD in the service sector, point out the possible shortcomings and propose quantitative methods that enhance the effectiveness and efficiency of QFD as a means of translating the “voice of the customer” into service requirements.

AHP and ANP are well-known quantitative techniques that were used in conjunction with QFD. The real world illustration provided in this paper demonstrated the applicability and ease of use of the modified QFD model, but also revealed at least one shortcoming. The integrated QFD-AHP-ANP method entails gigantic data collection tasks. It employs a lengthy questionnaire with numerous and quite similar questions, occasionally causing confusion to respondents. Consequently, it is extremely difficult for customers to make all these pairwise comparisons and the overall procedure also requires a lot of time and patience.

Lastly, while the proposed model adds quantitative precision to an otherwise qualitative method, on the other hand, there are several studies that point out weaknesses and drawbacks of AHP. In particular, we identified at least four main issues regarding AHP criticism. Therefore, our final comment regarding this analysis is that future research should be directed towards exploring alternative quantitative approaches of preference assessment, which may resolve the issues raised for AHP. Still, undoubtedly, the incorporation of AHP in the QFD context provided a more accurate and less subjective measuring framework. The outcome supports better service offerings that meet or exceed customers’ needs, leading to improved sales and higher satisfaction.
References


THE EXCELLENCE IN WORKPLACES AS COMPETITIVE FACTOR FOR BUSINESS SUCCESS

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Introduction

The managing of human resources in the workplaces - with particular attention to their motivation and satisfaction grade - can be a critical factor for business success of the organizations.

The excellence in the workplaces has been recently deepened by the Great Place to Work Institute - leader in the measurement of the quality in the organizations - whose aim is “building a better society by helping companies transform their workplaces”.

A few studies on quality management approach for the human resources - not necessarily involving the implementation of a complete quality management system - evidenced that the “inherent human resources variables constitute the long term drivers for business development”; in particular the companies that focus on human resources as factor of competitiveness, with the purpose to confer effectiveness to their projects of development, use objective indicators, whose correct choice is important to measure with precision the effects of their policies and management activities.

The objective of the present paper is to propose - as a consequence of a detailed analysis of the data at disposal from the 100 “best workplaces in Europe 2007” - a general “workplace panel of factors and indicators” in order to monitor the quality of a workplace, giving the organizations a competitive advantage deriving from an increased satisfaction and motivation of their personnel.

The following analysis takes in consideration the 100 Best workplaces in Europe (whose national distribution - as synthesized in Table 1 - includes the different sites of every company), according to the ranking proposed from the Great Place to Work Institute Europe for the year 2007.

Table 1 - National distribution of the 100 Best workplaces in Europe (2007)

<table>
<thead>
<tr>
<th>NATIONS</th>
<th>Germany</th>
<th>Ireland</th>
<th>Denmark</th>
<th>UK</th>
<th>Austria, Portugal, Netherlands, Norway</th>
<th>Italy, Sweden</th>
<th>Spain, France, Greece</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nº SITES/NATION</td>
<td>21</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
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</table>

The Italian automobile company Ferrari best place to work

It can be evidenced that the Italian luxury car maker Ferrari “has earned the number one spot (2007) and - with it - the title of European Workplace of the Year”; in particular the
automotive company (2850 employees: 11% women and 89% men) - already in the European List in 2003 - has been appreciated for:

training programs named after famous explorers (for instance: Christopher Columbus, for Basic Training/Orientation information teaching people - especially new hires - to live the company values; Charles Lindbergh, for the Managers’ Institutional Training; Neil Armstrong, for Leader’ Continuous Training; Marco Polo, for Workers’ Training);

a 12-points values system modelled after a 12-cylinder motor (including values as Tradition and Innovation; Individual and Team; Passion and Sport Spirit; Territorial and Internationality; Ethics and Profit; Excellence and Speed);

quality improvement projects organized as races between teams/employees (for instance: “Fiorano Race”, among 10 working teams who challenge themselves with quality improvement projects; “Grand Prix” program, for employees who offer new ideas) 5.

In 2008 the Ferrari “Formula Uomo” program focuses the attention on occupational safety, ecology, workers quality of life, technological aspects and energy savings: “a long time strategy to create a only in the world workplace started in 1997” 6 and finished this year with the complete innovation of the “Gestione Industriale”. From 2009 the strategy will impact with the “Gestione Sportiva”, the division of the company concerned with racing.

The historical entrance, with the office of the deceased founder Enzo Ferrari, is the only one structure remained of the original plant (1947) a: the actually workplaces, in seven other buildings, are completely new, with big glasses for natural light, innovative technologies, internal and external gardens, a thousand trees, a considerable number of benches, 100 red bicycles at workers’ disposal for the movement in the internal “avenues” (named in honours of famous racers). The cost sustained to implement such a plant transformation was 200.000.000 euros in ten year; in 2008 the investments for occupational safety amounts to 4.000.000 euros. The company in order to improve workers’ quality of life implemented some other initiatives such as: granting of loans - at competitive rates - for the first and the second house, free medical-sportive check-up (extended to workers’ members of the family), free gymnasia, discounts for scholastic books and University texts 7.

“In the new workplaces, with noise, temperature and humidity under control, the high technological machinery stops less frequently. As a consequence of better maintenance and energy savings such an investment is profitable in a couple of years. By end 2009 the company will be 90% energy autonomous, grace to an existent photovoltaic plant and to a tri-generator (planned for spring 2009) that will allow to transfer the energy surplus to the surrounding territory. In the same time there will be a 35% reduction for the CO2 emissions” 8.

The Ferrari Quality and Environmental Management Systems in Maranello obtained - from the Certification Body Det Norske Veritas (DNV) - respectively the ISO 9001:2000 9 and the ISO 14001:2004 10 certifications. The initial Quality and Environmental Management System certifications are respectively dated 1996 and 2001. The scope in the actual certificates deals with:

Planning, realization, sale and post-sale assistance for Grand Tourism cars (ISO 9001);
Planning and realization of Grand Tourism cars, through the phases of: planning and development, light alloys fusion, mechanical operations, plating, painting and assembly. Realization of Racing cars through the phases of: light alloys fusion, elaboration of composite materials and painting, mechanical operations and assembly. The activities in the autodrome of Maranello are not included (ISO 14001).

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a Ferrari is based in Maranello, Italy, and was founded by Enzo Ferrari in 1929 as Scuderia Ferrari. The company manufactured racing cars and sponsored drivers before moving into production of legal street vehicles in 1946 as Ferrari S.p.A.
A model for the Best Workplaces and the assessment process

The Great Place to Work Institute is a research and managerial consultancy company based in San Francisco (USA) with over 30 affiliate international offices all over the world in four macro areas: North America, South America, Europe and Asia. It has been established in 1991 by Robert Levering and Amy Lyman following the publication of the best seller "The 100 Best Companies to Work for in America". The first activities of the Institute were developed in collaboration with the magazine “American Fortunes”, actually editorial partner of the Institute, and involved organizations of every sector and dimension. The Institute offers to the organizations different services such as assessment/evaluation, education and/or research on great workplaces.

The Institute firstly expanded in South America (Brazil in 1995) and then in Europe, with projects in Italy, United Kingdom, Denmark and Switzerland, and with the creation of the Great Place to Work Institute Europe in 2001. In March 2003, with the support of the European Union, it has been announced the first List of the 100 Best Workplaces in Europe. The Great Place to Work Institute aims to help the organizations to understand and to put into practice those qualities and behaviours that bring to the creation of excellent workplaces. This effort brings to improve the quality of the working life for the employees and the efficiency for the organizations.

In 2006, in fact, the 100 Best Workplaces in Europe have increased revenue by 20% and hired 12.6% more staff, have lower rates of absenteeism and lower voluntary employee turnover compared to the general labour market. In the year 2007 - worldwide - more then 3,000 companies in 30 countries participated to the evaluation process (the data include more than 1,000 companies from 15 European countries, with more than 100,000 European employees responding to the survey) (Source: Great Place to Work Institute, 2007).

According to the protocol of the Institute, it is necessary that each organization reaches the excellence in the quality of three key relationships, i.e.: a) between employees and management; b) between employees and their job/occupation; c) between employees and other employees.

The model

The Institute employee-centred model (“protocol”) is based on the analysis of five different variables or “Dimensions” (Credibility, Respect, Fairness, Pride and Camaraderie) as summarized in the Scheme 1. “Trust” is the essential ingredient for the primary workplace relationship between the employee and the employer: according to the model, “Trust” includes the three “dimensions” of Credibility, Respect and Fairness.
Scheme 1 - Dimensions of the Great Place to Work Model

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<tr>
<th>T R U S T</th>
<th>1 - C R E D I B I L I T Y</th>
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<td>2 - R E S P E C T</td>
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<td>3 - F A I R N E S S</td>
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<td>4 - P R I D E</td>
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<td>5 - C A M A R A D E R I E</td>
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1. Managers regularly communicate with employees about the company's direction and plans - and solicit their ideas. Coordinating people and resources efficiently and effectively, so that employees know how their work relates to the company's goals.

2. Providing employees with the equipment, resources, and training they need to do their work. Appreciating good work and extra effort. Reaching out to employees and making them partners in the company's activities, fostering a spirit of collaboration across departments and creating a work environment that's safe and healthy.

3. Economic success is shared equitably through compensation and benefit programs. Everybody receives equitable opportunity for recognition. Decisions on hiring and promotions are made impartially, and the workplace seeks to free itself of discrimination, with clear processes for appealing and adjudicating disputes.

4. Workplace relationships between employees and their jobs/company. Employees take pride in their job, their team, and their company: they feel that they can be themselves at work.

5. Workplace relationships between the employee and other employees. The workplace becomes a community: employees celebrate the successes of their peers and cooperate with others.

Source: elaboration from the Great Place to Work Institute Internet site (2008).

The assessment process
The participation to the assessment process starts with the voluntary registration of the organization that must have a minimum of 50 employees and not to have an acquisition in progress that increases the personnel more than 25%.

The process implies the anonymous compilation of a standardized questionnaire (called "Trust Index", structured in 57 questions related to the five above "Dimensions" and two open questions) and the delivery - from the organization - of “workplace documentation” (i.e. procedures and programs for the excellence in the workplace).

The scale of evaluation in the questionnaire is based on six impressions (almost always false; often false; sometimes false; sometimes true; often true; almost often true); for the final classification a weight of 2/3 is assigned to the questionnaire and a weight of 1/3 to the documentation sent by the organization.

For each “Dimension” three representative macro aspects (A, B, C) (Table 1) are investigated through the questionnaire.
Table 1 - Dimensions and macro aspects of the Great Place to Work Model

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>MACRO ASPECT</th>
</tr>
</thead>
</table>
| 1 Credibility | A Communications are open and accessible  
                B Competence in coordinating human and material resources  
                C Integrity in carrying out vision with consistency |
| 2 Respect | A Supporting professional development and showing appreciation  
           B Collaborating with employees an relevant decisions  
           C Caring for employees as individuals with personal lives |
| 3 Fairness | A Equity - balanced treatment for all in terms of rewards  
            B Impartiality - absence of favouritism in hiring and promotions  
            C Justice - lack of discrimination and process for appeals |
| 4 Pride | A In personal job, individual contributions  
         B In work produced by one’s team or work group  
         C In the organization’s products and standing in the community |
| 5 Camaraderie | A Ability to be oneself  
                B Socially friendly and welcoming atmosphere  
                C Sense of “family” or “team” |

A tool to improve the quality in the workplaces

As a consequence of a detailed analysis of the material at disposal in the Internet site of the Great Place to Work Institute it has been possible to elaborate a sort of simplified questionnaire (“Check-list”), structured in only 21 questions but useful to orientate the processes of an organization to the five typical “Dimensions” of the “employee-centred” Model (Table 2).

According to the previous indicated scales of evaluation, as proposed by the Great Place to Work Institute, the results of the check-list could be classified in demographic and functional categories. In particular the obtained data could be disaggregated and elaborated in four categories - with reference to sex, class of age, title of study and level in the company (worker, employee, manager) - in order to monitor both the personnel satisfaction grade and to influence the correct managing not only for eventual complaints and other observations, but also for appreciations and improvement proposals 12, 13.

Table 2 - Check-list basically aligned to the Great Place to Work Model

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>QUESTION</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Credibility</td>
<td>Q1 Can you freely set any pertinent question to the management and to receive a clear answer ?</td>
<td>It measures the propensity of the management to divulgate information to the employees and the availability to make to understand them the motivation of the business choices.</td>
</tr>
<tr>
<td></td>
<td>Q2 Do you believe the management informs you about the most important problems and changes ?</td>
<td>It measures the interest of the management to establish a relationship of trust with the employees involving them in the decisional process.</td>
</tr>
<tr>
<td>2</td>
<td>Respect</td>
<td>Q3</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Q4</td>
<td>The personnel is encouraged to find a correct balancing between professional and private life?</td>
<td>It measures the propensity of the management to pay attention to the personal necessities of the employees, encouraging them to balance their professional appointment with the personal necessities.</td>
</tr>
<tr>
<td>Q5</td>
<td>The services offered by the company contribute to improve the quality of the workplace?</td>
<td>It appraises the effectiveness of the services to the employees in order to contribute to the quality of their workplace and is therefore a check for the company about the utility and the costs met for such services.</td>
</tr>
<tr>
<td>Q6</td>
<td>Can you freely take a period off work when you feel that it is necessary?</td>
<td>It measures the management propensity to prefer the psychophysical health of the employees to the logic of the profit, showing attention to the worker as a person.</td>
</tr>
<tr>
<td>Q7</td>
<td>Do you believe that this is a psychologically healthy workplace?</td>
<td>It measures the management efforts to make the company a valid workplace, investing in the structures, the services and the assistance towards employees.</td>
</tr>
<tr>
<td>3</td>
<td>Fairness</td>
<td>Q8</td>
</tr>
<tr>
<td>Q9</td>
<td>Do you think that the employees receive a correct quote of the company profits?</td>
<td>It is facing to measure the management propensity to redistribute, among the employees, part of the profits as a reward for the attainment of the objectives.</td>
</tr>
<tr>
<td>Q10</td>
<td>Do you perceive to be considered as a real member of the company independently from your position?</td>
<td>It is directed to measure the ability of the management to involve in the productive and managerial processes every employee, attributing to each the worth for the contribution given to the attainment of the business mission.</td>
</tr>
<tr>
<td>Q11</td>
<td>The personnel is fairly treated without any distinction based on age, sex, race or ethnic group, sexual orientation or other diversity?</td>
<td>It measures the top management ability to respect and accept the diversities, not to discriminate the minorities, in the processes of selection and evaluation, in guaranteeing equal salaries and not setting limits to the possibilities of career.</td>
</tr>
<tr>
<td>4</td>
<td>Pride</td>
<td>Q12</td>
</tr>
<tr>
<td>Q13</td>
<td>Do you believe your work contributes to “do the difference”?</td>
<td>It measures the perception of the employee to contribute to the business mission and to realize something useful for the life of the people and/or for the environment in which the company operates.</td>
</tr>
<tr>
<td>Q14</td>
<td>Considering the reached results, do you perceive a sense of pride?</td>
<td>It not only measures the management ability to reach the objectives but also to be able to make the most of every employee, showing appreciation for his contribution and making to feel him responsible of the business success.</td>
</tr>
<tr>
<td>Q15</td>
<td>Do you feel satisfied about the way the company contributes to the welfare of the society?</td>
<td>It measures the management ability to communicate and to effectively transmit to all the employees the mission to be an important part of the society in which the company operates, contributing to its welfare.</td>
</tr>
<tr>
<td>Q16</td>
<td>Do you feel you can realize yourself in your workplace?</td>
<td>It appraises the management ability to establish a serene workplace based on the mutual trust and, when possible, without formalities among employees and between them and the management.</td>
</tr>
<tr>
<td>Q17</td>
<td>The personnel celebrates the special events inside the company?</td>
<td>It appraises the sense of aggregation and the management mission to consider the structure as a family, introducing in the company some aspects concerning the employees personal life.</td>
</tr>
<tr>
<td>Q18</td>
<td>Do you perceive your workplace as a friendly one?</td>
<td>It measures the grade of existing affinity among employees, that can be supported by the management by proposing aggregation moments to improve the interpersonal relationships among colleagues.</td>
</tr>
<tr>
<td>Q19</td>
<td>Do you perceive your workplace as an amusing one?</td>
<td>It measures the grade of informality in the workplace and the perception that the employees have about the management efforts to favour a serene and amusing environment in the company.</td>
</tr>
<tr>
<td>Q20</td>
<td>Do you think you can count on other personnel cooperation?</td>
<td>It measures the “team spirit” present in the company. The management can influence this variable evaluating the personal employees’ contribution to the common projects: aware of being evaluated with equity and objectivity, the employees will be more induced to participate in common projects.</td>
</tr>
<tr>
<td>Q21</td>
<td>At the moment of your assumption, did you feel at ease and well-accepted?</td>
<td>It measures the management ability to involve, since their assumption, the new employees making them feel part and share the mission of the company.</td>
</tr>
</tbody>
</table>

Source: elaboration from S. Rivella, The mutual trust between management and human resources in achieving business success: The Great Place To Work Institute’s analysis, Dissertation, University of Turin, 2008.
Conclusions

A practical instrument for the management in order to evaluate the grade of satisfaction of the personnel about their company is represented by the check-list. The correct use of a business tools as the above - or a similarly structured - check-list can facilitate the process of quality improvement in a workplace.

Such a tool could be inserted in an internal auditing procedure in order to consolidate a business praxis oriented to periodically analyse the trend of the grade of satisfaction.

The final result of the elaboration of the data obtained could be used: as a useful synthesis (for instance articulated in indexes) of the grade of perception of the personnel about the quality of their workplace; as a starting point for a periodical improvement process about the quality of their workplace; for a benchmark analysis among other companies (with other similarly obtained indexes); to obtain a third part certification about the quality of the workplace; to obtain an appreciation about the excellence in the workplace.

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6 L. di Montezemolo, La Stampa, Economia, 26 June 2008, 29.
7 F. Spini, La Stampa, Economia, 26 June 2008, 29.
8 A. Felisa, La Stampa, Economia, 26 June 2008, 29.
9 ISO 9001, Quality management systems, Requirements, 8 December 2000.
10 ISO 14001, Environmental management systems, Requirements with guidance for use, 15 November 2004.
11 R. Levering, M. Moskowitz; The 100 Best Companies to Work for in America, Addison Wesley, USA, 1984.
1. Market participants and credit derivatives use

The growth of credit derivatives suggests that market participants find them useful for risk management. Notional amounts of credit derivatives outstanding have roughly doubled each year for the past six years. In 2007 notional amounts of these derivatives was reached almost 58,000 billion USD [1]. Credit derivatives have been used by a wide variety of market participants. No single data source provides definitive information on the activity of different types of market participants. But by combining the Bank for International Settlements (BIS) Semiannual Derivative Statistics and surveys providing by Fitch Ratings, we can get a relatively clear picture. These data sources measure activity in credit derivatives market with notional amounts, which are often not a good measure of the credit risk that is actually transferred in a particular transaction. However, notional amounts are relatively easy data to collect and that’s the reason why they are the most common data reported.

Table 1 shows the notional amounts outstanding of credit default swaps by type of counterparty for December 2007 [1]. The largest category is reporting dealers, reflecting the inter-dealer nature of the market. In any dealer market, dealers rely on inter-dealer trading to adjust their risk profile in response to trading flows from end-users.

<table>
<thead>
<tr>
<th></th>
<th>Notional amounts outstanding bought</th>
<th>Notional amounts outstanding sold</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CDS contracts</td>
<td>44,298,440</td>
<td>45,625,528</td>
<td>57,893,972</td>
</tr>
<tr>
<td>Reporting dealers</td>
<td>31,386,564</td>
<td>32,673,440</td>
<td>32,030,002</td>
</tr>
<tr>
<td>Other financial institutions</td>
<td>12,423,089</td>
<td>12,562,246</td>
<td>24,985,336</td>
</tr>
<tr>
<td>Banks and security firms</td>
<td>6,767,797</td>
<td>7,081,360</td>
<td>13,849,157</td>
</tr>
<tr>
<td>Insurance and financial guaranty firms</td>
<td>319,060</td>
<td>166,362</td>
<td>485,422</td>
</tr>
<tr>
<td>Other</td>
<td>5,336,232</td>
<td>5,314,524</td>
<td>10,650,757</td>
</tr>
<tr>
<td>Non-financial institutions</td>
<td>488,788</td>
<td>389,843</td>
<td>878,631</td>
</tr>
</tbody>
</table>

Banks and security firms that are not reporting dealers make up around 15% of the total. Some of this captures non-dealer banks investing on their own account in credit derivatives. Some likely captures banks acting as fiduciaries for private banking or high-net-worth investors. The category of “other financial institutions”, besides banks and security firms, includes also hedge funds, pension funds, and special purpose vehicles and makes up another 12.7% of the total. Many structured credit products, including collateralized debt obligations (CDOs), make use of special purpose vehicles. Hedge funds are active traders but tend to maintain their positions for a short amount of time; their share of trading volume would likely be larger than their share of notional amounts outstanding. This category is the fastest-growing among the non-reporting dealer categories. Insurance firms account for a small portion of outstanding notional amounts, but are notable for their one-sided participation as net sellers of credit protection to dealers. It is unclear how much risk transfer that data represents, given that notional amounts cannot be equated with risk.

Fitch Ratings has repeated its survey annually. The most recent survey done in February 2008 suggests that insurance and financial guaranty firms remain net sellers of credit protection, mainly through portfolio credit derivatives, a category that includes synthetic CDOs, credit default swap indexes and credit index tranches [3]. Banks as a group remain net buyers of credit protection, but in last two years some individual banks has shifted to net sellers of credit protection via derivatives.

In general, market participants think that the credit derivatives are useful tools for risk management. The market participants are differing in the way they are using the credit derivatives. Having this in mind, we are going to point out to three main types of market participants:

(1) Commercial banks,
(2) Investment banks and,
(3) Investors.

1.1. Commercial banks

Commercial banks use credit derivatives to tailor their credit risk exposure. They shed credit risk via credit derivatives. Banks have used credit derivatives and other means of credit risk transfer (e.g. securitizations), to shed risk in several areas of their credit portfolio, including large corporate loans, loans to smaller companies, and counterparty credit risk on over-the-counter (OTC) derivatives. Banks use single-name CDS to shed the credit risk of issuers to whom they have a large exposure. Banks can transfer the credit risk of a portfolio of exposures to investors via securitization transactions, such as collateralized loan obligations (CLOs). In last few years the categories of credit risk shed include not only the large corporations, but also loans to medium-sized and small enterprises, loans to emerging markets, and counterparty exposure on derivatives [3].

There are three key reasons that can explain why commercial banks became the important hedgers of their credit risk. First, credit spreads are at low levels, reducing the cost of hedging. Second, accounting changes in Europe have made it possible for banks to carry loans at fair value, reducing the conflict that was perceived between the accounting treatment of credit derivatives and their use in risk management. Third, the Basel II capital accord aligns regulatory capital charges more closely with actual credit risks and allows greater recognition of hedging.

1.2. Investment banks
An investment bank can use credit derivatives to manage the risk it incurs when underwriting securities. An underwriter assumes credit risk for the short time between when it takes the risk on its own books and when it sells the risk into the market. By virtue of the growth of credit derivatives, the underwriter may now be able to hedge some of that credit risk more easily. Non-agency residential mortgage backed securities (RMBS) have been a rapidly growing market for securities underwriting in recent years. The rise in issuance volume led to a rise in credit risk borne by underwriters, because they must warehouse residential mortgage loans on their books during the time it takes to assemble a large enough pool to launch a securitization. Underwriters must find a way to cope with the potential increase in credit risk, which might be so large as to discourage them, at the margin, from taking on additional underwriting business. One way for underwriters to cope with such a potential increase in credit risk is to hedge more of it.

New credit derivative instruments (i.e. credit default swaps on asset-backed securities (ABS CDS)) appear to have proved useful to underwriters who want to hedge the risk of a residential mortgage loan warehouse. The notional amount outstanding of ABS CDS in 2007 was more than $17 billion. An underwriter can use an ABS CDS to buy credit protection on an RMBS with similar characteristics to the loans in its warehouse. The performance of the ABS CDS should roughly offset the performance of the warehouse loans. As is typical of successful and liquid new markets, there appears to have been a healthy balance of supply and demand of credit risk in the ABS CDS market. In addition to underwriters seeking to hedge warehouse loans, asset managers with a negative view on the housing sector are also natural buyers of credit protection on RMBS. Investors seeking exposure to the RMBS market, including CDOs, are natural sellers of credit protection. ABS CDS have proven to be relatively liquid compared to the markets for individual RMBS.

1.3. Investors

Investors are the third group that uses credit derivatives for risk management. An investor can use credit derivatives to align its credit risk exposure with its desired credit risk profile. Credit derivatives can be more flexible and less expensive than transacting in cash securities. Investors are a heterogeneous group that is participates in the credit derivatives market in different ways, such as:

a) “Buy-and-hold” investors,
b) Active traders and,
c) Investors in credit index trances.

In general, “buy-and-hold” (usually insurance companies and pension funds) investor seeks to earn a return from a broad exposure to issuers of fixed income securities. This type of investor by using credit derivatives can shift its exposure away from the issuers in sector for which it has a negative view. The investor can do this by buying credit protection on issuers in certain sectors using credit default swaps. The bid-ask spread on credit default swaps is generally lower than the bid-ask spread on corporate bonds, and the difference is larger when the bonds are seasoned. To replace the sector exposures, this investor can sell credit protection on other issuers (in other sectors), or simply sell credit protection on a credit default swap index.

Investor can act as an active trader (usually hedge funds), which means that it seeks to earn a return by predicting short-term price movements better than other market participants. For example, let’s suppose that there is an investor who is an active trader with a view that over
next two months issuer X credit risk standing will improve and its credit spreads will tighten. One obvious trade based on such a view is to buy one of issuer X’s bonds or sell credit protection on issuer X with a single-name credit default swap. However, buying a bond or selling credit protection exposes the investor to the risk that issuer X defaults, which may be a risk the investor does not want to take.

Investor can use credit derivatives to take a customized exposure to particular components of credit risk, such as spread risk, default risk, recovery risk, or correlation risk. In our example, the investor wants to be exposed to the spread risk of issuer X but not default risk. To achieve this, suppose that the investor sells $1 million notional amount of credit protection on issuer X with a 10-year maturity and buys $1 million notional amount of credit protection on issuer X with a 5-year maturity. These two positions have the same $1 million exposure to default risk, but the longer maturity position has a greater sensitivity to credit spreads (higher credit duration).

Table 2 shows what happens in three different scenarios. In scenario 1 issuer X defaults, so the investor will receive $1 million face value of issuer X’s bonds on the 5-year CDS and will deliver $1 million face value of bonds on 10-year CDS. Clearly, such a trade is hedged against the default of issuer X within the next 5 years. Scenarios 2 and 3 show what happens when issuer X’s credit spread curve narrows or widens at all maturities in a parallel shift. As expected, in scenario 2, the issuer gains on net when the credit spread narrows, and the opposite occurs in scenario 3 when the credit spread widens. Of course, credit spread curves do not always shift in parallel, and an additional risk of this trade (not shown in the table) is that the credit spread curve steepens. Without credit derivatives, such a trade would only be possible if issuer X happened to have bonds outstanding with 5-year and 10-year maturities, and if it was possible to borrow a bond to establish a short position. While the stars may align on occasion for both of these conditions to be satisfied, it is clear that a liquid credit derivatives market offers more possibilities for customizing risk exposures along these lines.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Change in market value</th>
<th>Sell $1 MM@10yr</th>
<th>Buy $1 MM@5yr</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>X defaults</td>
<td>Deliver bonds</td>
<td>-$76,347</td>
<td>$43,837</td>
<td>$32,510</td>
</tr>
<tr>
<td>X credit spread falls by 10bp at all maturities</td>
<td>+$76,347</td>
<td>-43,837</td>
<td>+$32,510</td>
<td></td>
</tr>
<tr>
<td>X credit spread increases by 10bp at all maturities</td>
<td>-$76,347</td>
<td>+$43,837</td>
<td>-$32,510</td>
<td></td>
</tr>
</tbody>
</table>


The role of asset managers combines the “buy-and-hold” investor with active trader because they may place some of its assets in a “buy-and-hold” index strategy and some with an in-house team of “active traders”, while the remainder may place with external managers who could pursue either type of strategy.

Credit index tranches are another example of how credit derivatives can produce different risk-return tradeoffs. A credit index such as iTraxx (in Europe) is a liquid product that provides exposure to a broad segment of the credit derivatives market. Credit index tranches take the risk of a credit index and tranche it into pieces with different seniority. Because these tranches on credit indexes are standardized, they are relatively liquid compared to other tranched credit products, which are usually customized on a one-off basis. Table 3 shows the tranches for the iTraxx Europe index, along with the spreads and deltas on each tranche at the 5 and 10-year maturities as of March 1, 2007. The spread represents the cost paid by a buyer...
of credit protection. Understanding the relative risk of credit index tranches is difficult, but is obviously important for investors who are choosing the risk and return of their investment portfolio. A common way that market participants compare the risk of different tranches is to use a model to compute the relative size of the position in the underlying index that would have the same sensitivity to a small movement in the index credit spread as the tranche. This measure is called “delta” and, by construction, the delta of a position in the index equals one. Delta can be seen as a measure of the tranche’s leverage. The deltas themselves purport to measure the risk of a tranche relative to a position in the index. We can also use deltas to compare the risk of different tranches. For example, at the 5-year maturity, the 3-6 percent tranche is 20 times riskier than the 12-22 percent tranche. However, delta only measures one dimension of a tranche’s risk, exposure to credit spread risk. Other dimensions of risk, such as default risk, may give a different sense of the relative risk of different tranches.

<table>
<thead>
<tr>
<th>Tranche</th>
<th>Spreads on iTraxx Europe tranches (basis points per annum)</th>
<th>Deltas on iTraxx Europe tranches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5-year</td>
<td>10-year</td>
</tr>
<tr>
<td>0-3 percent</td>
<td>500 + 9.98% upfront</td>
<td>500 + 40.85% upfront</td>
</tr>
<tr>
<td>3-6 percent</td>
<td>46</td>
<td>334</td>
</tr>
<tr>
<td>6-9 percent</td>
<td>13</td>
<td>88</td>
</tr>
<tr>
<td>9-12 percent</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td>12-22 percent</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Index</td>
<td>23</td>
<td>43</td>
</tr>
</tbody>
</table>

Source: [www.creditfixings.com](http://www.creditfixings.com)

2. Credit derivatives and risk management challenges

Credit derivatives pose risk management following challenges:

1. Credit risk,
2. Counterparty risk,
3. Model risk,
4. Rating agency risk and,
5. Settlement risk.

Credit derivatives do not eliminate credit risk, but they can transform credit risk. This could be done by using: credit default swaps, where the exposure is nearly identical to that of a corporate bond; credit default swap indexes, where the exposure is nearly identical to that of a portfolio of corporate bond and; complex credit derivatives, such as CDO tranches.

Counterparty risk is the risk that the counterparty to a credit derivative contract will default and not pay what is owned under the contract. For credit derivatives, as with other OTC derivatives, counterparty risk is an important risk that needs to be managed. Given the growing role of hedge funds in the credit derivatives market, counterparty risk is becoming even more prominent, since hedge funds generally are among a dealer’s riskier counterparties. In many cases, dealers use collateral to reduce counterparty risk. However, despite the widespread use of collateral and margin, there are some important risk management challenges associated with counterparty risk on credit derivatives. One challenge is simply
measuring the exposures on complex credit derivatives. One of the key measures of counterparty risk is potential future exposure. Potential future exposure takes into account the possible future moves in credit spreads or future defaults that could create a larger credit exposure if the market moves in the dealer’s favor. This potentially larger credit exposure is something that is already present in the current derivative contract and therefore should be measured like any other credit exposure.

Complex credit derivatives require complex models for valuation and hedging. While a few complex credit derivatives, such as credit index tranches, are traded in liquid markets with some price transparency, most are not. Products without a liquid market are referred to as “mark-to-model.” The risk of loss due to a flawed model is known as model risk. [5], which is materialized in the market for tranched credit derivatives in May 2005.

It is important to have in mind that any model is only an approximation of reality, and model improvement must be a continuous process for products as new as tranched credit derivatives. In the two years since the May 2005, there has been an explosion of research into alternatives to the Gaussian copula model. While eventually this research is likely to lead to better models and a reduced level of model risk for complex credit derivatives, there could be a long wait until that occurs. For the foreseeable future, those who trade complex credit derivatives will need to pay careful attention to measuring and managing their exposure to model risk.

Rating agencies play an important role in the credit derivatives market. Moreover, the structured finance market, including the credit derivatives market, relies heavily on ratings [2]. Given the complex nature of many credit derivatives, many investors rely on rating agencies to assess the credit risk of a particular transaction. However, large institutional investors do not rely solely on ratings for making investment decisions.

The debate over the role of rating agencies in the market for complex credit derivatives has two sides. On one side, it can be argued that rating agencies are fully transparent in the methodologies they use to rate synthetic CDOs. They publish detailed criteria reports that are available to the general public without charge, and in some cases they allow their models to be freely downloaded. They implicitly acknowledge that their ratings of structured finance transactions are fundamentally different than their ratings of corporate debt, for example, by compiling and publishing separate default and migration statistics for the two groups, rather than pooling them into a single group. This should discourage investors from treating an AAA rating on a structured credit derivative exactly like an AAA rating on a corporate bond. On the other side of the debate, it can be argued that the one-dimensional nature of traditional credit ratings makes them insufficient for comparing the risk of corporate debt and structured credit derivatives, and that using the same rating scale for the two is misleading. While the expected loss or probability of default of a BBB-rated corporate bond and a BBB-rated synthetic CDO tranche may be the same, their risk differs materially in other important dimensions. For example, synthetic CDO tranches are much more sensitive to the credit cycle, or to business cycle risk, than a portfolio of similarly-rated corporate debt [4]. Finally, the tranches of the iTraxx index can also be used to illustrate some of the points about rating agency risk. In general, without taking a stand on which risk measure is better or worse, it is not a good idea to rely on a rating when thinking about risk on a tranched credit derivative product.

When an issuer defaults, credit derivatives that reference the issuer’s debt must be settled. Traditionally, settlement in the CDS market was based on physical delivery by the protection buyer of the referenced issuer’s debt securities in exchange for par. Physical settlement is the natural settlement mechanism when a CDS is used to hedge the credit risk of owning a bond. Cash settlement is less desirable in that situation, because the value of owning the bond of the
defaulted issuer may diverge from the cash settlement price on a CDS, reducing the effectiveness of the hedge. Since the growth of the credit derivatives market shows no signs of slowing down, settlement risk is likely to continue to increase as long as physical settlement is the standard in CDS contracts. Although all participants in the credit derivatives market have a broad interest in seeing the market function well, their interests may diverge in a settlement situation when some are protection buyers, some are protection sellers, some would probably prefer physical settlement and some would prefer cash settlement. However, each auction is an ad hoc process that must be quickly agreed to following a default. Settlement risk will still be high until the auction settlement mechanism is incorporated into standard CDS documentation and is tested in actual defaults, including some in less benign market environments.

3. Conclusion

The paper has tried to document the striking growth of credit derivatives. Driving this growth, market participants, including commercial banks, investment banks, and investors, appear to find a variety of credit derivative products to be useful for their own risk management purposes. We discussed a number of the ways that credit derivatives can be useful for risk management. At the same time, credit derivatives are posing some significant risk management challenges. Many of these challenges reflect the immaturity of the credit derivatives market. For the credit derivatives market to develop and mature, market participants must address these risk management challenges.

References

THE TIME-SPACE DYNAMICS OF FOREIGN TRADE: INTERNATIONALIZATION MAPS*

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1. Internationalization and local development

Firms operate in a competitive environment where technological and managerial capabilities are developed under the influence of national culture, institutions and common knowledge. Moreover, their internal assets and capabilities are often developed in collaboration with both domestic and international partners like other enterprises, institutions, local actors. Indeed, according to Porter (1990), firms’ competitiveness is interdependent with that of their national business community, sub-national business clusters or industrial districts (see also Kristensen, 1989).

In such a scenario, the internationalization of firms is co-evolving with the internationalization of their national business environment. Factors like local culture and education, regional economy, business interactions between firms and local markets and institutional conditions constitute local competitive advantages, which are the foundation of firms’ competitive advantages, and determine the country’s outward international business (Chetty et al., 2003).

The most important consequence of this relationship between internationalization and local business is perfectly highlighted by Kasahara et al. (2008). According to the Authors, in this environment, trade liberalization which lowers restrictions on the importation of intermediates increases aggregate productivity because some inherently productive firms start importing and achieve within-plant productivity gains. This, in turn, leads to a resource reallocation from less productive to more productive importing firms, enhancing the positive aggregate productivity effect. Furthermore, productivity gains from importing intermediates may allow some importers to start exporting, leading to a resource reallocation along the intensive margin. In equilibrium, higher labour demand from new importers and exporters increases the real wage and, as a result, the least productive firms leave the market.

In this context it is easy to understand why it is very important to thoroughly investigate the link between local development and internationalization and the steps of the internationalization process.

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2. Literature review

Existing literature can be divided into three main theoretical areas: stage theory (Johanson et al., 1975), network theory (Coviello et al., 1999), and foreign direct investment theory. To summarize,

- **Stage theory.** According to this model, firms internationalize using a staged approach. A staged approach may mean that (1) firms start exporting their products and then open offices, building production facilities et cetera. It may also indicate that (2) firms expand geographically in stages, such as first expanding into countries adjacent to the country of origin and then into countries farther away. It may also mean that (3) firms begin expanding into countries with cultural familiarity (Gankema et al., 2000; Coviello et al., 1997).

- **Network theory.** According to this model, a firm’s network relationships are the basis for internationalization (Coviello et al., 1999). The network model is used to describe an approach to internationalization where firms use networks to access foreign markets.

- **Foreign direct investment theory.** According to this theory, internationalization depends on investment patterns (Lu et al., 2001; for the Italian case see Bronzini, 2007; Ne-fussi et al., 2007).

Independently from the internationalization approach, the authors agree to underline that firms establish relations with actors in foreign countries through a multiplicity of channels: through import and export trade flows; through direct investments abroad and from abroad; through sub-contracting; and through commercial, technological and other kinds of formal and informal agreements.

Empirical evidence shows that internationalization in the form of direct investment involves a limited number of businesses; much more many firms have engaged in intermediary forms, such as technical collaboration agreements with overseas companies.

The competitiveness of the company-territory system, intended as the ability of the local actors to compete with and measure themselves against their competitors, is generated by a number of factors. In an ever more interconnected economy the degree of internationalization of commercial flows seems to be a good indicator of competitiveness. Foreign commerce is a source and expression of the competitiveness of an area because its dynamics reflect heterogeneous combinations of the ability to export local products and, through the importation of semi-finished and finished goods from other countries, take advantage of economies deriving from the difference between labor and production costs.

Nevertheless the analysis of import/export flows supply an approximate measure of the competitiveness of an area because it doesn’t consider the flows of financial capital and the exchange of intangible assets (patents, trademark licensing).

3. The Italian case

In Italy, traditional sectors are less present in overseas markets and hold smaller foreign direct investments than high-tech sectors do. The only sector with a significant delocalization is the textiles, clothing and footwear sector (Rossetti et al., 2003; Constantin et al. 2008).

Similarly, an important survey of Italian manufacturing sectors for the period 2000-2003 (Capitalia, 2005) showed that a very big number of Italian firms export abroad (70% of the total), and that the majority of them were maintaining, or starting up, trade operations or overseas trade agreements with foreign correspondents, with a marked increase over earlier periods.

Moreover, it is evident that a significant part of firms’ international activities concerns trade. This is much more evident if we consider the typical Italian regional context: the district. District firms, in fact, have better export performance than non-district firms (Pyke et al., 1992; Enright, 1996; Bronzini, 2000; Carpinetti et al., 2007). A district, as we know, is something very close to a cluster. According to Porter they are “(...) geographic concentrations of inter-
connected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition” (Porter, 1998, p. 73).

As such, it is evident how important it is to thoroughly understand the relationship between trade and local development. There are some studies of this kind which highlight very interesting aspects.

For example, Bronzini (2000) states that Italian districts exhibited a strong export performance compared to the national average, and some of the most dynamic export areas were typically districts. By the same token, Menghinello (2003), and De Propris, Menghinello, and Sugden (2008) demonstrate that industrial districts are among the most competitive of local industrial systems; Becchetti, De Panizza and Oropallo (2007) investigate the relationship between districts and exports and they find that firms located in industrial districts export more, and have higher value added, than firms located elsewhere, net of the impact of appropriate controls.

Finally, De Arcangelis and Ferri (2005) provide a new point of view on the export dynamics of the Italian districts. They state that Italian districts have changed in the last few years; indeed, they are now specializing in the production of capital goods closely linked with the districts’ traditional areas of specialization.

The evaluation of the competitiveness of the single areas cannot, however, be based on a simple reading of the quantitative flows. Instead, it must also look into the rate of variation and analyze the advantages and weaknesses related to the structure of the commercial flows. Indeed, the geographic composition of imports/exports expresses the vocation of the territory and the strategies pursued by its operators. This then implies a greater or lesser sensitivity to potential geopolitical and/or economic or financial shocks, in addition to a differing exposure to competition from newly industrialized countries.

In this case attention is focused on the recognition of the influence of the spatial composition of commercial flows. The objective is to bring to light the dynamics of foreign export and import markets.

Through shift-share analysis, areas that can obtain advantages and/or are exposed to risk, because of the structure of imports or exports are identified. Indeed, the cartographic representation provides us with a map of internationalization. The choice of carrying out the study for the entire national territory as well as at a provincial level allows us to make useful comparisons, identify the existence of eventual economies of proximity or the existence of similar structures for territories that are spatially distant. The comparison between administrative areas with similar productive specializations brings to light the territorial systems that were able to carve out significant shares of “difficult” markets and the realities that, in spite of their dynamism, have seen a dramatic reduction in their exports, including in markets experiencing strong growth.

4. Shift-share analysis

Shift-share analysis (Dunn 1960; Cugno, 2006) is a quantitative method to examine the time-space dynamics of an aggregate, for which a latent structure exists. The method empirically separates the contribution of the different components:

- **trend** (or of the entire area), i.e. the degree of variation attributable to the overall movement of the variable studied;
- **structural** (or of a sectoral mix), i.e. the contribution of the initial structural characteristics of the phenomenon of the single territorial units at the beginning of the period. These components, if positive, indicate that in the sub-area the phenomenon studied has grown at a higher rate than the average of the referral group because of the presence within the structure of sectors or typologies which as a whole have demonstrated a rapid growth. When negative, the sectoral composition of the sub-area appears as a factor that, within the
spatial context, contrasts or reduces the development of the phenomenon being studied;

- **local** (or of a local mix), i.e. the tendency of the phenomenon within the various sub-areas to grow more or less as is to be expected given the initial structure, when each modality develops at the same rate as the corresponding typology of the area. The entity of the parameter shows the effect of factors complementary to those of the structural component, which originate in local specificities, while the positivity or negativity indicates the promotional or regressive effect on the development of the phenomenon.

The analysis is based on the construction of a matrix containing the different data for each sub-area in each year considered. The variations of the matrix at the beginning and end of the period –or of the years where the largest increase of the phenomenon was recorded- are then determined, and identified respectively as \( t_0 \) and \( t_1 \).

Indicating as

- \( y_{rht} \) the determination of the variable in the sub-area \( r \) of typology \( h \) in the reference period \( t \);
- \( \Delta y_{rh} = (y_{rht} - y_{rht_0}) \) the absolute variations in the period considered;
- \( g_{rh} = \frac{\Delta y_{rh}}{y_{rht_0}} \) the relative variations in the period considered.

One obtains

\[
Y_{tr} = \sum_{h=1}^{q} y_{rht} \quad Y_{hr} = \sum_{r=1}^{k} y_{rht} \quad Y_r = \sum_{r=1}^{k} \sum_{h=1}^{q} y_{rht}
\]

\[
\Delta Y_r = \sum_{h=1}^{q} \Delta y_{rht} \quad \Delta Y_h = \sum_{r=1}^{k} \Delta y_{rht} \quad \Delta Y_r = \sum_{r=1}^{k} \sum_{h=1}^{q} \Delta y_{rht}
\]

\[
G_r = \frac{\Delta Y_r}{y_{r,t_0}} \quad G_h = \frac{\Delta Y_h}{y_{h,t_0}} \quad G_r = \frac{\Delta Y_y}{y_{r,t_0}}
\]

Therefore, the variation \( \Delta Y_{rh} \) can be expressed in the following form

\[
\Delta Y_{rh} = G_{rht} Y_{rht} = [G_r + (G_h - G_r) + (G_{rh} - G_h)] Y_{rht} = \]

\[
= G_r Y_{rht} + (G_h - G_r) Y_{rht} + (G_{rh} - G_h) y_{rht_0}
\]

Summing according to \( h \) one obtains the breakdown of the absolute variation of the variable considered in the sub-area \( r \) for the three trend, structural and local components

\[
\Delta Y_{rh} = G_{rht} Y_{rht} = [G_r + (G_h - G_r) + (G_{rh} - G_h)] Y_{rht} = \]

\[
= G_r Y_{rht} + (G_h - G_r) Y_{rht} + (G_{rh} - G_h) Y_{rht_0} \quad [1]
\]

If one wants the relative variation each term, [1] must be divided by \( Y_{r,t_0} \), which yields

\[
\Delta Y_{r} = \sum_{h=1}^{q} (G_h - G_r) Y_{rht} + \sum_{r=1}^{k} (G_{rh} - G_h) y_{rht_0} \quad [2]
\]

Fundamental to shift analysis is the choice of:

- the units of analysis;
- the data sources, the reliability of which will affect the quality of results;
- the extremes of the temporal interval, which obviously influence the entity of the variations of the phenomenon;
- the definition of the phenomenon.

**The unit of analysis**

The study is carried out in 103 Italian provinces, for which it measures the volume of the imports and exports – international trade –.
Data sources
The data on imports and exports comes from the ISTAT database, specifically the International Trade of the Territorial System for goods, broken down into geographical area: countries of the European Union (UE-25); other European countries; North Africa; Other African Countries; North America; Central and South America; the Middle East; Central Asia; South-East Asia; and Australia, Oceania and other countries.

The extremes of the temporal interval
In the definition of the temporal arc it was considered preferable to not overly extend the period considered, given that the processes of internationalisation of a territory can be appreciated better within the mid-term. This also guarantees that the institutional operators are able to obtain the information necessary for a timely promotional or corrective intervention. As such, the study considers the data from the last available five years, ie 2000-2004.
For the year 2004 particular comments will be made regarding the individual geographic areas.

