Integrated Performance Management: A Guide to Strategy Implementation

Obtaining Better Performance through Business Process Orientation

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As a conclusion to Chapter 4, we introduced four stages on the path to operational excellence:

- In the first stage, a company tries to stop making mistakes. Quality is defined as conformance to specifications and ISO 9000 is recognized as an important quality framework.
- In the second stage, the focus is more externally oriented and the operations function incorporates the customer's expectations. A company aspires to be among the best.
- In the third stage, a company is giving more attention to the relationship between the performance at the operational level and the strategic performance. Management understands that the operations function is the implementer of the company's strategy. This is the stage where a comprehensive framework such as EFQM becomes very popular, because the strategic links between process performance and many of the other management areas are made clear.
- In the fourth stage, the operations function is not only a basic element of strategy implementation, but is seen as the foundation of the company's competitive success. The operations function is considered to be the long-term driver of the strategy. In this stage, Time-Based Competition is a very important issue.

Organizations going through the evolution from stage 1 to stage 4 look differently at the role of operations. Our central hypothesis is that an evolving company puts increasing emphasis on the importance of business process orientation. This will be further explained in the first section of this chapter. In the remainder of this chapter, we will develop three major topics which are related to maturity in Business Process Orientation:

- Process management (stage 2);
- Supply chain management (stage 3);
- World-Class Manufacturing (stage 4).

Maturity in the Operations Function: An Evolution towards more Business Process Orientation

Organizations going through the evolution from stage 1 to stage 4 look differently at the role of operations. In the first stage, *operations* is considered *as one of the functional areas* among others (such as marketing, research and development, human resources, accounting, etc.). In this stage, the biggest challenge is to manage the interface between the various functional areas. The greatest opportunity for performance improvements lies ‘in the points where the “baton” is being passed from one function to another’ (McCormack and Johnson, 2001: 17). In this stage, the major focus of many scientific research projects is on how to improve the relationship between the operations function and other functions, such as marketing. In this functional approach, processes are unstructured and ill-defined.

The first scholars to take on a *more business process orientation* were Edward Deming and Michael Porter in the 1980s. The Deming (1986) flow diagram maps the process from supplier to customer, and Deming's 14 points and seven deadly diseases describe strategies for optimizing the flow diagram (Walton, 1986). Deming used this flow diagram in his presentations at every conference with top management in Japan. It was one of the basic tools in the *Kaizen* toolbox. *Kaizen* adds the dimension of continuous improvement of everything, every day. The *Kaizen* tools are various methods and techniques to design, monitor, and evaluate processes. Michael Porter's (1985) value chain puts a lot of emphasis on linkages, i.e., relationships between the way one value activity is performed and the cost of performance of another. One example is the linkage between the supplier and customer value chain. Optimizing these linkages can create a competitive advantage for the firm.

In the same years, Peter Drucker (1988) pointed out the growing importance of knowledge and information technology in firms, and this led to a shift towards an 'information-based organization'. Central concepts in this information-based organization are process-orientation, customer focus, and teamwork among empowered specialists. These are the major characteristics of the second stage in our four-stage model. The basic processes are defined, documented and available in flow-charts. There is a lot of coordination or linkage between the various functional areas.

In the 1990s, the importance of processes is further underlined with the coming of the concept of *re-engineering.* Re-engineering is described as 'the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed' (Hammer and Champy, 1993: 32). According to Hammer and Champy, the major elements of rethinking processes are:

- Work units change from functional departments to process teams;
- Jobs change from simple tasks to multidimensional work;
- People's roles change from controlled to empowered;
- Job preparation changes from training to education;
- The focus of performance measures and compensation shifts from activity to results;
- Advancement criteria change from performance to ability;
- Values change from protective to productive;
- Managers change from supervisors to coaches;
- Organizational structures change from hierarchical to flat;
- Executives change from scorekeepers to leaders.

Other authors further developed and operationalized the idea of *process re-engineering* and introduced the enabling role of information technology (IT). The focus in this third stage is no longer on optimizing functions within the organization, but on ways of understanding and managing the horizontal flows within and between organizations. This is called the horizontal organization as opposed to the vertical organization (Byrne, 1993). Managers employ process management with strategic intent and results. This is the stage where companies recognize that something like 'operations strategy' exists.

In the last stage, process measures and management systems are deeply imbedded in the organization. The company and its suppliers and customers work together from a process point of view. In the digital, Internet age, competition will be based on cross-company process integration across a network of companies (McCormack and Johnson, 2001). In this fourth stage, the *World-Class Manufacturing* (or World-Class Operations) firm emerges:

> A symbol of the level of manufacturing performance that is being exhibited by the top manufacturers in the world. This is a precursor of the standard performance that will be expected of all who are to continue as manufacturers in the future.
>
> (Roth and Griffith, 1990)

Process Management

When we talk about processes in this chapter, we are primarily focusing on work processes as opposed to behavioural processes or change processes. A work process can be defined as: 'a specific ordering of work activities across time and place, with a beginning and end, and clearly defined inputs and outputs: a structure for action' (Davenport, 1993: 5). Approaches based on work processes draw heavily on the principles of quality management and re-engineering, both of which equate process improvement with process management. Process management means that processes are defined, documented, implemented and measured such that they can be improved in a structured way. In this part of the chapter, we further describe the basic building blocks of process management:

