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The competence system in performance  
improvement:  
A reference framework

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# THE COMPETENCE SYSTEM IN PERFORMANCE IMPROVEMENT: A REFERENCE FRAMEWORK

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## ABSTRACT

Over the past decade, many best practises have become available which have, little by little, been incorporated into the management practises of excellent firms. Reality has shown, however, that applying these practises *tout court* without careful planning or without selecting and adapting them to meet the specific requirements of the firm does not always give the sought after results: improvements in the firms competitiveness. In particular, implementing improvement initiatives often come up against either a lack of internal consistency or a lack of external coherence. This paper seeks to offer a contribution to help overcome these problems by proposing, firstly, a reference model which identifies and links the competitive advantage of the firm to performances achieved and to the individual and organisational competencies which already exist within the firm. The model proposed here is based on integration of the concepts drawn from specific theoretical approaches, such as OM, Competence Based Competition and the Resource Based View. The paper also reports the results of both an empirical test done using the model and the tools derived from it and summarises the ways in which it was used, in practise, in 55 Italian and British firms.

## INTRODUCTION

Improvements in operating performances are a crucial factor in the quest for competitiveness. Firms who seek to improve their competitiveness are often forced to launch improvement initiatives. In the last ten or fifteen years, OM research has emphasised the opportunity of choosing, as improvement initiative, from among the many best practises that have gradually become established as part of management practises in excellent firms (Filippini *et al.*, 1998). However, it has also been noted that simply applying these practises *tout court*, without first making a careful selection and adapting it, or them, to fit the specific situation of the firm itself, has not always led to improvements in the firms (cit, anno). One of the reasons for this could be a lack of internal consistency (for example a lack of the specific individual and/or organisation competencies which are necessary to implement, appropriately, the best practise chosen. Or, there could be a lack of external coherence (for example, the improvements may not be sufficiently in line with the strategy the firm already adopts in the competitive arena (Hayes, Wheelwright, 1984). This study will attempt to make a theoretical contribution to overcoming this problem. More specifically, it will seek to offer a reference model which can identify and link the competitive advantage of the firm to performances achieved and to the individual and organisational competencies which already exist within the firm. The practical function

of this model is that it can facilitate the development of tools for analysing performances and competencies, and for guiding and supporting firms when they are trying to identify which are the most appropriate improvement initiatives for their specific case.

The paper has four sections. The first presents the question of improvements in operations, referring to the main contributions already available in the literature. The shortcomings of the simplistic “best practices adoption = performance improvement” approach are highlighted and it will be shown how, when evaluating an approach to improvement through the adoption of best practises, both the Resource Based View (RBV) and Competence Based Competition (CBC) theories can be very useful, as they identify competitive success not within the single best practises as applied to various processes within the firm, rather, they consider the individual and organisation competencies that these best practises require and develop. The second section presents the reference model, highlighting the nature of the variables considered and the rationale behind various links. The third section illustrates some of the possible uses of this model and the results of a pilot application carried out various firms in order to test it. Lastly, the fourth section discusses the contribution this study can make both to theory and to practise.

## **PERFORMANCE AND OPERATIONS IMPROVEMENT**

The literature on world class manufacturing / lean production has highlighted the importance of the fact that when a firm wishes to embark on the journey towards achieving and continuously improving its performance, it should invest in many, if not all, of the best practices available. Some initiatives will tend to improve performance in the area of quality, while others will reduce costs, and others again, will tend to work on reducing lead times. The initiatives should be carried out in a co-ordinated manner and often will have an impact on more than one area of performance (Flynn, Flynn, Schroeder, Filippini, Forza and Vinelli, 1996).

However, over the last ten or fifteen years, firms’ experiences have shown that it is very rare for a firm to decide to set up more than one improvement programme at a time. Thus the problem would seem to be that of choosing between what are almost “too many” options, hence, the decision of where to begin is of critical importance: what should be launched first, which priorities should be considered, or rather, how to go ahead and what restrictions regarding priorities should be respected (Filippini, Forza and Vinelli, 1997).