Cartographic representation of the components
The results of the structural and local components are reflected in different cartograms, where the values are then subdivided into two classes (positive and negative).

5. A proposal to integrate shift-share analysis
In order to offer the evaluation of the potential strengths and weaknesses of the territorial system (Golinelli, 2000, Golinelli C.M., 2002, Tardivo-Cugno, Forthcoming, Tardivo-Cugno-Bresciani 2008), three syntheses of the information generated through shift-share analysis are proposed and validated:

1. Maps of the spatial-temporal dynamics of distinct import/exports per province. The cartographic depiction shows the variation of the phenomenon during this period and reflects the results of the integration of the trend, structural and local components identified by the shift-share analysis. Their usefulness is linked to the reconstruction of the entire result as a consequence of the operation of the latent structure of the phenomenon.

2. Dispersion graphic of the trend, structural and local components. This instrument (Fig.1) allows, through the punctual graphic representation of the administrative areas and the measurement of the components, to recognize the entities that are furthest from the average progression.

Fig. 1 – Diagram of the graphic representation of the results of the shift-share analysis

The gray dotted line represents the new bisector that is obtained by adding the trend component to the two structural and local component.
It corresponds to the shift of the axis:
– UP in the case of a negative trend component;
– DOWN in the case of a positive trend component.
Within the graph the structural component is represented on the $x$-axis and the local component is on the $y$-axis. In this way one can read the value of the components and their combined effects.

- In quadrant I both components are positive and they generate an increase in the degree of internationalisation of international trade.
- In quadrant III both components are negative and they cause a reduction of the degree of internationalisation of international trade;
- Quadrants II and IV are intermediate zones, where the two components have different signs.

The value of the trend component is incorporated by shifting the axis: the bisector of quadrants II and IV is shifted up, when the trend component is negative, and down when the trend component is positive.

Using a dispersion graphic to illustrate the results of shift-share analysis therefore ensures the possibility a) of clearly distinguishing the positioning of the different administrative units within transnational economic relations, i.e. to identify the modalities that regulate their involvement in the flows of the global economy; b) to evaluate their degree of competitiveness/vulnerability.

3. Map of the distribution of the shares of volumes of imports/exports by geographic area of origin/destination. The relationship does not enter in the output of the shift-share analysis, but provides an interesting support element when evaluating the eventual specialisation of commercial flows.

$$R_{loc} = \frac{y_{st}}{y_{r}}$$

where

$$y_r = \sum_{r=1}^{q} y_{r}\delta$$

$$y_{r} = \sum_{r=1}^{q} y_{r}\delta$$

$$y = \sum_{r=1}^{q} \sum_{\delta=1}^{n} y_{r}\delta$$

The informative value of the quotient is linked to the capacity to circumscribe the administrative areas that align with the national reality ($R_{loc}=1$); are in positions related with a lower incidence of the latent form considered ($R_{loc}<1$); are distinguished by its larger impact ($R_{loc}>1$). The coefficient therefore locates –hence its name- the areas that show signals of competitiveness/vulnerability compared to the weight of a certain sectoral typology $h$. The indicator assumes the national value is an ideal border line between the two conditions, and essentially a normal situation, given the dominant behaviours and dynamics.

The readability of the map given the locator index is improved by using a color scheme. The quotient then becomes a sort of “synthetic indicator” of evaluation of the situation. This can be obtained by classifying the values according to three levels: the areas in “progress” with a weak gradation ($1<R_{loc} \leq 1.5$ in pink) and those with a strong one ($1<R_{loc} \leq 1.5$ in red); the areas corresponding to the national value ($R_{loc}=1$ in beige) and the areas “in regression” with a weak gradation ($0.5 \leq R_{loc} \leq 1$ in pale green) and those with a strong one ($0<R_{loc}<0.5$ in dark green). In this way one can provide a first assessment for decision makers through a compared evaluation of the existing situation in the various areas. This analysis is highly reliable given that it has been carried out thanks to a fixed parameter, which serves as a “comparison point”.

6. Foreign Trade

The presentation of the results should begin with a brief reconstruction of the traits that affect the dynamics in the sector of the Italian peninsula.

With regards to foreign trade (ICE-PROMETEIA 2006, UnionCamere, 2006), the balance of payment is worsening, because of the slowing of commercial growth and an increase in the
income gap and in unilateral transfers. The service dynamics remains substantially un-
changed. The current account has registered, since 2000, a deficit in the Euro area, while re-
main ing positive elsewhere.
In the last decade (1995-2004) imports grew mainly due to demand for energy products. Ex-
ports in real terms increased by little less than 42%. This increase is linked to a fall in the
share of the Italian market of about one percentage point (moving from 4.53 to 3.79%). With
regards to worldwide exports, Italy therefore fell from sixth to seventh place.
The increase in international trade flows, in any case, does not follow a linear trend: in the
decade considered, the years 1995 and 2000, which exhibit a record variation in both imports
and exports, stand out. There are also signs of slowdowns that can be reflected in occasional
negative results.
The discordant progress of the data with regards to the value of exports and their market share
is surely a “warning sign” for national operators: indeed the global demand for goods has in-
creased faster than the Italian supply. As such, more market opportunities were created abroad
and these have not yet been perceived and/or taken advantage of by national firms.
For a correct interpretation of the phenomenon, one must therefore:
- understand whether this lesser dynamism is linked to the productive and organisational
  structure which is insufficient to sustain a more intense activity abroad, or
- whether the loss of market share is due to a lack of competitiveness of our products;
- recognize the existence of eventual differences in the capacity of administrative areas
to take advantage of the opportunities of an economy that is ever more international
and/or to promote niche production.

6.1 Italian Provinces’ Imports
The cartogram of the time-space dynamics of imports summarizes the entity and the nature of
the process of internationalisation of purchases, within the 2000-2004 period. The colour ex-
presses the direction of the change; the tone indicates the relevance of the opening or closing
of commercial channels to internationalisation.
Map 1A shows a reality that is rather differentiated. The areas where a change can be per-
ceived are found:
- in the North of the peninsula, which is coherent with a past dominated by a fordist
  model of large industrial development and today is characterised by a move towards a ser-
vice based economy and by economic systems defined by the presence of a large number
of family-run businesses;
- in the South of the country, where compact administrative areas are defined by enor-
mous increases in revenue flows, well indicated by the intensity of the pink-red colour
scheme; and
- in the centre of Italy and in the islands, where one finds the largest part of the areas
where there is a fall in the initial values or where the variation –even when positive – is not
above 5%.
The structural component [Map 1B] places the provinces that register a positive intensity in
the Centre-North of Italy, along the Adriatic coast, and in particular areas of Sicily and Sar-
dinia. In these administrative areas the weight of imports increases because of a purchasing
model that favours contacts with the geographic areas that, at a national level, have shown
themselves to be more competitive in the commercialisation of their products.
The entity and nature of the flow of imports is oriented by the local component in agglomera-
tions of contiguous administrative areas [Map 1C], which tends to exhibit a “leopard print”
pattern and is, in most cases, relevant. Once more the focus is on a large portion of the Cen-
tre-North, as well as the higher part of Tyrrenhian and Southern coast of the peninsula and a
large part of the South-Central Sardinia. Within these areas imports grow as a result of inter-
nationalisation processes that, at least in part, are shaped by the particular socio-economic preferences of the provinces.

The local component, although operating in a similarly broad part of the peninsula, is crucial to determining specific characteristics of imports in a smaller portion of the national territory. In this case, this includes the province of Mantova (862.67%) and Imperia (767.59%), followed by Brindisi and Lecce with smaller values than the first group, but which are nonetheless above 300%, as well as the province of Rovigo (204% approx). Instead, Caserta, Ferrara and Modena exhibit a negative local component: the phenomenon increased less than what would have happened if the structure of local imports had increased their value at the same rate as the national average. Local factors therefore attenuated the increase in demand originating from trend and structural components.

On the contrary, Pescara, Frosinone and Ancona represent emblematic cases of a regression in the degree of internationalisation (quadrant III)
In the other two quadrants one finds a situation where the two components are of opposite sign and therefore partially offset each other. The outline of the situation shown here can be further strengthened through a report on location (Set Map 2) which describes the nature and “strength” of the characterisation of the geographical structure of imports. This allows us to identify the areas that are furthest from the national dynamics and which can be reconsidered as standard. All of the areas in green represent areas where the importance of manufactures as a share of the total is lower than the national average, while those in red indicate that this share is higher. The gap between these statistics, which can be compared to the locator index, becomes obviously more marked as the colour tone darkens. A quick overview of the whole allows us to note immediately that provinces with a rate close to the national rate or that do not entertain commercial relationships with one or more macro-areas of importation are the exception. The tendency to acquire goods from the European Union is diffused and well entrenched in over half the Italian provinces, located overall in the North and South of the peninsula. Only in three cases – Lodi, L’Aquila and Potenza – the relationship seems significantly different. In this case there is a larger number of entities that stand out for being “negative”, i.e. where the value is lower. The situation with regards to the other macro-areas is more varied and shows the existence of a network of purchasing channels punctured by real “provincial gravitational centers”, in many cases situated outside of the great axes of movement of the goods and far from each other. The comparison of the locator indexes reveals several surprises, as it shows openings and the sharing of interests that are unexpected and unpredictable.

6.2. Italian Provinces’ Exports
The mapping of the time-space dynamics of exports (2000-2004) shows a situation of great vulnerability for a large part of Italian provinces (Map 3A). This can be seen when one compares the progress of the phenomenon in the administrative area and its evolution at the na-
tional level. The location of the areas that have increased their competitiveness and stand out, therefore, from the national “trend”, does not seem to follow any pattern nor reflect the Italian economic development models. The “best behaviours” are found in the regions of Calabria, Sicily, Sardinia, Liguria and in lower Lombardy, where the variation is positive and substantial. On the other hand, there is no shortage of other cases –more or less isolated – that exhibit the opposite trend compared to the rest of the region, notably Bolzano, Verona, Livorno, Roma and Brindisi.

Shift share analysis allows us to investigate the reasons behind the situation described above. The effect of the global trend of exports is evaluated as a “push” on local exports equivalent to 3.84% and therefore superior to the similar trend component identified for imports. This means that the operators of the provinces have been able to count on the increase in competitiveness of the overall Italian system.

The impact of the structural component (Map 3B) is evident in the vast area in the North-West of the country, in the top part of the Adriatic coast, in Sicily and in South West Sardinia, as well as in a few scattered administrative areas. The overlap of factors allows us to verify that in a large part of the area indicated as highly “vulnerable”, the contribution of a structuring of exports, significantly focused on the more dynamic markets, has been positive. This represents the propensity of local actors to invest in the commercialisation of their products in macro-areas where the presence of Italian firms and the image of Made in Italy is noticeable and well entrenched.

The overall result is therefore chiefly explained though the local component, that is negative for most part of the national territory and that, in these areas, acts as a constraint on the competitiveness of national products. This component is also the main reason behind the “virtuous” situations illustrated by the cartogram of the time-space dynamics of exports, where it is shown to be an essential contribution for the development of relationships that are already existent and for the promotion of new projects.
Graphic 4 focuses on a select group of provinces that, under the combined effect of the positive structural and local components (quadrant I), increase their degree of internationalisation in target markets: Trapani and Oristano are “limit” cases of this which, for contrasting reasons, stand out for their increased capacity to commercialise their own products abroad. The sub-group of administrative units where commercial exchanges have fallen as a result of the negativity of both components is even larger. Within the third quadrant the values of the two components seems to be more similar in absolute value and the outlier realities – identified as Matera, Arezzo and Nuoro – can then be seen as “isolated cases”.

<table>
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<th>UE_25</th>
<th>Other European Countries</th>
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<th>Other African Countries</th>
<th>North America</th>
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Set Map 4 – Share of export volume by geographic area and province for 2004
In the other two quadrants one finds the provinces for which the value of the two components is of opposite signs and tends, at least in part, to compensate for each other. This is the case of the most part of Italian provinces and is the defining characteristic of the Piemont provinces. Except for Vercelli (for which both components are positive) and for Cuneo (where both values are negative) all of the others can be found in the fourth quadrant, which highlights the stronger weight of the structural variable compared to the local one.

The panorama described up to now, which must serve to improve efforts of governance in the firm-territory system, should conclude with a quick comparison between the structures that exist at the national level (Set map 4).

A substantial number of Italian provinces, located mostly in the North and in the South of the peninsula, demonstrate a good capacity of exporting towards other member states of the European Union. This form of commercial exchange – contrarily to what takes place in the other macro-areas of destination of the goods – does not follow any “excellence” patterns, but does permit the identification of positions of “weakness” for Pordenone, Lucca, Pesaro and Urbino, Grosseto, Salerno, Catanzaro and Oristano. There are four provinces that in this regards are aligned with the national situation: Pavia, Chieti, Benevento and Nuoro.

Commercial flows towards the other European countries and North America highlight agglomerations of neighbouring administrative areas responsible for a consistent volume of exported merchandise. Commercial exchange with North Africa seems in large part to concern the provinces of the two Italian islands. The exports towards the other geographic macro-areas are of a more heterogeneous character. The zones that stand out for their volume of exports that is superior/inferior to the national average can not be fit into any pre-existing pattern, but are instead explained by specificities of local economic systems.

References


With the expression ‘third industrial revolution’ many scholars mean what happened around the year 1974 with the introduction of production ‘just in time’ and of ‘Total Quality’ of Toyota type. The Japanese industrial revolution marks also the shift from industrial society to a society of information since it integrates productive processes into the new social system. The American model of the Henry Ford kind, adopted also by many Japanese firms, was abandoned in favour of the Japanese model of Toyoda Kiichiroa. The concept of work was completely revised. There are two fundamental points to grasp the deep change developed by the Japanese applications of the idea of Quality and its evolution:

- Overturning of the logic of marketing
- Conversion of industry into a computer information system

Total Quality replaces the production ‘in line’, based on the assembly line island of production and quality circles. Workers do not specialize in few elementary tasks but they accomplish different ones and are able to control the productive process. Actually control is internal and self-managed by workers on the opposite, in the tayloristic system of work, control was external and based on two different positions: the worker and the person who checked on him. In a Quality-based system direct contacts with customers take up a leading role and innovation comes from people working in the production department. Innovation is suggested by labour and there is no top management that plans work, as in the tayloristic system. Information and communication are horizontal rather than vertical. ‘Just in time’ production, as regards quality and quantity, is based on customers’ requests and market demands. Stock is abolished and flexibility in the working process is introduced. Altogether these innovations are integrated with a system which makes it possible both to reverse the logic of marketing and to turn industry into a computer information system. Only an integrated management of information can allow to meet the demands of Total Quality above mentioned. The reversal of the logic of marketing means considering customers’ satisfaction a matter of primary importance. Instead of trying to convince customers, it is necessary to meet their requirements and abandon the idea of a standardized mass-production. Every productive process must be flexible and able to bring about changes and improvements (KAIZEN). This can happen only in a factory capable of immediately communicating all information about processes and conditions of production. The most suitable tools are the ‘kanban’ and the ‘andon’ (PINBOARD). They are simple, elementary instruments which have proved the importance of work organization and have highlighted how simple innovations, based on communication, have become decisive. The introduction of the new information electronic machines enhances and speeds up this trend, overturning the old logic and abolishing old devices.

In the ‘80s American enterprises have discovered Total Quality and with it they have tried to reduce the competitiveness gap; with a certain delay the same happened in Europe. Following up the success of Japanese enterprises, in the same years in Italy, like in the rest of the world, Quality was the talking point in the world of economics and business. In order to spread the culture of Quality in U.S.A and in Europe awards have been established. In 1984 President

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1 Sakichi and Kiichiro Toyoda are big leaders in the history of Toyota. K. Toyoda was the first to introduce the concept of ‘just in time’ - ‘Lo spirito Toyota’ di Taichi Ohno – Einaudi, 1993.
Reagan officially declared the start of an annual campaign for promoting Quality, October being the national month for it. Soon after election President Clinton, in his turn, launched the idea of Quality for Government bodies; also the European Union has created offices to spread the concept of Quality. On 15 September Jacques Delors, President of the European commission, when EFQM was being founded, declared: “the battle for Quality is one of the prerequisites for the success of our enterprises and for our general success”. In Italy the first initiative to promote Quality on a national level dates back to 1995, about ten years later than other European nations.

Since the years after the Second World War, the historical concept of Quality intended as compliance with the requirements of a needed product-service, has remarkably modified changing into a much larger one. Quality in its latest evolution can be intended as the whole of characteristics of a material and immaterial entity, product or service, which enables to meet explicit or implicit requirements and to associate the employments of the entity itself to production and supplying processes. Therefore according to such definition the focal elements of Quality culture and praxis consist in satisfying the mix of needs which may be moral, material, economic or social. These may come from the so called Stakeholders: customers and users-patients, consumers, workers, shareholders, suppliers and in general the present and future community. The objectives can be achieved through adequate processes able to build Quality in a wider, integrated sense which includes the defense of the product conformity and of the inside and outside environment; furthermore it considers workers and consumers’ security in observance of the ethical principles of social responsibility. Therefore enterprises and associations in general must be oriented not only towards customers and their satisfaction to remain competitive, but also towards Stakeholders.

LITERATURE
There is a vast literature concerning the idea of Quality, a lot of texts are addressed to managers by others successful managers who have felt the need to share their winning experiences. They are especially authors of American and Japanese school, their approach to Quality though, even if they share some points of views, show remarkable differences due to their different cultures which led Quality to a different evolution.
In Italy according to different schools of thought and approaches, several authors\(^2\) have dealt with Quality in the industrial field and elsewhere; unfortunately there has not been much coordination among them.
Total Quality has several fathers and variations. There is Quality according to Deming, Juran, Crosby, Feigenbaum and many others; moreover there are the ideas of Q. created by adviser agencies which want to promote their own model to the extent of giving a different definition of Q.
We have thought useful and appropriate to take up again the most representative authors\(^3\) whose re-reading has allowed us to meditate on ideas which, being habitually widely used, may be emptied of all meaning. We have made any effort to give a meaningful content to the word Q. in the original industrial field and in its evolution into a managerial model; after that we have tried to define the concept of T.Q. in the Health service and in the Public Administration.
All authors underline the importance of a strong, innovative leadership and invite managers to produce strategic, cultural changes and look at reality from new perspectives. T.Q. is used by all authors to define a mentality which leads to meet in the best way the customers’ demands.

\(^2\) Among the first Galgano in 1990 with the book ‘La Qualità totale’
\(^3\) For ex. W. Edwards Deming, Joseph M. Juran, Kaoro Ishikawa, Taichi Ohno, Yasuhiro Monden, Armand V. Feigenbaum, Philip B. Crosby, Hitoshi Kume, Masaaki Imai
reducing costs and improving efficiency and effectiveness. There are different methodological approaches, which we believe can be summarized in ‘Japanese Quality’ and ‘Western Quality’. It is possible to state that they are essentially different in two aspects: the first one concerning the different cultural approach, the second one concerning attention towards people more than to standards.

Comparative reading of the texts of Feigenbaum and Ishikawa emphasizes the different cultural approach. The systemic interpretation of Quality contrasts with the specialist outlook, expression of a mentality influenced by taylorism. In the Japanese managerial model, Quality refers to a business culture in which all functions contribute to reach it, while in the western model Quality is entrusted to a specialist function. This interpretation has largely influenced the western model as we can notice both in the building of ISO regulations and in the reality of many enterprises.

In his book ‘WHAT IS TOTAL QUALITY’ Ishikawa criticizes this approach as he considers that the western approach to TQM puts too much emphasis on the traditional department of Quality control. The Japanese approach differs from Feigenbaum's as evident in Ishikawa words: ‘since 1949 we have been insisting on the importance of sharing and promoting the study of Quality control by all departments and the whole staff. Our movement has never exclusively belonged to specialists of Quality control.’

ISO regulations are largely influenced by the western approach. According to them the head-office has to appoint a person who is to be entrusted with the responsibility of correct rules application in compliance with the principles they are based on. Actually this idea has led many companies to create two parallel organizational routes: A real one and a ‘paper’ one in conformity with the regulation demands. ISO require a documentation and a specific terminology to account for the organizing project of the company. This has led the various organizations to the production of documents, not only for exclusive internal use, but to respect the demands of regulations.

In the ‘70s the institutional approach was taken up again, this is an important school of thought composed of several currents and opinions in economic, political and social sciences sharing the acknowledgment of the importance of institutions in conditioning human behaviour. Men create institutions and then they are conditioned by them. To the question ‘Why organizations of the same kind are so similar among them’ the authors Meyer and Rowan answer that there are processes of ISOMORPHISM and in an essay of 1977 they state that organizations operate in highly institutionalized contexts which establish the rational criteria which enterprises have to respect to be considered efficient. Once enterprises originated from the initiative of an entrepreneur who was endowed with a great spirit of enterprise, intuition and propensity to risk. Nowadays there are a lot of different institutions forming a thick net of rules by which an enterprise is conditioned The criteria ruling the development of processes of isomorphism are pointed out, by authors, in powerful institutional rules defined as Rational Myth. The expression is an oxymoron meaning rules not based on the empiric proof of the scientific method but justified by the belief that they are effective, efficient or in conformity with a legal warrant. They facilitate the creation of new fields of activity to satisfy the business fed by Myths. Typical rationalized myths are, for ex., the regulations of Total Quality in the certification of products and the enterprise system. The authors distinguish between two kinds of organizations: those which take the criteria of rationality from the outside (museums, theatres, school, associations of voluntary work) and the ones which have their own criteria which may be in conflict with the outside. The latter

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presents researchers with the most interesting problems because of the contrasts which may originate between their efficiency criteria and the ones suggested by outside institutions. Two possible parallel structures may originate: a formal one and an informal one. The formal structure is visible and respect external ceremonials. The informal structure is discreetly hidden to follow its own efficiency rules. The institutional pressures which push organizations to become more and more similar do not necessarily, as the two researchers point out, contribute to make them more efficient. In an article of 1983 Powel and Di Maggio indicate the organizational field as an answer to the research of the reasons of the process of isomorphism. The organizational field is defined as: a whole of organizations and subjects forming an acknowledged area of institutional life such as enterprises, suppliers, consumers who, altogether, form a recognized area of institutional life. The idea of organization becomes so wide as to include the organizational fields and to abolish the distinction between organizations which exercise pressures and others which suffer from them. Isomorphism, intended as homogenization of criteria and inside performances in an organizational field, is the result of all the actors in the field itself. Researchers distinguish among:

- Coercive isomorphism: when the organizations are subject to external pressures, typically law restraint or contractual obligation such as it happens for the head-enterprise of the production chain towards the sub-suppliers enterprisers.
- Mimetic (imitative) isomorphism: when the enterprises carry out mimetic processes to face uncertainty.
- Normative (prescriptive) isomorphism: it originates from professionalization processes, that is when people belonging to the organization learn new methods, techniques and technologies, in specialized centres, voluntarily with no constraint but aware of the validity of innovation in comparison with the traditional way of operating.

The account of the debates developed during technical committees for the writing of ISO in Kume’s article, confirms this different cultural approach and also points out the other much discussed aspect: the existence of two souls of Quality: one based on attention to the people, the other on standard. From classical literature there comes the idea of an ideal organizations carried out through instruments rationally oriented to the achievement of special purposes. Each organization is characterized by:

- a chain of commands
- technical and managerial competence
- division of work

One of the problems to be solved in every organizational project is the delegation of tasks (and its degree) which demands mechanism of coordination and control of the delegated activities. To make the organization both efficient and effective, in a regular and time-constant way, it is considered essential, according to the classical concept which considers an organization as a formal structure, that management standardize the working performances. It is equally important to make the components of the staff more and more interchangeable among them in spite of their different abilities. This approach is at the bases of the standardization of positions and enterprise procedure typical of tayloristic inspired models. It is necessary to consider, on the other hand, that in the reality of an enterprise there are routines and creative activities, routine decisions and critical decisions.

Bureaucracy, which is a typical organizational apparatus is not composed of positions which are all alike. Many authors, also of the American area, have noticed that the Weber’s principle

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6 Di Maggio P., Powel W. - The iron cage revisited: institutional isomorphism and collective rationality - American Sociological Review, April 1983
of disciplined competence is indeed an oxymoron. Competence is in contrast with discipline. Most of bureaucracy apparatuses are organized so as to distinguish between jobs of high professionalism (where the principles of competence is institutionally recognized as superior to discipline) and jobs of low professional level, where discipline dominates the level of competence. Mintzsberg makes a distinction between professional bureaucracy and mechanical one and asserts that the organization control must be based on different criteria. In professional bureaucracy, which includes positions demanding some discretionary power and personal initiative, control is exercised over initial training and results. In mechanical bureaucracy, on the other hand, where the tasks are repetitive and standardized according to pre-established procedures (regarding both works and clerks), control is exercised on the way of executing the assigned work. These considerations try to motivate the two different souls of Quality which are expression of differences in culture and also reflects the complexity of reality.

Ishikawa, in expressing his opinions about ISO regulations and about the western model, invites to consider how the two souls must integrate as they represent two important realities in enterprises. Standards-based Quality management tends to obtain Quality creating standards which are to be achieved by the people composing the organization, in a process that will be verified. Quality is ensured documenting the flux of work and with written instructions describing the methods to be used. The documentation of actions, objectives and methods of the process show what it is necessary to do and the people who must do it. Standards are created by the organization: ‘how to do’ depends on the size of the organization, the field and culture of the enterprise.

Japanese Total Quality and what derived directly from it in western world (in Italy the model suggested by Galgano and ‘Premio Quality Italia’) are certainly people-oriented in the respect of procedures; people’s needs and usefulness are primarily recognized. Moreover the strategic levers for motivated, responsible human resources are found in the staff management and in good training-formation. The texts of Japanese area, as regards the history of Quality management, highlight that a laborious, formative process has been necessary to obtain the cultural support of managers.

Many authors describe the difficult path to obtain answers to how to do, through a process of errors and attempts, rather than to what to do. The latter approach is suggested by Quality based on standards and by ISO. This managerial model in its two varieties has undoubtedly a pragmatic approach as it considers the organization in its productive processes, in its physicalness, in the daily management of problems, and gives importance to the organizational project which every enterprise must formulate, considering the ever increasing complexity of markets.

The theory of Total Quality develops the concept of Quality evolving it from the mere observation of Quality in the product to observation of the enterprise system, in which all the positions are involved in the final achievement of results. I think it necessary to turn our attention to the cultural and organizational change in which the enterprises must engage to reach the control of the whole system: customer’s satisfaction, constant improvement and prevention; all these objectives have made the difference from the tayloristic model. Every cultural change requires a long laborious cultural growth. The effort Quality in its last evolution, can be intended as the whole of characteristics and attributes of a material or

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8 Mintzsberg H. - La progettazione dell’organizzazione aziendale.
immaterial entity, product or service, which have given it the possibility to meet explicit or implicit requirements and to associate its use to processes of production or supplying. Thus the focal of culture and praxis of Quality consists in satisfying the mix of moral, material, social, economic demands typical of all the parts interested in the organizational processes, meaning as ‘interested parts’ the so-called Stakeholders: customers, users-patients, consumers, workers, shareholders, suppliers and in general present or future collectivity. Such objectives may be reached through adequate processes of building and ensuring quality, intended in a general, integrated way which combines the respect of conformity of the product-service with the respect of internal and external environment, the security of workers and consumers (customers, users, patients) and finally the ethical principles of social responsibility.

QUALITY AND ITALIAN PMI
The model offers remarkable possibilities of growth both in sizes and in efficiency. PMI, a model of enterprise typical of the economic Italian reality, has positive characteristics such as: flexibility and creative capacity which have contributed to its success on the market. On the other hand there are also negative characteristic such as the scarcely formalized structure and its being centred on the charismatic person of the enterpriser, which may limit the development and make the generational changed more difficult. Quality is increased also by certification instruments and self-evaluation, these being characteristics of the prize. Quality gives a remarkable contribution to a formalized and documented structuring of productive processes. Total Quality can make the enterprise less dependent on the enterpriser, at the same time facilitating its continuity in favour of the creation of a more rational structure.

MODERNIZATION OF ITALIAN PUBLIC ADMINISTRATION
P.A. is a whole of public institutions and subjects, both central and peripheral (Councils, Provinces, Regions, State, Ministry…) sometimes private (organisms of public law, sole agents, contractors, S.P.A…) and all those who have somehow an administrative function in the interest of collectivity according to the principle of subsidiarity. P.A. (peripheral and central) must meet citizens’ demands in social life, such as: health, security, education, mobility, work, public works; they must also supply commodities and facilities of public utility: in school, transport, environment, energy, and technological and administrative services. In services organizations, both public and private, one of the focal points is surely the relationship consumers-producers since the production of the service coincides with the relation with users. An enterprise of services is an organization suitable to solve problems, therefore by definition it should be customers-oriented and obliged to listen to the customers’ real needs beyond what is declared. P. Administration should contribute to the cultural, social, economic welfare of the community with a fair management of resources. Thus the main objective is the creation of confidence between the subject supplying services and the ones who benefit from them. The reforms of the ‘90s can take the credit for pushing change especially in the economic and social field, also because of the European influence. Since then the function of P.A. have been moving progressively from a regulating influence to an active one of promotion and development.
Since the ‘90s the rich Italian production of regulations has accepted the strong European insistence to make P.A. closer to civil society through the devolution of several State functions to local institutions. Hence comes the need to reform the P.A applying criteria of effectiveness, efficiency and constant improvement in the Quality of services. Italian and European regulations base their way towards modernization on the model Quality through its strategies and managerial techniques.
Improvement of public institutions, as underlined in the Lisbon summit and in the other extra
Spring summits, becomes effective if we create the conditions to make services measurable
and verifiable and we define the assumptions to reduce ‘waste’ and to promote University
high education and research. Europe can stand competition with the other countries of the
world if economic processes are modernized. From the first summit conference held in 2000
to the fourth held in Tampere in September 2006, Quality and its evolution has been the
object of projects and exchanges of experiences to increase competitiveness of the system
Europe. In Dec. 2006 the Department of Public Function sent out to all administration the
directive ‘For a Public Administration of Quality’; it is a directive signed by Luigi Niccolais,
Minister of Reforms and Innovations in P.Administration; it is aimed at focusing the
administrations’ attention on Quality and constant improvement of its policy and on self-
assessment of organizational performances. It invites each administration to evaluate its
organizational performances, highlighting priorities of intervention and planning the
necessary changes which may enable to meet demands especially taking advantage of new
technologies. As well, it is necessary to develop in a more balanced way the relationship
between State and Society and modernize the services supplied especially in local institutions
like Council Administrations.
The main factors which have pushed organizations to a strategic re-thinking of the ways of
supplying services can be seen in:
- the social-economic change which strengthen the competitive challenge between
  States, regions and cities.
- The present technological changes, which bring new opportunities and new ways of
  supplying services (for ex.: internet, the digital signature, the electronic identity card,
  the territorial portal...)
- A greater awareness of his rights on the part of the user, who is now more demanding
  and ready to discuss the operating ways of institutional people, should they be unfair
  
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  - Changes in regulations.
These changes have contributed to introduce, even if with some delay in comparison with
other fields, organizational principles, methods and techniques of the model Quality.

QUALITY AND THE SANITARY REFORM
In Italy the legislative decree 502/92 and its subsequent modifications, introduce the idea of
Quality into the national Health system. In short an organizational model is introduced by law
into sanitary enterprises: it comes from the model Quality subtended by ISO/9000 and other
system for ex. VRQ originating from the industrial world.
The change wanted by this reform is remarkable and involves the sanitary system and the
regions which are asked to manage the changes expressed in regional legislation. The
introduction of this new organizational-managerial model is pushing the sanitary system with
all its components to modify work organization, the personnel management, administration
and resources control.
However so far the evolution of the approach to Quality in the sanitary system is
characterized by decision making factors not easily interpreted. Actually Quality has been
introduced here but with some approximations and persistent blind spots as regards methods
and instruments. There are few, generic rules and sometimes they are contrasting one with the
others. In the sanitary system, just like in industrial field, different methods are proposed; they
share organizational principles such as constant improvement, customer’s satisfaction,

servizi nella Pubblica Amministrazione. Il caso del comune di Fidenza’. Milano, Guerini e Associati, 2003,
pp.57-58.
processes to measure and assess Quality. Different influences have made the general context quite confused, therefore institutions choose one or the other of the methods or of the instruments proposed. People operating in the Sanitary System seem to be rather skeptical as concerns the possibility of applying effectively the new methods to the daily assistance and work. This has delayed the transformation of routine operating methods into new ones. The adoption of a system of management Total Quality has one of the most strategic levers in the management of human resources, whose involvement is essential to achieve the execution of tasks which, at present, are more controlled and requires more sense of responsibility to get to a service-product which can meet all the customer’s requirements. These organizational projects represent an important step towards co-sharing and appreciation of the enterprise objectives. For all these reasons and to manage the changes, the sanitary reform acknowledges the need for sanitary institutions to undergo formative interventions. This attitude was shown in the attention given to constant formation, especially the managerial one. Moreover the difficulties in defining the idea of Quality in the sanitary field are even bigger than in other fields ranging from the complex idea of health to the varieties of people composing the Health System.

There is a vast literature mainly North American on the difficulties in defining Quality in the Sanitary System. Here we quote Avedis Donabedian\(^\text{11}\) who historically was the first to deal with this topic. He defines Quality in the Sanitary System as ‘relationship between the improvement in health conditions and the maximum improvement attainable with the present knowledge, with available technologies and the circumstances of patients’ life. The author identifies three parameters or indicators to be considered when assessing Quality in Sanitary assistance:

- **STRUCTURE**: with this word the author means the relatively stable characteristics of administrators and sanitary staff, of instruments and resources at their disposal and of the physical organizational environment in which they work. The idea of Structure includes the human, physical and financial resources necessary to sanitary assistance and the organization of hospital personnel both doctors and nursing staff.
- **PROCESS**: such a word means and includes all the aspects concerning the activities linked with sanitary assistance.
- **RESULT (EFFECT)**: this word is used by the author to indicate a change in the present and future health conditions of the patient, ascribed to a previous intervention of assistance.

Summing up if we analysed the different dimensions of Quality we can state that the different methodological approaches tend to assess, measure and constantly improve:

- Professional Quality
- Organizational Quality
- Perceived Quality

Therefore the different dimensions needs methods techniques and instruments to assess and measure the different points of view of Quality observed.

In order to implement the model Quality in the Sanitary system and in P.A, the organized managerial approach, concerning Organized Quality, uses the following instruments:

- The Chart of Services
- Authorized accreditation and minimum Q. requirements
- Certification of Quality according to ISO9001\(\text{2}000\)
- Accredited excellence (JCAHO)
- Prizes for total Quality management

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\(^{11}\) A.Donabedian ‘The Definition of Quality and Approaches to its Assessment’ published in America in 1980
INSTRUMENT OF QUALITY

There are different instruments to implement the model Quality in organizations, some can be used in all fields: private and public, industrial or services enterprises; some instruments belong specifically to the sanitary field.

The instruments which can help the management implement the model Quality in the industrial field are: certification according to regulation ISO9001 and the Prizes such as the Japanese Deming Prize, the US Malcolm Balbridge National Quality Award, the European Quality Award and the Italian Premio Qualità Italia.

Certification according to ISO9001 has two purposes: ensuring the Quality of the product on the market and enabling organizations which produce goods or supply services to exploit successfully their resources and their productive processes, so as to be able to meet customers’ requirements. Moreover it invites to respect some compulsory requirements and demands constant commitment to time-sustainable improvement. To be effective the strategy of Prize must plan actions which are to be constantly monitored, analysed and assessed. Self-assessment is an instrument for staff education in the fundamentals of Total Quality Management; it facilitates the sharing of examples of ‘best practice’ within the organization and the ‘benchmarking’ with organizations similar or related among them.

The Prize as a permanent instrument for Quality promotes culture and Quality methods through:

- Associations or foundations created purposely to spread the model Quality;
- The support of self-assessment activities and of personnel education-formation.

In my opinion these instruments represent the two different ‘souls’ of Quality. They can hopefully combine to help an enterprise develop the aspects that they want to favour. It is necessary to underline that Certification in itself is not a synonym of Quality, but it is a practice useful and necessary to achieve Quality, which is an instrument not an objective.

Nowadays Certification may, unfortunately, become ‘profitable business’. Advisers and Certifying Agencies quite often behave unethically, thus discrediting Certification and its strategies and justifying the critical, skeptical attitude of enterprisers, organizations and managers who do not want to be under discussion.

Certification, as well, has an original sin: the controlled entity is the controller’s customer; this process might turn out as an operation not always credible if behaviour is not ethically correct.

Culture and praxis of Quality have spread more as ‘culture and praxis of procedure’ than ‘culture and procedure of results’. This justifies the bad reputation of Quality in some fields, and is one of the reasons why the actions of renewal and improvement do not give the expected results. Actually the use of instruments shows a logic of bureaucratic fulfillment which have often undermined their credibility and their real validity. It would be necessary to abandon the idea of bureaucratic fulfilment in favour of the idea of ‘result’. The logic of bureaucratic fulfillment has unfortunately spread also in public institutions, as it had in private sectors, this may have been caused by poor understanding, scarce involvement and participation of the management, cultural reasons and factors due to the professionalism of advisers and certifying agencies. Finally it has to be considered that in the different fields people choose to use Certification, which is the most largely adopted instrument, for reasons concerning markets or regulations, as in the Sanitary System; while the principles of the model Total Quality are still scarcely understood. For ‘principles’ we mean customers’ satisfaction, constant improvement, measurement of results, efficiency, effectiveness in the use of resources which are more and more expensive in all economic fields; we can add a strategic management of human resources. For its implementation this model needs a strong will and a management capable of innovating culture and supporting change. Moreover to obtain the envisaged purposes, the strategic management must carry out actions able to favour
communication and support formation-education, and to keep the structure aware of principles and objectives.

From literature and from the analysis of successful enterprises, it is clear that a motivated, committed leadership is the real Keystone to operate: adherence to the model and therefore to the different instruments, becomes a real opportunity of growth and improvement.

In the reality of P.M.I (small-medium industry), of P.A. and the sanitary system the management is maybe the weakest link in the path towards implementation of this model, introduced for market reasons, for legislative decree, and for the European Community urging. The research done have led to verify and confirm these opinions. The instruments common to the Sanitary System and to P.A. are the Chart of services, certification according to ISO9001, and the different prizes; while others such as the institutional crediting, and the Accredited Excellence ¹² belong specifically to the Sanitary System. The Chart of Services, was meant to regulate citizens ‘access to Public Administration, it originated from the Act no. 241 of 1990,¹³ concerning the administrative proceedings. The Chart of Sanitary Services represents an agreement between the structures of the National Health System and the citizens, according to the informative principles clearly described in the regulations. They are:

- Impartiality in supplying services and equality of admittance to the services themselves.
- Definition of standards, promotion, on the part of the local Administration, of Quality services and of self assessment of the Quality itself.
- Organization of procedure structured for the defense of citizens’ rights
- Attention to opinions and criticism about the Quality of the service, expressed by citizens directly or through Associations representing them with modes and instruments of participation and involvement.

The Chart of Services has been thought as one of the most suitable ways to introduce the idea of Total Quality management into P. Administration and sanitary enterprises; it is considered a suitable instrument to carry out and support the organizational change in these realities. The implementation of the Chart of Services in all organizational fields producing services, should represent an engagement of the whole enterprise to respect: information about time and Quality standards, participation of citizens, efficiency and inexpensiveness of management. It is also an opportunity to re-examine the organizational processes that must be followed by the management to introduce the idea of constant improvement and Quality programmes.

INQUIRIES

Inquiries have been restricted to the most meaningful instruments Certification has been examined in the field of PMI: an empirical model of Bergamo enterprise. The investigation carried on among people coordinating nursing staff and sanitary technicians aimed at verifying the knowledge and sharing of the Chart of Services, of certification and excellence accreditation among operators, while inquiries among Bergamo municipalities have analysed the diffusion of the Chart and the certification of the above mentioned realities. Inquiries on Bergamo PMI started at the end of the ’80s and are still in progress since the sample is constantly monitored to verify the evolution of the certification phenomenon both in numerical quantity and in terms of certifying procedure and enterprise culture.

¹² The Accredited Excellence is a process of assessment through standards, specifically planned for the hospital structures, carried out by advisers-certifying not belonging to the structure which is being assessed. This kind of accreditation, born in 1917 in U.S.A. by initiative of associations of surgeon as professional accreditation, imposed itself definitely in the ’50s thanks to the activity of the now so-called Joint Commission on Accreditation of Healthcare Organization (JCAHO). JCAHO is at present the most influential crediting organization for sanitary structures in the world. It has accredited more than 20.000 organizations.

¹³ Act no.241\90 Nuove norme in materia di procedimento amministrativo e di diritto di accesso di documenti amministrativi.
An enterprise may be induced to be certified for internal or external reasons. The former originate from situations of scarce satisfaction in the enterprise progress as regards efficiency, effectiveness, organization and relationships with the staff. Once chosen Quality as a strategy, certification according to ISO9000 regulation can represent a valid instrument to put this system of management into practice. The external reasons are linked with the market requirements, therefore with commercial strategies. Internal motivations have been the leading incentive to certification in few cases of the analysed samples; often internal and external motivations cross each other, but almost ever the need to set out on the path of certification originates from market demands.

Undoubtedly all the examined enterprises have shown that conviction and shared principles are at the basis of certification and are necessary to help this document become effectively a useful instrument for the system Quality, beyond the value of a paper document, almost a tax to be paid to the market. Adherence to ISO9000, whatever the motivations, represents, in the examined PMI, a remarkable effort and implies managerial, operative, organizational changes which involve all the enterprise functions. The difficulties are mainly connected with the commodity sector, the customers and the dimension of the enterprise. Inquiries in the local Public Administration of Bergamo started in 2005 with the administration of a first questionnaire to 244 Municipalities of Bergamo taken as a sample; it continued in 2007 with a second similar questionnaire administered to the same people. The second questionnaire was initially devised for verifying improvement in the diffusion of instruments in Municipalities, but actually it was motivated by the hope to obtain a bigger adherence than to the first one. Unfortunately this hope was not fulfilled because the number of questionnaires given back was even lower than the first one, in spite of all the efforts. It was ascertained that the lack of participation, in both surveys, derives in general from the fact that Municipalities think it useless to answer all the questions negatively. In the distribution of questionnaires there have been difficulties due to inaccurate or not up-to-date addresses supplied by Municipalities. The consulted web sites, phone communication or faxes have proved heterogeneous, even ‘folkloristic’. The difficulties highlight that communication between local institutions and their public must be improved to guarantee access to information about their structure and their activities as established by the European Community and the Italian State. It must be pointed out that many Municipalities of Bergamo area, especially in the mountain, are small, scarcely structured realities and their dimension justifies situations which are still out-of-date as the survey noticed.

The passing on of the second questionnaire was less difficult; addressed proved more accurate and many Municipalities had prepared electronic addresses, showing that obligation coming from law directive has improved communication among institutions. The questionnaires given back after the first administration were 46. Many were not completely filled in, 25 were not filled in at all. Anyway even the empty questionnaires or the incomplete ones are useful for assessment as the incomplete answers or the blanks are a meaningful datum to understand the level of diffusion of the instruments, object of the inquiries. In the second administration the questionnaires filled in and given back were 35. They had been administered to different Municipalities (except two) from the first administration. They were built considering the activation of the Chart of Services, which is compulsory, and they aimed at monitoring adherence to the voluntary instrument of certification.

Of the 46 Municipalities of the first survey, only 4 have drawn the Chart of Services; three of them stated that they did not know that obligation came directly from the law. Certification according to ISO9001/2000 is still only occasionally used; the two Municipalities which have certified some services took the incentive from the Mayor’s experience grown in another field; the same motivation has been verified also in the ten Municipalities which have started the way towards certification. The data obtained in the second questionnaire show that 80% of
the 35 Municipalities have drawn up the Chart of Services. The blank answers are still a very high percentage and refer to all questions. Also the outcome of this administration clearly highlights the persistent scarce diffusion of the organizational tools considered. Inquiries among people coordinating nursing staff and technicians of Bergamo sanitary structures aims at verifying how much sanitary employees share and know of the different organizational instruments used to manage the organizational change, compulsory imposed: the level of knowledge may depend on the organizational culture and the ability to communicate shown by the management. Inquiries started in 2006 with the building up of a questionnaire composed of four different parts: in the first one there are 22 questions aimed at monitoring the sanitary structure, the second one has 13 questions about quality certification in order to verify the way of use and adherence to this organizational tool; the third part aims at verifying through 15 questions, diffusion and understanding of the Chart of Services by the staff, especially of its importance for communication and organization. Finally the fourth one wants to verify, through the last 16 questions, the approach to excellence accreditation on the part of sanitary structures. Altogether 180 questions were sent through e-mail or personally delivered. The evaluated questionnaires were 69. In the first part of the questionnaire there were questions to get information about the structure where people work. Many answers show a scarce knowledge, others were incorrect or incomplete. The Chart of Services, which was the first instrument for Quality introduced by law, proves to be less known than certification and above all far from the operators living experience. The examination of the questionnaires show a high number of blank answers or ‘I don’t know’. This result highlights that a category of operators who have an active part in the institution, is not involved and does not share the objectives of the structures as regards patients. This consolidates the idea that the Chart may be introduced only for bureaucratic fulfillment. The answers about the excellence accreditation (JCAHO) prove the appearance of this instrument in Lombardy hospitals. The percentage of blank answers is quite high and they show a critical attitude towards the instrument. Lombardy insisted for years on the use of certification, now it has been insisting for quite a long time on excellence accreditation to help sanitary structures step constantly forward. The introduction of this instrument was not without problems and was not free of criticism, as previously pointed out. Moreover it led to the creation of parallel paths which were not integrated with the course followed by certification.
BUILDING A HIGH PERFORMANCE SERVICE ORGANISATION

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1 INTRODUCTION
Most of the research on best practice companies has been conducted in the USA and has provided valuable experience and insights into key factors for building sustainable and successful organisations through operational and service excellence. In 1994 Collins and Porras published "Built to Last" which assessed 18 high performing companies (mainly USA) and identified common factors which were keys to their success. This research advanced Peters and Waterman’s (1982) pioneering book "In Search of Excellence" which also identified a group of excellent American companies and their management practices. The findings followed 6 years of research and reflected CEO’s opinions as to what created high-performance companies.

Despite these findings and extensive media coverage of the performance of businesses in Australia there is little consensus about which companies might qualify as winning organisations and more importantly, what practices they have followed to become the best. These questions provided the impetus for this major empirical research study which took 4 years to complete and covered the evolution of these organisations over a 25 year period from 1982 to 2006.

The research methodology was based on that of Collins and Porras (1994) and all types of organisations were considered – listed, private, government, non-profit and subsidiaries of overseas organisations. Based on surveys from 1000 CEO's more than 100 organisations were nominated and detailed analysis reduced this to a final group of eleven. These were then studied in detail to identify their key principles and practices.