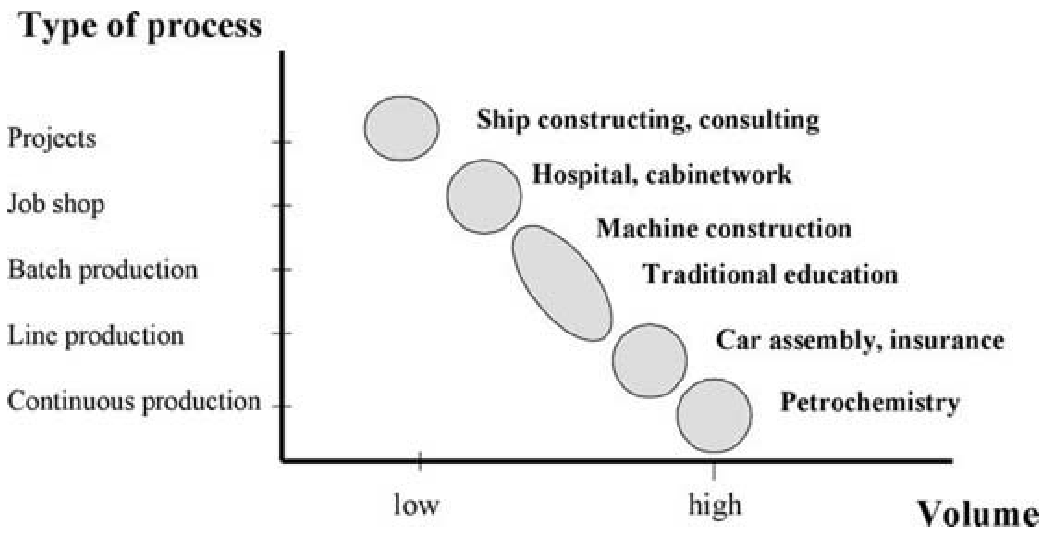
- *Process choice:* Not all processes are equal. We have already made a distinction between material, information and people processes. Further characterization is necessary to manage these processes in an adequate way.
- *The 'as is' process:* The starting point in process management is to draw a flow chart of the existing process. This allows one to analyse processes and to evaluate the 'as is' situation, which can lead to suggestions for improvement.
- *The 'to be' process:* In this stage, the 'to be' situation is formulated. This 'to be' situation can be an incremental improvement of the existing process (as suggested by Total Quality Management) or, instead, a radical change (as suggested by re-engineering scholars).

Process Choice

A three-star French restaurant looks quite different from a fast-food restaurant (such as McDonald's) for a variety of reasons, and both of these restaurants are quite different from a Benihana restaurant, a Japanese-style restaurant where the meal is prepared in front of the customers on a hibachi cooking table (Benihana case, 1972). One of the major differences is the type of process. The French restaurant has many characteristics of a so-called *'job shop process'* and has a functional layout. The fast-food restaurant has many characteristics of a *'line process'* and has a line layout. The Benihana restaurant, with its insistence on grouping customers in 'batches' of eight in the bar before preparing and serving the meal, seems more like a *'batch process'.*

In manufacturing firms as well as in service firms, the main determinant of the type of process is the transaction volume. The higher the volume, the more a line process will be appropriate; the lower the volume, the more a job shop process will be used. In extreme cases, such as management consulting, a project approach might be desired. This relationship between process type and volume is illustrated in Figure 7.1.

Figure 7.1 The relationship between process type and transaction volume



The matrix in Figure 7.1 has the process type as a multidimensional construct - several different manufacturing dimensions are combined. Correlated with process type are such variables as:

- Product range (from narrow to broad);
- Size of the (customer) order (from large to small);
- Degree of product change accommodated (from standardized products to completely customized products);
- Degree of innovativeness (from low to high);
- Degree of automation (from highly automatic to purely manual work); and
- Capital intensity *versus* labour intensity.

The choice of production process is also determined by the competitive strategy of the organization. A firm will select a certain type of process depending on whether the emphasis is on cost-effectiveness, flexibility, innovation or delivery speed. For example, Volvo makes cars on movable pallets rather than on an assembly line. Thus, in Figure 7.1, this process would be at the intersection of the line and batch production processes. Volvo's production rate is lower than that of its competitors because it is sacrificing the speed and efficiency of the line. However, the Volvo system is more flexible because it uses multi-skilled workers who are not paced by a mechanical assembly line (Chase et al., 1995).

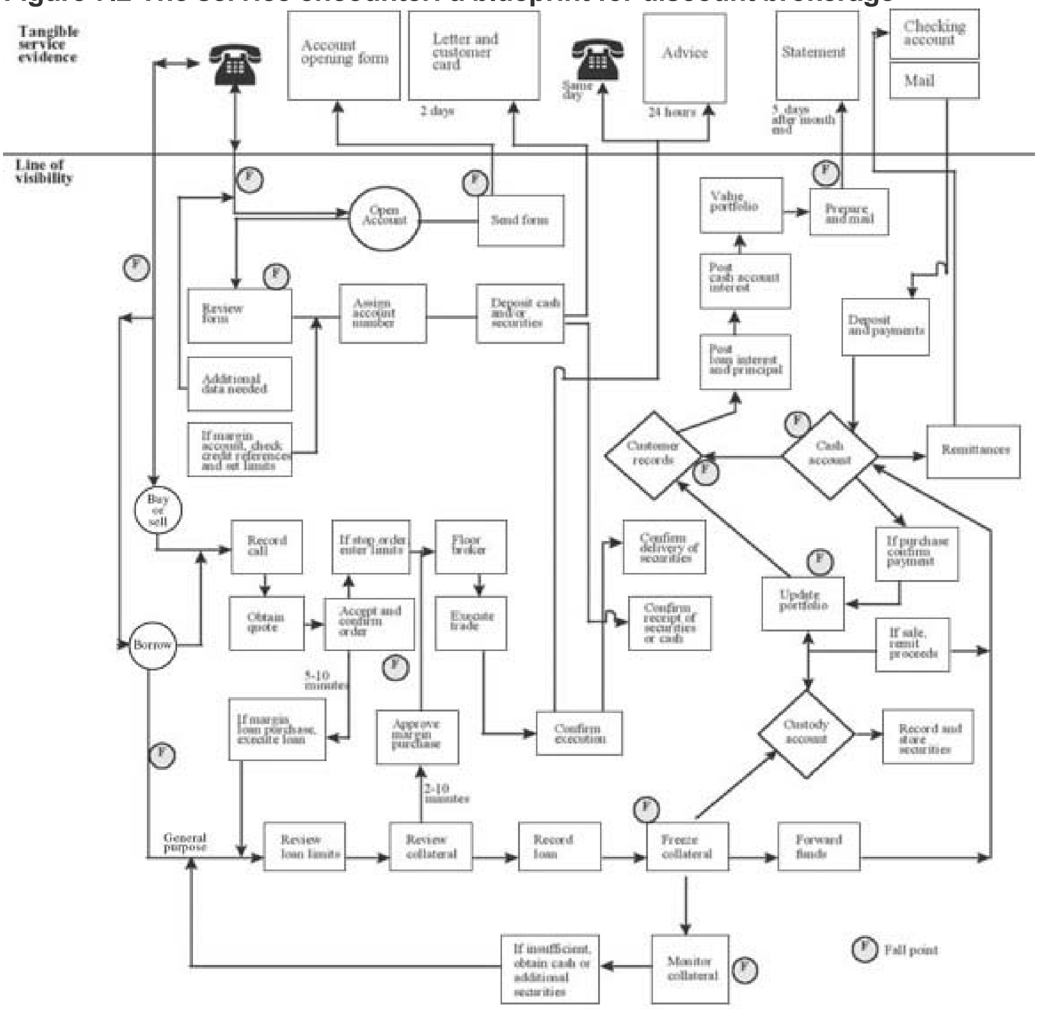
The choice of process type also limits the strategic options. Therefore, we can state that the choice of process is probably the most important variable in strategic operations management.