Although there is a vast amount of material about what being a world class / lean producer involves, in our opinion there is still some confusion about how to become one, which competencies are necessary and, which practices should be selected and implemented. Skinner (1974, 1985) stated that a production system is set up so as to be able to do only certain things “well”, thus, in order to be competitive, a firm must be focussed. Inevitably this means that managers are forced to make choices on the basis of alternatives and to invest only in those initiatives which are closely linked to its pre-established focus.

On the other hand in Schomberger’s opinion (1986), in order to achieve excellency in production, the highest possible number of best practices should be adopted, one after the other. When analysing best practices and their impact on many aspects of performance, Ettl (1988), Giffi and Roth (1990), and Steudel and Desruelle (1992) also underlined the importance of investing in as many different methods of improvement as possible in order to compete at the international level.

Ferdows and De Meyer (1990), in the sand-cone model, argued that excellence in production can only be sought by following a specific sequence, through a sort of

accumulation of skills, which enable the firm to reach more than one goal simultaneously and to improve different performances by means of further expansion of the skills themselves. This sequence is extremely important because, in the view of the two authors, there is only one ideal combination that will permit best performances to be achieved (that is, quality, deliveries on time, flexibility i.e. speed with which new products can be introduced and, lastly, cost efficiency). Again, the authors do not indicate which particular initiatives should be set up in the different areas, and leave the firm free to decide what to do in order to follow the sequence suggested.

Another, alternative approach is that of the Resource Based View. This approach investigates which internal resources are best able to guarantee improved performances and, how to further improve them over time. Here, the term resource is used to mean the skills and the competencies the firm uses within its processes and the information and knowledge it controls, those which allow it to successfully carry out its improvement strategies and to achieve its objectives (Barney, 1991). According to this model all the improvements a firm introduces are the fruit of its special capabilities and past history (path dependency) which determine its current investment strategies (Bates and Flynn, 1995).

Even according to the Strategic Flexibility Model, the central role of core competencies are fundamental within the continuous improvement process in Operations. Hayes and Pisano (1996) and Clark (1996) argue that the current availability of initiatives for improving operations, in reality, offers each firm a wide range of strategic options that the firm must choose between. In this case, production strategy plays a fundamental role in choosing the most suitable option. Each firm must decide, in the light of its own priorities for competition, how to proceed in its search for better performance, a choice which concerns not only which competitive performances to prioritise, but also the speed at which such improvements should be introduced.

### THE REFERENCE FRAMEWORK

Based on the above, we will present a framework of reference which seeks to integrate the various perspectives considered (see, Figure 1):

