

Chapter 6

Managing quality using the process approach

I must create a system or be enslaved by another man's;
I will not reason and compare: my business is to create.

William Blake (1757–1827), English poet

A general philosophy of process management

Function approach versus process approach

Most organizations are structured into functions that are collections of specialists performing tasks. The functions are like silos into which work is passed and executed under the direction of a function manager before being passed into another silo. In the next silo the work waits its turn because the people in that silo have different priorities and were not lucky enough to receive the resources they requested. Each function competes for scarce resources and completes a part of what is needed to deliver product to customers. This approach to work came out of the industrial revolution influenced firstly by Adam Smith and later by Frederick Taylor, Henry Fayol and others. When Smith and Taylor made their observations and formulated their theories, workers were not as educated as they are today. Technology was not as available and machines not as portable. Transportation of goods and information in the 18th and 19th centuries was totally different from today. As a means to transform a domestic economy to an industrial economy the theory was right for the time. Mass production would not have been possible under the domestic systems used at that time.

Drucker, defined a function as a collection of activities that make a common and unique contribution to the purpose and mission of the business.¹ Functional structures often include marketing, finance, research & development and production that are divided into departmental structures that include design,

manufacturing, tooling, maintenance, purchasing, quality, personnel and accounting etc. In some cases the function is carried out by a single department and in other cases it is split among several departments. However, the combined expertise of all these departments are needed to fulfil a customer's requirement. It is rare to find one department or function that fulfils an organizational objective without the support of other departments or functions and yet, the functional structure has proved to be very successful primarily because it develops core competences and hence attracts individuals who want to have a career in a particular discipline. This is the strength of the functional structure but because work is always executed as a process it passes through a variety of functions before the desired results are achieved. This causes bottlenecks, conflicts and sub-optimization. A functional approach tends to create gaps between functions and does not optimize overall performance. One department will optimize its activities around its objectives at the expense of other departments. For example, the Purchasing function may have as its objective the minimization of costs and select suppliers on lowest price not realizing or even ignoring the fact that product quality is lower and as a consequence the Production function cannot meet its objectives for product quality. Similarly, a Finance function may have as its objective the optimization of cash flow and hold back payment of supplier invoices. Once again the production function feels the impact as suppliers refuse to deliver goods until outstanding invoices have been paid. One approach that aims to avoid these conflicts is what is referred to as "balancing objectives". On face value this might appear to be a solution but balancing implies that there is some give and take, a compromise or reduction in targets so that all objectives can be met. The result is often arrived at by negotiation implying that quality is negotiable when in reality it is not. Customers require products that meet their requirements not products that more or less meet their requirements.

When objectives are derived from stakeholder needs, internal negotiation is not a viable approach. The only negotiation is with the customer. If the customer requires X and the organization agrees to supply X, it is under an obligation to do so in a manner that satisfies the other stakeholders. If the organization cannot satisfy the other stakeholders by supplying X, it should negotiate with the customer and reach an agreement whereby the specification of X is modified to allow all stakeholders to be satisfied. If such an agreement cannot be reached the organization has to decline to supply under those conditions.

Some of the other differences are indicated in Table 6.1.

Functional outputs are indeed different from process outputs and obviously make an important contribution, but it is the outputs from business processes that are purchased by customers not the functional outputs.

When we organize work functionally the hierarchy can be represented by the waterfall diagram of Figure 6.1. In this diagram we observe that the top-level description of the way work is managed is contained in a Quality Manual with supporting Department Manuals. A common mistake when converting to a

Table 6.1 Function versus process

<i>Attribute</i>	<i>Functional approach</i>	<i>Process approach</i>
Objectives focus	Satisfying departmental ambitions	Satisfying stakeholder needs
Inputs	From other functions	From other processes
Outputs	To other functions	To other processes
Work	Task focused	Result focused
Teams	Departmental	Cross functional
Resources	Territorial	Shared
Ownership	Departmental manager	Shared
Procedures	Departmental based	Task based
Performance review	Departmental	Process