The 'as is' Process

A process (as a sequence of activities) must deliver the expected outcomes in a reliable way and at a satisfactory level of quality. In manufacturing, systematic analytical methodologies are used to design processes that are reliable and satisfactory. In services, it is much less common to design processes in a systematic way. Services are put together haphazardly, relying on a mixture of judgement and past experience (Ramaswamy, 1996).

One of the most important basic techniques in process management is *flowcharting.* Although flowcharting is a rather straightforward technique in manufacturing, it must be adapted in a service situation to bring in the customer interaction. Shostack extended the existing process mapping techniques by explicitly taking into account the interaction with the customer in what is called 'blueprinting' (Shostack, 1984). Blueprinting makes the process visible and distinguishes between front- and back-office. Blueprinting allows focus on the crucial points of interaction and can be used as a tool in service positioning (Shostack, 1987). To illustrate this, consider the example in Figure 7.2 of a financial service process for discount brokerage (Shostack, 1985).[1]

Figure 7.2 The service encounter: a blueprint for discount brokerage



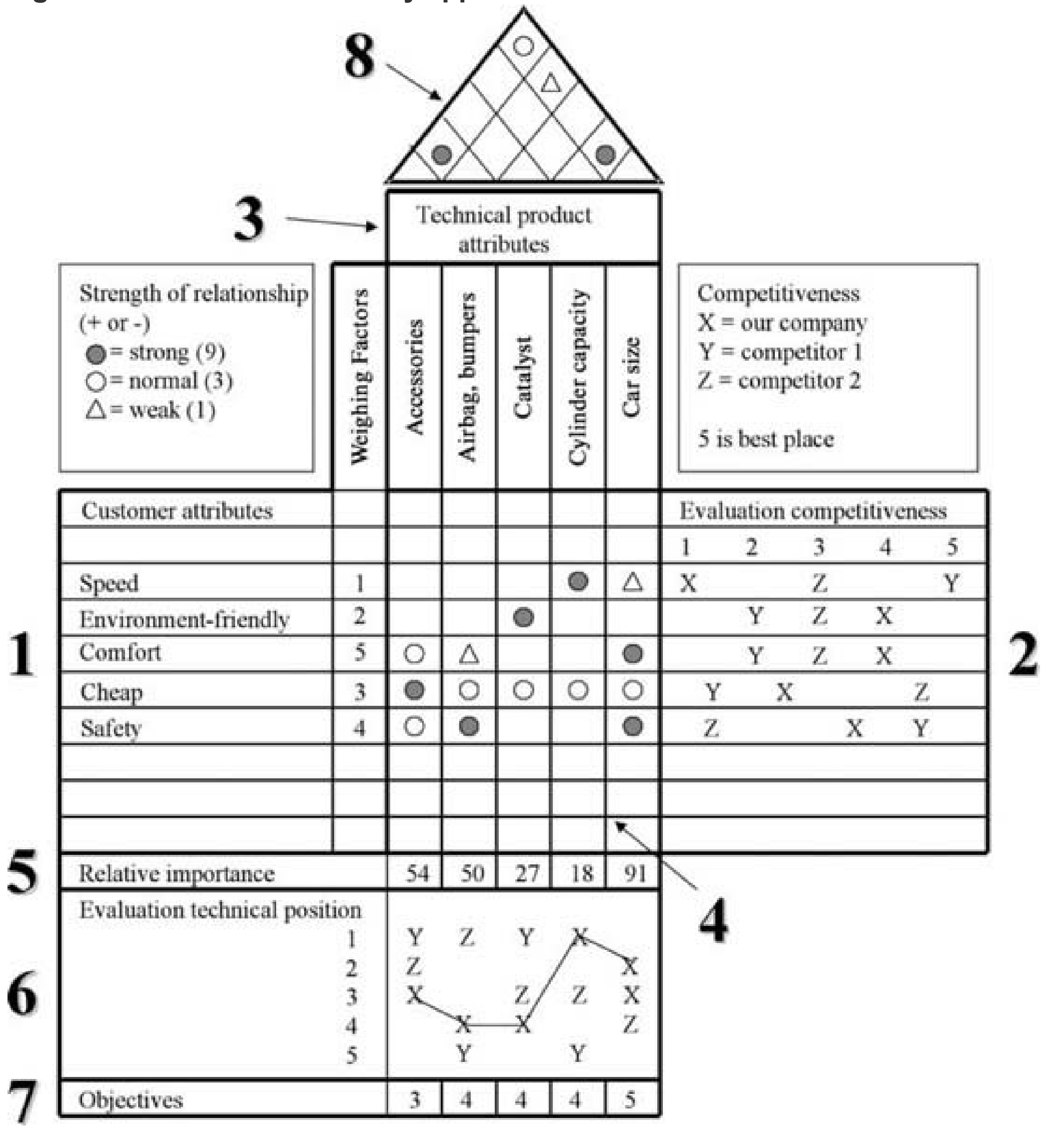
Source: Shostack (1985: 94)