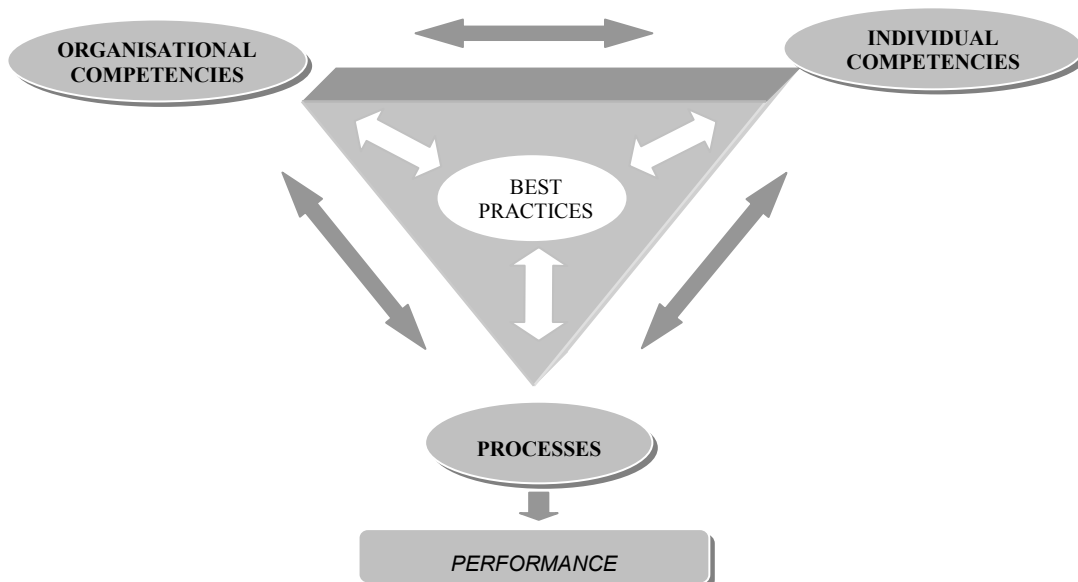


Figure 1. The reference framework

The framework refers to both external performances, those perceived by the customer and internal performances, those not directly perceived by the customer. Analysis of external performances makes it possible to a) highlight the differing importance of these performances on the market and b) see where the firm stands in relation to its competitors. Analysis of internal performances serves when a) assessing the importance of different performance objectives and b) evaluating when and how the desired performances can be, or are, achieved. Table 1 shows, in detail, both the various external performances considered in this study and the operating performances the framework refers to.

Table 1. Internal and external performances

<p><b>EXTERNAL PERFORMANCES</b></p> <p>1. product:</p> <ul style="list-style-type: none"> <li>1.1 product performances</li> <li>1.2 conformity to specifications</li> <li>1.3 innovative contents of the product</li> <li>1.4 product mage</li> <li>1.5 aesthetics / design / ergonomics</li> <li>1.6 depth of range</li> <li>1.7 eco-compatibility</li> </ul>	<p>2. service</p> <p>delivery:</p> <ul style="list-style-type: none"> <li>2.1 speed of deliveries</li> <li>2.2 punctuality of deliveries</li> <li>2.3 completion of delivery orders</li> </ul> <p>support:</p> <ul style="list-style-type: none"> <li>2.4 pre – sales assistance</li> <li>2.5 post – sales assistance</li> <li>2.6 breadth of the range</li> <li>2.7 personalisation of the product</li> <li>2.8 flexibility of volume and mix in accepting orders</li> </ul>
<p><b>PRESTAZIONI INTERNE</b></p> <p>3. costs / productivity</p> <ul style="list-style-type: none"> <li>3.1 cost of materials and of purchased components and of external manufacturing on turnover</li> <li>3.2 level of circulating capital and materials being processed on turnover</li> <li>3.3 level of saturation of machines</li> <li>3.4 productivity of work</li> <li>3.5 productivity of machines and plants</li> <li>3.6 costs of new product development on turnover</li> <li>3.7 logistic costs of distribution on turnover</li> <li>3.8 commercial costs on turnover</li> </ul>	<p>4. quality</p> <ul style="list-style-type: none"> <li>4.1 quality of materials and purchased components</li> <li>4.2 quality of product design/development</li> <li>4.3 quality of process engineering/technology</li> <li>4.4 internal defects (discards, scrap, re-processing)</li> <li>4.5 external defects (returns, claims while under guarantee)</li> </ul> <p>5. times</p> <ul style="list-style-type: none"> <li>5.1 average time of new product development</li> <li>5.2 respecting times planned for during design</li> <li>5.3 average delivery time of suppliers of critical materials/components</li> <li>5.4 average production throughput time</li> <li>5.5 respect of planned times for purchasing/production/distribution</li> </ul> <p>6. flexibility</p> <ul style="list-style-type: none"> <li>6.1 production flexibility – volumes</li> <li>6.2 production flexibility – mix</li> <li>6.3 flex. product introduction/modifications</li> </ul>

Particularly in SMEs, during the early phases of the firm's life the competencies present will be the individual competencies of the entrepreneur, of his/her partners and, to a certain extent, those of the entrepreneurial group's closest collaborators. In this phase, the firm will be successful if these competencies offer a balanced foundation. Some of these early competencies are, simply, elements within the personality of the entrepreneur which will remain "imprinted" within the organisation. Others are more directly related to specific circumstances and will change, as and when, they are transferred to other parts of the organisation. Individual competencies become organisation competencies through learning processes that come into play as the group develops and grows: people transmit their personal competencies to colleagues and others during group work.

Twenty three individual competencies have been considered in this study (see Table 2). On the basis of the literature these have been divided into three classes or categories: competencies of implementation, of influence or direction and cognitive competencies (Bojatzis, 1982; Spencer, 1993).