2 RESULTS AND DISCUSSION

2.1 Winning Organisations and the Winning Framework
The methodology identified the 11 winning organisations in Table 1: Australia’s Winning Organisations

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Services/Operations</th>
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<tbody>
<tr>
<td>Brambles</td>
<td>Diversified industrial services</td>
</tr>
<tr>
<td>Harvey Norman</td>
<td>Discount specialist retailer</td>
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<tr>
<td>Lend Lease</td>
<td>Property developer and manager of property</td>
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<tr>
<td>Macquarie Bank</td>
<td>Specialist banking and funds management services</td>
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<tr>
<td>National Australia Bank</td>
<td>Retail bank</td>
</tr>
<tr>
<td>Qantas Airways</td>
<td>Airline</td>
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<tr>
<td>RioTinto</td>
<td>Diversified resource explorer, miner and developer</td>
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<tr>
<td>Salvation Army</td>
<td>Religious welfare agency</td>
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<tr>
<td>Telstra</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>Westfield</td>
<td>Shopping centre developer</td>
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<tr>
<td>Woolworths</td>
<td>Retail</td>
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It is a very diverse group with ten “for-profit” organisations - all well-known public companies from a range of industries - and includes one “not-for-profit” organisation. Each can be characterised as either a service organisation in its own right or one where there is a major service element in the core processes of their total value chain. The research suggests that it is the organisation itself, not their industry sector, which is the underlying cause of success - winning service organisations do not need to be in significant growth industries to prosper.

The research identified nine common elements for long-term success. Collectively, these elements form a “Winning Wheel” framework (Fig 1) that appears to apply to service organisations of all types and from all industry sectors.

Fig.1 The Winning Framework for Organisations in Australia by Hubbard et al. (2007)
The power of the model lies in its integrative approach - there is no "start" or "finish" to the wheel. All elements are important and success is based on superior execution of all elements in the winning framework to deliver results. A brief outline of each of the nine principles now follows.

2.2 The Nine Principles of Winning Organisations

Effective Execution
Effective execution is the pivotal element that characterises winning service organisations. Conventional wisdom might suggest this should be one of the last elements and perhaps even the end result of doing everything else well. Leadership or strategy formulation might be considered as the logical starting point. However the research showed that it was results that they delivered that caused success - they were chosen on the basis of their results. It is effective execution that enables them to deliver these results and that is what makes them different.

Perfect Alignment
Getting alignment across the organisation is very difficult but essential, and requires all internal and external activities to be consistently matched. Alignment must cover all external key stakeholders including customers to ensure that the internal process delivers the products and services that are wanted, rather than those the organisation can produce. The research indicated that winning organisations aligned mainly around strategy, culture and leadership depending on the stage of the organisation in its strategic cycle and its industry.

Adapt Rapidly
Winning organisations do not necessarily provide the same products and services over time. As organisations grow and develop, they must change, adapt and do so quickly. The catalyst for change may be externally or internally induced but generates continuous improvement and innovation within the organisation.

Clear, Fuzzy Strategy
Strategy is an important element of the winning framework but it must be integrated with other elements if effective execution is to occur. In winning organisations the strategy is consistently aligned with its values and vision, all of which will vary over time depending on the organisation’s stage in its strategic cycle. Sometimes all aspects of the strategy are not defined and this allows some flexibility to take advantage of unexpected opportunities whilst retaining commitment to the overall direction. Good strategy is an important driver of success but on its own does not guarantee success. It helps overall alignment and direction setting by promoting correct choice and ensuring focus and consistency.

Leadership, not leaders
In winning organisations, leadership is seen as a team based capability rather than the responsibility of one individual. Leadership style is dependent on the particular needs of the time and the organisation, with an ability to adjust rapidly to changing needs as a key characteristic of success.

Looking out, Looking in
Winning service organisations have a very high external focus and alignment with all key stakeholders, especially customers. They carefully manage relationships outside the organisation and know their place in the value chain, understanding how future value is created and can be extracted. Winning organisations think from the customer’s perspective and develop customized products and services, using market research used to validate needs and satisfaction. The same energy is deployed to building lasting relationships with suppliers and other alliance partners such as government and regulators.
Right People
Getting the right people into the right jobs is critical for service excellence. Initial recruitment and subsequent retention requires good alignment with the organisational culture and strategy if collective talents are to be harnessed to achieve superior performance. What is right for one winning organisation may not be right for another. Having the right attitude and being effective in a team based environment may ultimately be more important than having the ‘best’ formal qualifications. The resulting higher commitment and motivation of individuals means less need for organisational hierarchy, bureaucracy and excessive controls.

Manage the Downside
Winning organisations are relentless in their drive for progress to stay ahead of their competition and in tune with their customer’s needs and market place changes. Their quest for continual renewal impels change and forward movement as they try to understand the discontinuities and to get to the future first. The research however, indicated many of those organisations are financially conservative and sought to manage risk rather than avoid it. These organisations accepted risk was necessary to progress and proactively developed techniques and contingencies to manage the downside in critical areas.

Balance everything
Winning organisations achieve superior service performance by combining all elements of the framework, which are executed to the highest standards. They do many things consistently well and at the same time thus achieving the “correct” balance between strategic and operational activities. This ability is built into the organisational culture, leadership and strategy in each element of the winning framework which creates an effective balance between external and internal, top and bottom, individuals and teams, geographical and functional activities.

3 KEY PRINCIPLES – EXECUTION AND LEADERSHIP

3.1 Effective Execution in Winning Organisations
Most organisations disappoint their stakeholders by failing to deliver what they say, what they promise and what they promote and market. On the other hand, winning organisations say what they are going to do and then do it. And they keep doing it, again and again. This is quite challenging because saying in advance what will be achieved sets an expectation and a target. For most organisations this invites an assessment of failure. For winning organisations it is an opportunity to demonstrate success.

Seven factors for effective execution that directly contribute to delivering service excellence are:

Clear Processes
Knowing what is expected to be done - having clear processes - is an important ingredient for delivering outcomes. Having structures that support these processes and delegating the authority and responsibility to carry out the processes - and making decisions quickly in borderline cases - supports the completion of the organisation’s tasks and activities. Irrespective of whether the process is structured, informal or democratic, acceptance by those who are responsible for making the process and decisions work is critical.

Operational and Technical Efficiency
Effective execution means being efficient. Operational and technical efficiency is about using systems that work to achieve expected objectives. These objectives usually relate to cost, quality, speed and service.
Taking Personal Responsibility
People’s attitudes to the systems and processes will significantly affect outcomes and results. To get effective execution, people need to take responsibility for the performance of their part of the organisation. Open and direct feedback from management during planning and execution is essential.

Good Management Control Systems
Winning organisations need robust management control systems to check whether they have clear processes that are efficiently undertaken by responsible people. Controls begin during the planning and approval process.

Rigorously Measure Performance
In using systems and processes to achieve results, winning service organisations are differentiated by the rigour and discipline they apply to make them work. This usually involves setting targets and developing a small set of key performance indicators that are lead rather than lag indicators.

Handling Mistakes Positively
Winning organisations are not error-free in their execution. However when an error is made, they expect people to admit it early, fix it as quickly as possible, learn from the mistake and never make the same mistake twice. They treat mistakes as opportunities to improve.

No Cross-Subsidisation
Effective execution in winning organisations involves focussing on delivering results at each unit level as much as it does across the entire organisation. The poor performance of a business unit is not allowed to drag down the overall performance of the organisation (or at least not for very long). Every business unit needs to meet the standards and pay its way.

To summarise, winning service organisations do what they say. They announce what they plan to do and they get the job done, on time and on budget. They have clear processes for execution, efficient operational and technical systems to assist in delivering the required results and the right people who take responsibility for the outcomes of their work. The organisation has good control systems and rigorously measures performance. Winning organisations learn quickly from mistakes and do not cross-subsidise business units. These factors give winning organisations the ability to effectively execute their plans and strategies. Together with the other elements in the framework they characterise winning service organisations in Australia.

3.2 Leadership Characteristics of Winning Organisations
The research indicated that there is no single leadership formula in winning organisations. The required skill set includes a list of generic competencies matched by additional leadership characteristics that are strongly evident in winning organisations in Australia. Some of these are cultural differences peculiar to Australia with its more egalitarian view of leadership, consistent with the values of “mateship” in the Australian culture. Leadership is clearly a critical element since it is often the driver of the other elements.

The leadership characteristics that distinguish winning organisations in this research are:

Leadership Means Teams
Emphasis is on team leadership rather than just a single visionary leader. Within each organisation, leadership comes from a different group of individuals and from four levels - the CEO, top management team, business unit leaders and the board of directors. Each leader and leadership team has faced different circumstances from their predecessors and successors so it is concluded that leadership must be “right for the time”.

Captain-Coach Leadership
The leadership style that people seek in Australian organisations is unique. People want their leaders to be coaches who exhort them and encourage improvement rather than “generals”.
describing a vision and telling them what to do. They respond to leaders who are players on
the field, participating in the game, showing captaincy skills and sharing the work. They want
a relationship with their leaders. Australians are also comfortable with change that gradually
evolves and builds on the current situation within a structured framework. It follows that
leaders in winning organisations tend to be low key, not particularly charismatic and focus on
building a sustainable business rather than egotistically promoting themselves and their own
careers. They don’t display the trappings of office. Being captain-coach leaders, they tend to
easily build informal communication networks within the organisation. They also go to great
lengths to find different channels in which to communicate formally, frequently and as widely
as possible.

**Home Grown and Stable Leaders**
The vast majority of leaders come from within a winning organisation and have been with
that organisation for long periods. The CEO also remains for a long time - nearly twice the
current tenure of CEO’s in Australian industry. Turnover in winning organisations is lower
than the industry average. Promotion from within means that the strategic direction is likely to
change incrementally but since winning organisations are externally focused and performing
well, this is not an unexpected result. Promotion from within means the organisation identifies
with the new CEO and vice versa. When managers are brought in from outside it is usually
because an organisation is either not performing well or it needs or wants transformational
change.

**Passion for the Cause**
There are many organisations with passion and energy but without a strategy this passion
cannot be harnessed to make the organisation more effective. Conversely an organisation with
a robust strategy but which is not passionate about that strategy is unlikely to effectively
execute it. Leaders in winning organisations are passionate and fiercely proud about the
reason why their organisation exists and they understand why this is important. Their passion
is traced to the existence of a cause – a fundamental belief in the value to external parties of
what the organisation stands for and is doing, other than just financial returns to shareholders.
They understand that good strategy must have a cause. Australians tend not to believe mission
or vision statements and organisations struggle to get their people to buy in to the vision or
mission. The leadership group needs to identify the cause, generate emotion around the value
of that idea and coach their people towards achieving it. The cause is a key motivator for the
organisation and effective leaders in service organisations use it to attract the right people and
galvanise the creative talent of their workforce.

**Decisive and Long Term Views**
Leaders in winning organisations, through being close to their people, open to external
influences and having good information systems, are well placed to make good decisions and
to make them rapidly. However being decisive is not just about speed and being focused on
the short term – it is also about commitment to the long-term view. This provides stability and
courage to pursue the long-term purpose of the organisation, even when things are not
going well. People then see their leaders as consistent in their actions and in their
communication of key priorities and initiatives.

In summary, this research has identified a distinctive set of leadership characteristics of
winning organisations in Australia. Leadership is a team-based capability made up of captain-
coach leaders who build the business and are grown from within. They are passionate about
the cause and are decisive but maintain the long-term view. They communicate widely and
are consistent in their actions and behaviours.
4 CONCLUSIONS
This empirical research has revealed nine timeless elements that define the practices of eleven winning service based organisations in Australia over the last 25 years. These elements are; effective execution, perfect alignment, adapting rapidly, clear and fuzzy strategy, leadership not leaders, looking out and looking in, right people, managing the downside and balancing everything. Collectively these elements provide a winning framework for long-term success that applies to service organisations of all types including listed, private, not-for-profit, higher education, public service and government.
To be a winning organisation, these best practice elements need to be in place and linked together – change in one precipitates change to others. Leadership is clearly a critical element since it is often the driver of the other elements and effective execution is identified as the pivotal element to achieve service excellence and long term success.

5 REFERENCES
EVOLUTION FROM TQM TO ORGANIZATIONAL COMPETITIVENESS
THE CASE OF THE 2008 MEXICO QUALITY AWARD MODEL

Rafael Espinosa and Fernando Gonzalez

I. - THE CONTEXT

The Mexican Quality Award (MQA) started in the early nineties, under the auspice of main private industrial groups, in order to help Mexican organizations develop and improve their work systems and business performance. With this purpose in mind the Award Model was developed and conceptualized considering Total Quality Management concepts, with an approach focused on design, implementation and improvement of organization systems that gradually impact performance results in a cause-effect relation.

The MQA has been fulfilling its assignment recognizing organizations that have been successful in Model implementation and promoting the use of this Model. During 18 years, the use of the Model was increased around the country. Several important industrial groups developed their own models customized to their own specific needs, and established assessment processes to evaluate their business units. Education, Government and Health Care organizations have been adopting the model in recent years. As a result of this, the MQA has had one of the highest world participation rates, for this kind of awards, from around the years 2000 to 2005.

During these 18 years, the Model has been updated at least every three years, gradually trying to incorporate new tendencies, but it had not been revised deeply considering the economic environmental changes, organization challenges, and it had privileged the point of view of quality specialists in its conception and actualization.

According to MQA participation statistics, it was observed that MQA participation rate of large private industry started to decrease since 2000; total participation continued to grow until 2005, supported by government and education sectors, but it started to decrease in 2006. These facts were a point of concern for the MQA Technical Board, because the award started with the support of large private industry groups and their absence was an important reason to analyze. We can see participation tendencies from 2000 in the following graphs.

![Graph showing MQA participation trends from 2000 to 2006](image)

This information brought about a series of discussions and analysis inside the Technical Board, in order to identify the root causes of the decrease in MQA participation and Model usage. The first step considered was to carry out a series of direct interviews with senior executives in business and
academic sectors (22), in order to have a clear idea about their perception of the MQA model. The questions asked were:

1. Is the model responding to Mexico’s present competitive context?
2. Is this a model that Mexico’s organizations need to respond to today’s challenges?
3. Does it consider key factors for organizations’ success in 2005 - 2010?
4. Does it consider today’s tendencies for competitiveness, high performance and innovation?
5. Does it have a language spoken by top management?
6. Is it understood by top management?

From the interviews we learned:

- In Mexican companies, results are more a consequence of the positive or negative economic environment than from the execution of company strategies.
- There is a lack of alignment between strategy and execution, and the deployment of plans is limited.
- Many companies still work from the seller’s market point of view; they still don't feel the heat of being in the buyers market.
- Leaders have a rational understanding of the need to change, but they have a blurry vision about how to do it.
- Everybody has an initiative for innovation, but they really don't know what to do with it.
- There is a clear understanding that growth is imperative.
- They consider 6 Sigma, Lean Manufacturing and Toyota Production Systems as the new mantras in quality.
- They approach our present Model (2005) with skepticism as to its capacity to deliver results. They don't understand the language.

In addition to senior executive’s interviews, one of the MQA Technical Board members participates in the annual Global Excellence Meeting (GEM) that congregates main world Quality Awards and Excellence Model responsibles. GEM 2005 was held in Bangalore India and the most important conclusions were:

- Changes in the environment have been dramatic during the last fifteen years.
- We have seen a decline in business participation in many of our awards.
- We have to define what gives success today to organizations and reflect it in our Models.
- Unintentionally Models are becoming a sort of standard, this is required to grant recognition.
- There is an absence of interest in the models and awards form the media and academia.
- A new challenge, how does the assessment process generate more value to the participant organizations?
- New competencies will be required to form the assessors.
• We have to act proactively if we want to add value with the award process to the participant organizations.

II. - MQA MODEL REVISION AND REDESIGN PROJECT

PHASE 1

Senior executive’s interviews and GEM 2005 conclusions illustrated a misalignment between MQA Model design and the challenges faced by Mexican organizations, because the factors that gave success to organizations and the economic environment have evolved. According with this information the Technical Board identified the need to open a MQA Model revision and redesign project, which was considered to be executed in four phases: Start Up, Solution Development, Model Review Process and Launch Changes. Phase one was completed with project team nomination and a plan to ensure efficient and effective progress and on going control.

PHASE 2

It started with the question: Does MQA Model respond to the requirements of new realities that confront Mexican organizations today? In order to answer this question, an intervention model was defined with the purpose of explore from different perspectives, the challenger’s nature that Mexican organizations deal with. The following information sources were considered: a) A workshop with MQA Technical Board members for identify main factors that support success and competitiveness in Mexico, analyze the response capability of 2005 MQA Model and identify main characteristics to be considered in the new MQA Model and assessment methodology changes; b) The World Economic Forum (WEF) index of global competitiveness, which analysis the capacity to compete of each country based on WEF key competitiveness factors performance; c) The senior executives interviews conclusions mentioned before; d) A workshop with senior MQA assessors to identify their points of view about Model and assessment process’ change requirements; e) The Above the Clouds study from EFQM focused on the future of work to visualize the more critical changes and tendencies in the work world at global level, due to globalization process and the revolution of technology; f) A benchmarking study with Australia, Canada, EFQM, the United States of North America, Brazil, Japan and Singapore Quality Awards Models in order to situate the MQA Model in the world-wide context; g) A study on the position of global companies about Excellence Models implementation; h) American Society for Quality 2005 report on the future of Quality, where main change drivers and their implications for the Quality field were identified; i) Finally, we analyzed several diagnosis methodologies used by global consultant companies, specially the Mckinsey approach to observe the way they focus their evaluation and diagnosis processes. These findings allowed us to evaluate the response capability of the MQA Model to complex and sophisticated internal and external economic environment challenges.

With this information, it was possible to establish main topics to be considered in the new MQA Model, they were:

- Main competitive factors have changed radically in the last 10 years.
- Consider the MQA Model an instrument for strategic and competitive reflection, characterized by be focused in key organization elements for competitive advantages development such as: flexibility, innovation, operative efficiency, strategic alliances, to mention some of them.
The WEF scheme allows us to situate under a single global perspective the competitiveness factors. Businesses Sustentabilidad and Innovación should be considered, because they affect directly the development of organization internal capabilities as a prerequisite to compete.

Derived from senior assessors’ comments, we had as important subjects: innovation, agility, personnel competences development, value creation, social responsibility and operative efficiency. Also the necessity to redesign assessment methodology was identified, to do it more objective and rigorous in relation with organizations approach to their strategic challenges.

From the study on Future of the Work developed by EFQM, we had significant coincidences with the points of view of senior executives of Mexican organizations and senior assessors of MQA, aspects like: more sophisticated and informed consumers, development of personnel new competences and knowledge management illustrate these perceptions.

The benchmarking with other models has allowed us to compare different forms of structure in each model. The comparison of Baldrige and EFQM permitted to contrast the way it is reflected the organization philosophy of the United States of North America and the European Community; also important differences in the score weight of Results Orientation criteria was identified.

The ASQ report on the Future of Quality where main change drivers as: agility, business system development, anticipation, innovation, sophistication of the consumer and outsourcing and their implications were identified.

Finally consulting firm intervention methodologies, which allowed us to observe the importance of understanding the context and the analysis process that they perform in the organization diagnosis.

In conclusion the new MQA Model required integrating a series of key concepts for the success of Mexican organizations in the actual economic context. The most important were: Strategic Reflection, Innovation, Agility, The Concept of Value Creation, Development of New Competences, Knowledge Management, Strategic Vision in the organizations, Sustainable Development and Operative Efficiency. Next figure shows the synthesis of concepts integrated in the 2008 MQA Model.
Phase two second step considered Michael Porter, Resource Base and Delta Model Competitive Strategy Schools analysis.

Michael Porter: considers there are five forces that describe the success or failure of an industrial sector or company that should be considered for strategy formulation. These forces are: new competitor entrance threat, competitor rivalry, product substitutes’ entrance threat and supplier and buyer negotiation strength. The central focus for strategy formulation is industry and business environment.

Resources Based View: It considers critical for strategy formulation to think about internal resources such as tangible and intangible assets, to develop and robust key organizational capabilities, which are defined as a unique combination of knowledge, abilities, processes, human competences and technology that differentiate an organization and establish the basis for sustainable competitive advantages development of the firm.

Delta Model: It considers key for the strategy formulation, deep customer and consumer understanding. This understanding should be extended to critical suppliers and complementary partners. The implementation of the new business model is realizable mostly because the opportunities and potentials offered by the Internet and its associated technologies: e-business, e-commerce, e-systems. The appropriation of this skill is essential.

We can see in the following table main characteristics of each school according with our research interest.

<table>
<thead>
<tr>
<th>Competitive Strategy Schools</th>
<th>Porter</th>
<th>Resource Based View</th>
<th>Delta Model</th>
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</thead>
<tbody>
<tr>
<td>Focus of strategic attention</td>
<td>Industry/business environment</td>
<td>Corporation</td>
<td>Extended enterprise (the firm, the customer, the supplier)</td>
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<tr>
<td>Types of competitive advantage</td>
<td>Low cost or differentiation</td>
<td>Resources, Capabilities Core competencies</td>
<td>Best product, total customer solution, system lock-in</td>
</tr>
<tr>
<td>Basic unit of competitive advantage</td>
<td>Activities</td>
<td>Core products, strategic architecture</td>
<td>Adaptive process: operational effectiveness, customer targeting, innovation</td>
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We also wanted to understand the business basics (avoided tools and “fads”), and its relationship to superior business performance. We found a report from Harvard University Evergreen project that carry out a multiyear research effort in which it was examined more than 200 well-established management practices as they were employed over a ten-year period by 160 companies. The report established: “Most of the management tools and techniques studied had no direct causal relationship to superior business performance. What does matter, it turns out, is having a strong grasp of the business basics. Without exception, companies that outperformed their industry peers excelled at
what we call the four primary management practices - strategy, execution, culture, and structure. And they supplemented their great skill in those areas with a mastery of any two out of four secondary management practices - talent, innovation, leadership, and mergers and partnerships”.

These findings about Competitive Strategy Schools and High Performance factors complemented and validated the proposed 2008 MQA structure developed in step one of phase two, especially factors such as strategic reflection, strategy execution and economic environment effect.

The following step was to define the 2008 MQA Model conceptual bases.

**2008 MQA Conceptual Bases:** The purpose of 2008 MQA Model was defined as: “Impulse organization’s performance, competitive position and sustainability level, through a deep reflection for strategy creation that fortifies and develops competitive advantages and a faultless strategy execution”. It was also conceptualized, the main actions that we expect the model implementation will generate in the organizations. They are commented in the following paragraphs.

Organization’s competitiveness and sustainability result levels should be the starting point for strategic reflection and analysis. They provide organization competitive position.

Strategic reflection purpose is to pose the following questions: 1) Who am I as organization?, 2) What can I do?, 3) What could come in the future? 4) What am I going to do?, 5) How am I going to do?; trying to motivate a profound analysis for organization’s direction.

Strategy will emerge from last step and its main purpose is to generate competitive advantages, understanding them as the ability to offer a better value proposal through greater benefits or minors costs to customers. The strategy implies a set of capabilities in which an organization must be excellent to achieve its strategic objectives.

<table>
<thead>
<tr>
<th>Conceptual Bases 2008 MQA Model</th>
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<tr>
<td>Competitive Advantages</td>
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<tr>
<td>Environment</td>
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<tr>
<td>Strategic Reflection</td>
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<tr>
<td>Key Capacities</td>
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<tr>
<td>Competences</td>
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<td>Resources</td>
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<tr>
<td>Organization Design</td>
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<tr>
<td>Execution</td>
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<tr>
<td>Results</td>
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Organization key capabilities are defined as a unique combination of knowledge, abilities, processes, technology and human competences that differentiate an organization and provide it competitive
advantages. They are created internally and they are difficult to imitate by others. The strategy
definition determines the more important organization’s key capabilities.

The strategy execution initiates with organization design alignment to strategy. Structure, Processes,
Personnel Competences and Reward Practices are the main elements considered to be in line with it.
This step continues with the organization always looking for changes, to identify strategy alignment
or contingency actions, derived from the economical environment dynamics and the speed of change
that characterizes actual times.

Finally we have performance and sustainability result levels evaluation to identify competitiveness
and sustainability as a consequence of strategy creation and execution. We understand sustainability
as the capability to assure organization’s permanence in the future.

In synthesis 2008 MQA was conceptualized as a reflection tool to stimulate the Mexican
organizations to have a clear picture about their present situation, as a starting point to carry out: a) A
strategic definition of its direction, which considers how they will compete and in consequence
clarify the competitive advantages to develop; b) The strategy construction process that considers key
capabilities and how they will be developed and strengthen; c) The strategy execution; and d)
Evaluation of their competitive position and sustainability level.

2008 MQA Model structure design: Once defined the model conceptual bases, next step was to
integrate them with the key design factors previously identified, to put together the final structure.

To incorporate the key design factors that complement model structure design, they were grouped in
seven value drivers. We can see a summary of each one in the following paragraphs:

Leadership: This driver defines the way leaders set a direction and how they take on the external
challenges of the organization by establishing innovative strategies that respond with an execution
focused on priorities.

Planning: This driver proposes the approach on how the organization develops its business strategy
regarding what it seeks to be in the future, considering the dynamics of the environment and its
challenges, setting, and prioritizing objectives and goals as well as the capabilities and competences
needed to reach them.

Customers: This driver promotes a strategic thinking around the markets and market segments in
which the organization participates or it is interested in. The strategic thinking must covers the way
markets are identified as well as the needs and requirements of current and potential customers, the
characteristics of the associated value chain, the need to establish strategic alliances with customers,
a deep knowledge of competitors and the development of new products and services. Additionally,
the “Customers” driver considers how does the organization launch, promote and support its products
and services, as well as the programs and systems it has for formal relation and contact with
customers to respond to their needs and requirements, and at the same time this relationship
supported on innovation stimulate sales growth.

Processes: This driver focuses on how the organizational processes are aligned with the business
strategy and stakeholders’ needs, and on the way the organization develops competences different
than those of its competitors in terms of agility, flexibility, and on-time delivery, among others. It
includes as well issues regarding innovation of products, services, processes, and management
systems, and the establishment of strategic alliances to strengthen those competences. It also addresses process management and business relation with suppliers and subcontractors seeking a high operational performance.

Human Resources: This driver concentrates on how the organization achieves high performance by aligning the competences of its employees and the work systems to the business strategy. The capacity of the organization for being competitive highly depends on the individual competences and motivation of its employees and on their involvement on operational decisions; for these reasons, it is necessary to develop a strategy for human resources management congruent with the business strategy.

Information and knowledge: This driver considers the alignment and projection of the information system and knowledge creation processes with the objectives and priorities of the organization, its structure, and operational mode. Furthermore, it proposes a strategic reflection on the relevant knowledge needed by the organization to be and remain competitive, and on the formation of intellectual capital.

Sustainable Development: This driver rests on four aspects: economic growth, ecological balance, social/human development, and on the interaction between business and governmental organizations with the society. Organizations, in collaboration with their employees and families, the local community and the society as a whole, support sustainable development through their commitment, contribution, and permanent interest on the improvement of their welfare, well-being, and the quality of life. This commitment is executed through community involvement, organization’s respect for its employees and their families, as well as by the development of trusty relationships with consumers and suppliers. After several discussions inside the MQA Technical Board three model main components were defined: Results Orientation, Strategic Reflection and Execution in line with the conceptual bases.

The seven value drivers had topics related with the Strategic Reflection and with the Strategy Execution, taking in consideration this point, they were considered in both components. Additionally the Strategic Reflection was segmented in two sections: Organization Direction Definition and Alignment with the Strategy. The Strategic Reflection segment “Organization Direction Definition” has topics of Leadership, Customers and Planning value drivers; the “Alignment with Strategy” segment has topics of Processes, Human Resources, Information and Knowledge and Sustainable Development value drivers; Execution component has topics of all the seven value drivers. We can see the final model conceptualization in the following figure and model structure:
The figure wording is in Spanish but “Resultados de Competitividad y Sustentabilidad” corresponds
to “Competitiveness and Sustainability Results Orientation”; “Reflexión Estratégica” to “Strategic
Reflection”; “Definición del Rumbo” to “Organization Direction Definition”; “Alineación” to
“Alignment”; “Capacidades Clave” to “Key Organization Capabilities”; and “Ejecución” to
Execution.

Once defined the general structure of the model and value driver scope and content, next step was to
structure MQA guide for implementation. As it was commented previously, one of the new model
objectives was to be an organization reflection tool. In consequence, every one of the value drivers
was structured around several topics and a series of questions tied to them were included to facilitate
depen in the subject.

<table>
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<th>2008 MQA STRUCTURE</th>
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<td><strong>3.- EXECUTION</strong></td>
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<td>3.1.- LEADERSHIP</td>
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<td>3.6.- INFORMATION AND KNOWLEDGE</td>
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<td>3.7.- SUSTAINABLE DEVELOPMENT</td>
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Once it was fully structured 2008 MQA Model had several revisions inside the Technical Board and
with numerous senior executives groups. It was also discussed in Sao Paulo GEM annual meeting in
November 2007 where it was well accepted and comments from the participants were encouraging.

The MQA Technical Board finally had consensus for launching the model for 2008 Mexican Quality
Award cycle.

**III. - MQA MODEL EVOLUTION**

As we can see 2008 MQA Model had had an evolution driven by Mexican organization needs and
global tendencies present in the actual economic environment. The actual model is focused in the
organization system innovation and improvement versus the precedent one that was focused in
management systems improvement.
Another important point considered for MQA redesign was a tendency to use it as a standard, where the assessment methodology reinforced this perception. The 2008 version is focused to support the strategy formulation in each organization that decides to use it, considering their specific characteristics. Additionally the assessment methodology has been adequate for be congruent with this effort.

Next table shows main evolution issues between 2008 MQA Model and the precedent.

### Evolution of the MQA Model

<table>
<thead>
<tr>
<th>From focus on internal efficiency</th>
<th>To focus on external effectiveness</th>
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<tr>
<td>• Concepts in the Model that respond to a predictable environment</td>
<td>• Concepts in the Model that respond to a dynamic and unpredictable environment</td>
</tr>
<tr>
<td>• Focus on operational efficiency of each system.</td>
<td>• Focus on the operational efficiency of the organizational system.</td>
</tr>
<tr>
<td>• System design to comply to Model requirements.</td>
<td>• A tool to promote strategic reflection, design and execution of the organizational system and its processes</td>
</tr>
<tr>
<td>• Understanding of results causality as product of internal systems efficiency not influenced by external environment.</td>
<td>• Understanding of causality of results as a product of the organizational system and the economical environment opportunities or threats.</td>
</tr>
<tr>
<td>• Model implementation as a sequence of activities not related to a strategic reflection</td>
<td>• Design of organizational system (Strategy and Capabilities) and continuous improvement from the strategic reflection perspective.</td>
</tr>
</tbody>
</table>

### IV. - CONCLUSIONS

In an integrated world, economic competitiveness has become a central concern for both developed and emerging economies. When talking about competitiveness we often focus our attention on the macroeconomic, political, legal, and social circumstances of a country. These factors are important, but not sufficient. “They provide the opportunity to create wealth but do not themselves create wealth”. “Wealth is actually created at the microeconomic level of the economy, rooted in the sophistication of actual companies”, according with The World Economic Forum.

Business sophistication plays a key role in country competitiveness. If we measure Mexico performance against an international standard like WEF, we can see a big gap against leading countries. Mexico was in position 48, 55 and 52 from 2005 to 2007 for Total Competitiveness; in position 52 and 54 for Business Sophistication and 58 and 71 for Innovation in 2006 and 2007 respectively.

Mexico is subject of strong pressures to improve its competitive position, because we are one of the most open countries for commerce and investment with free trade agreements with the USA, EU, Asia Pacific Countries and most of the Latin American Countries.
This information showed us that Mexico's ranking in world competitiveness is unimpressive and declining and also participation in the award process, as an indicator of interest in the implementation of the MQA Model is not encouraging, overall participation and large private industry is down, also we can say that industry has little interest in model use, and along with little attention from media and academia.

Taking into consideration these facts MQA Technical Board considered the Model doesn't have all the answers for improving the country competitiveness, but it could play an important role. Mexican organizations to be more competitive, must work in the sophistication of their operations and innovation. The MQA could be a key initiative to support organizations in this process but it was necessary to review and redesign it.

We consider 2008 MQA Model meet Mexican organization needs and global economic tendencies challengers. It is a semi radical change for a business or organization’s model reference but Mexico competitive conditions demand this kind of challengers.

We had started 2008 cycle for Mexican Quality Award, the comments and feedback that we have been receiving generally speaking are positive, specially from several senior executives that say in their comments: “I understand now the model language but I’m living worried, because we don’t have answers for many questions in our organization, we should work on them”.

We are in the initial phase of 2008 MQA Model use by different organizations in sectors such as: private large industry, services and government. We have a sample of about 80, which participate in the Mexico Quality Award this year. They have been receptive about the model new concepts and scope. We will be in touch with them to analyze their experiences in model implementation and achievements.

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SUPPLY CHAIN AND QUALITY MANAGEMENT

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KEYWORDS: Quality Methods, Logic, Rational Manager, Metanioa, Intellectual Honesty, Quality Education

1 INTRODUCTION

With the globalisation of business, firms are sourcing and distributing products across the globe; accordingly, since the 1980s the strategic benefits of production planning and inventory management have become obvious. These subjects are provided to students in several University courses: a problem arises, formulas are given to students without any scientific proof; therefore the students learn like parrots! We will provide a case used in many Universities, learned all over the world through the formula

$$\frac{C}{Qp})\lambda = (R + Q/2 \cdot \lambda LT) + (1 - F_{LT}(R))\lambda / Q :$$

this "logistic" formula is not proved in the books listed in the references (one can not read all the books!), it is only "intuitively suggested", or "heuristically derived"!!

What we are going to show is certainly "contrary to popular notions": unfortunately, "it is difficult to see what one does not expect to see". Will professors understand that?

I beg the reader pardon, but I have to start with my experience, telling him a story.

My name is Fausto (from the Latin "Faustus"=lucky), but I am very unlucky: I always was having bloody rotten luck (capability) of being fond of Quality (and Intelligence) and hating stupidity: for at least half a century I have been asking people (my friends when I was a student, my collaborators when I was Quality Manager, my colleagues and students when I was teaching, the readers of my papers and books when I was writing) to use their own brain and not to act as parrots repeating stupid sentences. I had limited success, in spite of my 150 papers on the scientific way of dealing with Quality matters. A scientific way of dealing the problem "inventory management with demand and lead time stochastic" was provided by F. Galetto in the reliability context, in 1975 with the paper "A general model for system cost-effectiveness, EOQC & IAQ Joint Conf." and in 1977 with the paper "CLAUDIA (Cost Life Analysis), 21st EOQC Conf., Varna". AITEM attendees were given the same ideas in 1997 with the paper "Reliability model of costs in a production unit, AITEM 1997, Salerno".

Unfortunately, in the Universities generally there are not "Quality experts" and professors do not know the ISO 9001:2000, Quality management systems – Requirements; any Good Quality Manager knows very well that making Quality involves prevention of potential nonconformities and correction of actual nonconformities (problems) [while many professors and referees do not]; we provide here some excerpts of ISO 9001:2000:

8.5.3 Preventive action The organization shall determine action to eliminate the causes of potential nonconformities in order to prevent occurrence. Preventive actions shall be appropriate to the effects of potential problems. A documented procedure shall be established to define requirements for

a) determining potential nonconformities and their causes,
b) evaluating the need for action to prevent occurrence of nonconformities,
c) records of the results of action taken (see 4.2.4) and,
d) reviewing preventive action taken.

IF universities should have applied this idea of "preventive actions" they never had provided the

students with that wrong "logistic" formula
average cost rate = $A\lambda/Q + h(R + Q/2 \cdot \lambda T) + (1 - F_{+}(R))p\lambda/Q$ in Logistics courses.

Human beings evolved because they were able to develop their knowledge from inside (the deductive logic, with analytic statements) and from outside, the external world, (the inductive logic, with synthetic statements), in any case using their own intelligence; the inductive logic is such that the premises are evidence for the conclusion, but the truth of the conclusion follows from the truth of the evidence only with a certain probability, provided the way of reasoning is correct.

The scientific knowledge is such that any valid knowledge claim must be verifiable in experience and built up both through the inductive logic (with its synthetic statements) and the deductive logic (with its analytic statements); in any case a clear distinction must be maintained between analytic and synthetic statements.

This was the attitude of Galileo in his studies of falling bodies. At first time he formulated the tentative hypothesis that "the speed attained by a falling body is directly proportional to the distance traversed"; then he deduced from his hypothesis the conclusion that objects falling equal distances require the same amount of elapsed time. After a "Gedanken Experiment", Designed Experiments made clear that this was a false conclusion: hence, logically, the first hypothesis had to be false. Therefore Galileo framed a new hypothesis: "the speed attained is directly proportional to the time elapsed". From this he was able to deduce that the distance traversed by a falling object was proportional to the square of the time elapsed; through Designed Experiments, by rolling balls down an inclined plane, he was able to verify experimentally his thesis.

Such agreement of a conclusion with an actual observation does not itself prove the correctness of the hypothesis from which the conclusion is derived. It simply renders that premise much more plausible. Proposing the criterion of testability, or falsificability, for scientific validity, Popper emphasized the hypothetico-deductive character of science. Scientific theories are hypotheses from which can be deduced statements testable by observation; if the appropriate experimental observations falsify these statements, the hypothesis is refused. If a hypothesis survives efforts to falsify it, it may be tentatively accepted. No scientific theory, however, can be conclusively established. A good example of that is Bell's Inequality. In physics, this inequality was used to show that a class of theories that were intended to "complete" quantum mechanics, namely local hidden variable theories, are in fact inconsistent with quantum mechanics; quantum mechanics typically predicts probabilities, not certainties, for the outcomes of measurements. Albert Einstein stated that quantum mechanics was incomplete, and that there must exist 'hidden' variables that would make possible definite predictions. But in 1964, J. S. Bell proved that all local hidden variable theories are inconsistent with quantum mechanics, through "Gedanken Experiment" and Logic, and through Designed Experiments.

The ultimate test of the validity of a scientific hypothesis is its consistency with the totality of other aspects of the scientific framework. This inner consistency constitutes the basis for the concept of causality in science, according to which every effect is assumed to be linked with a cause. The scientific community as a whole, however, shall judge the work of its members by the objectivity and rigor with which that work has been conducted; in this way the scientific method should prevail.

To prove that a formula is wrong, one needs only intelligence; to find the right formula, that substitutes the wrong one, you need both intelligence and ingenuity and Intellectual Honesty. I will use only intelligence and I will not give any proof of my ingenuity: this paper is for intelligence … For example, it's well known (from Algebra) that the coefficients and the roots of any algebraic equation are related: it's easy to prove that $\pm \sqrt{-c/a}$ is not the solution (also if you do not know the right solution) of the parabolic equation $ax^2 + bx + c = 0$, because the system $x_1 + x_2 = -b/a, x_1x_2 = c/a$ is not satisfied.
The literature on “Quality” matters is rapidly expanding. Unfortunately, nobody, but me, as far as I know, [I thank any person that will send me names of people who take care …], takes care of the Quality of Quality Methods used for making Quality (of product, processes, services and Methods). I am eager to meet one of them, fond of Quality like I am.

If this person existed he would have agreed that "facts and figures are useless, if not dangerous, without a sound theory" (F. Galetto), "Management need to grow-up their knowledge because experience alone, without theory, teaches nothing what to do to make Quality" (Deming) because he had seen, like Deming and myself "The result is that hundreds of people are learning what is wrong. I make this statement on the basis of experience, seeing every day the devastating effects of incompetent teaching and faulty applications." [Deming (1986)]. Many times F. Galetto spoiled his time and enthusiasm at conferences, in University and in Company courses, trying to provide good ideas on Quality and showing many cases of wrong applications of stupid methods [see references]. He will try to do it again … by showing, step by step, very few cases (out of the hundreds he could document), where we show that data and their scientific analysis is fundamental for Quality achievement.

2 INVENTORY AND LOGISTIC; THE GENESIS OF THE WRONG FORMULA

We consider here the case of inventories. There are many courses on Logistics, Production Planning, Inventory Planning, … ; there are many books on these matters. I will consider only a few, I found by chance: it's a "sampling plan".

Inventories are stockpiles of raw material, supplies, components, work in progress and finished goods that appear at numerous points throughout a firm's production and logistic channel. Inventories on hand cost at least 20% of their value per year. Therefore, carefully managing inventory levels makes good economic sense: in recent years, the holding of inventories has been criticised as unnecessary and wasteful. Actually, good management of inventories improves customer service and reduces costs. Inventory plays a key role in the logistic behaviour of all manufacturing systems. The classical inventory results are central to more modern techniques of manufacturing management, such as material requirement planning (MRP), just-in-time (JIT) and time based competition (TBC).

Let's consider first the oldest, and simplest, model – the Economic Order Quantity – in order to work our way to the more sophisticated ReOrder Point (ROP) model.

One of the earliest applications of mathematics to factory management was the work of F. W. Harris (1913) on the problem of setting manufacturing lot sizes. He made the following assumptions about the manufacturing system; production is instantaneous, delivery is immediate, demand is deterministic, the demand rate is constant over time, any production run incurs a fixed setup cost, there is no interaction between different products.

Let's consider now the problem of establishing the order quantity Q [lot size] for an inventory system, dealt in "Logistics courses" and related books. In this field the assumptions are very similar to Harris: a single item is subject to "constant" demand "λ" [demand rate, in units per year], there is a fixed cost A [ordering cost, in euro] of placing an order and a carrying charge "h" [holding cost, in euro per unit per unit time allotted (often year) to each item in inventory]. If no stockouts are permitted and lead time is zero (orders arrive immediately) there is a quantity Q (named EOQ: Economic Order Quantity), that minimise the "total cost per year", given by the famous Wilson lot-size formula \( Q = \sqrt{\frac{2Aλ/\bar{h}}{}} \). The production cost does not influence the solution and therefore in not considered in the "total cost per year" \( Y(Q) = hQ/2 + Aλ/Q \). Taking the derivative of \( Y(Q) \), and using elementary concepts of calculus, one gets easily the Wilson formula \( Q = \sqrt{\frac{2Aλ/\bar{h}}{}} \). In this particular case, we repeat, in this particular case, the number of lots ordered per year is perfectly known to be \( N=λ/Q \) and the optimal time between orders is \( T=Q/λ \), i.e. \( T=1/N \).

F. Galetto met this formula in 1967 when he was student in the course "Economy and
Let's now see what happened (2006 and 2007) in two MASTER Courses (dealt after 5 years of Engineering courses) on Maintenance and Reliability, in the lessons for RCM [Reliability Centred Maintenance]: Wilson formula \( Q = \sqrt{2AL/h} \), which holds only in the hypotheses we said before, was provided to student for buying the spare parts, which obviously depend on the number of failures, which obviously depend on the unreliability, which obviously depend on the time failure, which obviously is a random variable!!! A serious teacher should have proved that the formula holds true, before showing it to students !!!!

So we see that many are the situations where professors provide wrong formulas.

If delivery is not immediate as assumed before (second model), one can consider delivery times (LT, lead Time) as known and fixed: LT=constant; the order is placed when the on-hand inventory is \( R = \lambda \cdot LT \) and the lot is received exactly after the time LT, when the inventory is zero; the Wilson formula is still valid, in this case.

If delivery times are uncertain, as "random variables", then a different approach is required. There is, however, a more important source of randomness: the demand. In this case we enter the "Statistical Reorder Point" model (third model) developed by Wilson (1934). Probability concepts are needed because demand is random.

The third model is named \((Q, R)\) model \([2, 3, 4, 5, 6]\) and works this way: inventory is monitored continuously; when the inventory level reaches (or goes below) \( R \), an order of size \( Q \) is placed; after a "fixed" lead time \( LT \), during which a stockout might occur, the order is received: the problem is to determine appropriate values of \( Q \) and \( R \).

Now the demand \( D \) (in units), at any instant \( t \), is a random variable; \( D(t) \) is a stochastic process; for convenience it is considered as continuous, with cumulative distribution \( F(d) \) \([CD]\) and probability density function \( f(d) \) \([pdf]\); \( \mu \) is the mean demand and \( \sigma \) is the standard deviation of demand: all these "quantities" depend on the time \( t \). the inventory \( X(t) \) is a stochastic process, as well. In the third model the replenishment lead time \( LT \) is assumed constant. Since we place an order when there are \( R \) units in stock (including a Safety Stock) and we expect to incur demand while we wait for the replenishment order to arrive, we face the case where we can go out-of-stock: we do not have any more units to sell, we are in stockout. Two cases can happen causing bad Service Level and consequent losses: either customers are willing to wait until the order arrives \([we\ name\ it\ "back-order\"\ model,\ or\ "type\ II\ Service\"\ model]\), or customers do not wait and buy the product from another supplier \([we\ name\ it\ "stockout\"\ model,\ or\ "type\ I\ Service\"\ model]\). For both the models it is important to consider the IP (Inventory Position) which takes into account the on-hand inventory (the physical inventory in stock) the backorders and the replenishment orders: \( IP = \text{on-hand inventory - backorders + orders} \).

In the third model a replenishment order of size \( Q \) is placed any "first-time" the IP becomes \( \leq R \); after a constant \( LT \) the order is received: unfortunately in the meantime a stockout might occur.