The first step is to identify the various activities that together constitute the service process. The customer makes a telephone call, asking to open an account. The back-office then processes that request and decides to grant or deny an account. If accepted, the customer can place various orders, obtain advice and receive a monthly financial statement. All activities should be mapped - the activities that the customer actually sees (front-office), as well as the back-office activities. Front- and back-office activities are separated in this approach by a *line of visibility,* indicating where the customer intervenes in the service delivery process.

Increasingly, scholars are proposing the use of more systematic approaches to designing customer needs into processes. One of these approaches is *Quality Function Deployment* (QFD), which translates customer needs and preferences into operational goals for the firm.

In a manufacturing context, QFD is very popular because it creates a bridge between the engineer and the customer. The QFD methodology uses a hierarchy of interconnected matrices, which establish the quality relationships between higher-level design activities (i.e., at the product or service level) and the associated lower-level activities (i.e., sub-process, sub-system or function) (Ramaswamy, 1996). The most famous matrix is the first in the QFD hierarchy, the so-called *'House of Quality'.* Using a 'House of Quality with eight rooms', QFD translates customer requirements into the technical characteristics of the production process (Hauser and Clausing, 1988). Figure 7.3 shows a simplified example of a House of Quality. Using this house, the working of QFD can be explained.

Figure 7.3 The House of Quality applied to cars



Room 1 shows a list of the customer attributes. These are the requirements of the customer for a particular product or service. Each attribute receives a weight indicating its relative importance. In this example, comfort is a more important customer attribute than speed.

Room 2 shows more descriptive information about the customer's desires and needs. In many cases, it contains the customer evaluation of each of the customer attributes in other competitive firms. Is the score of the attribute in the organization concerned better or worse than in other organizations?

Room 3 is the voice of the design team and shows the technical attributes that the design must have to satisfy the customer's needs.

Room 4 (in the centre) describes the correlation between the customer attributes (Room 1) and the technical attributes (Room 3) using a matrix diagram. Generally, the strength of the relationship between these customer and technical attributes is measured with an ordinal scale. For example, the speed of a car is strongly influenced by the cylinder capacity; to a lesser degree, speed is also related to car size.

In Room 5, the relative importance of a particular technical attribute (e.g., accessories) is calculated. First, the weight of a customer attribute -5 in the case of comfort - is multiplied by the correlation value of a technical attribute (accessories) and the customer attribute (comfort). This multiplication results in a value of 15 (5 × 3). This calculation is repeated for each customer attribute that is correlated with that particular technical attribute. In this case, accessories is also correlated with attributes such as price level and safety. The scores here are 27 for price and 12 for safety. The total value of the technical attribute ‘accessories’ is therefore: 15 + 27 + 12 = 54 (taking into account the relative importance of each customer attribute, as long as it is correlated with it). The importance of the technical attributes are compared one to another. In our example, car size is the most important technical attribute to satisfy the customer's needs.

Room 6 shows more descriptive information about the quality of the performance of the competitors' designs. As company X, we have rather small cars compared to our competitors Y and Z. So, we have a clear disadvantage in satisfying the desires of our customers.

In Room 7, we define target values (based on the figures obtained from Rooms 5 and 6). These objectives teach us more about the future direction of the company in improving the design function. In the example, it is important that the company improves its technical attribute ‘car size’.

Room 8 (the roof) shows which technical attributes are compatible (or not) with each other. In our example, there is a strong correlation between cylinder capacity and car size. A higher cylinder capacity requires a larger engine block, which in turn requires a larger car.

The QFD methodology has been applied in many different business environments (both in manufacturing and in services). Applications of QFD have been reported in car manufacturing, the computer and electronics fields, machine construction, software development, education, and the transport and distribution industry. The service applications of QFD are rather limited, but nevertheless are promising (Dubé et al., 1999).

The main benefits of the QFD method are cost reduction and increasing returns. Cost reduction is achieved through more standardization in the production process and the availability of a tool to evaluate interim changes in the project. Increased returns are obtained because the products or processes incorporate the customer's requirements. QFD also leads to reducing time for designing, developing, producing and selling products or services (Cohen, 1995). Since its first introduction, QFD has evolved from simply an engineering technique to an overall quality management technique. In this perspective, QFD is not only useful in the first stage of the life cycle model of operations functions, but it is also relevant in the later stages.

A key aspect in the analysis of processes is the detection and explanation of variation in the process. Basically, a distinction must be made between *common causes* and *special causes* of variation. Only special causes of variation lead to a process that is 'out of control'. To be able to make a distinction between common and special causes of variation, control limits can be introduced. Control limits represent the range within which all points are expected to fall when the process is in control (i.e., when only common causes of variation are present). *Statistical Process Control* (SPC), using control charts, is a very common way to monitor variation in processes. We refer to the specialized literature for more explanation about the working of SPC.[2]

In some situations, especially in the service sector, SPC and similar tools cannot be used to detect process variation. In order to understand process variations in these cases, it is helpful to look at the relative performance of similar processes (or part of processes) in different organizations. One technique that can be used in this case is Activity-Based Management (ABM).