Table 2. Individual competencies

Competencies of implementation	Competencies of influence/ direction	Cognitive competencies
1 orientation towards result(s)	10 empathy	20 use of concepts
2 precision	11 persuasion	21 systemic thought
3 planning	12 construction of relationship networks	22 giving meaning to events
4 initiative	13 negotiation	23 construction of models
5 search for information	14 group work	
6 flexibility	15 leadership	
7 self-control	16 development of others	
8 faith in oneself	17 organisational knowledge	
9 orientation towards customers	18 communication	
	19 commitment to the organisation	

On the other hand, organisation competencies concern the know-how that is typical of an organisation. An organisation competency can be considered such only if it pervades all the fundamental operating processes of the firm: new product development, marketing and sales, logistics and processing, when, that is, the whole firm is centred on that competency. In these cases this competency acts as a catalyst upon which the resources, the activities and the firms efforts are focussed: this type of competency lays the foundations for competitive success. Table 3 show these organisation competencies: they have been split into four classes.

Table 3. Organisation competencies

<p><b>Management of relations with the environment</b></p> <p>Ability to understand quickly, or in advance, the needs and evolutions in the market for the goods and/or services produced</p> <p>Ability to understand quickly, or in advance, customers' needs and/or explicit or implicit demands, and their dynamics</p> <p>Defence of and care for relations with both central and local institutions, with the area, with trade unions, banks,....</p> <p>Choice of suppliers, creation of networks, involving them in the firm's strategies, their development, ....</p>
<p><b>Expertise with one or more technologies</b></p> <p>Product: ability to introduce innovations in the materials, functions, aesthetics.</p> <p>Process of transformation: ability to improve efficiency, to introduce innovations into processes</p> <p>Management of information: opportunities offered by IT, CAD-CAM, networks, to improve business performances</p>
<p><b>Human resource management</b></p> <p>Recruitment, involvement, motivation, trustworthiness, loyalty, development, reward systems, management style, leadership, shared values</p>
<p><b>Management and organisation systems</b></p> <p>Internal integration between functions, co-ordination, planning and control/checking systems, .....</p>

Competencies, both organisation and individual, influence and affect firms' performances through improvements in processes and efficacious adoption of improvement initiatives and/or best practices.

Individual competencies are pre-requisites for the effective introduction of these improvement initiatives into the firm.

The introduction of improvement initiatives may allow these competencies to be improved, by enabling the firm's management to understand both their importance and significance (learning by doing). In this way the improvement process is itself one of the tools which encourages the passage from individual competencies to organisation competencies.

## **APPLICATIONS OF THE RESEARCH FRAMEWORK**

The model was first tested within the ADAPT project "DO - to develop operations in SMEs", funded by the European Union and by the Italian Ministry of Labour, with the private contribution of the companies involved, in the period September 1998 – March 2000.

It was used in two steps. Differences concern both the number of variables-links of the model analysed and measured and the extent to which the researchers from outside the firm, those involved in training the personnel who used the model inside the firm, were used.

### ***First step***

The model was used first in order to analyse the links between: external performances – internal performances – processes. This is not much different from the path usually suggested by researchers and consultants in the field of OM. The original contribution made by this model is that it defines a structured, but simple, path which manages to identify the areas that should be improved within fundamental operating processes (e.g. production, new product development, logistics etc.) starting from the performances that are most important for the market in which the firm competes, those wherein the firm is either at a disadvantage or wishes to increase any existing advantages it has over its competitors.

The following support tools have been developed in order to support this path to improvement:

1. a dictionary of external performances
2. a dictionary of internal performances
3. a questionnaire (to be compiled for each of the firm's product lines) in order to identify the
  - importance of each external performance in the market segment
  - position in relation to competitors for each external performance
  - presence/absence of measurements for each external performance
  - importance attributed to each internal performance
  - achievement of the desired performance levels for each internal performance
  - presence/absence of measurements for each internal performance
4. a report designed to identify the critical nature of the external performances (based on Slack's matrix) which seeks to "photograph" the competitive profile of the firm with respect both to factors of competition in the chosen market segment and to the firms competitors themselves, as well as identifying performances that do not conform or suit (too much or too little)
5. a report designed to identify the critical nature of the external performances (also based on Slack's matrix) which seeks to "photograph" the firm's ability to set itself suitable objectives, and to achieve them, as well as to identify those performances that are not suitable, do not conform to requirements (either too much or too little).