To show his ideas F. Galetto considers here only the "lost sale" model, or "type I Service" model, as it is found in books and papers published by "...serious international editors that will submit them to a serious peer review before publishing it.". The cost involved are \([\text{symbols unified for all the documents}]: \bullet A\lambda/Q, \ "average\ order\ cost\ per\ year, \bullet [1-F_{LT}(R)]p\lambda/Q, \cost\ of\ stockout\ \[\text{cost\ per\ stockout,\ in\ euro}\] F_{LT}(R) \ CD\ of\ demand\ during\ the\ lead\ time\ LT, \bullet h(R+Q/2-\lambda LT), \ "average\ inventory\ cost\ per\ year,\ being\ \lambda\ the\ rate\ of\ demand.\ It\ is\ important\ to\ highlight\ the\ hypotheses\ of\ the\ third\ model,\ the\ so\ called\ "lost\ sale\"\ case: 1) the\ rate\ of\ demand\ \( \lambda \)\ is\ constant, 2) the\ Lead\ Time\ LT\ is\ constant, 3) the\ ordered\ lot\ of\ size\ Q\ arrives\ exactly\ after\ the\ time\ LT, 4) every\ order\ costs\ A, 5) every\ item\ costs\ h\ per\ unit\ time, 6) every\ stockout\ costs\ p, 7) the\ demand\ during\ LT\ is\ a\ random\ variable\ with\ CD\ F_{LT}(R).\ When\ the\ Lead\ Time\ LT\ is\ a\ random\ variable\ we\ get\ the\ forth\ model,\ with\ the\ hypotheses\ in
the "lost sale" case: 1) the rate of demand $\lambda$ is constant, 2) the Lead Time LT is a random variable $T^{**}$, 3) the ordered lot of size Q arrives exactly after the time LT, 4) every order costs A, 5) every item costs $h$ per unit time, 6) every stockout costs p, 7) the demand, during the Lead Time $T^{**}$, is a random variable with CD $F_{LT}(R)$. There are two stochastic processes competing at any instant: the demand and the time for replenishment; the idea is depicted in figure 1: when at instant $s$, the IP(s) crosses the level R of the inventory, the order of size Q is placed and the inventory position immediately becomes IP(s)=R+Q; after a random time $T_Q$ [time for selling Q products], if there is no stock out, the inventory position is IP(s + $T_Q$)=R; another order is placed and IP(s+ $T_Q$)=R+Q; the sequence of the r.v. $T_Q$ is a renewal process that triggers the order placement; at time $s$, two stochastic processes "the demand, with the random variable $T_R$ [time for selling R products]" and the "the replenishment, with the random variable $T^{**}$ [time for arrival of the Q ordered products]" start competing; the winner determines the future of the system: if $T^{**}<T_R$ then the system is replenished with a lot of size Q and stockout does not happen: this occurs any time the event $T^{**}<T_R$ happens; stockout occurs only when $T^{**}>T_R$; and only in this case the penalty p is paid. (If $R>Q$ then $T_R>T_Q$, as in the figure 1: the stock out occurs because $T_R<T^{**}$, i.e. R products are demanded while waiting for the Q ordered products).

For the third model $T^{**}=LT=constant$, and figure 1 is to be modified accordingly.

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**Figure 1 Stochastic processes competing**

- $T^{**}$: Lead Time (r.v.) for transition from Order to Replenishment with pdf $g(t)$
- $T_Q$: time (r.v.) for selling Q products with pdf $f(t)$
- $T_R$: time (r.v.) for selling R products with pdf $f(t)$, for Lead Time $T^{**}$ (r.v.)

- $R_X(t)$: probability of not experiencing Stock out for the interval $0-t$, if the system entered state X, at instant 0
- $MTTS_X$: mean time to Stock out, from state X

- **probability of not experiencing Stock out are determined by Equations of Reliability Integral Theory**
For the third model $T^{**}=LT=\text{constant}$, the difference $R - \lambda LT = SS$ is named Safety Stock, in order to set the type I service level $> 50\%$, let's say $F_{LT}(R)$, being $F_{LT}(x)$ the probability of selling less than $R$ products during the lead time $LT$; the average cost rate $= \lambda Q + h(R + Q/2 - \lambda LT) + (1 - F_{LT}(R))\lambda Q$ is "the formula to be minimised if stockouts are permitted and lead time is $LT>0$, if demand is random, (where $R$ is the trigger quantity for placing the order of size $Q$, $p$ is the penalty for stockouts and $F_{LT}(d)$ is the probability distribution of the demand $d$, during the lead time $LT$". Actually the formula is inconsistent, because it is based on an intuitive [not proved] extension of the formula for <<"constant" demand, no stockouts permitted and lead time zero>>. Notice that this formula is the same as that in case of "everything known" and constant!!!!!!!!!. No scientific proof of the formula is ever provided!!! It is only an application of BAD knowledge of probability…

The justification of the formula is the following [4, pag. 276]: "... the number of stockouts depends on two factors: • the number of chances to experience a stockout, that is the number of planning cycles, when we wait for the delivery of the $Q$ units of the product and inventories might fall short of demand; • the probability that in each planning cycle the demand actually exceeds the stocking quantity $R$ and we face a stockout." $\lambda /Q$ is the number of lots ordered per year. Understanding that the formula is wrong is very easy.

The quantity $[1 - F_{LT}(R)]$ is the probability that the demanded quantity $D_{LT}$, during the lead time $LT$, is larger than $R$: $P[D_{LT}>R]$. That does not take into account that stockout occurs only if the replenishment order arrives LATE, later than all $R$ units are sold!!!!!!! The probability of stockout depends on the competition of two stochastic processes: the demand $D(t)$ versus the replenishment $U(t)$.

A point deserves attention: the mean of the on-hand inventory, $R+Q/2-\lambda LT$. In [4, pag. 274] they say: "... the inventory position fluctuates between the minimum level $R$ and the maximum level $R+Q$ and thus the average inventory position is $R+Q/2$", because "... the inventory level over time is, in a sense, uniformly distributed between the maximum and the minimum". This is wrong, because the mean of the inventory is $\int_{0}^{\Delta} E[X(t)]dt / \Delta$, being $\Delta$ the period for selling $Q$ products and $t_0$ any instant, and the distribution is … .

So we see that, actually, average cost rate $= \lambda Q + h(R + Q/2 - \lambda LT) + (1 - F_{LT}(R))\lambda Q$ is a formula inconsistent, because it is based on an intuitive [not proved] extension of the formula for <<"constant" demand, no stockouts permitted and lead time zero>>.

In [4, pag. 274] they provide the

$$Q^* = \sqrt{\frac{2E(d) \cdot [A + p \cdot (1 - F_{dLT}(R^*))]}{h}}$$

$$f_{dLT}(R^*) = \frac{Q^* \cdot h}{p \cdot E(d)}$$

where they set $\lambda=E(d)$. Is that sensible?

Just before sending the paper I received by e-mail an advertisement from Factory Physics (see Appendix), suggesting a course on Supply Chain Management; Factory Physics is a book [32] for Higher Education with the same errors as the others [2, 3, 4, 5, 6]: Higher Education?????
3 INVENTORY; THE "NORMAL CASE"

In all the books F. Galetto read, the Cumulative Distribution $F_{LT}(R)$ of demand during the lead time $LT$ is assumed to be the Normal distribution.

IF the Normal distribution is valid, then the pdf $y$ of $X(t)$, given $X(t_0)$, is

$$y = y(x,t | X(t_0) = x_0) = 1/(2\pi)^{\frac{1}{2}}\exp\left[-\frac{1}{2}\left(x - x_0 - \lambda(t-t_0)\right)^2\right]/[2\gamma(t-t_0)]$$

[F. Galetto knew that since he was a student (40 years ago [35])]. The probability density function $y$ satisfies the partial differential equation [35] $y_t + \lambda y_x - (\gamma/2)y_{xx} = 0$: this equation rules the stochastic process $X(t)$ of the inventory (due to the random nature of the demand): $\lambda$ is the demand rate [i.e. the demanded quantity per unit time] and $\gamma$ the "variance rate" [i.e. the variability of the demanded quantity per unit time] of the demand. The partial differential equation is important because it shows that there are two important random variables, $T_Q$ (the time to sell $Q$ products) and $T_R$ (the time to stockout, i.e. $R$ products sold, while waiting for the replenishment lot): the inventory starts at the state $R+Q$, then after $T_Q$ enters the state $R$ and then, if no lot arrive during $LT$, after $T_R$ enters the state "stockout"; the pdf of the "time to sell $x$ products" $T$ is

$$y(t) = \sqrt{\pi t}/2 \exp\left[-\eta(t-\mu)^2/(2\mu^2)\right]$$

where $\eta=x^2/\gamma$ and $\mu=x/\lambda$; it follows $E(T)=\mu$ and $Var(T)=\mu^3/\eta$.

The system faces stockout if $T_R < LT$; if, on the contrary, if $T_R > LT$, then the inventory, expired the time $LT$, raises its quantity by $Q$, and a new cycle starts. [see Fig. 1]

One can view the problem as a "two players game": one player is the Market [M] that demands the products, and the other player is the Company [C] that supplies the products; the game ends when the stockout happens: at this point there is a loser (the company) that suffers a payoff (payoff is a game-theory term referring to what happens at the end of a game). A game is characterized by a set of rules that determines the possible moves at each step, indicating which player is to move: in our case $M$ moves asking as many products as needed, and $C$ looks at the IP and pays $h$ (for any product and interval); when IP $\leq R$, $C$ moves (places the order, paying $A$, and knowing that he will get "probably" the ordered products at $LT$), in such a way that the risk of stockout is "probably" as stated; the game ends when the stockout happens: $C$ pays $p$. The length [i.e. the cost] of the game depends on the "probable" speed of the replenishment.

The formula average cost rate $= A\lambda/Q + h(R + Q/2 - \lambda LT) + (1 - F_{LT}(R))p\lambda Q$ does not "agree" with figure 1 and with the game, and therefore is wrong, even though I did not provide the right one: you can get all that using F. Galetto ideas, as given in his books and papers. [10, 11, 12, 13, 16, 28, 31] (notice the dates …)

The formula of the average cost rate can be transformed into the cost formula

$$A + h\mu(R + Q/2 - \lambda LT) + (1 - F_{LT}(R))p$$

we see then that $h\mu$, the holding cost of one product for the mean time to sell $Q$ products, is multiplied by $R+Q/2 - \lambda LT$: therefore $A+h\mu(R+Q/2-\lambda LT)$ is related to $E(T_Q)$, while $[1-F_{LT}(R)]p$ is related to $E(T_R)$, two different intervals; it is clear that the computed cost is related to the sole interval "interarrival of two consecutive lots"!

The partial differential equation [35] $y_t + \lambda y_x - (\gamma/2)y_{xx} = 0$ does not contain any item that rules the replenishment; so modification are needed for a correct description of the system. In any case it is useful for proving the falseness of the statement [4, pag. 274] "... the inventory level over time is, in a sense, uniformly distributed between the maximum and the minimum".

Let's consider for a while $\lambda=0$ and $\gamma=2$; we have

$$\int_0^T f(\tau)d\tau \sqrt{\tau(t-\tau)} = 2\gamma(t)$$

it follows that the pdf of the "time of maximum in the interval $0--t" is $1/[\pi\sqrt{t(t-\tau)}]$ which shows that the points of maximum and minimum are more probable near 0 and near $t$ in the interval $0--t$ (arcsine law) [most people may feel surprised by this idea certainly "contrary to popular notions": this is
startling due to faulty intuition: unfortunately "it is difficult to see what one does not expect to see".

If the Lead Time LT is a random variable, the books suggest the same formula (we showed it wrong) where \( F_{LT}(R) \) is **again assumed** Normal, with mean \( \mu = \lambda \mu_{LT} \) and standard deviation \( \sigma = \sqrt{\mu_{LT} \gamma + \lambda^2 \sigma_{LT}^2} \); they say \([2]\) (we use here the symbols of this paper) "A common hypothesis is that the quantities follow a normal distribution. Let \( \lambda \) and \( \mu_{LT} \) the mean of the demand rate and of the Lead Time, and \( \gamma \) and \( \sigma_{LT} \) the standard deviations. ... One proves that the demand during the Lead Time has mean \( \mu = \lambda \mu_{LT} \) and standard deviation \( \sigma = \sqrt{\mu_{LT} \gamma + \lambda^2 \sigma_{LT}^2} \)." Any good student can easily prove wrong that statement: as a matter of fact, if \( D \) and \( LT=LT^* \) are the random variables "demand rate" and "Lead Time" (and are independent) the demand, during the lead time, is the random variable \( D^*LT \), product of the two random variables: it follows that the standard deviation of \( D^*LT \) is not \( \sigma = \sqrt{\mu_{LT} \gamma + \lambda^2 \sigma_{LT}^2} \): in fact \([see 22, or any good book on probability]\), \( \text{Var}[D^*LT] = \text{E}[D^2LT^2] - \text{E}^2[D^*LT] \). Moreover \([22]\), the combined distribution is no longer Normal!!!

### 4 INVENTORY; THE "LOGIC MODEL"

In real cases the normal distribution is not adequate; therefore the formulas found in books are not valid.

A better approach is needed; it must take into account the distribution of the time to transition between the various states (we consider here the simple case \( Q>R \) ????): when the system enters the state \( R \) (in fig. 2), two processes "the demand, with the random variable \( T_R \) and pdf \( f_A(t) \)" and the "the replenishment, with the random variable \( T^* \) and pdf \( g_A(t^*) \)" start competing; the winner determines the future of the system: if \( T_{LT}<T_R \) then the system is replenished with a lot of size \( Q \) and stockout does not happen: this occurs any time the event \( T_{LT}<T_R \); when the ordered lot arrives the physical inventory level is either \( R+Q-\lambda LT^* \) for random lead time or \( R+Q-\lambda LT \) for constant lead time; after entering the Replenishment state the system takes a random time for the transition to the Purchasing state. Stockout happens only when \( T_{LT}>T_R \); and only in this case the penalty \( p \) is paid. \([see Fig. 1 and Fig. 2]\]

The trigger signal for the orders is provided by the random variable "time to sell \( Q \) product \( T_Q \)" \([see Fig. 1 and Fig. 2]\); the random variable "time to Stockout \( T_{S0} \) (time to enter the state 0)" provides the information for inventory holding cost and for the service level.
The Reliability Integral Theory (RIT) as given in [10, 11, 13, 17] provides the means for properly dealing the inventory cost and management.

Let's consider the interval 0−→t [see Fig. 1 and Fig. 2]. The service level, at time t, is
\[ S(t) = P[T_{Sto} > t], \]
the probability that the Stock Out occurs after time t: it is a real function stating from 1 and tending to 0 (as the reliability of any system). The order cost for the interval 0−→t is A*N(t), where N(t) is the random variable "number of orders" (whose probability parameters can be computed as in [13]). The inventory holding cost is given by
\[ t \int_0^t X_h(t)dt, \]
in the interval 0−→t. The stockout cost is p[1-S(t)]. Let C(t) be the total cost for the interval 0−→t and c(t)=C(t)/t the cost rate ("cost per unit time"). Using RIT [10, 11, 13, 17] one can prove that c(t) is a transient underdamped function versus time t (like a shock absorber) which tends to a limit g, as t→∞. Since the system is renewed after any stockout it follows that g=C_{Sto}/MTT_{Sto}, the ratio of the total cost to stockout C_{Sto} and the mean time to stockout MTT_{Sto}; the two quantities of the ratio depend on the competition of the two processes "the demand, with the random variable \( T_R \ [pdf f(t)] \)" and the "the replenishment, with the random variable \( T_{LT} \ [pdf g(t)] \)."

In order to find the equation for a finite interval 0−→t we consider the following: letting \( C^*(t) \) be the total cost for ordering and holding products over the finite interval 0−→t; if there is no stockout the cost is \( C^*(t) \) with probability S(t), while if there is stockout the cost is \( [C^*(t)+p] \) with probability 1-S(t); then \( C(t) = C^*(t)S(t) + [C^*(t)+p][1-S(t)] = C^*(t)+p[1-S(t)] \). Therefore the optimisation problem is finding the couple Q, R minimising E[C(t)/t]: obviously the optimum solution depends on the duration of the finite interval 0−→t.

The case \( T^{**} = LT = \text{constant} \) implies \( g(t) = \delta(t-LT) \), the Dirac "delta function" as a kind of a probability density function. In this case \( [1-S(LT)] = [1-F_{LT}(R)] \), a new proof of the inconsistence of the formula average cost rate = \( A\lambda/\lambda + h(R + Q/2 - \lambda LT) + (1 - F_{LT}(R)) p\lambda Q \), or of the cost.

Figure 2  Transitions between the states

Within the parentheses: number of items in the warehouse

- \( 1-W_X(t) \): probability of staying in X for the interval 0−→t
- \( b_{XY}(t)dt \): probability of transition from X to Y in the interval t−→t+dt
- \( R_X(t) \): probability of not experiencing Stock out for the interval 0−→t, if the system entered state X, at instant 0
- \( MTTS_X \): mean time to Stock out, from state X

\[ \text{probability of not experiencing Stock out are determined by} \]
\[ \text{Equations of Reliability Integral Theory} \]
A + μ(R + Q/2 - λLT) + [1 - F_{LT}(R)]p; both do not agree with figure 1 and with the game.

A better formula, consistent with probability theory, is provided by the following argument:

Let's consider the interval between the "interarrival of two consecutive lots of size Q"; two mutually exclusive events can happen, either 1) no stockout occurs during this interval [with cost A + μ(R + Q/2 - λLT) and probability S(LT)] or 2) stockout occurs during this interval [with cost A + μ(R + Q - λLT)/2 + p and probability 1 - S(LT)]; we name this method as "method2".

Only the formula derived by means of figure 2 [Reliability Integral Theory] is the right one: we name this method as "method3". It is easy to understand that the probability S(t) ≠ F_{LT}(R): S(t) is related to the interval 0 ≤ t, while F_{LT}(R) is related to the interval s ≤ s + LT with s the instant that the system enter the state "Purchasing". The reader knowing Reliability Theory can guess S(t) ≠ F_{LT}(R) by considering the reliability of a repairable stand-by system. Let R^{"Start"}(t) be the probability of not experiencing Stock Out for the interval 0 ≤ t given that the system entered state "Start" at time 0, R^{"Purchasing"}(t) be the probability of not experiencing Stock Out for the interval 0 ≤ t given that the system entered state "Purchasing" at time 0, and R^{"Replenishment"}(t) be the probability of not experiencing Stock Out for the interval 0 ≤ t given that the system entered state "Replenishment" at time 0; the Service Level S(t) is R^{"Start"}(t).

We can write the following system of integral equations of the Reliability Integral Theory (RIT) as given in [10, 11, 13, 17]

\[ R_{Start}(t) = \int_{t}^{\infty} f_{1}(x)dx + \int_{0}^{t} f_{1}(r)R_{Purchasing}(t-r)dr \]

\[ R_{Purchasing}(t) = \int_{t}^{\infty} f_{A}(x)g_{A}(x)dx + \int_{0}^{t} g_{A}(r)R_{Replenishment}(t-r)dr \]

\[ R_{Replenishment}(t) = \int_{t}^{\infty} f_{R^{**}}(x)dx + \int_{0}^{t} f_{R^{**}}(r)R_{Purchasing}(t-r)dr \]

The solution of this system provides the probability we need for computing C(t) the total cost for ordering, and holding products over the finite interval 0 ≤ t; if there is no stockout. Integrating any function R_{X}(t), one gets the MTTF_{X}. Therefore

\[ MTTF_{Start\Rightarrow StockOut} = \int_{0}^{\infty} R_{Start}(t)dt \]

\[ MTTF_{Purchasing\Rightarrow StockOut} = \int_{0}^{\infty} R_{Purchasing}(t)dt \]

\[ MTTF_{Replenishment\Rightarrow StockOut} = \int_{0}^{\infty} R_{Replenishment}(t)dt \]

are the mean times to Stock Out.

In the table we present the comparison of the 3 approaches (1: as given in [3, 4], 2: "method2", 3: "method3" with RIT) in the following case [see 3, pag. 195]: Q=100, R=141, λ=200/year, LT=6 months [with pdf N(μ, σ)=N(100, 25)], S(LT)=0.95 [A=50€, p=500€, h=2€/(pz*year)].

The findings, for the three methods, are:

<table>
<thead>
<tr>
<th>method</th>
<th>1: Q=100, R=141</th>
<th>2: Q=100, R=133</th>
<th>3: Q=100, R=121</th>
</tr>
</thead>
<tbody>
<tr>
<td>cost (6 months)</td>
<td>603,6</td>
<td>567,8</td>
<td>492,50</td>
</tr>
<tr>
<td>cost increment</td>
<td>22.6%</td>
<td>15.3%</td>
<td></td>
</tr>
</tbody>
</table>

The scientific method provides "Lower costs for the same service level"!!! Many other examples could be provided. How many students, all over the world, are learning wrong methods and will take wrong decisions?
5 CONCLUSIONS

Good Management requires Good Knowledge. Professors must remember that "Many wrongs don't make a right". The ideas we provided here show very clearly Deming statements:

"The result is that hundreds of people are learning what is wrong. .... I make this statement on the basis of experience, seeing every day the devastating effects of incompetent teaching and faulty applications." "It is a hazard to copy", "It is necessary to understand the theory of what one wishes to do or to make."

It is important to notice that teachers must apply "metanoia" (change their own mind), with Intellectual Honesty, if they want improve, because one does not need the right formula to understand that a wrong formula is wrong: an example is the following "The General Triangle is used for practical applications of trigonometry in determining distances that cannot be measured directly. Such a problem may be solved by making the required distance one side of a triangle, measuring other sides or angles of the triangle, and then applying the Carnot Theorem (cosine law): if α, β, γ are the three angles of a triangle, and a, b, c the respective opposite sides, it may be proved that $a^2=b^2+c^2-2bc\cos\alpha$ [Carnot Theorem (cosine law)]. You need a lot of ingenuity to solve the problem if you know only the Pythagorean Theorem, which states that the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other two sides. Anyway you do not need the knowledge of the Carnot Theorem (cosine law) to understand that it is wrong to apply the Pythagorean Theorem to General Triangles".

Any formula that does not consider the processes in fig. 1 is wrong! How many professors do not use the processes (in fig. 1) for their optimisation?

We showed certainly ideas "contrary to popular notions" [provided in university courses]: unfortunately "it is difficult to see what one does not expect to see".

The statement of the Nobel prize M. Gell-Mann is here relevant: "Once that such a misunderstanding has taken place in the publication, it tends to become perpetual, because the various authors simply copy one each other."...>> "The Quark and the Jaguar: Adventures in the Simple and the Complex" [W. Freeman and Company, N. Y., 1994])

Papers with errors are not scientific, even though the authors say: "We thank the referees and the editor for careful reading and helpful comments that improved our paper."

Once upon a time A. Einstein said "Surely there are two things infinite in the world: the Universe and the Stupidity of people. But I have some doubt that Universe is infinite".

Brain is the most important asset: let's not forget it, IF we want that our students be better that their professors.

Theory is Logic deduction from premises: our students must learn how to use Logic (see fig. 3)
We could, at last, paraphrase ST John "And there are also many other things, the which, if they should be written everyone, I suppose that even the world itself could not contain the books that should be written."

Will someone want to see the truth? Only God knows that ...

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MANAGING SUSTAINABLE BUSINESS AND TECHNOLOGY DEVELOPMENT

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KEY WORDS: SUSTAINABILITY, DYNAMIC BALANCE, STRATEGIC FIT

1. Basic concepts of sustainable business and technology management

The broad concept of sustainable development is analysed in terms of basic principles of sustainable business development at the firm level. Furthermore, sustainable firm development is viewed by the basic determinants of sustainable technology innovation management. The main idea developed in this paper is that the concrete dimensions of sustainable business development at the firm level represent the basis for sustainable development of the economy and society, the firms being the key units and agents in the economy responsible for the overall socio-economic development and welfare. It is argued that at the firm level the crucial decisions are made concerning the output to be offered in terms of products and/or services (what business should we be in), which inputs and resources are necessary to be engaged for the business and where should it be located, how to accomplish the business goals and what processes to develop. Crucial responsibility and starting point for sustainable development lies at the firm level, with emphasis on the importance of actions and guidance provided in the external environment - legal, economic, political, social and technological, in achieving sustainability goals. Focus is on the achievement of sustainable business operations that are based on key technologies. Managing technological dynamics in firms lies at the core of sustainable competitiveness of business operations.

Sustainable Business Development (SBD) is a challenging new concept balancing the external and resource-based view, reaching for solutions in the domain of balance and right “fit” to be achieved in situations of opposed and conflicting goals and dilemmas present in managing business. "SBD is a holistic management construct that includes the entire value system from the origins of the raw materials to production processes and customer applications to end-of-life (EoL) solutions. It encompasses the full scope of relationships with supply networks, customers and stakeholders, and support service providers for providing business solutions and also handling wastes, residuals, and impacts."2

Transition economies focus on a set of specific aspects of sustainability that are critical to their efficient and effective transformation. The complexity of the transitional change is defined by radical changes occurring in the domain of privatization, intensive technological change, restructuring, business strategy and competitiveness, developing markets and infrastructure with the overall concern for the well being of all the actors, environmental issues, satisfaction of all stakeholders – employees, customers, society, etc. Creating the sustainable and feasible development strategy takes into account the diversified needs and goals and strongly relies on the effort to evaluate the internal strengths and resources from the perspective of their competitive capacity. Traditionally, valuable, rare, non-substitutable and non-imitable resources are the key

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factors that create and maintain an advantageous position with respect to competitors. It is pointed out that the sustainable development perspective adds the sustainability as the fifth significant resource attribute.

External factors influencing the firm, traditionally related to political, economic, social and technological domains (PEST), are broadened by ecological domains in order to fully appreciate the forces of sustainability – PESTE.

2. Complex goals of sustainable business and technology development

Sustainable business competitiveness means the achievement of a set of different goals – economic and non-economic – of the firm. It is a concept based on quantitative and qualitative performance indicators, namely, the integration of traditional business performance goals measured by traditional economic indicators (e.g. profitability) and a set of new non-economic performance criteria that emphasize the satisfaction of needs of the customers, employees and all other stakeholders. Business performance balanced scorecard approach is based on the efforts to build sustainable competitiveness taking into account multiple factors. This new approach points to a set of new performance indicators and goals found in qualitative attributes such as culture, fulfillment, mutual understanding, creativity, enhancing mutual trust, etc. Based on complexity, dependency and contingency theories, much effort is made to identify and select priorities by relevance criteria attributed to factors influencing the concrete business and the specific situation of different firms. The ultimate result of these efforts is: strengths better appreciated and further developed, while the weaknesses reduced and eliminated. At the same time the orientation is at building capacities to grab opportunities and diminish threats in the environment.

Sustainable management is a concept of strategic management oriented at the achievement of sustainable competitiveness. Sustainable competitiveness is based on appreciation of strategic goals emphasizing competitive co-evolution, networking and partnering, long-term perspective, synergies, satisfaction, high quality of life standards. The emphasis on sustainable technology management is related to the role of technology and its position at the core of all the business operations, and with focus on primary operations delivering value in the form of products and services to the customers, but also in satisfying the goals of the society, economy, local community, while simultaneously developing profitable business results. Managing technology plays a significant role in accomplishing sustainable development due to the following:

* technology lies at the core of all the creative effort in the organization aimed at producing new value;
* it plays a dual role in firms: as external force and internal resource;
* it has a high impact on the environment;
* its deep correlation to other firm resources has provided ground for treating technology as the strategic dimension with high impact in respect to sustainable firm competitiveness.

The next table shows the results of the effort to relate the proclaimed principles of sustainable development of society, business sustainability and sustainable technology innovation management.

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Table 1. Transforming the principles of Sustainable Development (SD) into principles of Sustainable Business Development (SBD) and Sustainable Technology Management & Development (STMD).6

<table>
<thead>
<tr>
<th>SD</th>
<th>SBD</th>
<th>STMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coexistence (the right to)</td>
<td>Strategic enterprise thinking, “cradle to grave” approach, balanced objectives</td>
<td>Strategic technology management – optimizing technological portfolio; broad technology-business perspective; strategies leading to followers approaching leaders; reducing techn. gap; lifecycle thinking; value-chain approach; competency approach.</td>
</tr>
<tr>
<td>Recognize interdependence</td>
<td>Inclusiveness, business integration; linkages and relationships</td>
<td>Technological cooperation – vertical and horizontal relations; in-sourcing R&amp;D; R&amp;D consortia; technological fusion; competitive co-evolution.</td>
</tr>
<tr>
<td>Respect relationships</td>
<td>Value networks – business environment and natural world</td>
<td>Strategic technological alliances and networking- synergetic effects; technological transfer via partnering; technologies and operations in the broad perspective of supply networks and all the actors linked to the firm.</td>
</tr>
<tr>
<td>Accept responsibility</td>
<td>Social responsibility – Integrity, Honesty, Enterprise Management</td>
<td>Leading technological change with environmentally sound options, ecologically conscious innovation - ECI, finding the right measure of technological change in relation to PESTE.</td>
</tr>
<tr>
<td>Create long-term value</td>
<td>Value creation</td>
<td>Create operations based</td>
</tr>
</tbody>
</table>

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on technologies that offer products and services satisfying the needs of all the stakeholders.

<table>
<thead>
<tr>
<th>Eliminate wastes</th>
<th>Business innovativeness and creativity</th>
<th>Managing technological innovations based on simultaneous engineering; TQM approach; Life-cycle assessment – LCA; sustainable technological products and processes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rely on balanced solutions</td>
<td>Openness, transparency, balanced scorecard thinking</td>
<td>Strategic fit as balancing of strategic and operational technological goals: efficiency vs. innovativeness, competency enhancing (incremental) and (radical) technological innovation.</td>
</tr>
<tr>
<td>Design limitations</td>
<td>Risk mitigation; LCA; Risk assessment</td>
<td>Managing technological risks and threats at the same time accepting the chances and challenges; technological forecasting; probability assessment; managing technological portfolio for risk mitigation; reliance on emerging, base and key technologies in the portfolio.</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>Leadership short-term/long-term plans</td>
<td>Technological operativeness and long-term competitiveness; evolutive, continuous technological innovation and improvement; creativity enhancement, managing technological competencies, technological strategies, etc.</td>
</tr>
</tbody>
</table>
3. Dynamic fit of complex sustainability goals
The complexity of forces active externally and inside organizations, the goals and principles of different domains, functions and processes, often generate the background of confronted and conflicting goals demanding solutions and complex managerial decisions. The need to bring the conflicting goals and interests together in relation to the overall, common interests of company survival, development and growth, poses complex tasks of managerial decision making oriented at constant search for the optimal solutions in terms of "trade-offs" and balances. The balances are particularly important for companies to be able to "adapt quickly to an ever-changing business environment, while being able to seize opportunities to shape that very environment".

The complexity of the nature and problems of sustainable business development is found in:
- multiple goals that businesses have to accomplish today in order to be considered successful and in order to "stay alive";
- goals are to be determined according to the multiple needs of the broad set of stakeholders;
- multiple business goals corresponding to various needs of the economy, society, legal environment, technological push opportunities, ecological, political and legal demands, often are opposed, confronted and demand special attention in order that priorities and goal hierarchies are established based on different methods, models- e.g. trade-offs, game theory, the least loss approach, etc.;
- the multiplicity of factors influencing modern business operations;
- various interdependencies and relations of the factors influencing business;
- the very specific nature and various combinations of the influence and relationships of factors towards the achievement of overall business goals;
- the dynamics of change in the established relations meaning that frequently and very often radically, business operations, strategies, goals are to be reconsidered, reengineered and redefined.

The solutions are found in the general principle of managing by dynamically and continuously striving for the right balance or fit between all the relevant influences which in essence, represents the need to harmonize and evaluate all the potential options and select an option that is limited in time and subject to frequent changes as the given circumstances and situation of firms change.

In fulfilling the goal of sustainable development the first step would be to list the crucial dilemmas that businesses are dealing with today. Dynamic balancing of opposed goals is primarily aimed at firm survival. Growth and sustainable development as the next step adds a new perspective: not only should the company survive and grow, but it is to enable the environment and the stakeholders to achieve a high quality and level of satisfaction and to fulfill the task of future generations not only to survive but to achieve the goals of high quality standards in all aspects of their lives.

The primary dilemma of sustainable business development is that companies need not only to be adaptive, flexible and responsive to external factors and influences, but that they should be proactively creating and changing the environment by their own efforts and actions – proactive, innovative role. It is the dilemma of adapt vs. shape and the core balance is to develop competencies to adapt to external challenges while at the same time developing new ventures and entrepreneurial creative business activities that will shape the environment, directly

7 Oliver, D. et al. (2000), pp. 3.
influencing all the stakeholders and actors in the value chain.\(^8\) Responding and adapting to the environment on the one hand, and shaping it on the other, is at the core of the need of continuous balancing. The need to establish the right “balance, fit, harmony” between opposed demands, open dilemmas with multiple paradoxes is the core problem of sustainability. This crucial dilemma is further analyzed as the following dilemmas of business management strategies:

1. The dilemma of external/internal oriented strategy, often cited as the marketing/competency dilemma. Based on complexity theory, the main task for the company is to be well adapted and flexible, while simultaneously recognizing the opportunities in the environment and acting accordingly. The balanced strategy based on the right fit between the need to be responsive to external demands and influences and/or to proactively push forward the products and services of the company is translated into functional strategies and concrete actions.

2. The dilemma of how diversified, broad, should the scope of our business be in comparison to the focused business alternative is often cited as the “mono”, “multi” and “balanced multi” business strategy. The advantages and drawbacks of each alternative point to the more precise analysis of the trade-offs between strategic vs. operational dimensions being given more stress at certain points of time. Business diversification is considered to have more strategic impact while business focus gives more stress to accomplishment of high operations performance results in core business area.

3. Networks and business integration vs. organization efficiency is the dilemma of more networking and partnership relations bringing significant positive synergy of strengthening competencies and innovative capacities, while at the same time generating more problems of a complex nature in the domain of management and organizational efficiency. Balancing the trade-offs is the continuous effort and need to manage the dynamics of partnerships, networks, associations, alliances and other cooperative arrangements by constantly evaluating the benefits gained by the partnering organizations and stakeholders against the level of managerial and business excellence accomplished.

4. Operations efficiency vs. change and innovativeness is the continuous balancing between the need to introduce change and innovation and the need to be highly efficient in performing operations. The right measure of change and innovation is introduced according to the equilibrium defined for the specific company doing business in the specific area, dependent on multiple dimensions defining the equilibrium state.

5. Commitment to organizational culture values vs. the need to continuously reconsider and re-examine the basic values according to the external changes. Dynamic balancing is required between developing stable relations within the company, value systems and the need to be adaptive and open for changes in this domain due to the changes taking place in the global business environment, social, cultural and other intangibles shaping our mainstream corporate culture.

6. The need to achieve corporate creativity and innovativeness vs. strict control and division of tasks and responsibilities with standardized procedures with built in high efficiency standards in standardized operations. This dilemma is viewed in relation to different aspects and issues that need to be solved in organization – strategies, technologies, structure, processes and operations, management styles, skills. One of the general dilemmas of optimizing the organizational structure is viewed in the options to choose more rigid forms enabling better control or to decide upon more fluid, open structures enabling informal relations leading to idea communication,

\(^8\) Oliver, D. et al. (2000), pp. 68.
more creativity and innovativeness. It is typically viewed in the question of how many hierarchical levels to introduce, whether to decide upon flat organizational structure, and new solutions emerge in the form of matrix or project organizations.

The accomplishment of balance and equilibrium state, often defined as the right fit at different points of time are the continuous concern of management at all levels in the company.

4. Dynamic Balance Approach for Sustainable Technology Management

"Strategic technology management, technological innovation, and product development play vital roles in developing solutions to social, economic, environmental and market-related problems and in creating new opportunities."

The main dilemma of sustainable technology management in the form of two opposed, controversial demands is viewed in:

1. the need to stimulate and give full support to innovative and entrepreneurial actions as a strategy leading to more intensive creation of new technologies based on new ideas and creativity as the source of competitiveness and leadership strategies in the global markets,
2. the need to establish more control over all technological actions, starting from the idea generation phases and operations to developing of products and processes, their commercialization, diffusion and exploitation, to the end of the life-cycle and their eventual drawing back from the market and practical use.

The strategic technology goals are determined at two global management levels:

a) effectivity goals at strategic levels;
b) efficiency goals at operational levels.

Technology goals can be determined depending on the type of industry a firm is doing business in, firm size, specific characteristics, and one of the approaches is to identify the goals in the following way:

1. technology profitability goals;
2. product technology growth and development goals in product innovations;
3. process technology growth and development goals - process innovations;
4. ecological goals;
5. goals of invulnerability and flexibility which become dominant when:
   - new technologies penetrate markets where the firm does business in;
   - material or energy crisis emerge for the technologies that are part of the firm portfolio (oil crisis meant shock and destruction for multiple firms whose technologies depend solely on that energy source);
   - unpredictable regional and state characteristics that hinder successful technology implementation;
   - political revolutions, government rule changes, nationalization of firms, change of state and administration attitude that could prevent the success of certain STA.
6. Synergetic goals are recognized at corporate level when the technological portfolio is well balanced according to different strategic technological areas related to business units leading to positive, wanted synergetic effects.
7. Social goals comprise of philanthropic activities that are outside the profit oriented behaviour and they take away one part of the profit firms are making (ecological demands are one part of these goals although they have been classified under separate topic).

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The main paradoxes, dilemmas of strategic technology innovation management demanding strategic balance and fit are based on the two approaches: market-pull (external, market) vs. technology-push (internal, competency) based approach.\(^{10}\) Competitiveness based on competencies gives emphasize to technology and knowledge combined in superior operations as the key competitive weapon of modern firms awarding them with competitive advantages and generating long-term, strategic competitive powers.\(^{11}\) Market orientation stresses the satisfaction of customers and developing technologies that will better satisfy their needs as the driving force of technological innovation and competitiveness in firms. Although strongly related, the two concepts are not identical and the differences arise from the dual character of technology. The balancing of the push-pull approaches is the constant management effort aimed at sustainable technology innovation management.\(^{12}\) Efficiency vs. innovativeness poses a set of dilemmas and adds to the complexity of technology innovation management decisions. Innovations, especially radical, are viewed as a threat to organizational efficiency, but, on the other hand, the absence of innovation might jeopardize the mere existence of the firm having in mind the highly competitive environment the firms are doing business in today. This dilemma can also be viewed as the opposed goals of operational - short term vs. strategic-long-term perspective. The considerations of time dimension as the crucial factor in managing business, brings into focus technology innovation management as the key competitive force. Reducing the new product/service time to market as the strategic objective means managing technology innovation based on shortening time- lags as immanent features of the innovation cycle: invention – innovation – diffusion – adoption - modification.

Technological appropriability vs. technological integration and cooperation is viewed as technological rivalry vs. technological partnership. Again, time considerations are dominant in the perspective of achieving and maintaining longer lead-times with high appropriability regimes and rivalry as opposed to technological cooperation and partnerships in joint R&D projects with lower appropriability regimes with expectations of intensive innovativeness for leading positions.\(^{13}\)

Technological focus vs. technological diversification is the dilemma that is related to the modern approach of better understanding the core elements and dimensions of sustainable business performance. The concept of the multi-technology firm is related to the need to integrate the new technology trends of technological fusion, time and space compression and integration bringing together different technologies and technological fields in the effort to produce complex products and offer more complex services. This trend establishes the need to make distinction between business and technology diversification and to diversify the technological base even if the firm is mono-business.

Technological integration as the strategy of operations in-sourcing vs. operations outsourcing and transferring technologies to others focuses the attention on competencies and knowledge as the key sources of firm competitiveness.

Technology innovation and R&D strategies are the result of responsive vs. proactive business strategy considerations that are related to the dilemma of technological leader vs. technological follower strategies. The crucial aspect of technology innovation strategy is managing projects of

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vertical technology transfer (intramural, in-house R&D) vs. horizontal technology transfer
(external sources and buying of new technologies).

The Dynamic Balance Approach (DBA), as the strategic management method gives support to
management of crucial dilemmas, contraversies, paradoxies and confronted goals in striving for
performance excellence and sustainable business development. It means that the equilibrium
state for the company is found at a certain point of time as the resultant vector of different forces
and influences relevant to the determination of the optimal solution. Getting the right measure of
the business is interpreted as the identification of the degree of a certain dimension that is to be
active at a certain period of time. The equilibrium and balance of the firm is not equivalent to
what it means in physics where the equilibrium usually means equal parts of everything present.
The harmonized, equilibrium state for sustainable business is accomplished when the right fit,
degree or measure is found for the key dimensions shaping our business.

The next table describes the main principles and methods of sustainable technology management
and its effect on sustainable business performance results.

Table 2. Sustainable Technology Management and Development goals and methods.

<table>
<thead>
<tr>
<th>STMD methods</th>
<th>Description</th>
<th>Effects</th>
</tr>
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<tbody>
<tr>
<td>Strategic fit</td>
<td>Developing and introducing new technologies means high investments and commitment while absence of new technologies and innovation brings the positive effects of the learning curve and stable business in the short run.</td>
<td>Poor fit results in lost opportunity and wasted effort, optimal measure of technological innovativeness means that the short-term perspective of possible profit rising in the absence of innovation is to be measured against the threat of losing competitiveness. Investments in new technology above the optimal rate may potentially be a threat caused by the problems of absorbing new technology internally (efficiency) and externally (market).</td>
</tr>
<tr>
<td>Harmonize external influences</td>
<td>Develop high sensitivity and flexibility to external factors especially influential in the domain of technological portfolio and the dynamics of technological change.</td>
<td>In the extreme situation when the organization neglects the necessity to closely and continuously follow the relevant external signals, the absence of technology innovation leads to</td>
</tr>
<tr>
<td><strong>Technological leadership</strong>&lt;br&gt;- enhance creativity solutions- innovative, proactive technological strategies</td>
<td><strong>Build internal strengths by adding new technologies in the firm portfolio that will enable technological fusion, synergy at the base of competitive competencies</strong></td>
<td><strong>Technology-push, innovative, proactive, leader strategies are significant when dealing with the threat of losing market due to shortening of product/service life-cycles.</strong></td>
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<tr>
<td><strong>Introduce simultaneous engineering procedures in developing new technologies – product/services and processes</strong></td>
<td><strong>Multifunctional teams working together on solutions simultaneously in relation to different innovation phases – generating new ideas, design products and processes, implement, commercialize.</strong></td>
<td><strong>Simultaneous engineering further contributes to the shortening of the new product/service innovation cycle and enables early market penetration and leader strategy.</strong></td>
</tr>
<tr>
<td><strong>Involve senior management early and throughout the process of technology development and change</strong></td>
<td><strong>Strategic management based on technology management solutions affects long-term business performance and competitiveness.</strong></td>
<td><strong>Leaving out senior management in decisions concerning the dynamics of firm technological base leads to unwanted fragmentation and absence of integration of business and technological goals jeopardizing the overall effects of the business in the essential aspects – PESTE.</strong></td>
</tr>
<tr>
<td><strong>Use collaborative modes and methods</strong></td>
<td><strong>Develop technological cooperative competencies based on organizational structures, strategies, culture and processes that will contribute to building of partnerships, alliances and networks with relevant actors in the environment</strong></td>
<td><strong>The crucial effect is in strengthening technological potentials of the innovation cycle – from initial idea generation to commercialization based on strategic alliances. Basic motivation behind technological cooperation is found in strengthening critical technological and innovative strengths.</strong></td>
</tr>
<tr>
<td><strong>Technology assessment based on life-cycle</strong></td>
<td><strong>The basic models giving an overall perspective on</strong></td>
<td><strong>The main effects are in using assessment and</strong></td>
</tr>
</tbody>
</table>
**Table: Strategic Technology Management Framework**

<table>
<thead>
<tr>
<th>Analysis, Value Chain Analysis and Competency Models</th>
<th>Technological and Business Relations</th>
<th>Evaluation Criteria and Models That Rank New Technology Options in Relation to Sustainability, Profitability and Competitiveness Goals</th>
</tr>
</thead>
</table>

**Introduce Diversification of the Technological Portfolio**

| Introduce diversification of the technological portfolio | Broadening the technological base of the firm is considered strategic competitive weapon having in mind modern trends of technological fusion (integration), time and space compression (shorter technological life-cycles) and globalization. | Diversification of technological portfolio strengthens the competitiveness of both multi-business and mono-business (focused) firm. |

**Introduce Diversification of the Technological Portfolio in Relation to LCP (Life-Cycle Position - Emerging, Base and Key)**

| Introduce diversification of the technological portfolio in relation to LCP (life-cycle position - emerging, base and key) | Technological diversification in relation to LCP is a new way of diversifying the technological portfolio. | Diversification in relation to LCP contributes to continuing technological and business competitiveness |

**Special Attention to Intangibles Within the Technological Package**

| Special attention to intangibles within the technological package | Technological package consists of tangible (hardware) and intangible components (software, brainware, orgware) | The reasons for productivity paradox – investing in new technology which does not generate the expected productivity rise - are found in neglecting the importance of intangibles in technology transfer projects |

**5. CONCLUSION**

Dynamic balancing and dynamic fit at the focus of management activities is especially emphasized when opposed objectives, paradoxes and management dilemmas are encountered. Listing the essential opposed technology and business management goals draws the attention and focus to the situations occurring in practice demanding special attention and special support for managers striving to find optimal solutions and making complex decisions.

The dual perspective of SMTI is viewed through:

a) the need to internalize the influences of the environment by establishing a balanced corporate strategy, with technology innovations strategy as its constituent, recognizing the dynamic interrelations between the organizational competencies and environmental factors leading to complex strategies involving a technology portfolio with elements of i) reactive, responsive attitudes and ii) proactive, aggresive attitudes; and
b) the need to externalize the interrelations between organizations recognizing the close links that enable the acceleration of technology innovation cycles, leading to strategic technology alliances, networks as strategic weapons for reaching higher technology and market levels.

Strategic technology management is an essential part of enterprise thinking and the strategic management of the corporation. It includes managing all of the knowledge, technological capabilities, technologies, technological innovation and development processes for managing change and creating new technologies – product/service and process.

Sustainable technology innovation management is built on the principles and practices of enterprise thinking and sustainable business development - SBD.

6. REFERENCES
REAL SERVICE QUALITY: EXAMINING THE LINKS BETWEEN VALUE ADDING AND SERVICE QUALITY, AND THE IMPLICATIONS FOR SERVICE IMPROVEMENT.

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Keywords: Value adding (definition, development, delivery), service quality.

Introduction
The background for this study is longitudinal research within the financial services industry in the UK. The research has focused on 7 separate business units (SBU) of a major Retail Bank, and follows progress with various quality initiatives over a period of the last 10 years. Whilst a brief summary of past results and experiences is given for context, the historical pathway to where we are now is not the primary purpose of this paper (for a full discussion of these events see Longbottom et al 2006, and Longbottom 2008). The purpose of this paper is to examine current perspectives on quality and the developing of plans for the future. In the late 1990’s the bank introduced many systems initiatives based around Total Quality Management principles. It experimented with benchmarking and benchmarking groups and also moved into business process re-engineering in an attempt to employ more radical change methods. The main emphasis 2000 to 2006 was based on implementation of a business excellence programme and the bank followed the European Business Excellence Model (EBEM) which it closely aligned with the Balanced Scorecard. For a variety of reasons the bank has withdrawn from the use of the EBEM. Research conducted by the author (see Longbottom et al 2006) discusses the reasons behind this decision, but in summary for the purposes of this paper three important themes are identified:

- EBEM processes are not well aligned to strategic focus
- EBEM processes are not well aligned to marketing and in particular understanding value from the customers perspective
- EBEM processes are not well designed to be integrated into organisational activity.

Literature Summary
There are many references within the literature on quality presenting that quality and marketing should be closely linked. For example Oakland (2001) has long argued that TQM starts with marketing. Sila and Ebrahimpour (2003) find 76 empirical studies on critical factors in TQM, and show that customer focus is identified in 53, ranking second only behind leadership and commitment (67). Similar positions have been reached in empirical studies by Saraph et al (1989), Bossink et al (1992), Porter and Parker (1993), and Black and Porter (1996).