Activity-Based Management originated out of Activity-Based Costing (ABC), which itself originated out of a growing dissatisfaction with the traditional cost accounting systems. With the traditional systems, the rather arbitrary allocation of overhead costs often led to distorted cost information. With Activity-Based Costing approaches, it is the amount of resources used by the activities during the transformation process that determines the allocation of overhead costs to products or services. For instance, instead of allocating the cost of invoices to different sales departments based on the sales volume of each department - an approximate indicator - a company starts to use the actual number of invoices as this is the real cost driver. ABC implies that the relevant cost drivers are established for the activity invoicing; the major cost driver is without doubt the number of invoices. This driver indicates what is causing the consumption of resources for that activity and hence the cost of that activity.

ABM starts from the same basic ideas as ABC (Rotch, 1990; Antos, 1992). It extends the ABC logic to an overall management approach that focuses on influencing underlying activities and their dynamics (Campi, 1992; Roberts and Silvester, 1996). Applying activity-based management principles requires a thorough knowledge of the activities and the drivers underlying the service delivery process. If we want to link the consumption of resources with a specific activity, we have to know which activities make up the service delivery process. Process mapping has an important role to play in this respect.

Once the different activities have been distinguished and mapped within the process, drivers can be identified for each activity. Indicators of productivity are then derived by relating the resources spent on each activity with the appropriate driver. For example, if we know that three people (= the resources) are continuously handling invoices and we know the number of invoices (= the driver), a performance indicator can be derived for this activity by dividing the number of invoices by the number of resources. If all three people work eight hours and the daily number of invoices is 500, the performance indicator for productivity relating to this task shows that handling one invoice takes approximately three minutes.[3]

The final outcome of the process design stage is a very clear map of the 'as is' process, including a determination of problems and the root causes of these problems.

The 'to be' Process

In this stage, a 'to be' process is designed. Depending on the kind of philosophy being followed (Total Quality Management versus reengineering), this can be an incremental change of the process or a radical change. In this section, using a process of CT scanning of patients in a hospital as an example, we illustrate how processes can be re-engineered.[4] The particularity of the situation is that time is a very important performance measure in this case.

A company that wants to re-engineer processes has to walk through the six Rs: Realization, Requirements, Rethink, Redesign, Retool, and Re-evaluate (Edosomwan, 1996). The requirements and the rethink stages are based on the 'as is' process description (see previous section).

Realization

In the realization phase, a company must become aware that continuous and radical improvement of processes is a condition *sine qua non* for survival in a competitive environment. Data must be captured to convince decision-makers to start up a re-engineering process. It is impossible to re-engineer without the support of the whole company. For example, referral physicians are a very important customer group in the case of CT scanning. Getting quick access to the facilities and receiving fast feedback after investigation are important basic needs for these physicians. Data on these needs must be collected.

Requirements

Before changing the processes, it is important to define clearly the mission, vision, values, and the most important requirements for meeting (and even exceeding) customer expectations. The customer voice must be brought in and criteria for measuring process performance must be defined. These performance criteria must be in line with the strategy of the firm. The Balanced Scorecard (see Chapter 3) is often used to define these performance measures.

In our CT scanning example, ROI, cash flow, reliability, quality of the medical diagnosis, patient satisfaction, process innovation, utilization rate, throughput time and waiting time are all examples of performance measures, reflecting the financial perspective, the customer perspective, the internal process perspective, and the innovation and learning perspective (as identified by the Balanced Scorecard). Table 7.1 shows examples of some operational performance measures of the CT scanning process in two different hospitals. Hospital B is able to serve customers more quickly than hospital A and, at the same time, has a higher utilization rate.

Table 7.1 A comparison of operational performance measures for two hospitals

	Hospital A	Hospital B
Utilization rate CT scan	81%	91%
Ratio of real investigation time to total throughput time	23%	34%
Total throughput time (room out – room in)	66 minutes	43 minutes
Average waiting time before CT	23 minutes	13 minutes
Set-up times	2.48 minutes	1.25 minutes

Rethink

In the rethink stage, we examine the existing working conditions of the organization. The current processes are evaluated and compared with the objectives and expectations. The causes of the operational weaknesses in the organization and the variability in these processes are further investigated. Every activity or process that does not add value in the realization of the product or service is labelled as waste.

Figure 7.4 shows the relationships between different time components in the CT scanning process and the factors driving time (Gemmel, 2000). It is important to study the non-value-adding activities in greater detail. These are 'waiting' and 'transport'. One of the important drivers of the transport time is the architecture of the building and, more particularly, the presence (or absence) of an elevator. In a tall building, where patients and employees need an elevator to go to the radiology department, there seems to be no relationship between the distance (from the room to the department) and the total transport time. Because of the unpredictability of the transport time, patients are transferred earlier to the radiology department (to make sure that they arrive in time).

Figure 7.4 Time drivers in the CT scanning process

Drivers	Waiting on transport	Transport time	Waiting before preparation	Preparation time	Investigation time	Transport time
Architecture		X				X
Preparation room				X	X	
Appointment system			X			
Communication system	X					
Transport time			X			

Redesign

A process is a set of logical, related tasks which are executed to bring forth a predetermined output. Every task is analysed in the function of redesigning the most important processes. This redesign can be radical, i.e., old processes are substituted by totally new processes.

When analysing the CT scanning process, it was found that in several hospitals patients were prepared for CT when already lying on the CT scanner. This preparation seemed to be the most variable time component of the whole investigation. One possible solution is to install a separate room where patients can be prepared before entering the CT scanner room. Because the variability of the time on the CT scanner reduces remarkably, a higher utilization can be achieved without substantially increasing the waiting time.