6. a report that identifies the links between internal and external performances, designed to highlight the impact, within the firm, that critical internal performances have on critical external performances. This enables the firm to identify which improvement interventions they should prioritise within time/flexibility, quality and cost/efficiency performance areas.
7. a report that highlights the links between internal performances and the firm's main processes and identifies the tools and techniques that could be adopted to determine which internal performances are inadequate and affect critical external performances. (For example, Total Productive Maintenance to improve plant productivity or Just in Time to reduce stocks lying idle and cut delivery times etc.)

These support tools, which have been developed in Excel and are relatively simple to use, were adopted, without the help of experts, in 35 firms, and with expert help in 20 firms.

In both cases, we found that:

- a) both the model and the self-diagnosis tools developed were able to guide the analysis, in a focussed and efficacious manner, along a well defined path which started from the market where the firm competes and finished by highlighting those aspects of the various operating processes that should be improved;
- b) joint use of the tools proposed (for example, filling in a questionnaire together, as a group, encouraged discussion between managers of different functions) offered an important opportunity for clarifying and explaining diverse points of view and perceptions;
- c) in this way, from the performance evaluation phase on, involving all the functions even when there was conflict between them, led to the development of a common language between the personnel involved which facilitated the use of the model in subsequent phases;
- d) the firms' perceptions of performances should be frequently checked up on through comparisons with their more important customers;
- e) the learning process, hence the process of improving, is more effective if the rest of the organisation is told about the results that have been obtained.

### ***Second step***

The above-mentioned application of the model rests on analysis of the path external performances – internal performances – processes, going back to the organisation and individual competencies owned by the firm.

In order to explain improvements in operations, this path introduces references to theories, concepts and tools that are typical of both RBV and CBC. According to this "hybrid" perspective, true competitive advantage can be found in the organisation and individual competencies owned by the firm.

Once the conceptual framework of reference had been defined, the problem of developing valid tools for analysis and support for the firms, tools which were also both simple and efficacious, became more complex and required the involvement of experts from outside the OM field: experts from Organisational Behaviour. In this case experts must be present when the model is being used.

The other tools developed in order to guide firms along this path to improvement were:

1. a dictionary of individual competencies;
2. a questionnaire on individual competencies (to be compiled by personnel in the production, logistics and design functions and by general managers);



3. a reference framework to identify organisation competencies. The following were identified: a) the main competencies owned by the firm; b) the value/contribution to competitive advantage and c) the time for which they could be maintained/defended;
4. a report on the status of individual competencies, aimed to explicitly recognise the different types of individual competencies, identifying their strong points of developments;
5. a report on the status of organisation competencies, designed to identify the areas where the firm is “strongest” and just how “strong” it is.

Understanding the path taken by this analysis, the concepts defined and the variables involved was not difficult for the personnel and managers in the firms studied. However, in some cases measuring these concepts did prove to be a problem, even though, at the end of the learning process, that was triggered by using these instruments, firms were able to approach the problem. Indeed, the discussions and reflection that ensued while compiling the questionnaires etc. enabled many firms to perceive the obsolescence of some of their competencies and the consequent loss of competitiveness entailed for them. Consequently, some improvement projects were launched which included training and learning activities for their personnel.

## CONCLUSIONS

This study developed and carried out preliminary tests on a reference framework designed to support and help firms to identify improvement initiatives which could increase their competitiveness and take into account their requirements at the level of competencies and resources.

In our opinion, this framework has both theoretical and practical contribution. Theoretical contribution above all because it attempts to integrate a variety of theoretical perspectives (OM, Strategic Management, Organisational Behaviour). However, reasons of space have not permitted a full explanation of the relations and the links between the variables used.

The model's practical contribution lies in its ability to offer analytical tools which support the firm when identifying, in the first place the need for improvement and, in the second, the most appropriate ways of setting up an improvement process. The model, which was used in its entirety in more than 20 Italian firms and, partially, in a further 20 Italian firms and 15 British firms, has demonstrated its usefulness *in situ*. But there is one important difference between the two steps: the first does not require the assistance of experts, while the second, full use, does require training, even though minimal, of those people who will be analysing competencies and outlining improvement initiatives.

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