Within the marketing literature Piercy (1995) and (2002) presents that the role of modern marketing can no longer be confined to the activities of the marketing department, and finds that marketing to employees is a key task in strategic planning which should not be taken for granted. Similar positions are reached by Doyle (2001), and MacDonald (2003). Ahmed and Rafiq (2003) argue that organisations need to better employ marketing techniques internally to staff. Similar arguments can be found within the internal marketing and services literature from Gronroos (1981), Berry and Parasuraman (1991), Sargent and Saadi (1998), Varey and Lewis (1999), and Ballantyne (2003).
However, despite the evidence of these endorsements of the need for strong links between quality and marketing, we find little empirical evidence to support this happening in practice. Morgan and Piercy (1998) for example, have suggested that marketing was not playing an important role in quality. Part of the reasons for this might lie in roles and organisation structures which continue to separate functions such as quality, operations, and marketing. Some authors have attempted to address this issue by proposing alternative structures, for example Kotler (2003) sees the organisation as a series of rings with marketing at the centre, Piercy (2002) proposes a value adding structure with a central going to market process supported by functions along the way, whilst MacDonald (2003) presents a matrix style organisation. We find however very little empirical work to support such models and conclude that consequently such a shift for organisations may be perceived to represent upheaval and risk, and therefore in practice a barrier to implementation and change.

Mele (2007) reaches a similar position, identifying that whilst TQM represents a platform for marketing potentialities, and that TQM and marketing are complementary and synergistic in enabling value creation, finds there is ‘a paucity in the literature on the relationship between the two domains in value creation’.

Some insights into practical and implementation issues are presented by Seddon and Caulkin (2007). They propose that implementing a systems thinking approach starts with understanding customer requirements and they go on to describe a methodology for identifying how this might be achieved, developed and implemented. Similar systems thinking examples can be found in Checkland (1997), Ackoff (1999), Jackson (2003). The routes of such fundamental ideas can also be traced back over many years and are inherent in for example, Ohno (1978) presenting the Toyota Production System (TPS) that is based on customer demand and flow and Womack et al (1990) in the machine that changed the world. Some common characteristics emerge, for example, an emphasis on understanding value from the customer perspective, a focus on the work, aligning roles to manage variety in demand, and the delivery of value. Organisation structure appears to be a consequence of change rather than a pre-determined set of rules. A natural outcome rather than a barrier.

The notion of value and value adding has been prominent within marketing literature over the past decade. In summary we find the emerging key factors include; managing internal relationships; reciprocal relationships; building understanding and intimacy; trust and commitment; (Ahmed and Rafiq 2003), knowledge renewal based on mutual exchanges; learning activity; and market relevance; (Ballantyne 2003), a process by which value is profitably created for internal and external customers; (Varey and Lewis 1999; deChernatony et al 2000; Doyle 2001; Davis 2001; Piercy 2002; MacDonald 2003). Three critical components are commonly identified by Webster (1992), deChernatony (2000), Piercy (2002), and Mele (2007) as; value definition; value development; and value delivery.

Anderson et al (2006) argue that there is little evidence of methodology for identifying value propositions that resonate with customers. They find that managers often construct value propositions by simply listing product / service benefits (all benefits approach) or by identifying strengths against competitors (favourable points of difference). Both methods they contend are flawed and fail to identify value from the customer’s perspective, the points of difference that are important to each individual customer (or resonating focus as they call it). This idea of resonating focus has particular relevance we would submit within services industries, where customers have different priorities, and as Seddon and Caulkin (2007) have pointed out, systems need therefore to be able to handle variety in demand. This notion
however is often counter intuitive to the way managers have come to think about organisation structures and systems (and thus implicitly requires a fundamental shift in mindsets and behaviour).

Service quality has been central to service marketing and management literature with strong links made to customer satisfaction, loyalty and profitability, Parasuraman et al (1985), Heskett et al (1997).

The distinctive nature of the service quality literature evolves from the general recognition of the nature of service (heterogeneity, intangibility, perishability and simultaneity) and significance of the interactive nature of the service offering. The importance of the interplay between customer and organisation has given the definitions of service quality a customer focus. Quality is “whatever the customer perceives it to be” Gronroos (2007) p73 moving the service perspective on quality away from the traditional definitions within quality literature. The research has focused on understanding the process the customer goes through in interacting with the organisation. The technical and functional model proposed by Gronroos (1984) identified two aspects of quality but gave particular importance to the functional dimension (the how of being served) because “an excellent service process creates a distinct and sustainable competitive edge” Gronroos (2007) p71.

Much of the literature concentrates on how the customer derives a perception of service quality through the service encounters with the organisation. Indeed Normann (1992) considered there were moments of truth when the consumer perception of service quality might change.

The conceptualisation of customer value is grounded in the widely accepted disconfirmation theory which posits that perceived quality is a function of customer expectation of the service measured against perception of service performance. Whilst not without criticism Carrillat et al 2007 (offer a meta analytical view) the dominant and widely used SERVQUAL Parasuranam et al., (1985) suggests attributes (the quality dimensions) the customer looks for in assessing service quality and has been widely used by large organisations to measure perceived service quality. The quality Gap model Parasuraman et al., (1985) is designed to offer insights into the possible causes of a gap between customer expectation and customer perception of quality.

In a meta analysis Seth et al (2005) review 19 service quality models that are intended to enable management to identify quality problems and thus help in planning for the launching of planning improvement models. They observe that there are several models, Mattson (1992), Sweeney et al (1997), Oh (1999) cited in Seth et al (2005) that incorporate the value construct into quality, as customers don’t always buy best quality service but on their assessment of value of service. Most significantly for our purposes they examine all 19 models against the criteria of flexibility to account for the changing nature of customer perceptions and find only 6 models which accommodate that construct.

Walker et al (2008) argue that the widely quoted Service Profit Chain framework Hesketh et al (1970 ) whilst demonstrating the importance of extrinsic service quality (that perceived by the customer) gives insufficient attention to intrinsic quality (internal quality standards independent of what the customer cannot see). They suggest that the model should be modified to include intrinsic quality and may be particularly important in services high in credence qualities (for example banking). This paper may show a move in current thinking to...
align with the perception of quality in the quality literature, suggesting real quality is an alignment of both intrinsic and extrinsic quality.

Svensson (2006) supports the view that there should be a multidisciplinary approach to understanding service encounters and their role in service quality. He argues that the service literature has focused too strongly on the customer perspective and that the construct of service quality is multi dimensional and current methodologies do not address the inherent complexities and dynamics of service encounters.

In summary we conclude that the weight of literature suggests that for real service quality and improvement to be achieved there is a need for integration and interdependence when applying the disciplines and engaging the actors. In practice however there is little evidence to support that this is happening and we find evidence of disparity within the following areas:

- Marketing, Quality, and Operations
- Intrinsic and Extrinsic service development
- Functional and Technical aspects of services
- Value Definition, Value Development, and Value Delivery.

Further we conclude that popular models used in measuring service quality may not well address the important issues of variety, variability, and flexibility that arise at the moment of the service encounter.

Our primary research aims to investigate these issues further and identify what may be critical factors in success and failure for service improvement programmes.

**Methodology**

The research methodology follows the principles of action research (Bryman and Bell 2006) where researcher and client collaborate in the diagnosis of a problem and the development of solutions. This research is part of an ongoing collaborative project conducted within seven separate business units of a major financial services group.

In January 2007, we conducted a questionnaire survey to managers and staff engaged in quality and change initiatives determined from the implementation of process reviews typically identified from using the EBEM. A total of 550 questionnaires were distributed and 256 responses were received. The design of the questionnaire had been informed from earlier work with managers and staff largely comprising exploratory interviews and observations of working practices. Topics covered included:

- Criteria for project selection
- Key performance indicators
- Customer data and customer focus
- Project links to strategy, marketing and operational activity
- Outcomes
- Project duration and key issues

Subsequently primary research has involved the following activity:

- Interviews and site visits at key stages in planning, implementation and post implementation phases, with managers and front line workers.
- An ethnographic market study of six consumer groups (in collaboration with an external research agency),
• 12 focus group studies with experienced customer groups (in collaboration with an
external research agency).

The data for analysis largely comprises of qualitative transcripts which were analysed into
repositories using inductive methods. Emerging themes were identified and written up in
summary form to assist the analysis and evaluation of results and to engage researchers and
respondents to build in rigour.

Analysis and discussion
Results from the survey showed that all of the business units had discontinued following
formal EBEM procedures, though some of the projects identified were ongoing. Reasons for
discontinuing were:
• Too costly on time and resources (72%)
• Other competitive pressures taking priority (56%)
• Not achieved expected results (56%)
• Processes integrated into company procedures (48%)
• Change of leadership (15%)
• Not sure / other reasons (12%).

From the analysis of the survey data and subsequent qualitative data, we identified 85
separate quality improvement projects over a determined period 2005 to 2007. Of these 60
were considered to be completed with 25 still ongoing. From a careful analysis of transcripts,
projects were grouped together into word repositories where similar characteristics were
apparent, for example the project was the result of a legal or compliance change, or was
concerned with handling customer complaints. Through a process of analysis, discussion and
iteration four discrete classifications emerged displaying the following characteristics of
processes largely concerned with:
• compliance, legal or technical change, documentation and record keeping (Maintenance),
• handling customer complaints, re-work, error correction, and general enquiries, with an
emphasis on speed of process, cost reduction, resource reduction (Waste),
• developing improved products and services, process improvement and adding value, with
an emphasis on improved customer satisfaction and identified links with strategy and
marketing development plans (Value),
• research, innovation, and networking projects with no clear link to customer requirements,
strategy or marketing plans (Indulgence).

Table one below shows the breakdown of the 85 projects into the 4 categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>45</td>
</tr>
<tr>
<td>Waste</td>
<td>35</td>
</tr>
<tr>
<td>Value</td>
<td>12</td>
</tr>
<tr>
<td>Indulgence</td>
<td>8</td>
</tr>
</tbody>
</table>

The results suggest an imbalance and a lack of strategic focus in project selection with a high
emphasis on maintenance and waste projects and little on value adding. Further scrutiny of
the projects identifies that 57% of the projects originate from quality or operational areas,
whilst only 12% from marketing, the rest from other areas. This result perhaps is partly
explained by the emphasis that has been given in recent years to models such as EBEM,
Balanced Scorecard, ISO 9000, and latterly lean systems.
The high incidence of projects failing to meet expectations is perhaps surprising. A study of cases reveals some rich insights into why this may be so and we can derive from this some common factors.

**Case 1: Home Loans Centre (HLC)**

A key component of the bank's strategy was to organically increase market share in domestic home loans. Aligned with this was the need to grow processing capacity. HLC employs 1800 staff, and its main operation is to take in loan applications and process them through to completion. Loan applications originate directly from customers (personal callers at the office counter, or via the internet), or from originating high street branch offices located nationally, and a small number from introducing agents (typically small estate agencies). The HLC had been the focus of much consumer complaint over recent years. Under the EBEM process review managers had largely focused their efforts on processing speed; the total elapsed time from the receipt of an enquiry into the issue of a formal offer to lend. Targets and measures concerned time in days from receipt to offer, and increase in overall customer satisfaction ratings. The HLC had successfully over a number of years reduced the average processing time down from 21 days to 95% being processed within 3 working days. This was widely benchmarked within the industry as competitive. Yet it was less successful with customer satisfaction ratings which continued to show disappointing downward trends.

° We just couldn’t understand it. What’s going on? We knew we were better, stats proved it. But then we’d get the BBS [a reference to the Balanced Scorecard performance measure for customer satisfaction] down from HQ and we were down again.

*Operations manager*

° Customers never complained direct, not to us, not really. That’s why we couldn’t understand what HQ were going on about. I suppose we didn’t really trust the figures. Some research company I think. Maybe just after more business.

*Process worker*

Managers conceded at the outset that they had no real evidence of customer requirements and were unable to understand the declining ratings despite the apparent significant gains in processing times. To better understand this a series of actions were undertaken including an initiative involving managers going back to the floor to gain a thorough understanding of the work from end to end, and front line workers going floor to boardroom to present their views to senior management. The bank also commissioned two major customer research projects, an ethnographic study of families going through the home loan process, and a series of focus groups covering a range of customer profiles.

° It was all a bit scary really. Didn’t know what to expect. Thought it was a bit of a gimmick..........back to the floor and all that, but it did open my eyes. I could see it wasn’t coming together. Not at all. It looked ok on paper but it just wasn’t right. Some of the stuff was just plain daft. We’d insist that customers signed a loan acceptance notice............they’d forget and we wouldn’t chase them. Except then when they had the removal van outside. Couldn’t complete. Lawyers won’t allow it. We’d have a panic on. How daft was that.

*Loan underwriter*

° It was 3 weeks before they told us. Buyer had pulled out. Found another house. Agent was on holiday. You’d have thought the bank would have told us.

*Customer*
A number of significant findings became apparent. The process was built around speed targets which often worked against the overall quality of the service and the total time that the customer had to engage with the organisation. Examples of this occurred at the front line; making appointments with the customer with inappropriate lending officers; the customer not being well briefed on what essential documents might be necessary (causing a delay and second appointment). Loans initiated by branches were a particular problem; branch managers being largely targeted to achieve volume of business; HLC underwriters being targeted on building a low risk lending portfolio.

° This was a constant problem. A battle field. Them and us. We knew they had targets but some of the **** they tried to get through. Just had to send it back. Say sorry. But not having my name on this.

Loan underwriter

° First we’ze told we could av it then they said no. Rang the number on the letter and all’s they could say was that we’d have to go back to the branch to sort it out.

Customer

However the main issue to emerge was that the central performance target i.e. speed of processing was flawed. Customers were not overly concerned with this. Their main priorities (and these were well known to front line workers) were to be ‘well managed and looked after’ through the process. Indeed time frames for buying a new house, and completing a house move were accepted as being weeks (possibly months) and not days. Speed of paper work was not an issue. The real problem was knowing what was going on, what happened when and where, and how life arrangements and home moving could be brought together in a sensible plan. The system involved not just the bank and the customer but also, estate agents, solicitors, valuers, insurers, removers, not to mention other families in the inevitable house buying chain. Another key finding was that customers had high expectations that the bank were the key player in managing this process and would consequently tend to apportion most blame to the bank for any failings to warn of a potential problem, even if the problem was largely outside of their control.

Following this review the bank is now looking at addressing the real issues for to the customer, has introduced home arranger roles to guide the customer through the process, and changed the organisation structure to localised teams. They believe that this will add value for customers and workers, and help build better managed teams with a closer feel and knowledge of their areas and markets.

Case two: Share Dealing Services (SDS)

SDS has a relatively small portfolio of clients compared to its main competitors but the business is seen as strategically important to the Group and manages high value customers. Based in the City, London, it employs over 500 staff, of which it has 130 share dealers. Other staff work in support functions, for example financial experts, economists, legal advisors, and other administrative workers. Over the past 3 years the nature of the dealers role has changed significantly, partly driven by advanced communications technology, but also a desire to improve the productivity of high cost operational workers. The business had been slowly dismantling dealer teams, in favour of individual dealers with back up from specialised functional support activities. The result was a functional looking organisation structure with separate reporting responsibilities and with support staff housed in separate locations. The process re-designers claimed more efficient use of high value staff, greater flexibility and
utilisation of front line dealers, and clearer lines of control and accountability. In practice the
dealers were unhappy and complained of isolation, losing client knowledge, over burdened
with reporting and controls, and being increasingly pressured to meet unrealistic targets.
° *In theory it sounds fine blar de blar, but what these guys don’t realise is that you need
back up right now. What am I supposed to do when I’m offered a deal and my back up
is not picking up his phone, gone off for a fag break, I don’t know?*
Dealer

Others complained that the informal discussions within teams were often undervalued, and in
fact were a significant part of preparing for dealing.
° *I miss the conversation, the banter. Oh it doesn’t sound much, but it’s surprising what
you would pick up. These jobs all about having your ear to the ground, bits of this and
that. You make connections you see. Part of a picture.*
Dealer

° *Not managing a portfolio anymore I don’t engage with customers, don’t know them
personal like or their business. The social sides gone with it. Don’t know if their high
or dry.*
Dealer

° *Difficult to sense what’s really going on sometimes. They won’t always say, and if you
can’t see em, you don’t know. You don’t really know. You don’t know if their solid [a
reference to being in control of their situation and generally consolidating] or on heat
[a reference to over ambitious trading or risk taking].*
Financial support worker

An incident well known internally was accounted to us, where a particular dealer had ‘lost
it and gone on a run’ [a reference to serious overtrading and risk taking] which had
resulted in a substantial loss and some attention from the Regulator.
° *It was like being down the lane on a sat’day afternoon [a reference to White Hart Lane
home ground of Premiership football team Tottenham Hotspur], you’ve just gone 2
down and your chasing [football speak meaning all your players are attacking]. Then
you lose it [the ball], it breaks down [you have no defenders]. As AH would say [a
reference to BBC football pundit Allen Hansen] your ***** [isolated at the back].*

Over the 3 year period studied SDS has failed to grow its market share and customer
portfolios have generally not performed as well as some of its main competitors. At the start
of 2008 this has forced a re-think and some return to portfolios and team structures is likely.

Case 3: The Retail Branch Network (RBN)
The bank has an extensive branch network spanning the UK with over 4000 full branch
offices and other agency and sub-branch outlets. Within the industry the trend over the past
few years has been customer migration away from branches to self service and internet
 provision. There have been considerable job losses and branch closures, with the trend likely
to continue for some while yet.

For the last 3 years RBN has been the subject of research to investigate customer satisfaction
levels, with an annual survey based around the use of SERVQUAL assessment criteria. A key
concern for customers arises within the ‘empathy’ category where the RBN consistently
shows poor results. Typical issues revolve around trust (do you trust your bank to always act
in your best interest), fair play (do you believe your bank has a fair policy on fees and charges), and relationship building (do you believe your bank rewards you for your loyalty).

- **Basically our response has been to tell the staff to be more sympathetic and engage with the customers.** At the same time they must meet scorecard targets [reference to Balanced Scorecard performance measurement system] sell more stuff, and get the customer to use the technology more. At the same time you are wondering if you will still have a job tomorrow.

**Branch Manager**

The RBN response has been investment in staff retraining and development days. The results however have not improved and morale amongst front-line workers was described by several managers as very low. Scrutiny of the qualitative data suggests that whilst SERVQUAL has been a useful exploratory method highlighting particular issues, RBN have not developed a depth of understanding (why do customers feel this way), and consequently have developed only shallow none value adding solutions (what do we need to do), or developed the ability to handle variety in demand (how do we respond to individuals, in different circumstances, at the point of delivery).

**Discussion**

The 3 cases are illustrative of some of the major issues arising which we found in many projects. The first two cases are examples of projects originating from quality/operational areas (quality solutions) and case 3 from marketing (marketing solutions). Distilling the analysis we have identified a number of common factors identified in table two below with a following discussion.

<table>
<thead>
<tr>
<th>Critical areas:</th>
<th>Quality Solutions</th>
<th>Marketing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic focus</td>
<td>Weak</td>
<td>Strong</td>
</tr>
<tr>
<td>Value definition</td>
<td>Weak</td>
<td>Strong/exploratory</td>
</tr>
<tr>
<td>Value development</td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td>Value delivery</td>
<td>Weak</td>
<td>Weak</td>
</tr>
<tr>
<td>Sources and tools</td>
<td>Excellence models, Balanced Scorecard, IS09000, Lean</td>
<td>SERVQUAL, Customer Satisfaction Surveys</td>
</tr>
<tr>
<td>Integration</td>
<td>Weak</td>
<td>Weak</td>
</tr>
<tr>
<td>Service improvement</td>
<td>Counter intuitive</td>
<td>Counter intuitive</td>
</tr>
<tr>
<td>Ability to handle Variety in demand</td>
<td>Weak</td>
<td>Weak</td>
</tr>
</tbody>
</table>

**Strategic selection and alignment:**
Projects selected were often on a departmental/functional basis with no real alignment with strategic or marketing plans. This has resulted in sub-optimum use of resources. Time and resource allocations were often severely underestimated resulting in long over-runs and none completions. There has been too much emphasis on the maintenance and waste areas and insufficient attention to value based solutions. Strategically the emphasis of projects should shift away from managing failure demand to developing value adding processes.

**Customer focus:**
Many of the projects failed to define value from the customer’s perspective, and there is a lack of understanding of resonating focus (those factors which are critical in the customer’s eyes). Value is often defined by marketers using all factors, or favourable points of difference,
which fails to differentiate and identify important service elements. There is a failure to look at value from the perspective of internal as well as external customers. This has resulted in failures to develop value added solutions, or develop individual roles and organisation structures which can handle variety in demand (the ability to respond to individuals in different circumstances at the point of delivery).

Integration

There has been an over reliance on external models and performance measures to such an extent that workers are suffering from overload, and often see the work as additional and not related to day to day priorities. This emphasis seems to have developed into what we describe as ‘intuitive’ management practices (responses which follow prescribed patterns and behaviours that have become ingrained in organisations, practices, and dominant in management thinking). These intuitive practices may often be further re-enforced by over prescriptive use of models and their associated procedures. We find that developing value based solutions often runs contrary to this thinking and is ‘counter intuitive’. This may as others have suggested lead to the conclusion that often achieving real service quality improvement requires a shift in management thinking and a change of mindset and approach from the outset.

Concluding summary

In summary we find that integration and interdependence of disciplines and actors are key issues in determining successful outcomes in service solutions. In practice this often does not happen and is a frequent cause of failure. We find there are critical issues in strategic selection and alignment of projects, understanding and applying the principles of value definition, development and delivery to achieve a better customer focus, and the integration of change processes with organisational activity.

References


DEVELOPING QUALITY IN NEW COMMUNICATION STRATEGY: THE 7C MODEL

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Keywords: systemic communication, engaging vision, involvement strategy.

INTRODUCTION

Confirming its importance, the art of communication is one of the few metrics used in different scenarios: from a military and political one, where it becomes a true function of propaganda, to an enterprise one, where it holds an informative and/or an exhortative function in order to reach company goals (which, according to a systemic approach is not only profit but also an increase in value), to “social” contexts such as families, schools, etc., where communication plays a purely educational role.

It is the multiple use and the many functions connected to communication items that create the need to further investigate this issue, particularly if enterprise-located.

In the past communication didn’t transfer through the different company business units. This view has then generated a “hermetical compartment approach” in corporate management, without energizing strategies, ideas or information sharing. A wider angle and interesting view (of organisational concept) allows the integration of not only operational but also strategic dimensions. Process thinking means to consider the company as an integrated system of knowledge, competencies (at any structural level), considering (corporate) actions cohesive and coordinated towards a common business goal. A basic hypothesis of this paper relies on the consideration that the organizational structure doesn’t take care of the knowledge impact and the information transfer on corporate performance. The objective of our paper is the development of an innovative communication model, named “7c”. This new model fosters a company rethinking, with an engaging/captivating logic, definable Systemic Communication.

SYSTEMIC COMMUNICATION

During the last decades, practitioners and academics gave greater relevance to the communication conveyed by a company in order to inform stakeholders of its aims, goals, expectations, business ethic vision, social responsibilities activities, and so on.

Hence, communication, can be defined as the process by which an individual (the one communicating) broadcasts stimuli (usually verbal symbols) to transfer information and knowledge, in order to change the behaviour of other individuals (Hovland, 2003).

Usually the above mentioned corporate values, such as social responsibility or ethics, are included in the product (or in the company flag or in the shop layout): this kind of communication is called “embedded” because the product (flag or shop) incorporates the corporate values.

Concerning classical advertisement channel, such as media, embedded communication has a deep impact on consumer expectations. We can say that the main communication function is to supply information to the “world” from the company.

Furthermore, when we talk about a stakeholder, we mean an employee too! This is the second main function attributed to communication, the so-called internal communication.

Regarding the motivation of personnel, namely the second function of communication, in the ‘50s a scholar, Frederick Herzberg, took into consideration the factors influencing employees’ attitudes towards their work. Some surveys on technical and administrative employees in the
area of Pittsburgh, were able to show that there were two sets of factors positively or negatively influencing attitudes towards work. A combination of factors such as the success, recognition, work itself, responsibility and promotions, positively influenced the attitude towards work. The researchers called them “motivating factors”. A second set of factors such as working conditions, company policies, relations with the leaders, colleagues or employees, salaries, negatively influenced instead the attitude towards work. These factors were called “hygiene factors” (Herzberg, Mausner and Snyderman, 1959).

The theory of the motivating factors and hygiene factors was based on the findings of this study.

Not only advertisement but also human resources and organization are the fields where communication operates. On the stock exchange, for example, periodical communication issues are forced to listed companies in order to inform market and investors of its trend. Stock price volatility is often influenced by those communications.

According to the authors, communication performs and develops in different areas and involves the entire company, at every level, from the Board of Directors to lower-level workers.

The main goal is to monitor each field and market where the company works in, as well as engage, enclose, embrace and take into consideration all the stakeholders.

The aforementioned purpose rests on the hypothesis that, in order to:

- strengthen competitor bonds (Fang et al., 2008)
- create synergy (Ansoff, 1988)
- influence supplier's commitment (Prahinski and Fan, 2007),

Mainly customer oriented stakeholder-involvement-marketing-strategies are required.

This approach is equal to “systemic governance”, where a company tries to involve customers, employees and competitors in order to increase its value. The systemic approach identifies the most important goal in the increasing of corporate value instead of income.

According to this systemic perspective, we can define a company as "an adaptive system of physical personal and social components that are held together by a network of interpersonal communications and by the will of its members to cooperate in order to achieve a common goal" (Simon, 1947) (figure 1).

Figure 1 – The organization as a system

![Diagram](https://example.com/diagram.png)

Communication theme, according to the authors, can be framed within the wider theme of systemic communication, together with shared and integrated communication, because of the
use of system dynamics logic in the business area.
Systemic Communication includes and overtakes the traditional Integrated Marketing Communication and is strictly connected to the process of knowledge creation performed by firms (Rullani, 2008). According to the systemic approach, Systemic Communication gets companies in touch with other worlds, such as Real/Virtual ones and those connected to the Customers. These often clash.

Often you are afraid of what you don’t know, it! This is why communication plays an active role. In fact several studies have drawn, for instance, in order to investigate the phenomenon of employees’ resistance to organizational changes and other factors that influences the daily work contexts.

The timely and accurate provision of information, opportunities for participation, and the diffusion of trust in management’s vision underlying the change have all been noted as potential alleviators of employees’ resistance to change (Bordia et al., 2004; Oreg, 2006). The importance of being informed and reducing resistance to change are important: employees’ resistance to change has been associated with negative outcomes such as decreased satisfaction, productivity, and psychological well-being, and increased theft, and absenteeism (Van Dam et al., 2008).

THE 7C MODEL

We like to explain the concept of systemic communication by comparing it with a camera that, like communication, has a specific objective and tries to capture a snapshot of the (corporate) environment.

Following this metaphor, the 7c model can be seen as the lens (objective) of this camera. The model is composed of seven rings representing the seven levels through which the company can generate value.

Each ring is divided into seven cells that stand for the methodology to reach the company value.

$7 \times 7 = 49$ methods used by companies in order to follow the right way (to create value).

Some of the instruments present in the model, that gave the title to the present paper, are also innovative instruments, while others are bound to already known methodologies. For example, the methodology "coffee" exploits the concept of small groups dynamics.

“Cargo/passenger compartment”, instead, is a dramatic method that tries to exacerbate, harden and strengthen corporate team and the linkage between employees, enforcing people to launch from a plane with a parachute.

These innovative instruments are necessary to activate a profitable communication (not only internal) and training/coaching activities in order to produce higher performances.

Nowadays, the most important thing is linked to the theme of "turn/change", i.e. the company produces a desired positive breakthrough.

Today, companies, above all Italian ones, can not stop their processes because it would cause a loss of market share.

Therefore each company is engaged in several “turn/change”, such as:

1. change: the real change is one of the most difficult aims to reach. Italian companies usually have little willingness to change, or they change slowly and often too cautiously. The simple “change declaration” is not sufficient to obtain it;

2. culturing: that means “corporate culture”. The problem is to trust corporate culture, something that can be obtained in one or two years;

3. cutting: to compress the cost or the organizational corporate structure. It doesn’t simply

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1 Authors think that communication and coaching are strictly connected activities.
mean downsizing (i.e. drastically reducing costs), it rather means reducing of the incidence of costs (respect of income). Therefore this methodology looks at efficiency and efficacy;

4. converting: to convert the company towards new markets and a different mix of business;

5. contingency: It involves, dramatically, the company context or sector.

As a camera, the management focuses its attention on a particular “turn” (third circle); it must choose which innovative tools (second circle) it wants to use and which indoor/outdoor training activities (first circle) can help management achieve the third circle’ breakthrough. Therefore, consultants must combine the three internal circles in order to define the business strategy that should be adopted.

This model explains the complexity of business and companies, and clears why companies often choose different methods to solve the same problem or to reach the same “turn”. The use of different strategies is not only due to management habit but also because of the different combinations of the model.

The fourth circle provides classical communication activities, such as, conversation with the top management that in some companies can be considered as the most effective internal communication instrument. There is a huge need for information!

HR and Organization deal with issues relating to the consolidation, to the involvement and cohesion of corporate teams, to business climate and careers. Now, more than ever, it is easier to find Human Resources functions and Organizational activities converged in one Manager.

The sixth circle tackles issues more strictly reserved for marketing and strategies managers. According to a systemic approach, the marketing manager supervises and monitors all the business activities: this is why, in the 7c model, this circle is placed outside.

The said level plays an important role and has such a charm that some companies, almost for fashion, analyze issues related to marketing activities without facing the outcome of the results. The authors try to explain that it is not sufficient to take care of a problem if you don’t analyze the problem, identify the goal (turn) and choose the right solution.

For instance, if a company draws up the Charter of Services (airline companies are compelled to do it), it doesn’t mean that automatic services improve! Surely it’s a first step in the right direction, but a simple knowledge of a problem does not allow it to be solved.

Nowadays the line between success or failure is thin: there are companies that see the “wind” changing their results in a short time. In the past, this didn’t happen, or more time was required.

Companies which had a strong and consolidated competitive advantage, lose their market share in a very short time due to factors such as globalization, the improvement of competitors, the change of consumer taste or the rules of the game. This is why companies have to ride that wind of change and not to suffer from it.

The outer circle recalls the possible systemic components of communication. It is worth stressing the meaning of embedded or un-embedded communication. Embedded communication incorporates the features of the company in the product, such as values, environment, climate, employees behavior, corporate social responsibility, corporate ethics etc.

A company does not always use the classic channels of communication such as media. Indeed, embedded communication has a deeper impact than traditional forms of advertising.

The model must be used as the objective of a camera. If we compare the external circle (representing the wide-angle lens) to long-term objectives and the most internal circle (representing the focus of the problem) to short-term objectives, by turning the rings, the photographer (i.e. management) can see the corporate environment and the solution to its problem.

All the business units of the company must be directed towards the common and stated objective. In order to reach the corporate goal, it is necessary for top management to
continually issue messages. These messages should not be simple and aseptic, without an emotional impact. Rather, they should be like a psychological massage: not message but massage!

**CONCLUSION, LIMIT AND FURTHER RESEARCH**

Communication is one of the best instruments that companies have in order to reach their corporate goal. Several studies showed that only with the above mentioned tool it is possible to direct business the right way and reduce employees’ resistance to change. It is important for a company to inform all the personnel about the corporate direction and the future of the company. The lack of involvement, as expressly stated above, may generate negative outcomes because staff members might consider themselves excluded from future programs and schedules.

The role played by communication is not only toward personnel but also toward investors, customers, competitors, financial market and so on. According to the receiver, communication and how it is broadcasted can change. The 7c model explains the complexity of business and identifies several strategies often used by companies to reach the same goal. This instrument doesn’t show the best solution, but identifies the right phase sequence that must be followed in order to reach a particular goal or obtain a specific breakthrough, according to the habit and propensities of top-management. The innovative aspect of this model is at the same time its main limit: it is not easy to identify...
and simplify such a widespread topic. Hence, it may be that some components are not taken into consideration.

Anyway the real problem is the effective application of these instruments. In fact when company things get better, it is not considered necessary to undertake new strategies, vice-versa, when things get worse it is not possible (economically and psychologically) to tackle significant changes.

When do these instruments apply, then? Do companies adopt exclusively the urgent ones? Without a scientific approach to enterprise government, the future of a company is headed towards a sure decline if not even to failure.

Systemic communication is one of the best instruments that can lead a company to success, increasing its value, if correctly used.

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A review of business excellence models in EU-25.

Since the initiation of the Deming Prize in Japan, Malcolm Baldrige National Quality Award (MBNQA) in the USA and the European Quality Award (EFQM) in Western Europe, several national quality awards have been established to stimulate systematic quality improvement and to promote quality awareness in different places of the world. Many countries have modeled their award programs based on these three awards.

Respectively, many quality awards have been developed in Europe within the last 15 years. Their purpose is the improvement of the competitiveness of various types of organizations. Most of the European countries have initially used the ISO quality assurance standards in order to promote development and production procedures. The next stage was the implementation of methods of self-assessment and systems of quality management, basically through quality awards schemes, serving the ultimate goal of the alteration of the quality's philosophy and the improvement of competitiveness of small and medium sized firms.

The European Quality Award is administered by the EFQM. The EFQM has a membership of more than 750 European organizations, all of which are committed to improving efficiency, effectiveness and achieving excellence. Organisations in Europe widely accept that quality management is a way of managing activities to gain efficiency, effectiveness and competitive advantage. Consequently, it aims at ensuring long-term success via meeting the needs of their customers, employees, financial and other shareholders and the community at large.

The driving forces of the development of quality awards are more or less the same in all E.U. countries. Despite the fact that almost all the countries during the last 15 years have developed initiatives and strategies that facilitate the introduction of TQM in their organizations, basically all the decisions that have been made on the creation of various types of awards, are closely related to the political status, the law, the interaction and dependence between state on one hand and private and public sector on the other, and finally the business and administrative philosophy.

As it is noticed, and shown in figure 1, in the published paper [1], EU countries do not have a common framework to address business excellence, however the “European Quality Award” (EQA) based on the “EFQM Excellence Model” was the most widespread in the previous decade. There is a tendency of own developments on national quality awards in the current decade.
Also there is a clear indication of Quality Awards “nature” across EU: There are the national ones (could be also stated as Government Supported Awards) which are supported by their governments in the sense of financial support to organisations for operating and administrating the award, or in the sense of political support (as for example the presence of President or Vice President of the state in the award ceremony) and the private ones (could be also stated as Privately Supported Awards) which are supported by associations, chambers, private organisations and non profit organisations.

In bibliography, as national quality awards are referred all those awards which are supported by their governments both in the sense of financial – administrative point of view and in the sense of the content of the relative criteria. It should be noted that the Malcolm Baldrige National Quality Award (MBNQA) in USA is considered as a national quality award whereas the European Quality Award does not belong in the category of “National Quality Awards”.

In the published paper [1], it was found that 17 quality awards out of 31, almost half of them, are supported by their governments (“national” awards), as shown in table I.

<table>
<thead>
<tr>
<th>EU COUNTRY</th>
<th>NATIONAL</th>
<th>PRIVATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUSTRIA</td>
<td>“Austrian Quality Award”</td>
<td></td>
</tr>
<tr>
<td>BELGIUM</td>
<td>“K2 Award”</td>
<td></td>
</tr>
<tr>
<td>CYPRUS</td>
<td>“Quality Award of the Czech Republic”</td>
<td></td>
</tr>
<tr>
<td>CZECH</td>
<td></td>
<td>“ECO-Q recognitions”</td>
</tr>
<tr>
<td>DENMARK</td>
<td></td>
<td>“Danske Kvalitetspris”</td>
</tr>
<tr>
<td>ESTONIA</td>
<td>“Estonian Quality Award”</td>
<td></td>
</tr>
<tr>
<td>FINLAND</td>
<td>“Suomen laatupalkinto”</td>
<td></td>
</tr>
<tr>
<td>FRANCE</td>
<td>“Prix Francais pour la Qualite”</td>
<td></td>
</tr>
<tr>
<td>GERMANY</td>
<td></td>
<td>“Ludwig-Erhard-Preis”</td>
</tr>
<tr>
<td>GREECE</td>
<td>Hellenic National Business Excellence Award</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Business Excellence Models distribution in relation to time of establishment (numbers indicate the EU countries respectively) (Source: A comparative analysis and review of national quality awards in Europe”, V. Mavroidis, The TQM Magazine Vol 19, No.5, 2007)
### EU COUNTRY | NATIONAL | PRIVATE
--- | --- | ---
HUNGARY | "Hungarian Quality Award" | "Irish Business Excellence Awards"
| "Regional Quality Award" | | |
| "IIASA SHIBA Award" | | |
IRELAND | "Q-MARK" National Quality Award | | "Regional Quality Award"
ITALY | | "IIASA SHIBA Award"
LATVIA | "The Latvian National Quality Award" | | "IIASA SHIBA Award"
LITHUANIA | "Lithuanian National Quality Prize" | | "IIASA SHIBA Award"
LUXEMBOURG | "Prix Luxembourgeois de la Qualite" | | "IIASA SHIBA Award"
NETHERLANDS | "INK Management Model - Dutch Quality Award" | | "IIASA SHIBA Award"
POLAND | | "Polish Quality Award"
| | "Business Fair Play Award"
PORTUGAL | | "Premio de Excellencia - Systema Portugues da Qualidade"
SLOVAKIA | "The Slovak Quality Award" | | "IIASA SHIBA Award"
SLOVENIA | "The Slovenian Business Excellence Prize" | | "IIASA SHIBA Award"
SPAIN | "Premios Principe Felipe a la Excellencia Empresarial" | | "IIASA SHIBA Award"
SWEDEN | "Utmarklsen Svensk Kvalitet" | "Quality in Northern Sweden"
UNITED KINGDOM | | "UK Business Excellence Award"
| | "Investors in Excellence", IIIE
TOTALS | 17 / 30 | 13 / 30

Table 1: Quality Awards in EU: “National vs Private”

### Trends
According to the bibliography, it is noticed that the business and social culture of a country or region affects the level and diffusion of Total Quality Management practices, especially in Europe where there are diverse cultures and economies. This consideration shows the need that regional cultures should been taken into account due to the development of a National Quality Award or Business Excellence System.

These national characteristics which define the representative national culture have to do with the national priorities of competitiveness, development, integration of national frameworks regarding Quality, reliability of organisations managing Quality Management issues, the economical and social development, promotion and knowledge society and continuous improvement in general.

The review of the EU National Quality Awards shows the diverse adoption of Quality Management issues in companies. The EFQM Model is applied to almost 56% [1], of the EU National Quality Awards which indicates that although it is the dominant framework of business excellence there is an indication of own developments. According to the above considerations, including the findings in the published article [1] the following trends are revealed:

- Most of the EU models of business excellence which are the representative National Quality Awards follow an open architecture in order to be able to support dynamic changes and market demands.
- Plenty of the EU models of business excellence have been affected by the EFQM Business Excellence Model but they have changed on the needs of the business community they represent.
- There is a definite gap between the enterprises which are certified by ISO 9001 and use it as the means of managing business practices and the enterprises which use the
above standard for marketing reasons only.

- There is a growing demand of sector certification (e.g. education, telecommunications, food industries, etc).
- There is the need to identify and implement best practices in order to make companies more innovative and competitive. The Innobarometer index is a reference point to measure innovation and diffuse good practices per EU country.
- There is the need to integrate activities for Quality Management, in order to provide routes from “Quality” by the product point of view to “Quality” by the business perspective.
- Importance is given to the Managing Organization which implements the National Quality Award or Business Excellence Award for each country. The selection of this organization provides reliability and clarity of the country’s national mechanism.

According to the above trends and EU national quality (or business excellence) awards (NQA) review, a new Business Excellence System is proposed which will encounter the following issues. The proposed system is applied to represent the Hellenic National Business Excellence Model.

1. The development of a National Business Excellence System which will take into consideration the culture, social and business characteristics of the community it represents. EU is formed by countries which have different cultures and economies.
2. The proposed system should reinforce the implementation of ISO 9001 standard as the means of continuous improvement rather than marketing tool.
3. Sector certification and cluster – networking trend is clear and the proposed system shall encounter this market demand.
4. There is the need of systems integration as far as Quality Management practices or business practices to avoid competition between models, systems, or practices.
5. There is the need of a Managing Organization which will manage the representative National Quality Award mechanism and provide companies with reliability and clarity of its processes.
6. SMEs and their characteristics should be encountered, especially those with less than 50 employees.

Proposed System of Business Excellence

The proposed system is based on the above mentioned trends, especially in European Union. It is noticed that a new system is proposed rather than a new model of Business Excellence. The meaning of “system” is defined, in this research, by the inclusion of several Business Excellence models, initiatives which are related and influence each other and altogether form a “Dynamic Business Excellence System” (using as a theory framework the Dynamic Systems).

It is composed by well-structured levels or fields of excellence, with specific contents per level (as Quality initiatives or Business Excellence Models) which represent, up to a point, the meaning of the Quality, the Management & Organisation, and the Competitiveness-Innovation concepts in an organisation. The six levels are independent as to their approaches for Quality improvement, but they depend on one another for the total performance score and their consequent influence. The levels are 6, leaving the last level open towards the upper part (i.e. future levels). This approach is equivalent to the familiar level model of Telecommunications Networks (OSI-RM Model) that applies for computer networks and offers a clear description, a modular development and easy future development-enlargement.
This system proposes a dynamic evaluation of the business performance, taking into consideration time, culture and business differences.

The proposed System is not a congregation of initiative models, nor is it a new model. The concept “system” is characterized by the dependence of the levels (as to their influence) and by the concept already explained. The proposed system is dynamic as to:

- The integration of current and potential tendencies and initiatives,
- The time-relation of “self assessments” of itself or of other levels,
- The relation with the business cultures of the respective geographical areas

The levels should follow the changes occurring dynamically in the models (publications or new models) and refer to the requirements deriving from the current market trends and the differentiation requirements, always focusing on the Greek market (combined with the European directions). These levels of excellence (Mavroidis, 2005) comprise the following areas:

- Level 2, “Organising and Managing Sector specific and advanced (Quality) Management Systems” as refers to the international standards ISO 14001, ISO 22000 or other documented national initiatives.
- Level 3; “Managing and Supporting Clusters or Networked Enterprises”,
- Level 4, “Managing Human Resources”, either through a recognized standard or a documented national practice (such as the Investors in People initiative),
- Level 5, “Managing Advanced TQM Tools or Business Excellence Models”, such as the EFQM Model or other national or sector specific initiatives or other recognized TQM initiatives such as 6 sigma where appropriate,
- Level 6, “Managing and supporting Innovation”, as it is appreciated by national or European means of evaluation.

Additionally, the proposed System is open as to:

- The number of levels upwards (ie.7,8..) – Dynamic differentiation,
- The actions for new models implementing specific levels (ie. potential new national model for a quality system in super markets or a new model on level 5 for very small businesses)
- The methodologies for re situating and processing data deriving from internal and external self assessments.

Each level of business excellence represents an integrated and measurable initiative for the “Quality”. The levels structure follows a logic route which encounters:
A. From the **external** environment of a company as far as:

   i. Product processes,
   ii. Knowledge management

Towards the **internal** environment of a company as far as:

   i. Design of business processes,
   ii. New product development,
   iii. Knowledge management

B. From the environment of well structured criteria or demands, as expressed in international standards towards to the environment of less demands or defined criteria, as expressed by research results, new programmers or EU activities.

C. From the environment of standards and business administration systems which are well known and applicable to most businesses towards the environment of business initiatives which are less known and applicable.

The following figures (2 – 4) show the level definition, correlation and structure of the proposed business excellence system.

![Figure 2: Proposed Business Excellence System as an integration of business practices and levels correlation (source: TEE Chronicle Times, Sept 2005, V. Mavroidis)](source: TEE Chronicle Times, Sept 2005, V. Mavroidis)
An analysis of the proposed business excellence system is given in a published article [2] of the same author. This article makes reference on the application of Systems Dynamics to support measurement performance and computation of the total score or index of the system variables.
**System structure and levels definition**

The proposed system is structured in six levels of excellence and a general level of business results as shown in figure 5.

![Levels of excellence and business results. (Source: TEE Chronicle Times, Sept 2005, V. Mavroidis)](image)

The levels are defined as follows:

*Level 1,"Organising and Managing Quality Management Systems" as refers to the international standards ISO 9001 and ISO 9004 (latest edition).*

This level implements the demands for an efficient and effective operation of Quality Management Systems considering the international standards:

- ISO 9000:2000,
- ISO 9001:2000,
- ISO 9000 – 1,2,3,4,
- ISO 9004:2000

This level of excellence does not audit an ISO 9001 system but it assesses how much ISO 9001 or other relative standards affect the efficiency and effectiveness of an enterprise and how much a mature Quality Management System leads to business results and vice versa.

*Level 2, “Organising and Managing Sector specific and advanced (Quality) Management Systems” as refers to the international standards ISO 14001, ISO 22000 or other documented national initiatives.***

This level implements the demands for an efficient and effective operation of (Quality) Management Systems which are sector oriented or business field considering the international standards:

- TL 9000, for telecommunication sector,
- QS 9000, for automotive sector,
- IWA-1: ISO 9001, for health sector,
• Etc (current or future standards or sector practices).

Sector or specialized standards adopt the structure of international standards, such as ISO 9001 and add new demands of the sector that represent or adopt good practices.

The logic of level 2 is more open than level 1 since it is less descriptive as far as the sector standards and is flexible regarding the definitions of the sector standards or initiatives.

**Level 3, “Managing and Supporting Clusters or Networked Enterprises”**

This level implements the demands for an efficient and effective operation of clusters and networked organisations. Up today, there are not specific standards of creating and managing a cluster or networked companies, however there is a clear tendency in EU of forming this kind of business and better managing competition in regional or sector level.

**Level 4, “Managing Human Resources”, either through a recognized standard or a documented national practice (such as the Investors in People initiative)”**

This level implements the demands for an efficient and effective operation of managing the “internal part” of an enterprise which has to do with people, systems, knowledge, relations. This level is close to the demands of a Human Resources Management system. An initiative in EU which has been adopted by some northern countries is the “Investors in People (IiP) standard.

Also this level includes the demands for an efficient and effective operation of corporate social responsibility (CSR) and secure management systems.

**Level 5, “Managing Advanced TQM Tools or Business Excellence Models”, such as the EFQM Model or other national or sector specific initiatives or other recognized TQM initiatives such as 6 sigma where appropriate”**

This level implements the demands for an efficient and effective operation of TQM Advanced tools or business excellence models (EFQM, sector initiatives). This level is open as far the best tools or models identified by an enterprise.

**Level 6, “Managing and supporting Innovation”**

This level assesses the ability of an enterprise to address innovation and differentiation using the plethora of initiatives, tools, systems or models available in market. This ability is measured and assessed for its efficiency and effectiveness.