Retool

Radical change is not possible without having the right tools (equipment, machines, and other critical instruments). It is quite clear that the creation of a separate preparation room for CT scanning takes hospital space (which is often very scarce). Another way to solve the problem is to think about the layout of the radiology department. This layout is crucial to using the CT scanners efficiently. Having a working room in between two rooms with scanners is much more interesting than having two scanner rooms in separate locations.

In our example, it is possible to simulate the proposed changes and to get some insights into the change in performance before implementing the changes in reality. *Computer simulation* is a tool that allows one to imitate the behaviour of production or service systems to compare several designs of the processes. For example, in production, the layout of warehouses can be investigated before changes are implemented. In the CT scanning example, the effect of introducing a preparation room can be simulated before implementation. Computer simulation has been described in a variety of books and is extremely useful in those situations where a buffer exists - a queue in a service situation or an inventory in a production situation.[5]

Re-Evaluate

After redesigning and retooling, the complete process is re-evaluated to find out whether or not this has led to better performance. This assumes the availability of evaluation criteria such as throughput time, quality, productivity, customer satisfaction, employee satisfaction, market share, profitability, and other measures.

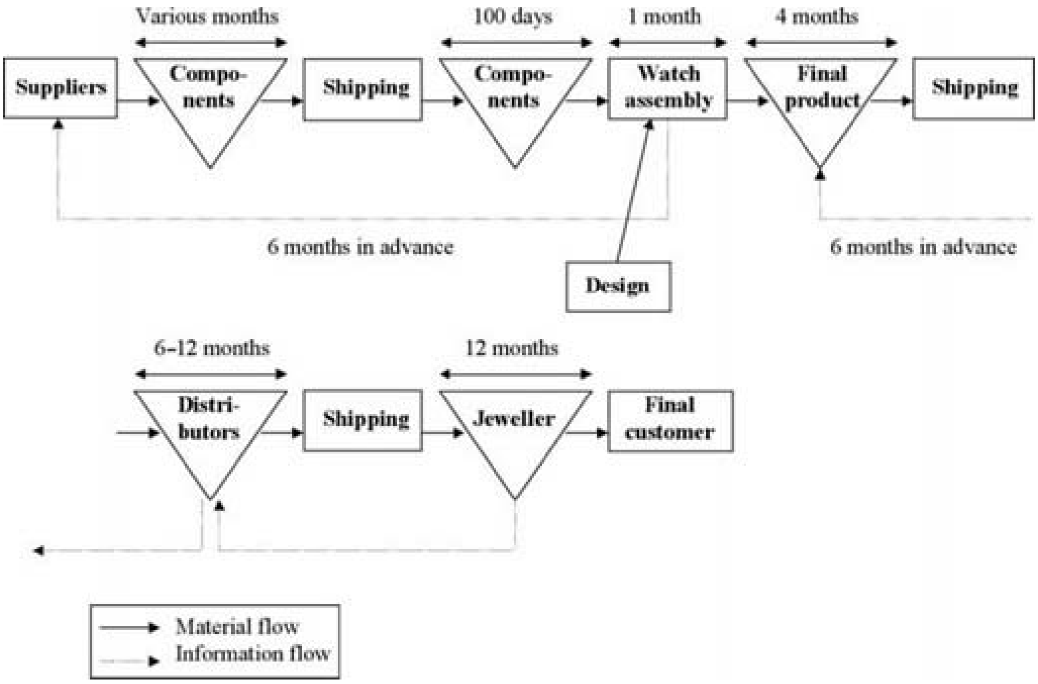
After implementing the changes (e.g., installing an investigation room), it is important to re-evaluate the performance of the new process.

Supply Chain Management[6]

The philosophies of Total Quality Management (TQM), and particularly Just-in-Time (JIT), emphasize the fact that the logistics chain does not end at the door of the firm. Better relationships with suppliers are considered crucial to process management across organizations. This might be the involvement of suppliers in product development, the development of long-term relationships with an intensive exchange of information, and even impact of the customer on the design of the supplier's production process. In the consumer business, producers are increasingly taking into account the desires of the distributors and the final points of sale.

Supply chain management (SCM) is the management of the entire chain: from the supply of raw materials, through the distinct production and distribution phases, to the final customer. Figure 7.5 shows the supply chain of a producer of watches. The fundamental principle of supply chain management is that through effective information exchange between the various links in the chain, and through striving for a win-win relationship, a better supply of products is generated for the customer.

Figure 7.5 The supply chain of a producer of watches



There are various driving forces behind the growing importance of supply chain management:

- *The shortening of the product lifecycles.* While in the past, the clothing industry considered it good practice to introduce a new collection two times per year, today - to be competitive - a clothing firm needs to introduce at least four new collections per year. This means that time-to-market is becoming a very crucial performance measure.
- *The focus on core activities.* In line with the idea of focus on core competences, firms are starting to outsource activities with greater frequency. Most often, these are secondary activities, such as maintenance, distribution and product development. But primary activities, such as production and packaging, are also outsourced. This makes the supply chain much more complex.
- *The virtual factory.* A virtual factory is a factory that attains its target of transforming materials and components into value for the customer by using resources outside the manufacturing function proper. If the service component of the offering represents the core of the company's competitive advantage, then traditional manufacturing companies may ultimately subcontract the tangible part and concentrate entirely on the service component. For example, E&J Gallo Winery, the largest wine producer and distributor in the USA, outsources the growing of specialized grapes for its wines. Gallo devotes its resources and management attention to the marketing and sales functions (Quinn et al., 1998).
- *Towards 'sensitization'.* Competitive pressures force firms to differentiate their product offering. This is achieved by enhancing the product. The product offering can be decomposed into a hardware core, traditional components of service such as installation, after-sales services, repair and payment arrangements, and finally all kinds of services that are necessary to offer a solution to the customer's problem. Consider the example of the full service contracts at Asea Brown Boveri (ABB). In such a contract, ABB partially or completely takes over the responsibility of its customer's maintenance function. With its 'Full-service contracts', ABB Service is being paid for its expertise in optimizing a customer's process. By providing guidance during the design and development stage, by offering preventive maintenance, and so on, ABB Services creates value for the customer, resulting in increased availability of the customer's machines (Desmet et al., 1998).

- *Towards more flexibility.* Customers want a broad range of products - or products that are customized - without paying a higher price for them or being confronted with longer lead times. Shorter lead times are only possible when a company actively manages the supply chain.
- *Evolution in information technology.* Information technology has a major impact on how the supply chain can be managed. Let us look at the example of electronic procurement (or e-procurement). E-procurement applications can help make procurement more efficient and can enhance the relationship with suppliers. The e-procurement evolution promises to redefine buyer and supplier relationships completely, yet many enterprises simply implement Web e-procurement software-without rethinking the processes needed to transform the procurement cycle (Reilly et al., 2000). This common, but short-sighted, practice again emphasizes the need to rethink or redesign the current logistic system. E-procurement can take a variety of forms, such as electronic data interchange, Internet, Intranet, Extranet, electronic catalogue ordering, e-mail, etc. The increased popularity of e-procurement is due to the multitude of operational benefits that it can bring to purchasing practices (Min and Galle, 1999).

Successful supply chain management assumes a radical rethinking of the supply chain. SCM is not just the automation of the existing production and distribution processes. Processes, roles and responsibilities sometimes must be changed drastically. This can lead to the elimination or substitution of a link in the chain. This rethinking of the supply chain can be based on the same steps as in process re-engineering. The supply chain must be mapped and the added value of each step in the chain must be evaluated.

A crucial element in successful SCM is the link between the material process and the information process. For instance, it is important for a component supplier to have fast access to information about the final consumption of the product in which his component is placed. Better information can significantly reduce inventories because these inventories are safety stocks against uncertainty. This leads to so-called lean production, an approach to managing operations without massive buffers of inventory.

Successful SCM also requires the shift from a vertical organization to a horizontal organization. More than that, it is important that there is some concordance in the degree of process orientation of the various companies in the supply chain. This also means that the performance measurement systems must be redesigned: existing systems are too focused on optimizing one department or one firm. SCM requires achieving a win-win situation in the whole chain (as in the example of ABB Services). In such a setting, the emphasis is much more on lead-time performance. It is important to point out that performance measures must relate not only to traditional logistical elements but also to the impact of the supply chain on the bottom line of the business.

World-Class Manufacturing[7]

World-Class Manufacturing (WCM) can be regarded as an objective, something like manufacturing excellence. It is a precursor of the standard performance for all firms that want to compete globally. WCM firms are better than almost every other company in their industry in at least one aspect of manufacturing. They have workers and managers who are so skilled that other companies are trying to attract them away. They are able to react quickly and adequately to market changes (Hayes et al., 1988). They foster continuous improvements in human assets, technology, materials and information flows. These are the kinds of firm that are able to break through the classical 'trade-off' between low-cost producer and differentiator. They excel in every kind of operating performance at the same time: quality, dependability, speed, flexibility and price (see Chapter 4).

An example of such a firm is Southwest Airlines, which is able to deliver low cost without giving up great service. Southwest Airline planes typically spend much more time in the air than planes in the more traditional airline companies - 70 per cent of their flights have a turnaround time of less than 15 minutes at the terminal. Their planes are in the air 11 hours per day, as compared to the industry average of eight hours. Their pilots fly many more hours for lower wages than pilots in other airline companies. At the same time, they have a very good record of on-time performance and very few lost bags.

A key element in their success is selecting their employees carefully and training them to be customer-oriented. It is interesting to read the comments of a Burger King manager after visiting Southwest Airlines.

> For me, I know a company has it right when the front line people actually do and say what management values. Any company can teach customer service, but only companies that have systems in place that reward great service will demonstrate it in practice. Very few companies treat people as their most important asset, especially the people that count the most - the ones that deal with the customer. For me, the lesson learned is that it is possible to be the low cost and high service leader. The key is to invest heavily in training, staffing, and reward systems for your people that are aligned with the values of the company.
>
> (Southwest Airlines (A-1) case, 1995: 3)

Many of these WCM firms very clearly understand that customers from different market segments cannot be served with the same delivery or production system. Therefore, they focus on one specific segment and are able to develop excellent performance in all areas. One other example is the Canadian hospital 'Shouldice', which performs much better than a traditional general hospital in terms of cost, quality, service, speed and customer orientation. So, it can be said that WCM firms have a very clear manufacturing strategy, which assumes a bi-directional relationship between the strategy of the firm and the production system.

The main secret of WCM firms is that they are based on dynamic processes that allow them to change and improve in a continuous way. These processes further explain why such firms are able to be active on these different performance fronts simultaneously:

- Customer orientation;
- Continuous improvement;
- Lead-time performance (Sweeney, 1991).

Customer Orientation

WCM firms understand very well that the production function must be externally oriented and, more specifically, customer-oriented. The message of Jan Carlzon, president of the Scandinavian airline company SAS, very clearly illustrates this idea: 'We fly people, not airplanes' (Carlzon, 1987). Bringing in the voice of the customer, servitization and a horizontal organization are the core elements in obtaining customer orientation.

Continuous Improvement

WCM firms apply the principles of continuous improvement *(Kaizen).* This starts with reliability of processes and products. Employees are considered as the main source of new ideas and are empowered to implement changes. Sometimes this leads to radical changes (reengineering) to obtain seamless processes.