Innovation is a European Union priority and there are plenty of activities running currently to address it.

The “Business Results” level is defined as the area of measuring the effectiveness of the following sub sectors:

- Customer Satisfaction,
- People Satisfaction,
- Community Satisfaction,
- Financial / Quality Business Results
Development of the Hellenic National Business Excellence Award

The Hellenic National Business Excellence Model is developed on the proposed business excellence system considering the following constraints:

- There were not other National mechanisms of business excellence in Greece apart from private initiatives with limited diffusion.
- Total Quality Management practices and business excellence systems were less known to SMEs especially those with local management (not international business units).
- Most of Greek enterprises are focused on the development of ISO 9001 or other ISO standards, less on the development of efficient and effective ISO 9001 systems.
- Human resources management and satisfaction, clusters / networks management, quality or advanced tools and innovation are not yet developed to assess their effectiveness and efficiency.

Also, the Hellenic National Business Excellence Award was supported by the third EU framework considering the rule of “de Minimis” for financial contribution.

Considering the above constraints, as well as the flexibility of the dynamic proposed business excellence system, the Managing Organisation of the Hellenic National Business Excellence Award (which, in this case, was the Hellenic Ministry of Development) proposed only the first 2 levels of excellence to be applied for the first implementation of the award scheme which are:

- Level 1: “Organising and Managing Quality Management Systems”,
- Level 2, “Organising and Managing Sector specific and advanced (Quality) Management Systems” as well as managing clusters – networks

and the “Business Results” general level.

The rest levels of excellence were noticed to be applied in following cycles of the National Award scheme where more mature systems will arise.

The Hellenic National Business Excellence Model is considered as a national platform to support the development and management of the Greek enterprises and to reinforce the implementation of good practices in the fields of the active levels of excellence. It is considered as the next phase of integrating national and European programs of competitiveness and an Award scheme was implemented to support this new national initiative.

As stated by the Minister of Development, it is expected that this new initiative will:

- Reinforce the competitiveness of the Greek Industry and especially the SMEs,
- Encounter the characteristics and culture of the Greek enterprises and market trends,
- Gain a national point of reference to compare performances and support barometer tools,
- Improve customer and employee satisfaction,
- Contribute to the development of Business Excellence tools or models in local level and in international level.
The Hellenic National Business Excellence Award scheme was first announced in September of 2007 and eligible enterprises for this scheme were only industries which apply the new rule of de Minimis. In these terms, plenty of the Greek businesses were forbidden to apply for the Award scheme, however it was the only way to financially support the Award scheme though the 3rd Framework of EU contribution.

Three (3) Hellenic National Business Excellence Awards are given for each category of an enterprise (Big companies, Medium ones and Small ones). The National Awards are given to these enterprises which gain the best comparative score in both ‘levels of excellence’ and in ‘business results’.

Six (6) Hellenic National Business Excellence Distinctions were to be given for each category of an enterprise and for each level of excellence:

- Big companies, level 1
- Big companies, level 2
- Medium companies, level 1,
- Medium companies, level 2,
- Small companies, level 1,
- Small companies, level 2

Only 5 National Distinctions are given. Those are given to these enterprises which gain the best comparative score in one ‘level of excellence’ and in ‘business results’. Therefore, it is encouraged and supported to improve in one field of excellence (or level) considering the impact on business results.

Twenty-five (25) Hellenic National Business Excellence Recognitions are given to the rest of enterprises to encourage their efforts on the diffusion of good business practices and business excellence.

Taking into consideration the development of a national point of reference for an annual Award scheme which will provide enterprises with reliability and clarity, certain mechanisms were developed to assure this concept, such as:

- The initiation of new activities in the department of Quality Policy, in the Hellenic Ministry of Development which are:
  - Selection and training of Assessors,
  - Management of proposals of the candidate enterprises,
  - Promotion and information of the new initiative

- The establishment of a Commission of Business Excellence with members from market and Public Administration with the leadership of the General Secretary of Industry.

- The establishment of a Commission of pre-assessment of candidate proposals.

- The establishment of a list of assessed Assessors, most of them coming from the European Assessors of the EFQM.

- The obligation of conducting site visits in the candidate enterprises.
A blind assessment by 2 (or 3 in some cases) assessors for each proposal.

In this year of running the Award scheme, 44 in total, industries made a proposal. Three of them are given an award, five of them are given a distinction and twenty-five are given a recognition. Some interesting statistics are being processed as far as the number of Assessors occupied with this project, the performances of the candidates and the maturity of their systems and readiness to new initiatives.

A concluding proposal

Avoiding a typical conclusion paragraph, a new Business Excellence System is proposed, being based on studying both the bibliography and the European trends. The author’s perception is that the new system shall be able to integrate current practices and business excellence models to support the European nations' effort to manage competition and innovation schemes.

This proposed system was implemented as the Hellenic National Business Excellence Award gaining the interest of both the academic and market community.

This new Business Excellence System could be considered as an initial framework to better set business systems or excellence in EU countries considering both dynamic issues and business mentality of EU nations. A challenge arises:

Could this excellence system be considered as a reference point to further develop EU National Quality Awards?

Notes

1. “NQAs” is the abbreviation of national quality awards.

2. Europe of 25 is consisted of: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

3. TQM is the abbreviation of Total Quality Management.

4. EQA is the abbreviation of the European Quality Award.

References


APPLICATION OF DYNAMIC SYSTEMS THEORY IN THE EVALUATION OF AN INTEGRATED BUSINESS EXCELLENCE SYSTEM

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Introduction
Most Business Excellence Models, by the means of National Quality Awards, attempt to analyze the impact of Total Quality Management (TQM) in the enterprises. Representative examples are the European Model of Business Excellence (EFQM), the American Model (Baldrige) and the Japanese one (Deming). The use of self-assessment technique against the above models has become a powerful tool in plenty of organisations nowadays. A critical phase of self-assessment is the establishment of an improvement plan that must be presented to higher management, linked to business planning, and then communicated to the whole organization. Far too often, organizations fail to do this, and consequently, self-assessment activities do not lead to lasting improvements. It is also vital to ensure that monitoring and implementation of actions become a natural part of the business review process and not a separate activity. A few reports suggest that many of the organizations face problems of accuracy and consistency in scoring during self-assessment, leading the organizations to draw wrong conclusions (Porter and Tanner, 1996).

However, all the above models are used mainly in role of inspection, realizing an evaluation in a given time, exactly as in the usual accountant practice. There are not many models which seek the dynamic influence of Total Quality (Leonard, 2003).

Realising the dynamic characteristics of Total Quality Management (TQM) in the enterprises it will be possible to evaluate and forecast the current and potential advantages by the application of Total Quality Management.

The next paragraph provides a criticism on the current assessment methodology of Business Excellence Models that provide a static picture and less objective evaluation against the need for a more dynamic picture with more argued results. Afterwards, it is presented a description of the principles of Dynamic Systems and how they are used in the proposed system of Business Excellence (Mavroidis, 2005). Finally, the results of the above study will be incorporated in a computer program so that tendencies are recorded.

Current Assessment Methodology
The European Model of Business Excellence and the other three main models (Baldrige, Deming, and Australian) are based on their own framework of Total Quality, which derives from the concept of the organisations they represent. These models use self-assessment as a tool for capturing business practices. They are not restricted to products or services, like in the ISO 9000 case, but they rather co-evaluate other business activities. These models are similar to the scoring procedures and are differentiated mainly as far as the evaluation method is concerned (Ghobadian and Woo, 1996).
These models are widely used all over the world by leading businesses and can be used as international evaluation criteria. They have considerably contributed to the development of the Total Quality, by making its philosophy a business practice. The American Award (Baldrige) has been the main catalytic factor of change in the American business society (Garvin 1991, Juran 1994).

However, there is a different approach that concerns the views of the gurus of Quality, around the world. In his last interview Mr. Deming when asked on the benefits for businesses that the American Model achieves, he replied «No, nothing could be worse. The evil effect of the Baldrige guidelines on American business can never be measured (Deming in Stevens 1994, pp. 21).

Additionally, Crosby (in Simms, 1991, p. 127) and Mc Adam & O’Neil (1999), Bester (2000), Gallear et al. (2000) have adopted the same critical line that applies also on the European Model of Business Excellence. Ghobadian and Woo (1996, p. 16) state that the European Model has several disadvantages, such as lack of innovative evaluation, of strategic placement, of marketing centred approach and R&D. However, it has assisted the European businesses on a first basis with the implementation of the Total Quality principles.

In addition, Leonard (2003, p.654) argues that the European Model of Business Excellence is revised every 2 years, and consequently does not dispose of the extended analysis of the complex business environment, that is dynamic in principle. The criteria for the European Model of Business Excellence connected to the “Policy and Strategy” do not focus on the effectiveness of the business strategy, or the amount of dynamics of the strategy planning, but they instead evaluate how the Total Quality issues are incorporated in the strategic procedures.

Additionally Van de Wiele (1995, page. 17) underlines that in large businesses, it is the representatives who decide when the self-evaluation will be conducted. Then, the middle ranged executives are activated in order to be aware of self-evaluation and then implement it. The Total Quality has to encourage data collection from the environment continuously in order to provide fast and dynamic strategies in businesses and should not have the passive role, mentioned in the above-mentioned models.

The EFQM model has been criticized for its self assessment mechanism, which provides a subjective score with wide fluctuation in the results, as it is stated in the bibliography by Porter and Tanner (1996), Siow et al. (2001), M. Liters and J.B. Yang (2003). The wide fluctuation in score results is owed to the lack of experience of the evaluators, the criteria complexity and the potential interactions and different scoring methods. The Multiple Attribute Decision Making (MADM) methodology, as a multi-criteria method, attempts to resolve the problem, without however taking into consideration the other dynamic parameters such as time, behaviour and culture as it is argued by Siow, Yang and Dale (2001).

Generally, a Total Quality system is described as a mental model and consequently it is highly possible not to provide the desired results in a more complex situation. The mental models are using the feedback theory, taking into consideration the current situation and interaction (Forrester, 1971). With respect to the complexity of the mental models in the Total Quality Management, Waldman (1994) suggested the application of the System Theory for implementing Total Quality. Bayer et al (2001) also suggested the use of dynamic models for Total Quality Management, so as to provide a more objective evaluation and long lasting decision-making. Leonard et al (2002) explained that Total Quality as a Dynamic System is complex, repetitive and is not adequately approached by the existing international Quality prizes.

According to the Theory of Dynamic Systems it is possible to capture the interactions among a range of system variables and predict the implication of each other over a period of time.
(Forrester, 1985). Through this methodology it is possible to have a better understanding of the self assessment process and to better value the business policy and strategy. Agrawal (1999) in his doctorate thesis uses the Dynamic Systems Theory in order to form models for the Total Quality Management and to define a final index, as the total performance of applying Total Quality (TQM Index), based on the Indian automobile industry. Consequently, as it is outlined by Leonard (2003, p. 655), the European Model of Business Excellence and other similar models have beneficial applications in businesses. However, it does not offer a complete approach on the business dynamics, and is thus becoming more a tool of a static image – business evaluation on a certain period of time, ignoring that the business itself is subject to dynamic changes and of course to dynamic pressures.

**Proposed System of Business Excellence**

Understanding the lack of models of Business Excellence – Total Quality, providing a static image and processing of Total Quality issues, the bibliography contains proposals concerning the creation of mechanisms, as models or systems, which represent a dynamic system of Business Excellence. Leonard and Mc Adam (2002) being based on the General Theory of Systems during their research, have reached the following conclusions that express the dynamics of Total Quality in businesses:

- Performance related to time,
- Repeated behaviours,
- Business Culture

Respectively, Mavroidis (2005) proposes a system of Business Excellence taking into consideration the above-mentioned issues consisting of the following, as well:

- Evaluation criteria or parameters expressing the existing European Business practice of the time,
- Focus on the performance and the effectiveness of the approaches (the approaches of the respective results are not evaluated separately),
- Explanation of the interdependence between the criteria or the variables of the system (feedback loops),
- Open architecture.

The proposed system of Business Excellence provides a dynamic approach of the Total Quality issues, which, combined to the application of the Dynamic System theory, aims mainly at the consideration of a more objective plan for an organization in order to provide constant improvement of the performance score.

It should be noted that currently a new **system** is proposed rather than a new **model** of Business Excellence. The system includes several Business Excellence models, initiatives on Quality, Quality Management systems etc. The interrelations and the influence of these models / initiatives are expressed by the performance and the effectiveness measurements, according to the above-mentioned theories (Figure 1):
The proposed system is composed by well-structured levels or fields of excellence, with specific contents per level (as Quality initiatives or Business Excellence Models) which represent, up to a point, the meaning of the Quality, the Management & Organisation, and the Competitiveness- Innovation concepts in an organization. The six levels are independent as far as their approaches for Quality improvement, but they depend on one another for the total performance score and their consequent influence. The levels are 6, leaving the last level open towards the upper part (i.e. future levels). This approach is equivalent to the familiar level model of Telecommunication Networks (OSI-RM Model) that is applied to computer networks and offers a clear description, a modular development and easy future development-enlargement (figure 2):

Figure 1: Correlation of levels of excellence formed as a Dynamic System (source: V. Mavroidis, University of Patras, 2004)

Figure 2: Telecommunication Model OSI-RM correlated to the proposed system of business excellence (source: V. Mavroidis, University of Patras, 2004)

The proposed System is not a congregation of initiative models, nor is it a new model. The concept “system” is characterized by the dependence of the levels (regarding their influence) and by the concept already explained.

The proposed system is dynamic regarding:

- The integration of current and potential tendencies and initiatives,
- The time-relation of “self assessments” of itself or of other levels,
- The relation to the business cultures of the respective geographical areas

The levels should follow the changes that occur dynamically in the models (publications or new models) and refer to the requirements that derive from the current market trends and the differentiation requirements, focusing always on the Greek market (combined with the European directions). These levels of excellence (Mavroidis, 2005) compose the following areas:

- Level 2, “Organising and Managing Sector specific and advanced (Quality) Management Systems” as it refers to the international standards ISO 14001, ISO 22000 or other documented national initiatives.
- Level 3, “Managing and Supporting Clusters or Networked Enterprises”,
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- Level 6, “Managing and supporting Innovation”, as it is appreciated by national or European means of evaluation.

Additionally, the proposed System is open regarding:

- The number of levels upwards (ie.7,8..) – dynamic differentiation,
- The actions for new models that implement specific levels (ie. potential new national model for a quality system in super markets or a new model on level 5 for very small businesses)
- The methodologies for restituting and processing data that derives from internal and external self assessments.

**Review of the Theory of Dynamic Systems**

The Dynamic Systems Theory explains the behavior of a complex, dynamic, social, technical, economic and political system (Social, Technological, Economic and Political Systems: S-T-E-P) for improved decision-making. Its roots go approximately 35 years back, to the Industrial Dynamics’ where Forrester (1971) explained the problems that derive from the industrial applications, such as unstable production and labor, unstable business development and market share. This theory expanded in other fields of interest, too, such as the management of a research and development project, the urban development, the management
of energy resources and the chaos theory. The name “Industrial Dynamics” soon became the Theory of Dynamic Systems.

The Dynamic Systems express the interactions of a system’s variables and predict their influence in a certain period of time (Forrester, 1985). The application of Dynamic Systems is a modern tool in the decision-making procedure (Dangerfield, 1979). In the area of Total Quality Management (TQM) the application of the Dynamic Systems theory has been extensively studied in the bibliography. The Total Quality Management is described as a contemplative model and thus does not have a predictable behavior. Consequently, the application of system theories of the dynamic systems is imposed, as it is described in the bibliography by Forrester, 1971, Waldman, 1994, Bauer et al, 2001, Leonard et al, 2002. According to the latter, a Dynamic System is defined in relation to time, culture and repeated behavior.

The Dynamic Systems do not aim at the system; they rather aim at the problem (Forrester, 1985). The problems recognised under the prism of Dynamic Systems have at least two things in common: Firstly, they are dynamic, meaning that they contain variables that change through time, by periodically repeated behaviors and by complex changes (Bauer et al, 2001). The “time” factor includes long-term development, current changes and predictable future directions. The factor “repeated behaviors” includes the non-linear behaviors either with positive or negative influence. The factor “complex changes” goes beyond the concept of cause and effect and includes phenomena that do not follow the predictable development in time. For instance, the local unemployment, the tax raises and the management of life quality could delay the construction of a building, the development of an economy, etc. The correct definition of the problem is the first step in the Dynamic Systems Theory (Richardson and Pugh, 1981).

Secondly, the problems include the concept of feedback, as the servo-mechanic systems in engines and in human systems (Goodman, 1983). The Dynamic Systems focus on the structure and behavior of interconnected feedback. The re-alimentation diagrams demonstrate a real system where the arrow is showing towards the influence’s direction, and the marking (+) or (-) is showing the influence type, i.e. positive or negative influence, or no influence if there is no marking. The re-alimentations with a positive influence are usually human systems, being opposed to the servo-mechanic systems.

The Dynamic Systems have a “holistic” approach, rather than an entry-exit approach. According to this approach, the changes that occur in a space or in a sub-total of the system influence the sub-system itself as well as the rest of the sub-totals, as it is shown in the diagram below:

![Dynamic Systems approach against Input / output model (I/O).](image)

The modelling of Dynamic Systems contains five types of equations (Forrester, 1985):
• Level or Accumulation,
• Rate or Policy Variable,
• Auxiliary,
• Constant,
• Initial Value conditions, where

**Level or Accumulation:** Current rate of the variable, deriving from the inflow-outflow difference on a certain period of time (calculated on a distinct time). An example of this would be the balance of an account, the balance of plant production, the number of personnel.

**Rate or Policy Variable:** Instant flow that raises or diminishes the variables’ rates (i.e. the levels). The rates demonstrate the flow movement, whereas the levels show the result as the system’s situation, changed due to this movement. In the natural systems the rates follow the rules of nature. In the other systems, the rates reflect the strategic policies that influence the personal choices.

**Auxiliary:** Auxiliary parameters for rate calculation. Rates and auxiliaries are based on certain constants, unchangeable in time when the Dynamic Systems are studied. Vij (1990) provides the Dynamic Systems with one additional parameter, the “delay”.

Concerning the Dynamic Systems model-making, Roberts (1978) and Spencer (1966) propose the following steps:

1) Definition of the problems to address and of the objectives to be reached,
2) System description with re-alimentation diagrams (causal loop / influence diagram),
3) Development of DYNAMO equations.
4) Collection of initial value conditions, either from historical sources, or by interviewing experts who are familiar with the system that is under evaluation.
5) Ratification of the model for developing its credibility.
6) Simulation of the model in order to control the policy and the action that will lead to the achievement of the defined objectives.

**Application of the Theory of Dynamic Systems to the proposed system of Business Excellence**

Dynamic Systems can be applied to the above proposed system of Business Excellence (Mavroidis, 2005) in order to:

1. Define through an adequate mathematical equation the influence of an organization performance over time. Being opposed to the current practice, where a business is evaluated on a precise moment of time, the proposed system would calculate the performances of previous periods of time.
2. Outline the interactions of the system variables, through the equations DYNAMO of the Dynamic Systems. As a result, it is possible to calculate which variables are influencing positively, negatively, or neutrally the rest of them and to form a basis for decision-making, as to which improvement actions should be set in the first place concerning the organization’s objectives.

*Organization performance over time*

As it is stated above, the final output or score of an organization that applies a business excellence model takes into consideration the final outputs or scores of the previous years. Consequently, an adequate mathematical equation is needed in order to calculate the quest, as:

Below, certain assumptions are given so as to utilise the adequate mathematical equation. For this aim to each assumption is given numeration. All the possible assumptions could be implemented, depending on the maturity of the Business Excellence system that exists in the organization. It is a business decision to define the best assumption of the mathematical equation that could best express the dynamic character of Business Excellence.

**Assumption 1: f1**
This simpler assumption takes into consideration equally the output or scores of the current and the previous years (considering that the time periods are measured as years).

The suitable mathematical equation of the first assumption is the average of the outputs of all years.

**Example:**

<table>
<thead>
<tr>
<th>Outputs or scores</th>
<th>Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 (2006)</td>
<td>100</td>
<td>Output of the year 2006 as defined by the assessors’ team. It is noted by “X” letter instead of “A” letter since it represents an intermediate result since the final output noted as A(2006) is the output in question.</td>
</tr>
</tbody>
</table>

Thus, the final output of the year 2006 will be:

\[ A(2006) = \text{AVERAGE} \{100, 90, 75, 55, 30\} = 70. \]

It is noted, in this example, that although the result of the assessors’ team was 100, what is finally encountered is the score of 70 because the outputs of previous years are taken into account.

The advantage of “assumption 1” is that it is quite easy to identify the final result through the use of a ready to use equation considering the outputs of the previous years as well. However, there is lack of information regarding the effort of the current year output, positive tendencies, continuous improvement tendencies, etc.

**Assumption 2: f2**
The next assumption takes into consideration the positive or negative tendencies of the current and previous years’ outputs and the rates of them.

Through a mathematical algorithm, in this assumption, it is given emphasis on both the improvement tendency of all the outputs and on the improvement tendency of the output rates. Therefore, the maximum of the output is given when there is a clear improvement of the scores through the years and also an improvement of the output rates.

The mathematical algorithm could be easily applied to a MS Excel program, as follows:
Let us consider the outputs of the last 5 years which is a considerable period of time for evaluating changes:

A (2003) = A2
A (2005) = A4
A (2006) = X5 (Output of the year 2006 as it is defined by the assessors’ team. It is noted by “X” letter instead of “A” letter since it represents an intermediate result as the final output noted as A(2006) is the output in question).

If A1 > 0 → True = 1, False = 0
If A2 > A1 → True = 1, False = 0
If A3 > A2 → True = 1, False = 0
If A4 > A3 → True = 1, False = 0
If A5 > A4 → True = 1, False = 0

Afterwards, the average of the fields “True” is computed:

If AVERAGE [TRUE] = 1, then Ai(2006) = X5 * 1
If AVERAGE [TRUE] = 0.8, then Ai(2006) = X5 * 0.9
If AVERAGE [TRUE] = 0.6, then Ai(2006) = X5 * 0.8
If AVERAGE [TRUE] = 0.4, then Ai(2006) = X5 * 0.7
If AVERAGE [TRUE] = 0.2, then Ai(2006) = X5 * 0.6

Up to now, continuous improvement over time is taken into account. In case that there is a positive tendency of all scores, then the final score is equal to the better output or else it is a percentage of the intermediate score.

However, there is a certain possibility to have improvement on scores but not on the rates of them. This algorithm goes further on computing equally the rates of the outputs over time, as follows:

Let us consider as “R” the rate of the scores or the outputs:

R1 = [(A1 – A0)/A0] * 100%, where A0 is an initial value less than A1 and is used only for computing the initial value R1. Therefore R1 is always more than 0.

R2 = [(A2 – A1) / A1] * 100%
R3 = [(A3 – A2) / A2] * 100%
R4 = [(A4 – A3) / A3] * 100%
R5 = [(X5 – A4) / A4] * 100%

R1 ≥ 0 → True = 1
If R2 > R1 → True = 1, False = 0
If R3 > R2 → True = 1, False = 0
If R4 > R3 → True = 1, False = 0
If R5 > R4 → True = 1, False = 0

Afterwards, the average of the fields “True” is computed:
If AVERAGE [TRUE] = 1, then \( k(2006) = X5 \times 1 \)
If AVERAGE [TRUE] = 0.8, then \( k(2006) = X5 \times 0.9 \)
If AVERAGE [TRUE] = 0.6, then \( k(2006) = X5 \times 0.8 \)
If AVERAGE [TRUE] = 0.4, then \( k(2006) = X5 \times 0.7 \)
If AVERAGE [TRUE] = 0.2, then \( k(2006) = X5 \times 0.6 \)

Then, equal weight is given to the \( A_i(t) \) and \( A_k(t) \) and the average of these two values is taken computing as such the final score:

\[ A(t) = \text{AVERAGE} [A_i(t), A_k(t)] \]

<table>
<thead>
<tr>
<th>Outputs or scores</th>
<th>Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 (2006)</td>
<td>100</td>
<td>Output of the year 2006 as defined by the assessors’ team. It is noted by “X” letter instead of “A” letter since it represents an intermediate result since the final output noted as A(2006) is the output in question.</td>
</tr>
</tbody>
</table>

By computing (in a MS Excel program) the above algorithm, the final score A1(2006) is equal to “85”.

**Assumption 3: f3**
The next assumption takes into consideration the comparison of the company’s own objectives over time.
The company’s own objectives could be defined either by the statistical equation “Trend” (as it is defined in the MS Excel program) or by other means of the business itself. In this assumption, own targets are compared against the intermediate performance. If the comparison is positive (i.e. own targets are met at least) then the company gets the maximum score, or else just a percentage of it. The mathematical algorithm could be easily applied to a MS Excel program, as follows:

Let us consider the outputs of the last 5 years which is a considerable period of time for evaluating changes:

\(A(2002) = A1\)
\(A(2003) = A2\)
\(A(2004) = A3\)
\(A(2005) = A4\)
\(A(2006) = X5\) (Output of the year 2006 as defined by the assessors’ team. It is noted by “X” letter instead of “A” letter since it represents an intermediate result as the final output noted as A(2006) is the output in question).

Then \(T1 = \text{Trend} [A1, A2, A3, A4]\) or defined as a business target.
T2 = X5.

If \( T1 \leq T2 \), then the company has met the own targets or achieved better performance. In this case, \( A(2006) = X5 \).

If \( T1 > T2 \), then the company has got its targets. In this case, the final score is a percentage of the intermediate.

**Example:**

<table>
<thead>
<tr>
<th>Outputs or scores</th>
<th>Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 (2006)</td>
<td>100</td>
<td>Output of the year 2006 as defined by the assessors’ team. It is noted by “X” letter instead of “A” letter since it represents an intermediate result since the final output noted as ( A(2006) ) is the output in question.</td>
</tr>
</tbody>
</table>

\( T1 = Trend \ [30, 55, 75, 90] \) or business arbitrary value, such as 85. 
\( T2 = X1(2006) = 100 \).

According to assumption 3, \( T1 < T2 \), then the final score is equal to 100.

In another case, i.e. \( T1 = 120, T2 = 100 \). Then \( A(2006) = X5*0.6 \) (the percentage given is subjective).

**Assumption 4: f4**
The next assumption takes into consideration the exterior or better comparatively sector-based objectives of the current and previous years’ outputs. It is a similar case to the one in assumption 3, however the term \( T1 \) is defined either by barometers or sector comparisons. The same algorithms are applied to this assumption.

**Assumption 5: f5**
The next assumption takes into consideration the positive or negative tendencies and/or the own objectives of an enterprise and/or exterior or better comparatively sector-based objectives of the current and previous year’s outputs.

All the above assumptions could be applied giving emphasis on those which are less bureaucratic and set the status of the company. The following table judges the pros (+) and cons (-) of all the 5 assumptions:
## Assumptions Pros (+) Cons (-) Recommendations

### F1 “average”

- Easy to use,
- Take into consideration equally the performances of previous years.

- No emphasis on the outcome of the last year,
- No information on positive tendencies.

> Use when the performances are quite similar and there is severe reason to consider all performances as equal.

### F2 “continuous improvement and rate of it”

- Take into consideration the most core principle of the continuous improvement,
- Consider the rate of continuous improvement,
- Most popular query.

- More complicated algorithm to use,
- No consideration of internal and external targets.

> Use in most cases where continuous improvement is the target and where there is no mature business excellence culture in the company to identify comparisons.

### F3 “comparison with internal targets”

- Take into consideration the comparison of the current performance against internal target identified either by statistical terms or by business decision,
- Easy algorithm to use.

- No information on positive tendencies,
- Difficult to decide the internal target objectively.

> Use when there is a certain gap between performance and business priorities and the company is mature to decide the targets to achieve.

### F4 “comparison with external targets”

- As in F3 case, the comparison is with benchmarking targets,
- Easy algorithm to use.

- Difficult to identify sector benchmarks which apply similar mechanism of assessing business excellence

> Use when there is mature culture of business excellence in sector companies.

### F5 “all or combination of the above”

- Easy to use as a combination of the above.

- Maturity level of business excellence systems implemented.

> Use when there is certain reason to combine the pros of the other categories.

---

### Table 1: Algorithms assumptions.

**Interactions of the system variables**

“System variable” provides every parameter with a metric value in the proposed system. Consequently, the variables are the performances of each level of the proposed Business Excellence system or the performances of distinct level questions.

Being based on the above, the “Final Score” or “overall performance” of a business in time \( t \) is defined as:

\[
\text{Final Score} = \frac{\sum \text{performances}}{\text{number of performances}}
\]
Final Score: \[ A(t) = \sum_{n=1}^{6} [A_n(t) \cdot \sigma_n] \]

Where: \( A_n(t) \) is the performance of level \( n \) (1 to 6) in the real time of assessment \( t \), \( \sigma_n \) is a dynamic factor of level that is fixed by the enterprising community (from external environment of enterprise with output from 0-1, and the summary of “\( \sigma_n \)” from \( n=1 \) to 6 is equal to “1”).

Example:
In the initial implementation of the business excellence system, the management organization of the business excellence system takes into consideration the business culture of the area and defines the following values:

<table>
<thead>
<tr>
<th>Weight factors ((\sigma_n))</th>
<th>( \sigma_1 )</th>
<th>( \sigma_2 )</th>
<th>( \sigma_3 )</th>
<th>( \sigma_4 )</th>
<th>( \sigma_5 )</th>
<th>( \sigma_6 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial values</td>
<td>0,6</td>
<td>0,4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

If the final score of level 1 in 2006 is 100 then:

\[ A_1(2006) = 100. \]

The same for the rest levels:
- \( A_2(2006) = 60. \)
- \( A_3, A_4, A_5, A_6 (2006) \) are not assessed due to business decision (\( \sigma_n = 0 \)).

The final score is \( A(2006) = A_1(2006) \cdot 0,6 + A_2(2006) \cdot 0,4 + 0 + 0 + 0 + 0 = 60 + 24 = 84. \)

The final score of each level is a function of the scores of the same level through the years (as it is described in the previous paragraph) and a function of the interactions of other levels. So,

Score of level \( n \):

\[ A_n(t) = \{ fx[X_n(t), A_n(t-\tx)] + \sum_{n=1}^{5} \{ fx[X(6-n)(t), A(6-n)(t-\tx)] \cdot R(6-n)n \} \}/n \]

Where: \( fx \) is a function of the evaluations of the same level in older times that could be the AVERAGE or another function that shows the tendencies and the level of self organizing, as it is already analysed in the previous paragraph. \( X_n(t) \) is the intermediate score of the same level in the current time \( t \) as is defined by the assessors team. Same for the intermediate performances \( X(6-n)(t) \). As RATE, \( R(6-n)n \) is defined the ratio or the influence (positive of negative) of the variable scored (i.e. \( n \)) with the other variables. This ratio is defined as \( R(6-n)n \) with \( n \neq (6-n) \) and it has a rate varying from “−1” to “+1”. Inversely, \( Rn(6-n) \) concerns the influence of level \( n \) on level \( (6-n) \). \( A_n(t-\tx) \) are the performances of the level \( n \) in previous years, as many as it is defined as by the variable “\( x \)”.

Example:
Considering the previous example, the final output is defined as:

Where there are only 2 levels of assessment.

The ratio \( R_{n(6-n)} \) or generally, \( R_{xy} \) shows the relation between 2 “variables” or ‘agents’ of a system. More specifically it shows the influence or the relation of variable \( X \) to variable \( Y \). The variables could be either levels, or level questions, or question groups (i.e. Criteria). Consequently, the ratio \( R_{xy} \) is defined as follows:

\( R_{xy} = \) If we CHANGE (improve [+] or decrease [-]) performance and effectiveness of variable \( X \), how will it affect the effectiveness of variable \( Y \)?

These relations can be defined, either by a) external factors for example, questionnaire processing for businesses, providing that level \( X \) influences level \( Y \), and so the demanded formula is derived from this procedure, or b) by internal factors for the business itself, where using simulation on PC will lead to the best value.

Initially, the relation \( R_{xy} \) acquires a rate of empirical estimation. Then, the two previously described methods result in a more documented rate. In the framework of a complex theory this relation is variable and is affected by the system itself (self-organizing).

Consequently in the effort of improving a level, it is not only sufficient to improve the effectiveness of the level itself or the performance of the other levels, but also the influence (through procedures) of the feedback procedure (Brodback, 2002). For example, education, change of culture, management changes, related to the implementation of level 1 could seriously affect level 6. Also:

\[
R(6-n)n = R_{zn} = \sum_{i=1}^{\omega} [R(z.k)n*\sigma(z.k)]
\]

Where:

- \( n \) declares the level in question (evaluation level),
- \( z,(6-n) \) declare the remaining levels \((z = 1 to 6, z \neq n)\),
- \( \sigma(z.k) \) declares the weight of question \((z.k)\) of level \( z \),
- \( \kappa \) declares the particular question of level \( z \),
- \( \omega \) declares the number of questions \( k \) in the level \( z \),
- Summary of “\( \sigma(z.k) \)” from \( k=1 \) to \( \omega \) is equally to “1”.

Validation

As it is stated in the previous paragraphs, the organization’s final output or score takes into consideration the outputs or scores of the same set of criteria of previous periods of time. This time correlation is calculated by an adequate mathematical equation “\( Fx \)”, or algorithm already described. These algorithms or assumptions may be validated as far as their usefulness against the defined business aims. It is the business’s decision to define which algorithm will reveal the status of excellence.

As a validation methodology of the described algorithms, the author proposes the use of an array of random numbers disposing the scores of five consistent years taking values from “0” (minimum) to “99” (maximum). By applying the algorithm \( Fx \) to these random set of numbers, it is possible to validate the aims of the relative function.

Considering that the most common business requirement is to identify paths of continuous improvement, function \( F2 \) (as it is shown in table 1) will be validated in the next paragraph.
The following table is a usual array of random numbers. Each column represents the set of data required to validate the function F2 hypothesis:

$$
\begin{array}{ccccccc}
03 & 47 & 43 & 73 & 86 & 36 & 96 \\
97 & 47 & 70 & 91 & 42 & 05 & 96 \\
16 & 76 & 29 & 26 & 66 & 55 & 48 \\
12 & 56 & 69 & 30 & 58 & 02 & 69 \\
55 & 59 & 53 & 34 & 51 & 06 & 80 \\
16 & 22 & 98 & 19 & 08 & 13 & 88 \\
84 & 42 & 64 & 02 & 36 & 87 & 70 \\
63 & 01 & 94 & 46 & 11 & 60 & 42 \\
33 & 21 & 51 & 75 & 73 & 16 & 62 \\
57 & 60 & 56 & 64 & 71 & 77 & 54 \\
\end{array}
$$

Table 2: Array of random numbers.

In table 2 each set of data in columns represents the scores of 5 equivalent years providing as such 20 cases:

Case 1: Set [03, 97, 16, 12, and 55],
Case 2: Set [47, 47, 76, 56, and 59],
...
Case 5: Set [86, 42, 66, 58, and 51],
Case 6: Set [36, 05, 55, 02, and 06],
...
Case 20: Set [83, 29, 78, 07, and 43].

The following hypotheses are defined:

*H1:* Function F2 computes scores of 5 consistent years, considering that the final score is the maximum of those defined in the range of the 5 consistent years, if there are both continuous score improvement and continuous score rate improvement.

*H0:* Function F2 does not provide information on the tendency for continuous improvement and rate of it.

The array of random numbers is incorporated in a computer program (MS Excel) which implements an algorithm as it is described in the previous paragraphs, and shown in tables 3a, 3b. It is noticed that the term “Az” (z = 1 to 5) shows the final score of that year, whereas the term “Xz” shows the results of the assessment score of that year. Therefore the “Xz” output is the intermediate result of the year out of which we would like to extract the final score.
Let us consider a few cases out of the 20 presented above which may be of interest. As a tool of comparison between the final score (A5) and the intermediate score of that level of excellence (X5) is used the “Rate X5-A5” defined as:

\[ \text{Rate X5-A5} = \left(\frac{A5 - X5}{X5}\right) \times 100\% \]

The rate “X5-A5” shows the gap between scores X5 and A5.

In case 1, the final output A5 (2007) is less than X5(2007) which is the intermediate score as it is found by the assessment team. This is because there is not a steadily continuous improvement, although there is a wide range of improvement variations between the scores of the years 2007 and 2006. This case could be applied to a business where they still lack of a tuned methodology of assessing business excellence or there are critical business changes.

In case 2, the final output A5 (2007) is still less than X5(2007). It is shown that there was great improvement in the year 2005; however there is a slightly continuous improvement in the other periods of time. The final score A5 (2007) is adequately less than X5 because there is not a tendency for continuous improvement rate.

Cases 1, 4, 12 have the minimum value of |Rate X5-A5| (equal to 15) which clarifies the fact that these organisations have more steady tendencies of continuous improvement.

Table 3a: Validation of algorithm F2 by random numbers (Cases 1-5, 11-15).

Table 3b: Validation of algorithm F2 by random numbers (Cases 6-10, 16-20).
In contrary, case 17 has the maximum value of |Rate X5-A5| (equal to 30) which shows that these organisations do not have steady tendencies for continuous improvement.

In case 18, the score A4 year should be changed from “0” to “0.1” so as to be possible to implement the algorithm. Score “0” is equal to score “0.1” and signifies an organisation that has not a score of that year.

Simulation

Assumptions

The features of the Dynamic System studied in the previous paragraphs, will be incorporated in a Business Excellence system, bearing a structure as described in the relevant published article by Mavroidis (2005). The aim of the simulation is to validate the usefulness of the proposed system by understanding the system variables’ interrelations or influences.

A set of questions or criteria are defined in each level. The content of these questions are subjective including the assessment methodology. It should be clarified that it is not our aim to define the most suitable questions or criteria per level.

A simplification of this Business Excellence System has been proposed to represent the Hellenic National Quality Award. Due to its dynamic nature, this system has activated only those levels which match the current business culture: Level 1 – “Organising and Managing Quality Management Systems” as it refers to the international standards ISO 9001 and ISO 9004 and level 2 – “Organizing and Managing Sector specific and advanced Management Systems” as it refers to the international standards or other documented national initiatives.

To be able to do the simulation on the proposed Dynamic Business Excellence System the following issues are taken into account:

- The Business Excellence System, which will be used, is a simplification of the one that is proposed by Mavroidis (2005), activating only 2 levels of excellence: Level 1 and 2.
- Questions or criteria defined per level are described in the Hellenic National Quality Award. They are not described in this paper.
- Function “f2” is used to compute time correlation as it has already been validated in the previous paragraph.

Definition of Level 1: This level assesses the effectiveness and efficiency of a Quality Management System which is mainly based on the principles of the ISO 9004 and the requirements of the ISO 9001:2000 standards. This level is composed of 6 questions or criteria of excellence. The table 4a indicates the weight factor, and the interactions with other levels per question code.

Definition of Level 2: This level assesses the effectiveness and efficiency of sector Quality Management Systems that is applied to specific business areas (such as Telecommunications, Education, Food, etc) as well as to advanced management systems (such as CSR, Health and Safety, etc). This level is composed of 4 questions or criteria of excellence. The table 4b indicates per question code the weight factor, and the interactions with other levels.
<table>
<thead>
<tr>
<th>Question Code</th>
<th>Weight factor %</th>
<th>Question interaction to LEVEL 2</th>
<th>Question interaction to LEVEL 3</th>
<th>Question interaction to LEVEL 4</th>
<th>Question interaction to LEVEL 5</th>
<th>Question interaction to LEVEL 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>σ1.1</td>
<td>R1.1_2 = A</td>
<td>R1.1_3 = B</td>
<td>R1.1_4 = B</td>
<td>R1.1_5 = B</td>
<td>R1.1_6 = B</td>
</tr>
<tr>
<td>1.2</td>
<td>σ1.2</td>
<td>R1.2_2 = A</td>
<td>R1.2_3 = B</td>
<td>R1.2_4 = B</td>
<td>R1.2_5 = B</td>
<td>R1.2_6 = B</td>
</tr>
<tr>
<td>1.3</td>
<td>σ1.3</td>
<td>R1.3_2 = A</td>
<td>R1.3_3 = B</td>
<td>R1.3_4 = B</td>
<td>R1.3_5 = B</td>
<td>R1.3_6 = B</td>
</tr>
<tr>
<td>1.4</td>
<td>σ1.4</td>
<td>R1.4_2 = A</td>
<td>R1.4_3 = B</td>
<td>R1.4_4 = B</td>
<td>R1.4_5 = B</td>
<td>R1.4_6 = B</td>
</tr>
<tr>
<td>1.5</td>
<td>σ1.5</td>
<td>R1.5_2 = A</td>
<td>R1.5_3 = B</td>
<td>R1.5_4 = B</td>
<td>R1.5_5 = B</td>
<td>R1.5_6 = B</td>
</tr>
<tr>
<td>1.6</td>
<td>σ1.6</td>
<td>R1.6_2 = A</td>
<td>R1.6_3 = B</td>
<td>R1.6_4 = B</td>
<td>R1.6_5 = B</td>
<td>R1.6_6 = B</td>
</tr>
</tbody>
</table>

**Table 4a: Level 1 correlation**

<table>
<thead>
<tr>
<th>Question Code</th>
<th>Weight factor %</th>
<th>Question interaction to LEVEL 1</th>
<th>Question interaction to LEVEL 3</th>
<th>Question interaction to LEVEL 4</th>
<th>Question interaction to LEVEL 5</th>
<th>Question interaction to LEVEL 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>σ2.1</td>
<td>R2.1_1 = C</td>
<td>R2.1_3 = B</td>
<td>R2.1_4 = B</td>
<td>R2.1_5 = B</td>
<td>R2.1_6 = B</td>
</tr>
<tr>
<td>2.2</td>
<td>σ2.2</td>
<td>R2.2_1 = C</td>
<td>R2.2_3 = B</td>
<td>R2.2_4 = B</td>
<td>R2.2_5 = B</td>
<td>R2.2_6 = B</td>
</tr>
<tr>
<td>2.3</td>
<td>σ2.3</td>
<td>R2.3_1 = C</td>
<td>R2.3_3 = B</td>
<td>R2.3_4 = B</td>
<td>R2.3_5 = B</td>
<td>R2.3_6 = B</td>
</tr>
<tr>
<td>2.4</td>
<td>σ2.4</td>
<td>R2.4_1 = C</td>
<td>R2.4_3 = B</td>
<td>R2.4_4 = B</td>
<td>R2.4_5 = B</td>
<td>R2.4_6 = B</td>
</tr>
</tbody>
</table>

**Table 4b: Level 2 correlation**

Where, A, C: Initial values, defined empirically for the first time or defined by business community itself. It takes a value from -1(totally negative), to +1(totally positive), defined as a one-digit decimal number (e.g. +0,3). Value “0” shows a neutral value.

B: This value is equal to “0” since it is anticipated as an assumption (only level 1, 2 are activated).

To be able to do the simulation, initial values are presented in tables 4a, 4b and are applied to cases 1-20 that were already mentioned in the previous paragraph. It is noticed that the final score is computed by considering:

- Outputs of all the levels of excellence, considering time and
- Interrelations of levels.

The following equations are also taken into account:

**Suitable algorithm is the second case “Algorithm F2 (Time correlation)” - (1)**

**Final Score:** \( A(t) = \sum_{n=1}^{2} [A_n(t) * \sigma_n] \) - (2)
Score of level \( n \):
\[
An(t) = f_x[Xn(t), An(t-t_x)] + \sum_{n=1}^{1} \{f_x[X(6-n)(t), A(6-n)(t-t_x)] R(6-n)n\} / n \quad - (3)
\]

Relation of level \( z \) to level \( n \):
\[
R(6-n)n = R_{zn} = \sum_{k=1}^{n} [R(z,k)n * \sigma(z,k)] \quad - (4)
\]

Implementation

Initial values are given to the variables in tables 4a, 4b which represent an empirical view of the author; however these values could be more objectively set by the business community itself by carrying out a survey. It is not an aim of this research to identify the most representative values but to validate the usefulness of the proposed methodology.

<table>
<thead>
<tr>
<th>Question Code</th>
<th>Weight factor %</th>
<th>Question interaction to ( \text{LEVEL 2} )</th>
<th>Question interaction to ( \text{LEVEL 3} )</th>
<th>Question interaction to ( \text{LEVEL 4} )</th>
<th>Question interaction to ( \text{LEVEL 5} )</th>
<th>Question interaction to ( \text{LEVEL 6} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>( \sigma 1.1 = 0.2 )</td>
<td>( R_{1.1_2} = 1 )</td>
<td>( R_{1.1_3} = 0 )</td>
<td>( R_{1.1_4} = 0 )</td>
<td>( R_{1.1_5} = 0 )</td>
<td>( R_{1.1_6} = 0 )</td>
</tr>
<tr>
<td>1.2</td>
<td>( \sigma 1.2 = 0.2 )</td>
<td>( R_{1.2_2} = 0.6 )</td>
<td>( R_{1.2_3} = 0 )</td>
<td>( R_{1.2_4} = 0 )</td>
<td>( R_{1.2_5} = 0 )</td>
<td>( R_{1.2_6} = 0 )</td>
</tr>
<tr>
<td>1.3</td>
<td>( \sigma 1.3 = 0.2 )</td>
<td>( R_{1.3_2} = 0.5 )</td>
<td>( R_{1.3_3} = 0 )</td>
<td>( R_{1.3_4} = 0 )</td>
<td>( R_{1.3_5} = 0 )</td>
<td>( R_{1.3_6} = 0 )</td>
</tr>
<tr>
<td>1.4</td>
<td>( \sigma 1.4 = 0.2 )</td>
<td>( R_{1.4_2} = 0 )</td>
<td>( R_{1.4_3} = 0 )</td>
<td>( R_{1.4_4} = 0 )</td>
<td>( R_{1.4_5} = 0 )</td>
<td>( R_{1.4_6} = 0 )</td>
</tr>
<tr>
<td>1.5</td>
<td>( \sigma 1.5 = 0.1 )</td>
<td>( R_{1.5_2} = -0.4 )</td>
<td>( R_{1.5_3} = 0 )</td>
<td>( R_{1.5_4} = 0 )</td>
<td>( R_{1.5_5} = 0 )</td>
<td>( R_{1.5_6} = 0 )</td>
</tr>
<tr>
<td>1.6</td>
<td>( \sigma 1.6 = 0.1 )</td>
<td>( R_{1.6_2} = -1 )</td>
<td>( R_{1.6_3} = 0 )</td>
<td>( R_{1.6_4} = 0 )</td>
<td>( R_{1.6_5} = 0 )</td>
<td>( R_{1.6_6} = 0 )</td>
</tr>
</tbody>
</table>

Table 5a: Level 1 correlation

<table>
<thead>
<tr>
<th>Question Code</th>
<th>Weight factor %</th>
<th>Question interaction to ( \text{LEVEL 1} )</th>
<th>Question interaction to ( \text{LEVEL 3} )</th>
<th>Question interaction to ( \text{LEVEL 4} )</th>
<th>Question interaction to ( \text{LEVEL 5} )</th>
<th>Question interaction to ( \text{LEVEL 6} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>( \sigma 2.1 = 0.3 )</td>
<td>( R_{2.1_1} = 1 )</td>
<td>( R_{2.1_3} = 0 )</td>
<td>( R_{2.1_4} = 0 )</td>
<td>( R_{2.1_5} = 0 )</td>
<td>( R_{2.1_6} = 0 )</td>
</tr>
<tr>
<td>2.2</td>
<td>( \sigma 2.2 = 0.3 )</td>
<td>( R_{2.2_1} = 0.2 )</td>
<td>( R_{2.2_3} = 0 )</td>
<td>( R_{2.2_4} = 0 )</td>
<td>( R_{2.2_5} = 0 )</td>
<td>( R_{2.2_6} = 0 )</td>
</tr>
<tr>
<td>2.3</td>
<td>( \sigma 2.3 = 0.2 )</td>
<td>( R_{2.3_1} = 0 )</td>
<td>( R_{2.3_3} = 0 )</td>
<td>( R_{2.3_4} = 0 )</td>
<td>( R_{2.3_5} = 0 )</td>
<td>( R_{2.3_6} = 0 )</td>
</tr>
<tr>
<td>2.4</td>
<td>( \sigma 2.4 = 0.2 )</td>
<td>( R_{2.4_1} = -0.1 )</td>
<td>( R_{2.4_3} = 0 )</td>
<td>( R_{2.4_4} = 0 )</td>
<td>( R_{2.4_5} = 0 )</td>
<td>( R_{2.4_6} = 0 )</td>
</tr>
</tbody>
</table>

Table 5b: Level 2 correlation

It is noticed that a negative value of the relation \( R_{xy} \) indicates a negative relation or influence of the variable “\( x \)” on the variable “\( y \)”.