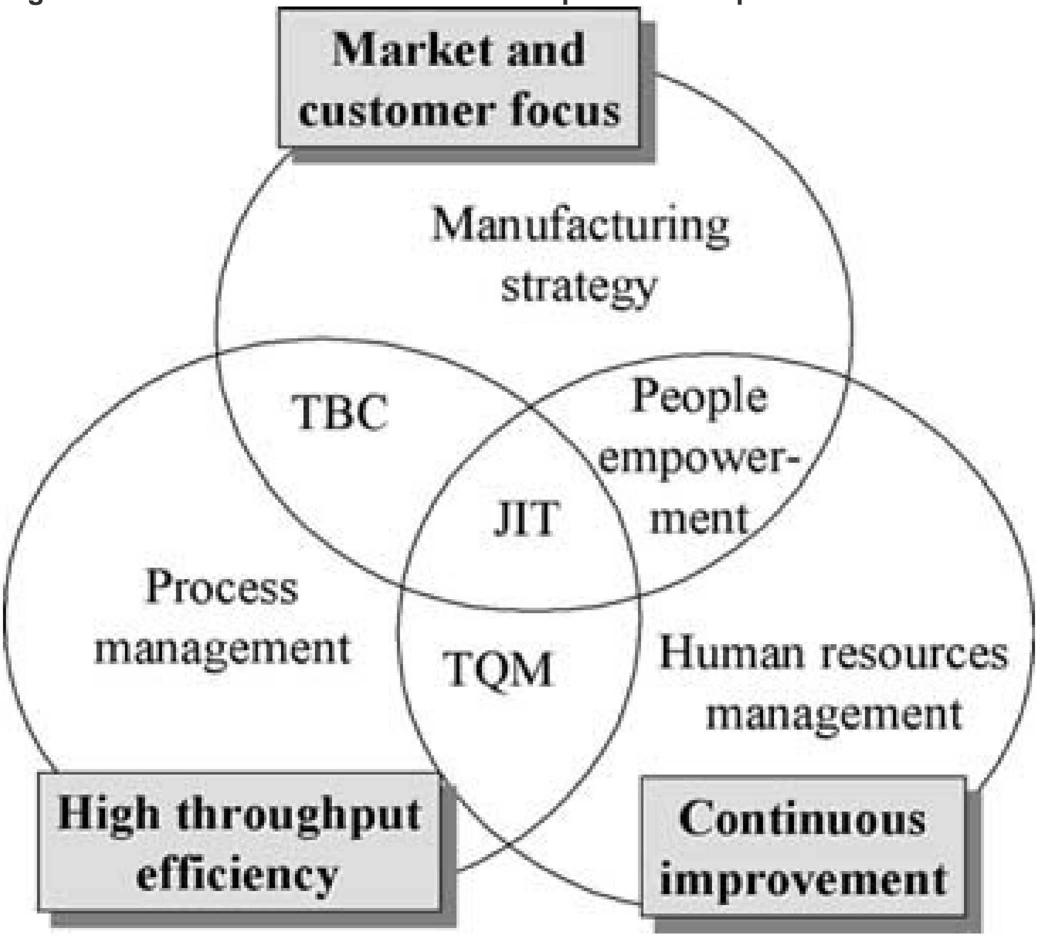
The results of the changes or the progress in the company are measured and made explicit. Then, at a certain moment, a quality assurance system (such as ISO 9000) must consolidate the progress of the company. Otherwise, there is a danger of regression.

Lead-Time Performance: High Throughput

WCM firms put the emphasis on the maximization of throughput. In other words, they believe in Time-Based Competition (see Chapter 4). The reduction of throughput times in production, administrative processes, purchasing, distribution and in product development generate an important leverage effect on performance.

WCM firms apply the concepts of Just-In-Time (JIT) to their internal production processes as well as to their relationships with suppliers. JIT teaches that inventories often hide many operational problems. Inventory reduction requires a fundamental strategy to cope with these problems-leading to better performance in terms of quality, productivity, lead-time reliability and flexibility.

Figure 7.6 The simultaneous interaction of performance processes that lead to WCM



Conclusion

In Chapter 4, we proposed a relationship between the various definitions of quality and the 'maturity' of the firm in terms of quality experience. In this chapter, we have further developed the idea that becoming more mature in terms of quality experiences means becoming more business process oriented. This also means that organizations going through the evolution from stage 1 to stage 4 look in a different way at the role of operations. In the first stage, we recognize the traditional functional department where the biggest challenge is the collaboration between the different departments. In the second stage, process management plays a greater role. The basic processes are defined and documented. The 'as is' process is described and evaluated. The 'to be' process is proposed. In the third stage, this process orientation is extended further towards relationships with suppliers and customers. This results in what is called management of the supply chain. In the last stage, firms are fully integrated in terms of functions and processes within and across the company. These are the firms that excel in the global economy and establish benchmarks for other firms. They are the so-called World-Class Manufacturing firms.

Notes

1 Many process mapping techniques exist, and process mapping has many other purposes which go beyond the scope of this book. The reader interested in learning more about process mapping may refer to, for instance, the structured analysis and design technique and the service logic map (see Congram and Epelman, 1995; Kingman-Brundge et al., 1995).

2 SPC is discussed in detail in Evans and Lindsay, 1999: 528.

3 The technique of ABM and an illustration of its use have been described in Van Looyet al., 1998.

4 CT scanning is an investigation based on radiology in order to look into the human body.

5 See, for example, Van Looy et al., 1998: Technical note 3.

6 This part is partially based on Van Dierdonck and Busschop (1996).

7 Parts of this chapter are based on Van Dierdonck and Vereecke (1994).

- invoices
- customers
- supply chains
- special cause variation
- procurement
- continuous innovation
- measures of performance

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