To proceed with, the data on tables 5a, 5b are used on the equation (4) that follows to define the relation or influence of “level 1” on “level 2”: 
\[ R_{12} = \{R_{1.1 \_2}* \sigma_{1.1}\} + \{R_{1.2 \_2}* \sigma_{1.2}\} + \{R_{1.3 \_2}* \sigma_{1.3}\} + \{R_{1.4 \_2}* \sigma_{1.4}\} + \{R_{1.5 \_2}* \sigma_{1.5}\} + \{R_{1.6 \_2}* \sigma_{1.6}\} \]
\[ = (1*0.2) + (0.6*0.2) + (0.5*0.2) + (0*0.2) + (-0.4*0.1) + (-1*0.1) \]
\[ = 0.28 \]

\[ R_{12} = 0.28 \text{ (5)} \]

Similarly to the above, the relation or influence of “level 2” to “level 1” is defined as follows:

\[ R_{21} = \{R_{2.1 \_1}* \sigma_{2.1}\} + \{R_{2.2 \_1}* \sigma_{2.2}\} + \{R_{2.3 \_1}* \sigma_{2.3}\} + \{R_{2.4 \_1}* \sigma_{2.4}\} \]
\[ = (1*0.3) + (0.2*0.3) + (0*0.2) + (-0.1*0.2) = 0.34 \]

\[ R_{21} = 0.34 \text{ (6)} \]

Next, the algorithm F2 is applied in the same way as in equation (1) to identify the balanced score of levels 1, 2 in the range of 5 previous years. In the case of simulation, score data is taken by the cases 1, 5 of the table 3a. Therefore,

<table>
<thead>
<tr>
<th>Case 1:</th>
<th>Case 5:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score level 1 (2005) = 16</td>
<td>Score level 2 (2005) = 66</td>
</tr>
</tbody>
</table>

Then the score of level 1 is computed, by applying equations (3), (5), (6) as well as the functions F2 as it is identified before:

**Final Score Level 1**
\[ = \{46.75 + 38.25*0.34\} / 2 = 29.88 \text{ (7)} \]

**Final Score Level 2**
\[ = \{38.25 + 46.75*0.28\} / 2 = 25.67 \text{ (8)} \]

Finally, applying equations (2), (7), (8) and considering that the weight factor of level 1 is 70% and level 2 is 30%, the final score is defined as:

**Final Score (2007)**
\[ = 29.88*0.7 + 25.67*0.3 = 28.62 \]

**Conclusions**

Summarizing, the proposed system of Business Excellence (Mavroidis, 2005) is modelised according to the principles of the Dynamic Systems, aiming at:

1. Defining the final balanced result of the Business Excellence of an organization in relation to time evaluation. Contrary to the current practices, where an organization is evaluated on a precise moment of time, the proposed system is calculating through an adequate mathematic equation the results of the previous evaluations of the same variables.
2. Outlining the interactions of the system variables, with an ultimate goal to find the influences, through the equations DYNAMO of the Dynamic Systems. As a result, it can be calculated which variables are influencing positively, negatively, or neutrally the rest of the variables, and form the basis for decision-making, as far as the action that should be routed in the first place considering the achievements of the organization’s objectives.

References


APPLYING IDEA GENERATION METHOD IN SERVICE ORGANIZATION

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Keywords: Creative problem-solving techniques, Brainwriting 6-3-5 method, services.

1. INTRODUCTION

Speed, efficiency and quality of innovating products, processes and services are becoming an imperative of contemporary way of doing business. Because of that, it is necessary to use all available potentials for determination of future course of development and directing process of innovating in adequate way, quickly and efficiently. These potentials are knowledge and experience of both experts, working for the firm or not, and employees at different levels, who are more and more appreciated by successful companies as originators of innovation and development activities.

Firms that set ambitious growth goals must have well organized and planned idea generation of new products. Because of that, sources of ideas for new products should be researched first and systematically. Those researches often lead to new ways of finding fresh ideas. In that case, it would be possible to create new ideas for new products systematically, using different techniques of creative thinking.

This paper shows application of Brainwriting 6-3-5 method in service providing company Energoprojekt-Entel. Above all, firm does its best to keep up with world trends so that it can improve business and that’s exactly what this research is based on.

2. IDEA GENERATION METHOD

Firms which want to keep up and improve their flexibility and competitive advantage must be creative in problem solving and idea generation of product, process and service innovation. Sessions for creative problem solving imply communication that develops new possibilities for research and learning, as well as the possibilities for creating important ideas which will be foundation for firm’s future development. The best known methods available for management today are: Brainstorming, Brainwriting, Object simulation, Nominal group technique, Metaphors, Wishful thinking, Rich pictures etc. [1]
2.1. Brainwriting

Creator of Thought writing technique is Rohrback. Method is suitable for solving problems which are not too narrow or closed. It is applied to small groups of 4-7 people and requires heterogeneity of group in order to have more creative atmosphere. Written communication is, when needed, expended on oral communication. Use of this method has many similarities with Brainstorming method, such as performance stages: [2]

- Problem definition;
- Writing down ideas;
- Circling of a piece of paper;
- Problem redefinition;
- Evaluation and assessment of ideas.

There are various applications of Brainwriting method: Brainwriting Pool, Brainwriting 6-3-5, Idea cards method, Brainwriting Game, Limited brainwriting.

2.1.1. Brainwriting 6-3-5

Variation Brainwriting 6-3-5 got its name thanks to 6 participants who write down 3 ideas in 5 minutes. Worksheet that every participant gets (6-3-5 Worksheet) is in table 1:

<table>
<thead>
<tr>
<th>Problem description</th>
<th>Participant</th>
<th>Idea 1</th>
<th>Idea 2</th>
<th>Idea 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>6</td>
<td></td>
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</tr>
</tbody>
</table>

*Table 1. Worksheet for Brainwriting method 6-3-5 [3]*

Each participant takes 5 minutes to write down 3 ideas in the first row of a worksheet. Ideas should be brief sentences of 6-10 words. After 5 minutes (or when all participants finish writing), worksheet is handed to the person on the right. Three new ideas are added to the sheet. They can be related to previous three ideas or completely different. It goes on until the worksheets are complete. In the end 6 worksheets produce 108 ideas which can be evaluated.

3. EP-ENTEL COMPANY

Energoprojekt Entel is a joint-stock company for planning, consulting and engineering of thermo energetic, nuclear, electro energetic and telecommunication objects and systems. It is a daughter company of ENERGOPROJEKT HOLDING AD. [4]
Company does business in the country and abroad. It provides services of planning, consulting and engineering for thermo and nuclear power stations, electric power facilities, telecommunication systems and neighbourhood facilities. It applies modern techniques for planning development, spending and producing all forms of energy, space planning of energetic facilities, creating strategies for development of energetics, as well as directing of energetic systems and facilities. Modern systems for environment protection, up-to-date techniques of waste processing and disposal are applied in all the stages.

Information system at all levels of Energoprojekt follows and updates development of business activities which are in a constant touch with scientific and business achievements both in the country and abroad. Since the first computer generations, Energoprojekt has been developing its own information system which provides its users with the most modern computer techniques. It also develops software packages that market demands. In cooperation with well-known companies, it is a significant producer of computer equipment, system and application software and complete info systems in the fields of banking, postal and business systems and government organs.

3.1. System for access control in ENERGOPROJEKT business premises

Entis KP (access control) is informational system for access control and keeping records of working hours. It is developed as an internet service in Energoprojekt Entel as an addition to information generated by uniform system for accessing control in Energoprojekt business premises. It is in compliance with “Technical instructions for application of system for access control in Energoprojekt business premises” which were prepared and delivered to companies in question by Energoprojekt AD in March 2005.

Entis KP enables system users, according to their level of security clearance, instant insights of people’s presence or absence from the premises, all movements at the entrance to the building, as well as data analysis at single or collective level of people’s presence/absence with their right character, assigned by authorised personnel.
4. DESCRIBING PROBLEM AND APPLICATION OF BRAINWRITING 6-3-5 METHOD IN EP-ENTEL

Problem definition: New chip cards were introduced as employees’ IDs. Experts\(^1\) were asked to think about their purpose, information they would contain and their features. After detailed introduction of the problem, experts were given 5 minutes to write down their ideas on worksheets. Worksheets circled from one participant to another, following the rule of accepting worksheet from the left and handing it to the right. Meeting was over when everyone had got their original sheets.

Example of a filled worksheet is given in table 2.

These are ideas selected from Brainwriting 6-3-5 method worksheets:

- **Access to network, defined clearance for use of network, access to computer from both external and internal location, phone access:** In view of the fact that computer is often used in the company, it is necessary to remember and use different codes. In that case, chip card would make it easier for employees and reduce time spent on those activities. In Entel telephones are used after entering a code, which shows a high level of access control. As far as external computer access is concerned, most of participants find this idea excellent. There is a question of necessity of internal control and what happens when employee is unexpectedly absent and therefore his data can not be accessed without his chip card.

- **Electronic signature and access control to Entis (Entel Information System)** prevailed and give impression of best accepted and developed ideas.

- **Keeping CV (expanded to scanned degrees, licences...), office and private phone numbers and health data:** There is a trend formed around the idea of replacing business and ID cards with a chip card which would contain both of these cards data.

- **Access to bank account:** Very attractive idea that would be useful, but there is a question of jurisdiction and feasibility.

- **Use of benefits:** This idea is about the use of company cars and kitchen/cafeteria only by employees. In that way it is possible to control access and time. For example, employee could spend some time in the kitchen with time limit of let’s say, half an hour as a determined break.

- **Possibility of storing and reading data (USB memory):** Possibility that card contains some kind of reminder. These features are considered to be desirable, but there is a question of uncontrolled modification of content.

\(^1\) Authors are familiar with the names of experts
**Problem:** Think about purpose of chip cards, information they would contain and their features.

<table>
<thead>
<tr>
<th>1. <strong>Entel executive director</strong></th>
<th>2. <strong>Manager of telecommunication bureau</strong></th>
<th>3. <strong>Information system engineer</strong></th>
<th>4. <strong>Technician</strong></th>
<th>5. <strong>Electrical engineer</strong></th>
<th>6. <strong>Manager of electronic data processing center</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Should contain occupation, office phone number</td>
<td>2.1. CV with additional info (licence, office phone number, information from personnel...)</td>
<td>3.1 Authorisation of communication, electronic signature with CD</td>
<td>4.1. ID card available for reading from mobile phone</td>
<td>5.1. Authorization - electronic signature is preferable</td>
<td>6.1. Authorization - electronic signature is preferable</td>
</tr>
<tr>
<td>1.2. Should contain CV</td>
<td>2.2. Personal planner, time organizer</td>
<td>3.2. Access to telephone, computer...</td>
<td>4.2. Use of company car, recording times of departures and arrivals</td>
<td>5.2. Access to the computer network and telephone</td>
<td>6.2. Access to Entel information system</td>
</tr>
<tr>
<td>1.3. For use of phone (without code)</td>
<td>2.3. I think it’s unpractical for phoning, especially when one has a lot of calls</td>
<td>3.3. Access to a bank account</td>
<td>4.3. Updating all important data on an individual</td>
<td>5.3. External access to a bank account</td>
<td>6.3. Possibility of reading data from the card, similar to USB memory</td>
</tr>
</tbody>
</table>

*Table 2. Sheet with ideas according to Brainwriting 6-3-5*

These worksheets point to several very interesting groups of ideas accepted in full. In the same way some ideas opened questions such as necessity, feasibility, practicality... It can be concluded that method was used efficiently and that employees took the problem seriously. Time limits given in general features of method were respected.

5. **CONCLUSIONS**

Nowadays, development of companies and innovative work are more and more results of systematic, organised and directed work with use of available methods, techniques and potentials in and outside of organisation. It is very important to see and understand early warning signs and act upon them with desired results. After idea or innovation generation, multidimensional and
multidisciplinary approach is needed. It implies suitable managing of innovation and development process in order to achieve commercial success of innovation and total development of a company. Suitable training programs for managers in different fields and levels are much needed in domestic business practice. They should teach well known methods and techniques and ways of strengthening creative potentials and innovation spirit in an organisation.

References

A TOOL FOR MANAGING INFORMATION TO IMPROVE SERVICES: PROBABILISTIC EXPERT SYSTEMS.

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Decisions and evidences

In the later years, factors such as growing attention for service sector, increasing well-being level, more qualified and well informed stakeholders and consumer safeguard, have strongly influenced organizations management system. Private and public organizations have to face the new challenge of quality, that has now assumed a complex and dynamic meaning. Quality management is a competitive strategy, oriented to raise stakeholders’ satisfaction and to improve whole organization performance through waste and costs cut. In particular, in the public sector the citizen’s attention is characterized not only by service availability and cheapness but also by supply personalization. For Service quality control systems are necessary to ensure uniformity and transparency and to verify the coherence with citizens’ expectation. Measuring service quality is a complex activity because of the contextual client presence in services delivery. In particular, different kinds of features can be surveyed to get a service state of art such as measurable characteristics (i.e. timing, cost and price, mistakes and production), observable behaviour and attitude (i.e. customer and personnel behaviour), etc. Achievement of process effectiveness and efficiency in services has become a crucial competitive factor. To this aim it is necessary to implement a systematic approach to measure, monitor and control process performance. To measure process performance is functional to develop continuous improvement and it is the most important step to build knowledge. Every organization should be able to monitor process quality in order to keep it under control and intervene if necessary. Additionally, according to continuous improvement and as suggested by the Deming cycle (Plan, do, check, act), an organization has to plan data collection and analysis to measure process output quality. In this way, useful information can be gathered helping to suggest favouring process performance improvement.

Decisions should not rely on decision-maker subject matter knowledge only but should take into account all the available evidence about the process of interest, in order to have a clear, objective and possibly complete picture of the organization. Evidence-based decision is a methodological approach and it is a paradigm of Total Quality Management. Statistical methods can help management developing continuous improvement and obtaining competitive advantage. So, the change from an “impression thinking” to a “statistical thinking” is a key factor for strategic decision-making. Statistical data analysis has the aim to extract the greatest informative contribute from data that has to be coherent with the aim of data gathering. As a first step, data analysis can highlight eventual process critical areas; their possible causes can then be identified by means of more advanced statistical techniques. It is useful to measure the trouble impact on general process performance and to develop potential solution for problem solving. So, decisions effectiveness is achieved taking into consideration data, statistical analysis and logical reading.

The quality statistical tools to monitor and control processes, in TQM represent a valid and well established help for managing; nevertheless they are not exhaustive. Among them, cause-and-effect diagram is a pictorial representation of the relations between an effect, say a quality...
aspect, and its possible causes (an example is shown in Figure 1). The diagram in constituted by: a straight directed line pointing towards the effect of interest; oblique lines linked to the straight horizontal line (also called “fish-bones”) representing the possible direct causes; short lines, connected to the oblique one, representing possible indirect causes.

![Causal-end-effect diagram](image)

**Figure 1:** A causal-end-effect diagram

The cause-and-effect diagram provides a qualitative eventually redundant graphical scheme of the effect generating process. This diagram is also a fundamental managerial tool that can become a strategic and decision supporting tool if the statistical (direct and indirect) dependencies between potential causes and the effect are appropriately measured and verified. So, it could be possible to select those causes that actually affect the quality aspect. In this way a corrective action could be easily proposed, by intervening on the factor(s) that more strongly determines the effect.

Here, we propose to use a particular multivariate statistical model, the Probabilistic Expert System (PES henceforth, see Cowell et al. (1999)), as a statistical pruned version of the cause-and-effect diagram. Pruning is performed by eliminating all those possible causes that do not result as actually affecting the quality aspect of interest and that therefore should not be taken into account in planning improvement strategies. Thanks to the graphical representation, a PES is also a structured and an easy tool to be interpreted. Therefore, we believe it is an appropriate instrument to model and manage complex aspects such as customer satisfaction.

**Survey of customer satisfaction with questionnaire**

Data useful for quality improvement can have different sources such as process markers, performance results, people surveys, customer satisfaction surveys, audit, etc.

In particular, customer satisfaction analysis is a strategic methodological approach that, combined with process efficacy and efficiency, can increase competitiveness by enabling process simplification and continuous improvement (if carried out systematically). Customers express their opinion about general and aspect-specific quality perception level.

Actually, also public organization has to systematically plan and conduct citizens’ satisfaction surveys in order to get feedback about the delivered service and suggestions for future improvements. Hence, citizens’ satisfaction survey represents an input to start process improvement and to increase competitiveness in the country system. According to the methodology used to survey satisfaction, we can extract two different kinds of information:
on quantity if a questionnaire is submitted to a sample of citizens; on quality if deepen interviews or focus groups are used. Here, we consider questionnaire based surveys. This kind of survey has to follow an accurate plan in relation to quality drivers’ identification, method and scaling choice, kind of administration, sampling design and statistical techniques for data analysis.

Usually, a questionnaire is composed by a set of items that could be organized in dimensions (multi-item scale) or simple (single-item scale). Once data are collected, they must be organized in a database where variables correspond to items (and are represented in columns) and observations are the interviewed people (i.e. the sampled units and are represented by row).

In addition, we deal with following steps that an organization should carry out in order to acquire information from a dataset.

**Statistical data analysis**

Statistical analysis usually starts with basic descriptions of the surveyed phenomenon and is then carried out by using more sophisticated methods particularly suitable to investigate the problem at hand. Descriptive statistic is used to get an initial representation of the main features of our data and helps the analyst decide further more specific techniques to be used.

In customer satisfaction analysis average rates relative to the different items of the questionnaire are generally computed at first. Although the information provided by the average is very important, it is only partial being relative to each variable central tendency only.

For instance, consider a customer satisfaction survey, based on a seven level scale (where 1 is the lowest and 7 the highest rate). Suppose (for illustrative purposes) also that the average of a specific item is computed and is equal to 5. At a first sight we could conclude that there is a good satisfaction level with respect to the analysed aspect. However, this value could result from either rather homogenous opinions (all rates around 4, 5 and 6) or heterogeneous opinions (all possible rates having been used). Therefore we cannot make any conclusion on the basis of the average only. Variability must be taken into account and measured as well. Data variability could be interpreted easily: not much variability stands for a homogeneous opinion perception, while much variability says that there are a lot of improvement queries and corrective actions are essential. In services quality framework, variability measurement gives a first idea of quality perception heterogeneity and therefore of the improving margins. Variability reduction becomes in this way an important and strategic task and in this sense it is crucial to understand and explain the possible sources of it.

When a phenomenon is complex due to the large number of different aspects defining it, a complete and clear picture can be obtained by studying the relation structure among the various aspects. Customer satisfaction is a complex variable. To measure it several items, assumed to be elements defining satisfaction, are observed on a sample, often together with the overall satisfaction. In order to understand as much as possible the generating process of citizen satisfaction, it can be important to properly model the dependency structure among the items. This gives important insights about both the variability of the items and their eventual (direct or indirect) influence on the overall satisfaction variable. Probabilistic expert systems are statistical models able to represent the dependence relation structure among variables. They can be estimated (learned) on the basis of a sample of data (in our case, the customer satisfaction questionnaires). Once the model (i.e. the PES) is estimated, we have a model helping to transform all the information collected from the interviewed citizens into a
knowledge-based machine that, by means of computationally efficient propagation algorithms, can be also used as support to take decisions.

Before seeing how PES can be applied to customer satisfaction analysis, we introduce some basic elements of graph and probabilistic expert systems.

**Basics on probabilistic expert systems**

PES belong the family of multivariate statistical models, namely graphical models (see Lauritzen, 1996) using graphs to represent statistical dependencies among variables. The graphical representation allows an easy and straightforward statistical model interpretation; therefore it facilitates communication and interaction among experts with different backgrounds. Graphical models verify many important and useful properties; among them modularity enabling complex problem specification by a combination of simpler subproblems (with no information loss).

A graph \( G \) is a pair \( G=(V, E) \), where \( V \) is a finite set of nodes or vertices and \( E \) is a subset of the set \( V \times V \) of ordered pairs of different nodes. In the graphical model framework, nodes represent the variables of interest and links (edges) between nodes represent conditional dependence relations among the variables.

The edges of a graph can be of two different types: directed, represented by arrows; undirected, represented by lines. A graph having only undirected edges is called *undirected* graph; a graph with directed edges is called *directed* graph. An example of both types of graphs is in Figure 2 below. PES are graphical models based on graphs with directed edges; therefore from now on we focus attention on directed graphs only. For definitions and properties of undirected graphs the reader can see Lauritzen (1996).

**Figure 2**: examples of a) a directed graph; b) an undirected graph

Consider Figure 2a) and an arrow connecting two nodes, say 1 and 3, pointing from 1 to 3. We say that 1 is a *parent* of 3 and that 3 is a *child* of 1. Vertices with no parents (1, 2 and 4 in Figure 2a)) are called founder nodes or roots of the graph (network). A sequence of distinct nodes connected by an arrow called a *path*. Two nodes linked by a path are said connected: in Figure 2a) for example 1 and 5 are connected by a path constituted by two edges, 1→3 and 3→5. When two nodes are connected by a path whose edges have the same direction, the path is said to be directed (or direction preserving); path from 1 to 5 is an example. When a path allows to start from a node and to go back to it following the direction of edges, is named a cycle. An example of graph containing a cycle is given in Figure 3 below, where the cycle involves the vertices 2, 3, 5 and 4.
Notice that the network a) in Figure 2 does not contain any cycles. A directed graph with no cycles in called directed acyclic graph (from now on DAG).

A crucial point in the use of graphical models is the possibility to describe and to read independencies (marginal and conditional) from the graph itself. The absence of an edge between two nodes (variables) might be read as a conditional independence statement. For example in Figure 2a) we see that nodes 2 and 5 are separated by the remaining nodes (in particular to go from node 2 to node 5 it is necessary to pass by node 3). In this case we can conclude that variables 2 and 5 are independent conditionally on variable 3 (i.e. when we know the observed value of variable 3, variable 2 becomes uninformative for variable 5). In general in a graph configuration such as $x \rightarrow y \rightarrow z$, we have that variables $x$ and $z$ are independent given $y$. As another, consider nodes 5 and 6 in Figure 2a); they are separated by node 4 and therefore they are independent conditionally on 4 (i.e. when variable 4 is observed, variable 5 becomes irrelevant for variable 6 and vice versa). In general in a graph configuration such as $x \leftarrow y \rightarrow z$, we have that variables $x$ and $z$ are independent given $y$.

Differently, if we consider nodes 1 and 2 of graph a) of Figure 2, they are not independent given node 3 (i.e. having information about variable 3 makes its two parents, variable 1 and 2, dependent). In general in a graph configuration such as $x \rightarrow y \leftarrow z$, we have that variables $x$ and $z$ are dependent given $y$.

Two equivalent methods have been proposed to verify whether an arrow missing between two variables denotes independence between them conditionally on all the other variables (nodes) of the graph:

- d-separation (Pearl, 1986) based on the analysis of all the possible paths connecting two unlinked nodes
- an approach based on construction of the moral graph (Frydenberg and Lauritzen, 1989).

For a detailed and rigorous account on this, refer to Lauritzen (1996).

PES combine features of graph theory and probability theory. They are, in fact, formed by two parts: a knowledge base and the inference engine. The knowledge base is represented by a DAG, i.e. the network and its conditional distributions; the inference engine provides efficient algorithms for processing and propagating partial and fragmentary evidences (information) through the network. Given a network, each variable (node), say $X$, is associated with the conditional probability distribution of the variable given its parents $p(X | pa(X))$ where $pa(X)$ denotes the parent set of variable $X$, i.e. the set of nodes connected to $X$ by an arrow pointing from them to $X$. If $X$ is a founder, then it is associated with its marginal probability. It is possible to factorise the joint probability distribution according to the graph as follows

$$p(V) = \prod_{X \in V} p(X \mid pa(X))$$
For the DAG in Figure 2 we have:

\[ p(V) = p(1) p(2) p(3|1,2) p(4) p(5|3,4) p(6) \]

When willing to use PES, we first have to learn the network. This can be built a “causal” network by the experts of the problem of interest. In this case, the construction can be an intensive and complex task to perform. The network can be also learnt directly from data. Efficient algorithms have been proposed: some of these are supported by a constraint-based approach, and others by a score and search approach (for details see Cooper et al., 1992).

For our application we have used the software Hugin (www.hugin.com) that performs two kinds of PC-algorithm (Spirtes et al., 2001). As implemented in Hugin, the PC-algorithm also allows to learn a graphical structure from data once dependence/independence constraints have been fixed for the variables of interest.

**Improving service quality with PES**

We can now see how PES can be applied to the problem of improving service quality.

In 2004, the Italian Department of the Treasury, in cooperation with University of Roma Tre, carried out a research project with the aim of testing the Common Assessment Framework (CAF-www.eipa.eu) in local offices of four Italian regions (Lombardia, Sardegna, Veneto, Lazio) representing the study panel. In this research, information was then given to us about aggregated data from a citizens’ satisfaction survey carried out in 2004. The citizens’ opinions were collected using a questionnaire organized in dimensions and items with a five level scale going from 1 (very low satisfaction) to 5 (very high satisfaction). The questionnaire investigated the following areas:

- **Tangible aspects:** facility to get information in the office, external signs clarity, office hours adequacy, cleanliness and comfort of the premises.
- **Functionality:** internal signs clarity; clarity of the necessary steps to use the services; ease of accessibility to services; waiting time; answers clarity; answers correctness; answers completeness; answers quickness.
- **Relationships:** staff courtesy; staff competency; staff willingness
- **Overall satisfaction**
From a qualitative viewpoint, we represented relations between the quality drivers (the causes) and overall satisfaction (the effect) by a cause-and-effect diagram (see Figure 4).

This tool was also very useful to represent dimensions and items of the questionnaire. Here we probabilistic expert system in order to derive a quantitative pruned version of the diagram in Figure 4. There are several reasons why we think this statistical model can help in quality improvement framework:

- PES representative structure is similar to that of cause and effect diagrams. Therefore they are easy to be interpreted;
- they summarise subject-matter knowledge and data derived information (different contributions merge can be done both when learning the relation structure and, eventually, when assigning the conditional distribution to the variables);
- they allow using easy and computationally efficient algorithms for evidence propagation. This means that various possible improvement scenarios can be easily simulated and evaluated.

We were given aggregated data for each questionnaire item and for the overall satisfaction. The aggregation level was that of local offices. The sample is made up of 124 local offices belonging to the study panel. For each variable we had the average of the grades of the interviewed citizens.

The average rates have then been divided in the following four classes:

- 1.00-2.99=class 1;
- 3.00-3.49=class 2;
- 3.50-3.99=class 3;
- 4.00-5.00=class 4.

Figure 4: The cause-and-effect diagram for a citizens’ satisfaction survey
The dependence relations in the network were learnt directly from our data using the PC algorithm\(^1\). Some constraint have been fixed to forbid eventual illogical link directions between variables: in particular edges oriented from the overall satisfaction to any of the other variable were forbidden.

The network in Figure 5 represents the learnt dependence structure.

\[\text{Figure 5: The network structure for citizens' satisfaction}\]

We can see that “overall satisfaction” has three direct causes, dark coloured in the graph, (“staff courtesy”, “answers quickness” and “answer completeness”) and several indirect causes. Following the paths (not necessarily according to the arrows directions) of the graph we can have an idea of the way the overall satisfaction judgement is generated in the citizens’ mind. For example we see that “ease of accessibility to services” is an indirect cause of overall satisfaction since is linked to it by two paths (one going via “answer completeness” and the other via “clarity of the necessary steps to use the services” and “external signs clarity”).

Before simulating any possible action, the marginal probability tables associated to the nodes are shown in Figure 6. The node tables show, for each variable (item), the percentage of local

\(^1\) We implemented the algorithm using a significance level \(\alpha = 0.05\).
offices that got the different possible rates. This information is the base to start, simulate and eventually implement improvement actions.

Figure 6: The node tables as observed in the sample, i.e. before simulating any improvement action.

If we simulate an improvement action on a variable we can obtain in a mouse-click time, by evidence propagation, the estimate of its impact on the overall satisfaction. For instance suppose that 100% of local offices obtain the highest mark for “quickness of answers”. We can insert this evidence in the network by double clicking on state 4 of “quickness of answers” (see Figure 7). The evidence is then propagated in the network and the probability tables of the variables are modified according to it.
Figure 7: The node tables according to a specific improvement scenario involving a direct “cause” of the overall satisfaction

Therefore we see that if we implement an improvement action increasing the satisfaction level with respect to the “quickness of answers”, the percentage of offices that have the highest mark in overall satisfaction raises from 26.36% to 79.12%. So, we are able to know improvement margins of a possible action. We can also simulate interventions on indirect causes. For instance, we can imagine to intervene on the variable “clarity of the necessary steps to use the service”. We can simulate that 100% of local offices obtain the highest mark with respect to this item. This means that evidence can be inserted and after propagation we find that the percentage of office having the highest mark for overall satisfaction goes from 26.36% to 79.30% (see Figure 8).
Figure 8: The table nodes after the improved action on an undirected cause

Conclusions

The aim of this paper is to verify PES effective potentiality in quality management. PES can be considered as an innovative and valid way to orient strategic decisions. We presented the results of an experimental application of PES to a citizens’ satisfaction survey.

In the application we identified the key factors that have an impact on overall satisfaction, suggesting potential improvement areas in processes. In particular, using the information enclosed in PES and the know-how concerning the organization, the decision-maker can take decisions supported by a scientific and objective tool. The results of this experiment showed that probabilistic expert systems are a promising for service improvement analysis, considering customer perceptions. However, it is necessary to verify how a customer satisfaction survey and its questionnaire have to be appropriately planned and designed in order to analysed the collected data by means of PES.
References

THE RELATIONSHIP BETWEEN CUSTOMER SATISFACTION AND CUSTOMER LOYALTY: AN EMPIRICAL RESEARCH

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Introduction

The objective of this work is to demonstrate how customer loyalty depends essentially, although not exclusively, by customer satisfaction. The customer satisfaction has been defined over time as a self-discipline management and a style of behaviour that characterises the firm1, and has a strategic choices for any enterprise. Customer satisfaction is generally associated with positive economic performance and higher levels of productivity2, the customer satisfied is probably the best indicator for estimating future revenue3. It is moving from the concept of customer satisfaction to the more advanced customer loyalty, which identifies a relationship between the customer and enterprise enriched by reciprocity, supported by perceptions of equity and fairness and inborn by cooperative attitudes4.

Satisfaction and loyalty are characterized by many differences: the satisfaction is a state of mind, fidelity is a behaviour. The satisfied customers can make purchases by competitors and not feel uniquely linked to a company; faithful customers assign a priority in the purchase and in relationships with a company according to a specific brand or brands and are often willing to pay a differential to continue purchasing goods and services of that company.

Oliver (1997 and 1999) has defined the customer loyalty as a condition of strong involvement to repurchase, or reuse of a product or a brand. The transition from customer satisfaction to customer loyalty is not granted, although there is a substantial agreement in the literature that customer satisfaction is the antecedent of trust and fidelity. Consumers can be met more easily consumers faithful (Bloomer and Kasper, 1997).

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Numerous studies have verified a very strong relationship between customer satisfaction and customer loyalty.5 This work focuses mainly on the relationship between customer satisfaction and customer loyalty, in particular, it assumes a relationship of dependency direct customer loyalty by customer satisfaction.

On this relationship can also affect other variables, among them a significant role could be represented by personal customer characteristics. In this respect the tension loyalty is already present in the customer behaviour and also intrinsic characteristics.

Then, using appropriate methods of research, it would be possible to identify a customers profile (target) of already potentially faithful. The validation of this assertion is one of the objectives of empirical research. The relationship between customer satisfaction and customer loyalty may also be supported by variables related to quality.

Quality, in its various connotations, is an essential element contributing to compete for value creation. The concept of quality can not be separated, both theoretical than the satisfaction of persons, with regard to personnel, customers and more generally to the stakeholders. It is possible that a company is oriented to the quality if the staff is unhappy and does not work with serenity and motivation, or if the customer is not satisfied and constantly delighted by the product they are buying or the service they receive.

A management model based on the TQM principles and methods and oriented to the value creation, can not, therefore, from a full and absolute sharing the principles of customer satisfaction, which increasingly is identified with quality in a customer oriented vision, in essence, the product or service positive perception can not irrespective of quality.8

Quality methods, techniques and tools should steer the efforts towards customer satisfaction, which then lead to loyalty. In this work also wants to validate the approach that, even if indirectly, there is a relationship between mediated factors of quality and customer loyalty. In order to verify as defined in the working hypothesis was conducted an empirical investigation through the administration of a questionnaire research to a sample of customers of a company operating in the services sector.

The research was conducted at a hypermarket of large retailers, identified for the characteristics of hypotheses made in this work; in the study must also be given the peculiarities that characterize the provision of a service from the product sale (immateriality immediacy between supply and performance, importance of relational aspects). Have been identified on the basis of existing literature, some variables (services, product and structure) of quality, and were measured the customer satisfaction, both in general terms with reference to individual variables, and customer loyalty.

The scale of measurement used is a Likert scale type with arrangements from 1 to 6, where 6 expresses the greatest positive assessment (fully satisfied) and 1 negative (no satisfied). The questionnaire is divided into three main areas:

The first contains information on socio-demographic and behaviour of the customer (needed to identify the personal characteristics of customers);

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5 Colgate and Stewart, 1998; Hocutt, 1998; Patterson and Spreng, 1997; Bloemer and Kasper, 1995; Mittal and Lassar, 1998; Oliver, 1999
The second is refer to specific satisfaction and service quality, with reference to the structure (logistics and internal organisation of individual wards, provision of products, cleanliness of wards…), services (personnel department, personnel all 'After-sales service, efficiency of boxes, visibility of prices…) and products (determinants for the purchase of products, assortment of brands and products…)

The third concerns the general measurement of customer satisfaction and loyalty, and is composed of 8 questions about motivation and the duration of the relationship with the company and level of satisfaction overall relationship with the hypermarket.

Overall, the questionnaire includes 54 questions to answer closed; 5 of these variable measure customer satisfaction, the customer loyalty 4 and 7 factors of quality, the others are for general information and other questions about products and services. The questionnaire was administered to a sample of customers who were interviewed during an entire week from Tuesday to Saturday, at various times in order to have a sufficiently large sample, and representative extended guest of the hypermarket.

Have been collected 534 interviews, of which 282 to customers members, eligible for special conditions (card purchases, offers and other facilities) on the basis of which were compiled and analysed the data collected.

Analysis of results

The results analysis of empirical was carried out using some statistical indicators simpler, as the mean and standard deviance, and other more complex as the correlation and multiple linear regression. The calculations were performed using the statistical programme "STATA Statistics/Data Analysis."

The analysis was first taken into account the evaluation of customer satisfaction and the relationship between customer satisfaction and customer loyalty and for this purpose were reduced the number of comments from 534 to 285, since the questions about customer loyalty were asked only to hypermarket customers members.

The abnormal distribution of frequencies were appropriately treated in order to avoid that could affect the validity of the results.

The values of customer satisfaction and customer loyalty resulting from responses (tab.1) are high, in particular the provision known guest to a positive word-of mouth, one of the most important indicators for measuring customer loyalty. The values of deviance standard proof of a substantial uniformity of results.
The correlation analysis between customer satisfaction and customer loyalty variables (table 2) highlights an excellent level of interdependence, demonstrating how the customer satisfaction, is a factor that will significantly impact on customer loyalty.

The relationship between customer satisfaction and customer loyalty was also analysed through regression analysis, assuming that one of two variables, in this case the customer satisfaction, take predetermined values and considering the other, customer loyalty, an official from the first.

Leading the analysis separately on both questions that measure customer loyalty (Table 3 and 4) and indicators of customer satisfaction we see that the values that assume the regression coefficients allow to affirm the existence of a predictive value of variables customer satisfaction on the variables of customer loyalty. The significance of slope is validated by the study of the test from the F and determination.
The validation of the regression analysis in explaining the variability of customer loyalty through customer satisfaction is given to the Adj R-Squared (0 ≤ R² ≤ 1); the value that the index of determination takes into tab. 3 and 4 can say that 49% (in the first case) and 41% (in the second case) the variability of total customer loyalty can explain through the linear relationship with the variables of customer satisfaction.

The important and significant effect that the satisfaction variables have on loyalty allows you to validate, one of our original hypothesis, namely that the level of fidelity is dependent on the level of satisfaction.

The only variable that produces a less significant effect on fidelity, as part of the model, is the satisfaction compared of the hypermarket ability to respond adequately and efficiently to the customers needs. The reasons for this result may be different, first of all different perceptions of each customer in respect to the expectations.

There were then analysed the relationship between customer loyalty and level of quality perceived by the customer in respect of certain parameters, in order to demonstrate how the relationship between customer satisfaction and customer loyalty can be supported by variable quality. The quality factors analysed in research, on the basis of experience, literature and the specific context of reference, are identified in the parameters of structure, services and products.

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</table>
The analysis of the average values of quality indicators (tab.5) highlights positive evaluations, although not full satisfaction if we consider the factor services, for which the score is positioned just above the average. The values of standard deviation show a substantial homogeneity of answers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>285</td>
<td>4.97</td>
<td>0.99</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Services</td>
<td>285</td>
<td>3.92</td>
<td>0.71</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Products</td>
<td>285</td>
<td>4.47</td>
<td>0.84</td>
<td>1</td>
<td>6</td>
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<tr>
<td>Member satisfaction status</td>
<td>285</td>
<td>4.81</td>
<td>1.25</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Client attitude to the on a positive word-of mouth</td>
<td>285</td>
<td>5.00</td>
<td>1.22</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

The correlation analysis between quality indicators and customer loyalty (tab.6) shows the existence a significant interdependence. The link is stronger for the variable products, and this may depend on whether the customer become loyalty in the first place to one or more specific categories of products or brands and this leads to high rates of repurchase and identification of the specific product as reference, in essence, the presence of products of customer satisfaction plays a key role in loyalty.

<table>
<thead>
<tr>
<th>Member satisfaction status</th>
<th>Client attitude to the on a positive word-of mouth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>0.38</td>
</tr>
<tr>
<td>Services</td>
<td>0.25</td>
</tr>
<tr>
<td>Products</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The correlation analysis between quality indicators and customer loyalty (tab.6) shows the existence a significant interdependence. The link is stronger for the variable products, and this may depend on whether the customer become loyalty in the first place to one or more specific categories of products or brands and this leads to high rates of repurchase and identification of the specific product as reference, in essence, the presence of products of customer satisfaction plays a key role in loyalty.

| Coef. | t  | P>|t| |
|-------|----|-----|
| Constant | 0.512 | 1.09 | 0.274 |
| Structure | 0.265 | 3.64 | 0.000 |
| Services | 0.221 | 2.35 | 0.019 |
| Products | 0.483 | 5.57 | 0.000 |

Observations number: 285
Adj R-Squared =0.25
Test F = 32.64
The regression analysis can help to understand the existence of a relationship of dependency between customer loyalty and quality indicators and the role of the latter in customer loyalty alongside customer satisfaction.

The results obtained from the model (Table 7 and 8) demonstrate the existence of a relationship between customer loyalty and quality indicators that can say that loyalty may depend also on the quality, which thus plays an important role in strengthen loyalty. As already revealed through analysis of correlation in this case services show a level of dependency lowest compared with other quality parameters.

The last phase of the analysis is focused on the customer fully satisfied profile, that can help locate a target with characteristics similar compared to the satisfaction condition. Theoretically, the repetition of regression on this small sample of individuals satisfied should demonstrate the existence of a dependency higher than general analysis conducted on all customers.

Using the methodology “AID”9 and taking into account the variables sex (F, F), age, occupation, number of customers (every day or almost, 3-4 times a week, 1-2 times a week, 2-3 times per month, 1 time per month, less than 1 time per month, rarely, only for deals), was calculated the value discriminating, separating classes with the proportion of satisfied customers (p1) above average (p = 0.821) than those with proportion (p2) below the consumer. The value discriminating higher you for Female Sex factor, so the first dichotomy is established under it (the first iteration).

### TABLE 8: regression model between the independent variables related to quality indicators and the dependent variable customer loyalty on client attitude to the a positive word-of-mouth

|                  | Coef. | t    | P>|t| |
|------------------|-------|------|------|
| Constant         | 1.596 | 3.28 | 0.001|
| Structure        | 0.335 | 4.45 | 0.000|
| Services         | 0.186 | 1.91 | 0.058|
| Products         | 0.231 | 2.57 | 0.011|
| Observations number: 285 | Adj R-Squared = 0.16 | Test F = 19.21 |

---

9 The methodology "AID" allows, on the basis of variables considered to identify the values of most importance discriminate on the basis of which stratify the sample to obtain a clear and accurate profile of typical customer.
<table>
<thead>
<tr>
<th>Factors and Conditions</th>
<th>Classes size</th>
<th>Number members</th>
<th>% Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Sex</td>
<td>M</td>
<td>97</td>
<td>73</td>
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<td>F</td>
<td>188</td>
<td>161</td>
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<td>285</td>
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<td>Age</td>
<td>min 18</td>
<td>16</td>
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<td>18-25</td>
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<td>Frequency</td>
<td>Every day</td>
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<td>3-4 times a week</td>
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<td></td>
<td>1-2 times a week</td>
<td>135</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>2-3 times a month</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>1 time a month</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>less than a 1 months</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Tenders</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>285</td>
<td>234</td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td>Student</td>
<td>62</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>66</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>Worker</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Housewife</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Entrepreneur</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Craftsman</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Pensioner</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>44</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>285</td>
<td>234</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 10: mean values and standard deviation for quality indicators and customer loyalty of the typical customer satisfied

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>46</td>
<td>5.37</td>
<td>0.67</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Services</td>
<td>47</td>
<td>3.91</td>
<td>0.68</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Products</td>
<td>48</td>
<td>4.50</td>
<td>0.68</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Member satisfaction status</td>
<td>44</td>
<td>5.34</td>
<td>0.74</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Client attitude to the on a positive word-of mouth</td>
<td>48</td>
<td>5.27</td>
<td>0.98</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Repeating the process five times and always using the value discriminating higher, is shaping up as a profile of the customer with the following characteristics:

Woman
Age between 34-41 and 50-57 years
Attended the hypermarket 1-2 times a week
Occupation: employed, housewives.

The analysis on the quality parameters and satisfaction (tab.10) for this small group shows all values significantly higher than those obtained from the sample and demonstrates how the technique AID has been effective in identifying a profile of customers, and its characteristics, particularly satisfied.

TABLE 11: correlation between variables customer loyalty and quality indicators, customer profile type fully satisfied (Obs=48).

<table>
<thead>
<tr>
<th></th>
<th>Member satisfaction status</th>
<th>Client attitude to the on a positive word-of mouth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>0.21</td>
<td>0.16</td>
</tr>
<tr>
<td>Services</td>
<td>0.13</td>
<td>-0.01</td>
</tr>
<tr>
<td>Products</td>
<td>0.46</td>
<td>0.27</td>
</tr>
</tbody>
</table>

The correlation analysis based on these observations, however, does not lead either to the same results nor to the same conclusions as that made with the total sample (tab.6); same evaluations also apply to the regression analysis that does not produce significant results, not confirming therefore one of the assumptions made, namely the fidelity dependence of personal characteristics of the customer.

Even using as a dependent variable factors quality (tab.12), the model does seem to confirm the results obtained with the sample general (tab.6); among all factors of quality, the only one capable of producing an effect really significant variable on customer loyalty is one relating to products, as indeed already occurred in the overall data.
Conclusion

The research confirms the existence of a meaningful link dependency customer loyalty by customer satisfaction, loyalty depends therefore a certain level of satisfaction in the absence of which the customer could hardly reach the condition of full fidelity. Research has also demonstrated how the variable quality can generate a significant effect of strengthening the level of customer loyalty. The analysis starting from the definition of a target of "typical customer satisfied" highlights the lack of factors that can connect in a meaningful way to the characteristics identified customer loyalty.

While therefore seems now ample evidence that loyalty depends, at least in part, by customer satisfaction, does not seem to exist a direct dependence of fidelity by personal characteristics. Or rather, there is no dependence on characteristics of customer socio-demographics (age, sex) or behavioural (motivations and methods of purchase), which are those developed in our work and proposals in the questionnaire. It is likely to exert a much more meaningful role in the report factors emotional and psychological character, hardly measurable, identifiable, because each customer's own and not easily reproducible in conceptual schemes homogeneous.

Moreover, several studies show the importance of emotional component on customer satisfaction, and indicate how this component is an element of predictive customer loyalty. It is on these issues that probably research should focus in the future, to identify what factors can play a decisive role for the loyalty of the customer, and therefore for the same economic prospects.

References


| TABLE 12: regression model between the independent variables related to quality indicators and the dependent variable customer loyalty, customer profile fully satisfied type. |
|-----------------|---|---|
| Coef. | t  | P>|t| |
| Constant | 0.93 | 0.68 | 0.502 |
| Structure | 0.09 | 0.50 | 0.619 |
| Services | 0.11 | 0.54 | 0.595 |
| Products | 0.72 | 3.05 | 0.004 |
| Observations number: 48 | Adj R-Squared=0.17 | Test F = 4.20 |
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IDENTIFICATION OF PROCESSES – CRITICAL REVIEW OF DIFFERENT APPROACHES

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Key words: Business process, identification of processes, process approach.

1. INTRODUCTION

Every business system should base its entire work, operation and sustainable development on systematic and process approach. That, among the rest, implies adequate structure of business system, functional dependency and correlation of all elements of business structure, good definition of external and internal inputs and outputs, fully recognized processes and well defined process model, resource backup, good backbone for managing processes, resources and organizational units, ond so on.

Systematic and process approach is necessary for efficient functioning of business system, as well as for arranging and developing the system. This, above all, refers to:

- definition of mission, vision and measurable business goals,
- consolidation of business programs and plans,
- determination of external and internal working objects (services and products), on the grounds of „DISTRIBUTOR-CUSTOMER“ model,
- process identification and classification according to „rigid“ structure (anatomical parts of business system),
- hierarchical decomposition of processes, as well as design of process model and process catalogue,
- revision and improvement (if necessary) of current organizational structure, with the strong accent on business processes,
- correlation of process model with organizational structure and creation of process registers for every part of the organization (sectors, plants, departments, ...),
- definition of responsibilities for processes (functional, managerial, process owners, ...),
- creation of prerequisites for continuous and systematic process revision and improvement (creating teams and educating them),
- creation of prerequisites for process arrangement (organizational, functional and managerial integration and correlation of processes, personal responsibilities, working instructions, control, ...),
- creation of fundamental principles for easy and efficient process management (performance and measurable goals, process indicators, reference black level data, ways of representing process indicators, frequency of reports, frequency and the way of revision, ...),
- determination of appropriate process management control.

Application of process approach, and especially the way that business processes are identified in business systems, can be considered an open question. Several different approaches to process identification were developed in last few decades, but we still don’t have unique and generally accepted way of process identification and process model design. It is a known fact...
that around 70% of Business Process Reingeneering (BPR) projects were unsuccessful. There are several reasons for that, but one of the basic reasons is poor business process identification and classification. The main reason for poor process identification is omiting the work object identification, as well as trying to attach poorly identified processes to variable organizational structure.

Approaches to business process identification that authors considered important will be presented in this paper. After that, analysis based on four criteria will be performed. At the end, the conclusion will be given, as well as suggestions for further research.

2. DIFFERENT APPROACHES TO BUSINESS PROCESS IDENTIFICATION

2.1 “Bottom-up” approach by grouping activities according to information flow and shared resources

Processes that are specific for a given company can be identified through a bottom-up approach. This can be achieved by focusing on individual activities within the company, and grouping these activities according to the level and criticality of interaction between the activities. [2]

This approach is analogous to Murther’s systematic layout planning (SLP), which analyses interrelationships between the processes through analysis of the frequency of material movement between individual processes. Murther suggested usage of matrix which contains processes and their interrelationships. Closely coupled processes are identified based on the frequency of material flow, and they form production cell.

Analogy is as follows: production process is observed as a production cell, and closely coupled processes (that constitute production cell) are activities of the observed process (or subprocesses). Instead of material flow frequency (which was criteria for grouping closely coupled processes), information flow frequency is primarily used as a criterion for grouping the activities that constitute the process. As an addition, shared resources criterion can be used. Besides the aforementioned criteria, time relation and location can be used for grouping the activities. However, these criteria are rarely used in practice, and they won’t be considered in this paper.

Information flow criterion – Information flow between two activities is considered as a key criterion in defining relationship between observed activities. This is because, in operational sense, information (and material, where applicable) flow is the only physical link between activities. Information flow between activities is considered according to frequency and criticality of the information flowing between the activities. The procedure devised to apply the scoring system is as follows: the individual information flows between two activities are identified, and each information flow is evaluated according to its frequency and criticality, and score is allocated. The procedure is repeated for all information, and the average of individual scores is computed to arrive at an overall score. The maximum score allowable for this category is 30 points. (Picture 1.)

Shared resources criterion – Shared resources are resources that are used during the execution of several activities. The shared resources category was deemed to be of secondary importance, based on the fact that activities that constitute business process may or may not use the same resources. To allocate the score in this category the user is expected to evaluate the need for shared resources (people and equipment), and allocate the score. Maximum
possible score is 20 points, and the score is allocated for each resource type based on the following criteria:

- 10 – sharing of resources between two activities is considered to be critical.
- 5 – sharing of resources between two activities is considered to be desirable.
- 1 – sharing of resources between two activities is of no importance.

This approach to business process identification includes the following steps: [2]

1. Identification of business activities
2. Identification of the information flows between business activities
3. Quantification of the relationships between business activities.

![Criteria for evaluation of the relationship between business activities](image)

Figure 1: Criteria for evaluation of the relationship between business activities [2]

Identification of business activities is based on functional division of labour, where representatives of each function are interviewed on the roles and responsibilities of their function. The analyst/researcher is responsible for interpreting each group’s response to business activities associated with that function. This results in a list of business activities for each function of the organization.

Identification of information flows between business activities is done with the aid of matrix. The activities and the corresponding information flows are tabulated to isolate the information flows between one pair of activities.

Having identified the information flows between activities, one further matrix is constructed to cover and facilitate the scoring of both areas (i.e. information flow and shared resources). A total score for information flow is calculated using the formula:

\[
\text{Total score (information flow)} = \frac{\sum (\text{frequency} \times \text{criticality})}{\text{Number of flows}} \quad [2]
\]

The total score for this area is calculated by adding the corresponding scores for human and equipment resources. The greater the final score, the greater the connection between the activities.

Having calculated the final score, the next task is to identify a group of closely coupled activities which could be extracted as a business process. The major problem here is the definition of “closely coupled activities”, i.e. it is not easy to determine which activities belong to which process and where one process ends and another starts.
2.2 Business process identification through Porter’s value chain analysis

To better understand the activities through which a company develops a competitive advantage and creates shareholder value, it is useful to separate the business system into a series of value-generating activities, i.e. to create a value chain [5]. In his book *Competitive advantage*, Porter introduced a generic value chain that comprises a sequence of activities found to be common to a wide range of companies.

The goal of these activities is to offer the customer a level of value that exceeds the cost of the activities, thereby resulting in a profit margin.

The primary value chain activities are: [4]
- Inbound logistics: the receiving and warehousing of raw material, and their distribution to manufacturing as they are required;
- Operations: the process of transforming inputs into finished products and services;
- Outbound logistics: the warehousing and distribution of finished goods;
- Marketing and Sales: the identification of customer needs and the generation of sales;
- Service: the support system to customers after the products and services are sold to them.

These primary activities are supported by the following activities:
- The infrastructure of the company: organizational structure, control system, company culture, etc.;
- Human resource management: employee recruiting, hiring, training, development and compensation;
- Technology development: technology that supports value-creating activities;
- Procurement: purchasing inputs such as materials, supplies and equipment.

The company’s profit margin then depends on its effectiveness in performing value chain activities, so that the amount that the consumer is willing to pay exceeds the cost of the activities in the value chain.

Core processes are usually identified through primary value chain activities, while the supporting processes are represented through supporting activities. Primary and supporting activities can also be observed as a group of processes. In that case, it is necessary to compose a list of subprocesses, which will later be modeled and shown in more details. Workshops are suggested as a solution for further decomposition of processes (or groups of processes). These
workshops include workshop leader, a business process modeler, and a person (or persons) who is familiar with processes in the area that is observed.

2.3 Business process identification through goals of the company

It is a known fact that the number of key business process in a company is not great, and it usually goes somewhere around 12 to 15 processes. Some of these key processes may be generic across the industry that the company is competing in (generally those are the processes that appear along the value chain). On the other hand, there are processes that are specific for the given company which derive from the company’s operation. Prerequisites for good identification of key business processes that are specific for the given company are clearly defined business goals. Suggested framework for business process identification has following steps:

- Identify critical success factors (CSFs) to achieve company’s objective. These are performance drivers which have major contribution towards accomplishment of company’s objectives.
- Identify metrics for measuring the critical success factors – this leads to establishing organizational key performance indicators (KPIs).
- Identify the processes that will deliver the above drivers for performance or KPIs.
- Group related processes and give them names that convey the activity or operation that gets done. These are the key processes of the company.

The above mentioned activities need to be done through a thorough brain storming among the senior level executives of the company.

This approach of business process identification is based on previously defined strategic maps and KPI charts. Strategic maps and KPI charts establish a clear cause and effect relationship between the goals of the company and the performance indicators that have major impact on those goals.

2.4 Identification of business processes through using Structured System Analysis

Structured System Analysis and Design Method (SSADM) is a systems approach to the analysis and design of information systems. SSADM is so called waterfall method (sequential method) in which development is seen as flowing steadily downwards (like a waterfall) through the phases of requirements, analysis, design, implementation, testing (validation), integration and maintenance.

Three most important techniques that are used in SSADM are [6]:

- Logical data modeling: This is the process of identifying, modeling and documenting the data requirements of the system being designed. The data are separated into entities (things about which a business needs to record information) and relationships (the associations between the entities).
- Data flow modeling: This is the process of identifying, modeling and documenting how data moves around an information system. Data flow modeling examines processes (activities that transform data from one form to another), data stores (holding areas for data), external entities (what sends data into a system or receives data from a system) and data flows (routes by which data can flow).
- Entity behaviour modeling: This is process of identifying, modeling and documenting the events that affect each entity and the sequence in which these entities occur.
For the analysis of the current state of the system it is best to use Data Flow Diagram (DFD). DFD is a graphical representation of the flow of data through a system. DFD can also be used for visualization of data processing.

DFD diagram can be designed in two ways: by Top-down approach and by Event partitioning approach [7].

Top-down approach:
- The system designer makes a context level DFD, which shows the interaction (data flows) between the system (represented by one process) and the system environment (represented by terminators).
- The system is decomposed in lower level DFD into a set of processes, data stores and data flows between these processes and data stores.
- Each process is then decomposed into an lower diagram containing its subprocesses.
- This approach then continues on the subsequent subprocesses, until a necessary and sufficient level of detail is reached which is called the primitive process).

This way of constructing DFD is similar to business process decomposition according to IDEF0 standard. Decomposition according to IDEF0 standard is done in three steps: the boundaries of the system are defined through context level diagram; decomposition of system is done by decomposition diagrams; at the end, hierarchical tree of activities is formed that depicts hierarchical representation of process within the system.

Event partitioning approach:
- Detailed DFD is constructed.
- The list of all events is made.
- For each event a process is constructed.
- Each process is linked (with incoming data flow) directly with other processes or via data stores, so that it has enough information to respond to a given event.
- The reaction of each process to a given event is modeled by an outgoing data flow.

It can be observed that this method of constructing DFD is similar to „bottom-up” approach where at the beginning the activities are being identified that are later grouped in processes or groups pf processes.
2.5. Business process identification for to-be modeling

The idea behind this approach is to identify the processes that represent the main activities of the company and to separate them from other processes. In addition to the core processes of the company, which are executed to provide related market performance, so called support processes exist. A characteristic feature of support processes is that they have no direct relationship to the company's external market. However, disturbances in support processes can also lead (after certain amount of time) to disturbances in core processes, and therefore they are indirectly important for delivering products or services of high quality to the customers. Examples of supporting processes are: financial management, humane resource management, or IT services. [1]

According to this approach, the core processes in company must be identified and sufficiently separated from each other as well as from the supporting processes. In principle, two methods can be used: top down and bottom up.

Based on the corporate strategy, the top down method generates core processes from the strategic business fields. The advantage of this method is the development of business processes which are very close to the strategic viewpoints. The hierarchical refinement of process structures may cause a lower overall process performance for local processes. This is particularly the resulting interdependencies between the partial processes are not considered or not recognized1. Often, the reason is the ignorance of conflicting resources within the concurrent processes. [1]

The bottom up method is based on the entirety of all planned activities. For every identified activity, process models are generated, from which the process structures on higher levels are derived through grouping. The business processes are later divided into core and supporting processes. [1]

2.6 Business process identification according to anatomical structure (process model design)

Process approach, defined as a logical group of object defined activities, has its technology. Procedure for application of process approach has its own sequence of activities or subprocesses which are part of a global process “Application of a process approach within the business system”. The structure of the aforementioned process depends on whether a new business system is designed, or if it is a business system that already exists. Common part of the procedure of implementing the process approach is as follows [11]:

1. To make a global structure of a business system.
2. To design a logical model of working objects.
3. To design a logical model of processes.
4. To connect global (anatomical) structure of the observed system with its organizational structure.

---

1 A detailed explanation of the top down method is given by Remme (1997), who deals, in particular, with the modeling of process particles (reference process modules). Individual business processes are created by forming variants from process particles. This topic is further discussed by Scheer (1998), p.7, and Gaitandies (1983), p.23.
5. To arrange (review, improve, re-engineer) processes.
6. To create the basis for process management and integrated management system.

If the aforementioned activities or subprocesses are conducted in an appropriate way in a given business system one can say that the process approach is implemented in that business system.

Process model of a business system is a fundamental solution, foundation of enterprise or institution. Process model is the basis for all other solutions within the business system: organizational structure; detailed division of labour, authorities (competences) and responsibilities; integrated management system; cost control system; IT support etc.. That is why the process model must be designed in accordance to “robust”, anatomical and unchangeable structure of a business system.

Starting with the “DISTRIBUTOR – CUSTOMER” model shown in figure 4, it is necessary to identify the global work object (product or service) of the observed business system that is delivered to the external market, i.e. to the customer.

Figure 4.: “DISTRIBUTOR – CUSTOMER” model, external and internal aspect [11]

In a production business system global work object is a product, and in a service enterprise or institution it is a service. Certain business systems deliver products and services to the market. Having identified global work object, we can identify global process that produces the observed work object. A part of a business system that directly executes the observed process is recognized through this process. This is the part of a business system that refers to CORE BUSINESS of the given system.

This is the way to determine the anatomical part of a business system which is specialized for producing global product and/or rendering global service. If a business system is a system indeed, with all specifications of a system (structure, inputs, outputs, interdependencies, ...), then the part of a system that executes specialized global process is the subsystem of the observed business system. This subsystem, which also has all specifications of a system, is often called “Production”, “Services”, “Production and Services”, “Services and Production”, “Core business”.

If the model “DISTRIBUTOR – CUSTOMER” is observed internally, within the given business system, it is possible to identify other parts of anatomical structure of the business system. Here, global work object, the one that is intended for customers, should be observed and its conditionality from internal services which other parts of business system provide. Certain number of services with universal characteristics are shown here. Without these
services it is impossible to provide the output. These services are universal because every business system has them in one form or another, regardless of core business and the size of the company.

Core business (creating product or rendering service) is meaningless if the product or service can’t be sold, i.e. if there is no customer for certain product/service.

Because of that it is necessary to do a market research, i.e. to render marketing services. Marketing services distributor is also anatomical part of a business system. Since marketing services are very similar (according to technology of rendering) in various business systems, the subsystem MARKETING is a universal part of a business system. In a similar way, core business couldn’t be done without procurement of all things that are necessary for producing a product or rendering a service, so PROCUREMENT can also be seen as a universal part of business system. Everything that is created in core business must be sold by someone, so we can say that SALES is the next universal subsystem. Services of cost determination and analysis, price calculation etc. are internal services of ECONOMICS. Financial services, like payments, claims etc. are done by FINANCES. Without the appropriate human resources and their further development core business can not operate successfully. That’s why HUMAN RESOURCES are also a subsystem of a business system. Delivering prerequisites for respecting all laws, regulations and norms is done by LEGAL DEPARTMENT. At first sight, all of the above mentioned systems are sufficient for business system to operate. However, there must be subsystem that plans, organizes, coordinates and controls operations of all the other subsystems. That subsystem is what we call MANAGEMENT. Since business systems operate in a stochastic environment and are exposed to frequent changes, they must be flexible in order to operate successfully. That’s why business systems must have RESEARCH AND DEVELOPMENT as a necessary backup to core business. As we can see, in most cases business systems consist of 10 anatomical parts, i.e. subsystems.

Certain deviations in a number of subsystems are possible. There are several reasons for that: if a certain international norm requires a specific subsystem, then certain parts of abovementioned subsystems should be separated and integrated within a new subsystem. For example, ISO 9001 norm requires a QUALITY subsystem. In that case, part of the RESEARCH AND DEVELOPMENT subsystem that refers to internal standardization and creation of prerequisites for quality management is attached to quality control thus creating QUALITY subsystem. Because of its great importance, the information support can be extracted from the “standard” subsystems and integrated into IT subsystem. Business systems that use expensive equipment (power plants, oil companies etc.), where maintaining the equipment is vital, must have specialized subsystem designed for that purpose called MAINTENANCE. Maintenance is usually placed within the core business. Number of subsystems can also be lesser that 10, especially in companies in which a universal subsystem is at the same time a specialized subsystem. For example, business system that renders marketing services has its own specialized subsystem that uses the same technology as its universal marketing system. In this case, the number of standard subsystems will be 9. at the end, it should be know that standard anatomical structure exists in every business system regardless of its size and activeness. The only thing that is different is the distribution of subsystems ad the number of executors that render internal services to core business.

Procedure for identification and classification of work object requires application of certain rules and principles. General rules and principles for work object identification and classification are explained in detail in the book “Process engineering” [10].
Logical tree, model or catalog of work object is primarily created in order to conduct the next step of process approach: “business process identification and classification”. They can also be used for planning, preparation and realization of marketing activities. Work object catalog should be transparent, visible and recognizable to every potential customer. With processes, the situation is different. They should be a secret, and the business system has no interest for them to be easily available.

Group of work objects can be uniform. If that is the case, the company has one logical tree with its appropriate hierarchical structure. In counterpart, several work object logical trees exist.

Identified and classified work objects (internal and external) are basis for complete and systematic process identification and classification, for designing process catalogues, logical tree and process model.

In order for identification and classification of processes to be adequate, one should follow these rules and principles [10]:

a) Processes can be precisely and completely identified only on the grounds of appropriately identified, classified, and specified work object of the business system in which the processes are being identified.

b) The biggest (basic, global) processes should be identified first, using the logic that can be recognized in logical tree or work object catalogue.

c) Universality as a very important characteristic should be used as much as possible during the business process identification. That means that every possibility for process identification of universal processes for all products with similar creating technology should be recognized. For example, all services for issuing different types of credits are rendered in a similar way (claim reception, claim processing, making decision, credit realization).

d) Hierarchical decomposition of processes should be done as far as the possibilities and methods for process specification are recognized.

e) Identified processes should be classified at least from the aspect of participation of routine and creative work.

f) Processes are, unlike work object, secret of a business system. They point to advantages and flaws of the observed business system, so this fact must be kept in mind during process identification and utilization.

Starting with the logical model of work object, processes of all subsystems as parts of anatomical structure of business system should be identified.

All process models, arranged within the subsystems, are usually prepared in the form of process catalogue, which usually has following content:

- process record number,
- process code (cipher),
- process name,
- process status, concerning the participation of routine and creative work.

Process model designed in this way represents a base for further use and selective process treatment.
3. COMPARATIVE ANALYSIS OF THE PROCESS IDENTIFICATION APPROACHES

By analyzing the examples from the production and service area, certain differences between the aforementioned process identification methods have been observed. The analysis was conducted according to 4 criteria defined by the authors of this paper:

1. Comprehensiveness of business process identification
2. Autonomy from the form of organization and ownership
3. Possibility of recognition of universal and specialized processes
4. Time needed for process identification

Results of the analysis are as follows:

3.1. „Bottom-up” approach by grouping activities according to information flow and shared resources

1. Comprehensiveness of business process identification – The idea behind this approach is that all the activities that are essential for business operation should be taken into account. However, problems can occur on two levels:
   1. whether all activities will be identified is subjected to representative of each function;
   2. what activities will form a process is subjected to the opinion of the analysts and that makes the identification business processes that are essential for business operation uncertain;
2. Autonomy from the form of organization and ownership – Because identification of the activities is done on the account of functional division of labour, it is clear that derived process model is highly dependent on the form of organization in given company.
3. Possibility of recognition of universal and specialized processes – It is not possible to distinct universal form specialized processes in this model. Because of high dependency from organizational structure it is possible that situation occur where the same universal process in different companies is not recognized and identified in the same way.
4. Time needed for process identification – Because of the absence of the universality principle, as well as high dependency from the form of organization, every company has to start process identification from the white piece of paper. That’s why this approach to business process identification needs a long period of time to be done.

3.2 Business process identification through Porter’s value chain analysis

1. Comprehensiveness of business process identification – The solution derived from this approach is generic, and it differs very little from company to company in the same area of business. Therefore, there is a possibility of misidentifying processes that are specific for a certain company.
2. Autonomy from the form of organization and ownership – Process identification is primarily done based on the type of business of the observed company, so we can say that this approach is independent from the form of organization and type of ownership.
3. Possibility of recognition of universal and specialized processes – This approach is suitable for universal business process identification. However, specialized process identification is not defined enough.
4. Time needed for process identification – Process model derived from this approach is based on universal solutions, so the application of this approach doesn’t require a lot of time.

3.3 Business process identification through goals of the company
1. **Comprehensiveness of business process identification** – This approach uses Porter’s value chain for identification of universal processes, and company goals for identification of specialized processes, and by that this approach highly fulfills this criterion.

2. **Autonomy from the form of organization and ownership** – Process model derived from this approach is dependent from organizational structure and form of ownership to the extent of which the goals of the company are connected to the form of organization and ownership.

3. **Possibility of recognition of universal and specialized processes** – This approach uses different approaches for identifying universal and specialized processes, which means that this criterion is fully satisfied.

4. **Time needed for process identification** – Because this approach is based on universality principle as much as possible, and only specialized processes are studied in details, the procedure is not time demanding.

### 3.4 Identification of business processes through using Structured System Analysis

1. **Comprehensiveness of business process identification** – This approach is not taking into account work object, but only information flows, so there’s a possibility that certain processes are misidentified.

2. **Autonomy from the form of organization and ownership** – Process model derived from this approach is highly dependable from the form of organization because information flows are traced throughout the entire organizational structure.

3. **Possibility of recognition of universal and specialized processes** – This approach is not making a difference between universal and specialized processes.

4. **Time needed for process identification** – Procedure for making process model by using SSA is not time consuming, given the fact that it only takes information flows into account and not work objects.

### 3.5 Business process identification for to-be modeling

1. **Comprehensiveness of business process identification** – This approach refers to designing new conditions of already identified processes so the comprehensiveness of this solution is subjected to the fundamental, original solution of business process identification.

2. **Autonomy from the form of organization and ownership** – Given the fact that the process identification is connected to strategic business areas, and that these areas are subjected to changes with the change of form of organization and ownership, we can say that this solution is dependant from organizational structure and ownership.

3. **Possibility of recognition of universal and specialized processes** – Since core processes are being identified first, and then supporting processes, universal (supporting) and specialized (core) processes can be recognized to some extent. However, since core processes can not be entirely identified with specialized processes and supporting processes can not be entirely identified with universal processes, we can conclude that their distinction is not entirely developed.

4. **Time needed for process identification** – This approach is not time consuming sine it is primarily used for designing new way of performing already identified processes.

### 3.6 Business process identification according to anatomical structure (process model design)
1. **Comprehensiveness of business process identification** – Gratification of this criterion is guaranteed because this approach is based on company’s anatomical structure, and it includes all subsystems of business system (universal and specialized).

2. **Autonomy from the form of organization and ownership** – Process identification is done according to previously identified work objects and is completely independent from the form of organization and ownership.

3. **Possibility of recognition of universal and specialized processes** – Company is observed as a system that consists of several universal and one specialized subsystem, therefore this criterion is fully gratified.

4. **Time needed for process identification** – This approach is relatively time consuming because it takes into account all distinctive features of every business system.

4. **CONCLUSION**

Process model is the basis for process arrangement, implementation of international norms of all kinds, process reviewing and re-engineering, assessing and redesigning organizational structure, creating foundations for process management, integrated management system constitution, and managing of the entire business system. That is what it is important to approach the process model design in a systematic and analytic way.

This paper describes process identification approaches that the authors considered to be important. Comparative analyses of these approaches were conducted based on 4 criteria. The analysis showed that Business process identification according to anatomical structure gratifies most of these criteria. The only problem with this approach (judging by these 4 criteria) is that it is time consuming. Time needed for process identification can be reduced by involving consultants that are experienced with this approach.

In order to get all-round analysis, it is possible to augment (or change) the list of criteria used for evaluation. Furthermore, it is desirable to implement all of the analysed approaches to one example in production or service company, which would make more systematic comparative analysis possible. That would be the direction for further research.

5. **REFERENCES**


PERFORMANCE OF INDUSTRIAL SERVICE SMES:
A CONCEPTUAL FRAMEWORK AND DIAGNOSTIC SYSTEM

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1. Introduction
The advent of globalization, of a knowledge-based economy and of new communication and information technologies has produced an important industrial restructuring in many countries. If unplanned or badly planned, this restructuring may have negative consequences on employment and wealth. In recent years, there has been a massive loss of employment in the manufacturing sector, sector that was always considered to be the economic engine of developed countries (Léo and Philippe, 2006). Manufacturing firms in these countries now face challenges that may be insurmountable for many (Raymond, 2003). For example, the pressure on production costs exerted by Asian firms in many industrial sectors is a phenomenon that keeps growing. This evolution of the role of various actors in the world economy is such that a great part of the manufacturing employment is shifting toward the emerging countries, whereas the developed countries that used to be most industrialized are seeing this employment being replaced by employment in the services sector.

A quick look at historical data shows that the transfer of employment to the new emerging economies and the increase of the services sector in the developed countries are not recent phenomena. The Conference Board of Canada (2004) indicates that as far back as 130 years ago, employment in the developed countries have shifted from the resources sector to the manufacturing sector and then to the services sector. This explains why the percentage of manufacturing employment in Canada and the United States has significantly diminished in the last century. Countries in Southeast Asia are those that are presently benefiting from these structural changes.

Given this new reality, the developed countries must review their policies and adapt their economy (OCDE, 2005). In the specific case of small and medium-sized enterprises (SMEs)1 in the manufacturing sector in these countries, these have no other choice but to modify their operations and development strategy in order to offer a product that is highly differentiated, distinctive and value-added (St-Pierre and Trépanier, 2006). To be able to offer such a product at a competitive price, these SMEs must specialise more and more and externalise activities in which they have less expertise and above all that they cannot realise at low cost.

1 For research purposes, given that there is no internationally-agreed upon definition of manufacturing firms based on size, a manufacturing SME is defined as an enterprise with more than 10 employees and less than 249, to be included within both North American and European definitions. Whereas in North American research, small enterprises (SEs) and medium-sized enterprises (MEs) are generally defined as having respectively less than 100 and 500 employees (cf. Mittlestädt, Harben and Ward, 2003), in the European Union, the definition is rather based on 50 and 250 employees (cf. Kalantaridis, 2004).

In facing this situation, owner-managers of manufacturing SMEs must change their vision of their firm, that is, from that of a “castle” to that of a “network” (Julien, Raymond, Jacob and Abdul-Nour, 2004). The castle metaphor presents the firm as a closed organisation that is self-sufficient and does things in its own way. Whereas the network enterprise is open both internally (collaboration between departments, participative management, etc.) and externally (cooperation with other organisations, business intelligence, etc.) and adopts a customer-centered strategy, where the quality of products is superior and flexibility is increased. Also, the networked enterprise is more specialised and cooperates with other firms that have the knowledge, know-how and resources required to complete its product offer with regard to the activities that are outside its own core competencies.

These characteristics of the new economy for the developed countries place the emphasis on the industrial services sector in its role within the development and competitiveness of the manufacturing sector. This increase in the industrial services sector is particularly important in those highly-industrialised countries where the production costs of manufacturers constitute an obstacle to their growth and even to their survival.

Notwithstanding its growing importance, there is as of yet little knowledge of the specific nature of service SMEs and on their operation, as well as little interest on the part of researchers and governments (e.g., Sauvé, 2006; Acharya, 2006). To the extent that these enterprises may become the new economic engine in a number of countries that are undergoing an industrial restructuring and a shift to the knowledge industry, it becomes more urgent to obtain a reliable and complete portrait of the reality, the needs and the challenges of service SMEs. This has also led some to call for the development of a “services science” discipline (IBM Research, 2004; Chesbrough and Spohrer, 2006).

As an initial effort within a research program on service SMEs, the present study was undertaken in order to provide Canadian governmental authorities with answers to these fundamental questions. As is the case for manufacturing SMEs that are provided with various forms of governmental aid and support, service SMEs could require the same type of intervention, but in a form appropriate for their specific needs. More extensive and deeper knowledge is necessary however in order to provide assistance that is relevant and adequate.

In the next paragraphs, having recalled the economic importance of service SMEs, we will center our discussion on their role within the environment of the manufacturing enterprise that, for most industrial service SME, remains the principal customer. Presenting a value chain management model will then facilitate the identification of the “key” or strategic services required by manufacturers to increase their competitiveness. Next we will be able to highlight the needs and challenges that must be met by industrial service SMEs and to identify “good” business practices that they should implement. We will conclude by presenting an expert diagnostic system designed to link the actual practices of industrial service SMEs to their global performance and vulnerability and, in so doing, to constitute a database for the planned research program.

2. **Role and growing importance of the services sector**

The service industry occupies an increasing part of the world economy. As estimated by the Organisation for Economic Co-operation and Development (OECD), this sector represents more than 70% of jobs and of the value added in the economy of the developed countries (OCDE, 2005). In 2001, services represented 72% of the gross internal products (GIP) of the

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2 For the industrial service sector, the definition of the European Union will be used, that is, a SME has fewer than 250 employees and an annual turnover of less than 50 million euros (cf. Parida and Westerberg, 2007).
developed countries, 57% of the GIP of the European Economic Community (EEC) and approximately 52% of the GIP of the developing countries (MDEIE, 2006). For the OECD, the interest in services is justified because they constitute an essential mean to increase employment, productivity and innovation within its member countries (OCDE, 2005).

In Canada, the proportion of services within the GIP has risen from 45% twenty years ago (Strategis, 2006) to 69% in the most recent estimates obtained in 2003, along with 75% of total employment and 35% of R&D investment (MDEIE, 2006). Among the sub-sectors that have most contributed to the rise of the service industry are wholesaling, professional, scientific and technical services, as well as the information industry and the cultural industry. In fact, all of these service sub-sectors have had a growth rate that is superior to the manufacturing sector’s growth rate (Acharya, 2006).

The services sector is also showing signs of high growth in certain Asian countries such as Taiwan, Japan, Singapore and Hong-Kong. This phenomenon can also be explained however by the greater specialisation of manufacturing enterprises (Wirz, 2000). Indeed, specialisation allows firms to benefit from economies of scale or of knowledge and thus produce at lower cost and often in a “unique” manner a product comparable to the one produced by its competitors. This increased efficiency originates in the specialised firm’s capacity to develop advanced knowledge that allows it to improve its service and thus remain competitive. Whereas the non-specialised firm, for whom the notion of service is less relevant and less important, will not allocate as much resources to it, notably in terms of R&D; also, in this case, the service cost is a more marginal component in the total manufacturing cost. This specialisation of activities is seen as an important advantage for national economic development and wealth creation (McRae, 1994). Rather than realising by itself all activities necessary to design, fabricate, market and service its own products, a manufacturing enterprise would thus be called upon to concentrate more on fabrication and work in partnership with specialised firms with regard to the other activities.

Czarnitzki and Spielkamp (2000) go further by affirming that the services sector constitutes the “bridge for innovation” not only for itself but also for the manufacturing sector that it supports more and more. Innovation in manufacturing cannot be done without the contribution of industrial service SMEs that have become suppliers, users, designers and intermediaries in the transfer of knowledge and technology. In summary, these firms now play the lead role in the product development process and in the knowledge economy.

3. Models of collaboration between the manufacturing and services sectors
Service and manufacturing enterprises can contribute to a country or region’s economic development by co-operating or working in synergy. To illustrate the relationship between the two sectors, one may recall with Pilat and Wölfli (2005) that manufacturing a product such as a motor vehicle requires a wide range of services such as R&D, marketing research, design and human resource management (HRM). Moreover, such a product is now sold as “packaged” offering that comprises, for instance, services related to its financing and its maintenance.

Previously considered as being “peripheral” to the manufacturing industry, the service industry is now considered as a dynamic component that is essential to the development of manufacturing firms and to their creation of value (Léo and Philippe, 2006). In the knowledge economy where no one firm can dominate the market or sustain a competitive advantage for long, strong and sustained collaboration with various economic partners has become necessary to the survival of manufacturing firms in the developed countries, and
manufacturing SMEs in particular (Julien et al., 2004). The need for these firms to specialise and reduce their costs has contributed significantly to the growth of the services sector.

Wirtz (2000) has identified two other determinants of growth in the services industry, namely the deregulation of certain markets such as telephone and cable services, and the development of information technologies including the Internet that enable business intelligence and facilitate business transactions. With the creation of numerous service enterprises that now provide communication and information services, manufacturers are now able to further reduce their costs and increase their effectiveness (Raymond, Bergeron and Blili, 2005). The skills and competencies of human resources in the services industry also constitute growth factors for this industry, as they constitute an important indicator of innovation as well as an assurance of the quality of services offered. One may also note the flexibility of the labour market in the services sector, with a higher rate of part-time and temporary employment as well as a higher rate of female employment than in the manufacturing sector (Czarnitzki and Spielkamp, 2000; MDEIE, 2006).

A most important implication of the growth of the services sector is that it contributes to increasing the competitiveness of a national or regional economy as a whole because specialised services tend to reduce the cost of manufactured goods (Wirtz, 2000). Another implication is obviously that it brings down the relative proportion of manufacturing jobs in the total job market; but these jobs are not always lost however, but are often “transformed” by the manufacturing enterprises themselves in deciding to externalise or outsource part of their activities in order to be able to offer a unique product to their national or international customers (Léo, 2000; Léo, Moulins and Philippe, 2006).

Notwithstanding the growing importance of industrial service firms, little is known on how these firms operate and even less on how they interrelate with manufacturing firms. The boundaries of manufacturing SMEs are being reshaped, given their increasing ties with service firms to whom they transfer various specialised activities (Merino and Rodriguez, 2007). It is in order to bridge this knowledge gap that the present research program was undertaken. We wish to increase our understanding of the organisation as well as of the success factors of the network enterprise that is emerging as a particularly effective industrial mode in the context of the knowledge economy (Julien et al., 2004).

As noted by Léo and Philippe (2006), the great heterogeneity of the services sector often makes it a “hodgepodge” that comprises firms with totally different realities, thus rendering its study as a whole almost impossible. Thus one cannot attempt to characterise the workings of service SMEs without circumscribing certain parameters to limit the research to specific sub-sectors. Given our interest in the development of the network enterprise, within which a manufacturing SME can increase the quality and value of its products, it was decided to focus on those services most relevant to this type of business environment. Starting with Porter’s (1986) value chain model and taking into account the breakdown of manufacturing activities, that is, essentially the “deliver products and services” core business process as defined in the process classification of the American Productivity & Quality Center (APQC, 2006), various manufacturing functions were identified for which external services could be required.

As presented in Figure 1, manufacturing functions are categorised as either “basic functions” needed to design, produce and deliver the product or as “support functions” that are required by the organisation as a whole and not specifically by the manufacturing process. For each activity in its value chain, the manufacturing SME will require specialised services from the following service sub-sectors as identified by national or international standard industry codes (SIC):
While all are categorised within the services sector, these sub-sectors show a number of distinctive traits and their contribution to the manufacturing enterprise varies. This contribution will be important to the extent that the service is directly integrated to the product and adds value to it. We will thus focus on the industrial service’s link with the product rather than on its intangibility. In analysing their role, industrial services were regrouped under the following three criteria: nature of the service, knowledge required to provide the service, and value added by the service to the products of manufacturing SMEs. The following classification was thus obtained: high-knowledge value-added services, high-knowledge Value added services, high-knowledge value-added services, high-knowledge value-added services.

3 The intangibility of the service may take on added importance in the case of exported products (Léo, 2000).
4. Challenges of service enterprises and key factors for their development

In order to integrate itself to the manufacturing firm’s value chain, the industrial service SME must offer a service that is unique, priced competitively and responsive to its customer’s exigencies in matters of quality and delivery. This leads the firm to value its human resources as its most prized asset (intellectual capital) that, when compared to the manufacturing SME, are often better educated and more professionalized. From “resource-based view” (Barney, 1991), the competencies of the service firm’s personnel remain a key factor, given their direct and most often personalised interaction with the customer, in the attainment of the firm’s strategic objectives. In order to acquire, preserve and protect these competencies however, industrial service SMEs must implement specific HRM practices such as recruitment, performance evaluation, mobilisation and remuneration practices that are appropriate (Barrette, Carrière, Frankhauser and Barrette, 2002). In this regard, informing, training and mobilising personnel appear to be particularly important to achieve innovation and quality (Wills, Labelle, Guérin and Tremblay, 1998; Fabi, Raymond and Lacoursière, 2007).

To achieve an effective relationship with customers, innovation and frequent renewal of its service offering are also considered to be elements of the performance and survival of industrial service SMEs (Storey and Kelly, 2001). In this regard, R&D, training, and business intelligence activities are meant to increase service innovation (Czarnitzki and Spielkamp, 2000). These activities are however difficult to realise, as shown by Mohnen and Rosa (2000) who identified the obstacles to innovation in service SMEs. These authors mention the lack of access to financing and of specialised equipment to be the most important obstacles indicated by the owner-managers of these enterprises.

Within the network enterprise context, it was previously mentioned that innovation can be achieved jointly by the industrial service SME and the manufacturing SME. Such collaborations are not without risk however, as each firm must protect yet share its knowledge and know-how through practices and behaviours meant to insure trust between business partners (Jacob, Julien and Raymond, 2003; Hoecht and Trott, 2006). In this regard, de Brentani (2001) delineates key success factors of service innovation, including a profound knowledge of the present and long term needs of customers, competent and motivated « frontline » personnel that are capable of identifying and adequately satisfying these needs, and appropriate planning of the service development project that starts with the identification of a business opportunity and ends with the commercialisation, delivery and post-sales maintenance of the new service. The author adds that an essential pre-condition to successful service innovation resides in the enterprise’s culture as manifested by the owner-managers’ attitude toward innovation, in particular their encouragement of employees who express new ideas and their emphasis on collaboration and teamwork to resolve problems in the course of developing new services. Hence, an enterprise where information freely circulates both horizontally and vertically is one where employees should be more creative, committed and eventually more productive (Jacob, Julien and Raymond, 1997), and one where the level of key personnel retention is higher, thus reducing the risk of a loss of knowledge that can sometimes be fatal to a SME (Vandenberghe, 2004).
For Nachum (1996), creativity is one factor that distinguishes successful service enterprises. Given that each customer has its own specific needs, especially when this customer is a manufacturing SME whose business processes are most often idiosyncratic (Raymond and Croteau, 2006), the service firm must develop tailored or contingent rather than “off-the-shelf” or “best practice” solutions with ideas and approaches that take these idiosyncrasies into account. Another factor is related to the reputation or notoriety of the service firm, given the intangibility of the service activity that makes it difficult to evaluate the value of a service. Especially as previous experience with a certain service does not constitute a reliable indication of its future performance. In this case, it is thus necessary for the service firm to insure its visibility and develop its reputation, notably by participating in business networks, in trade fairs and in public events. The author also emphasises the need for service enterprises to develop an international market if they want to grow and provide new work challenges to their highly-qualified employees.

In the face of globalization and the knowledge economy, providing services at a “world-class” quality level also requires an investment in information systems, technologies and equipments (Storey and Easingwood, 1998; Raymond, 2003). Information technologies and the Internet in particular enable the capture, analysis, and dissemination of strategic information both within the service firm and between the service firm and the manufacturing firm. In a complex and networked business environment, access to such information is a key element of competitiveness. As denoted by Jacob et al. (2003), this information exchange between partners goes beyond the administrative and co-ordination data required for effective collaboration to include collective learning and network-structuring information. Thus the quality and security of such technologies is to be considered in this mode of organisation. Moreover, these technologies have been shown to influence the internationalisation of SMEs, given that time, distance and resource barriers are greatly lowered (Raymond et al., 2005; St-Pierre, Monnoyer and Boutilier, 2006; Parida and Westerberg, 2007).

The needs and challenges of service SMEs are summarised in Table 1, as well as the organisation mode, business processes and management practices that these firms may adopt in order to maintain or increase their competitiveness. The information presented in this table as well as other information on owner-managers of these firms, their vision, leadership and strategic orientation constitute the basis for establishing a research database on industrial service SMEs.
Table 1: Needs, challenges, and potential responses of service SMEs

<table>
<thead>
<tr>
<th>Needs and challenges of the firm</th>
<th>Organisation / Processes / Management practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human resource management</strong></td>
<td></td>
</tr>
<tr>
<td>Dispose of competent personnel</td>
<td>Recruitment; Training; Performance evaluation; Remuneration system; Valorisation of personnel</td>
</tr>
<tr>
<td>Mobilise the personnel to commit to the firm’s success</td>
<td>Task descriptions; Performance evaluation; Motivation; Participative management; Valorisation of personnel</td>
</tr>
<tr>
<td>Assure the flexibility of personnel</td>
<td>Work organisation; Training activities for personnel</td>
</tr>
<tr>
<td>Retain key personnel</td>
<td>Participative management; Diffusion of information; Communication system and consultation of personnel</td>
</tr>
<tr>
<td><strong>Marketing and development of customer base, services and markets</strong></td>
<td></td>
</tr>
<tr>
<td>Know the market and detect opportunities</td>
<td>Business intelligence; Creativity</td>
</tr>
<tr>
<td>Satisfy customers’ needs</td>
<td>Training of sales representatives; Evaluation of customer satisfaction; Post-sales service to customers; Customer loyalty programs; Collaboration and data exchange with customers</td>
</tr>
<tr>
<td>Assure the firm’s visibility and notoriety</td>
<td>Participation to fairs and expositions; Participation to business network activities; Communication; Use of electronic communication tools</td>
</tr>
<tr>
<td>Dispose of an adequate distribution network (depending upon the sub-sector)</td>
<td>Alliances or formal collaborations</td>
</tr>
<tr>
<td>Maintain the firm’s position in the market</td>
<td>Business intelligence; Participation to networking activities; Product development process</td>
</tr>
<tr>
<td>Develop the international market</td>
<td>Business intelligence; Participation to business network activities; Alliances or formal collaborations; Participation to international fairs and expositions</td>
</tr>
<tr>
<td><strong>Development and delivery of the service</strong></td>
<td></td>
</tr>
<tr>
<td>Offer a service of quality to customers</td>
<td>Technological intelligence; Investment in appropriate equipments and technologies; Training of personnel; Collaborative work between members of personnel; Use of communication tools and information exchange between members of personnel</td>
</tr>
<tr>
<td>Preserve the value added of the firm’s services for customers</td>
<td>R&amp;D and continuous improvement; Market and strategic intelligence; Collaboration and data exchange with customers</td>
</tr>
<tr>
<td>Innovate in matters of service</td>
<td>R&amp;D and continuous improvement; Creativity; Market and strategic intelligence; Collaboration and data exchange with customers</td>
</tr>
<tr>
<td>Meet deadlines</td>
<td>Process of defining products/services to offer to customers; Pre- and post-sales service policy; Logistics and inventory management</td>
</tr>
</tbody>
</table>

4. An expert diagnostic system for industrial service SMEs

In order to create a database for our research purposes and given our previous experience with manufacturing SMEs (St-Pierre and Delisle, 2006), it was decided to develop a performance measurement system for industrial service SMEs. The system’s function is to provide owner-managers with a critical view of their firm’s performance by linking results to its organisational resources, practices and technologies. This evaluation will be contingent upon the owner-manager’s strategic orientation, given the latter’s influence upon the internal
organisation of the firm, the technologies and tools employed, and upon the managerial and operational processes developed by the firm (Raymond and St-Pierre, 2005).

The PDG® diagnostic tool for industrial service SMEs was thus developed for this purpose. As indicated in Figure 2, it is based on a model that presents an overall view of the firm, identifies improvements by linking practices implemented to results attained, similarly to performance models such as the EFQM and others (Van Landeghem and Persoons, 2001), and anticipates problems related to future performance by identifying the firm’s vulnerability.

Figure 2: PDG™ diagnostic model developed for industrial service SMEs

Industrial service SMEs wanting to participate in the diagnostic exercise for the first time are asked to complete a 15 page questionnaire. This questionnaire was developed on the basis of a literature review on the performance and failure of SMEs and service enterprises, improved with suggestions from experts in the management and evaluation of industrial service SMEs, and validated by the owner-managers. The data obtained are objective and subjective, quantitative and qualitative, and must include financial information for the last three years. Proceeding solely by means of a questionnaire was based on our experience and the owner-managers’ wish for a “light” and short intervention in their firm, thus respecting the SMEs’ resource constraints and facilitating their access to diagnostic services (Cassell, Nadin and Gray, 2001).

The content of the diagnostic report includes the most important performance measures for each function of the industrial service SME, based on the literature and on our expertise on the performance of SMEs. In addition to the financial measures traditionally used
by all firms, including small ones, non-financial or mixed measures were included given the nature of the practices evaluated, including most quality management practices (Frigo, 2002). Adapted to the firm’s strategic orientation, established as being either of the “defender”, “analyzer” or “prospector” type following Miles and Snow’s recognised typology (Croteau, Raymond and Bergeron, 1999), the report recommends actions to be taken by the firm and practices to be modified if need be. More specifically, 18 business practices are evaluated, covering the organisation, financial management and control of the firm, human resources management, development of markets/services and innovation, equipment and technology. From an integrative standpoint, the global performance and vulnerability of the firm is also evaluated. This last component of the report is important because it makes owner-managers sensitive to the fact that their firm could be exposed to market or competitive threats even if its performance is enviable.

The effectiveness of the practices is evaluated with 10 measures of performance and 13 measures of vulnerability linked to productivity, efficiency, growth, and returns, leading to 14 recommendations for action in the short term to redress the firm’s situation. While an expert system was developed in order to produce the diagnostic report quickly and automatically, it is read and verified by a human expert before being sent to the firm. Owner-managers can then ask for clarifications or suggestions from the expert if needed.

5. Concluding remarks

A basic question to be answered by this research is on the actual nature and strength of the relationship between industrial service SMEs and manufacturing SMEs, and on the extent to which the former enterprises’ development will contribute to the latter’s competitiveness and thus reduce employment losses in the manufacturing sector of industrially developed countries. Another question is whether the network enterprise mode of organisation, where each member is called upon to make a significant contribution to innovation, is a solution to the economic growth problems of these countries.

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