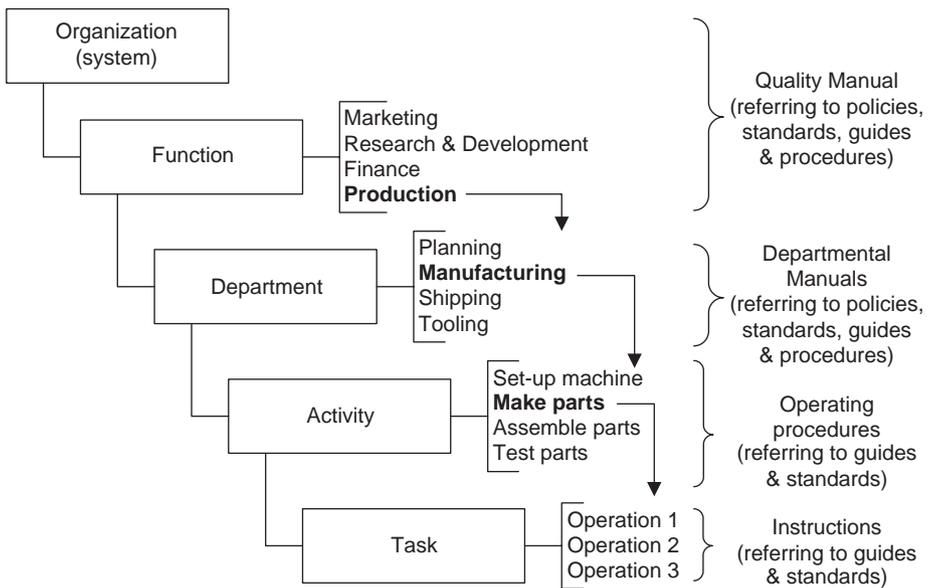


Figure 6.1 Functional decomposition of work

process approach is to simply group activities together and call them processes but retaining the Function/Department division. This perpetuates the practice of separating organization objectives into Departmental objectives and then into process objectives. This is not strictly managing work as a process at an organizational level. A more effective approach ignores functional and departmental boundaries as represented by Figure 6.2.

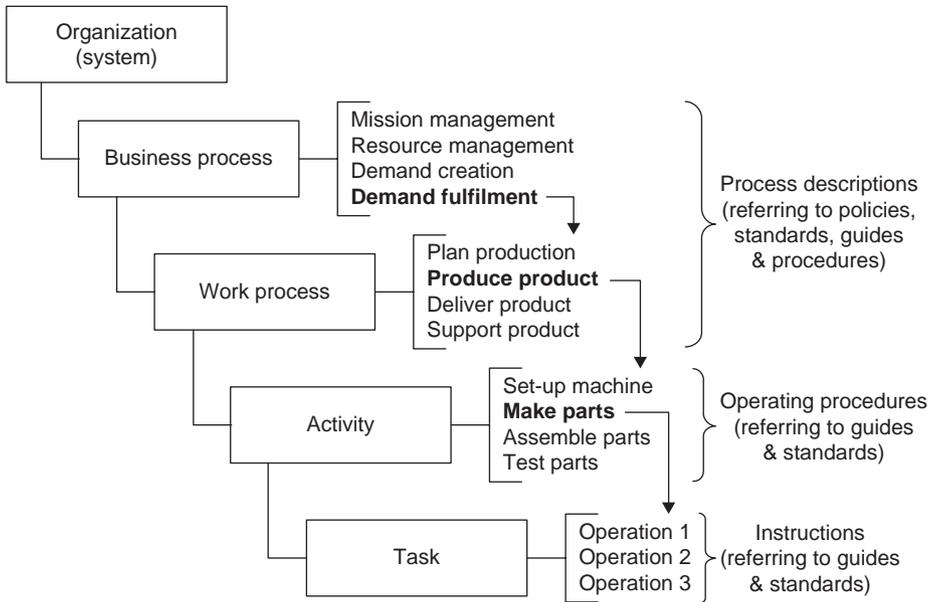


Figure 6.2 Process decomposition of work

Superficially it may appear as though all we have done is to change some words but it is more profound than that. By positioning the Business process at the top level we are changing the way work is managed. Instead of managing results by the contributions made by separate functions and departments, we manage the process which delivers the results regardless of which function or department does the work. This does not mean we disband the functions/departments; they still have a role in the organization or work. Work can be organized in three ways.² By stages in a process, by moving work to where the skill or tool is located or assembling a multi-skilled team and moving it to where the work is. In all of these cases we can still manage the work as a process or as a function. It comes down to what we declare as the objectives, how these were derived and how we intend to measure performance. If we ask three questions, “What are we trying to do, how will we make it happen and how will we know it’s right?” we can either decide to make it happen through a process or through a number of functions/departments and measure performance accordingly. By “making it happen” through a process we overcome the disadvantages of the functional approach.

Business process re-engineering

Re-engineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as costs, quality, service and speed.³ Business process re-engineering is about turning the organization on its head. Abandoning the

old traditional way of organizing work as a set of tasks to organizing it as a process. According to Hammer, re-engineering means scrapping the organization charts and starting again. But this does not need to happen. Process Management is principally about managing processes that involve people. A functional organization structure might well reflect the best way to develop the talents, skills and competence of the people but not the best way of managing stakeholder needs and expectations.

Managing processes as well as functions

It ought to be possible to manage people one way and manage the work that they do in another way. It works with Project Management where the functional authority is retained by the line departments and project authority rests with a Project Manager. In project management, staff are seconded to a project and are responsible to a Project Manager for their contribution to the project, but their line manager retains responsibility for their performance. If we adopt the same approach with process management, functional authority would be retained by the line manager and process authority would rest with a Process Manager. All it does is give people two sets of objectives, one set based on the objectives of the process and the other set based upon the objectives of the function. The function will now focus on developing knowledge, techniques, skills and competences rather than producing business outputs.

Processes in the Excellence Model

The notion of Process Management has been evolving over a number of decades but has gained real momentum during the 1990s through a number of fashions and trends including “business re-engineering”, “the business as a system” and “process mapping”. The introduction of national quality awards such as the Malcolm Baldrige Award in the US (MBNQA), European Quality Award, UK Business Excellence Award and many others across the world has also brought in the notion of Process Management.

All of the “excellence” models are based upon a number of common, underlying principles, namely Leadership including organizational culture; Planning including strategy, policies, stakeholder expectation, resources; Process and Knowledge Management including innovation and problem solving, and finally Performance Results covering all stakeholder expectations. Pivotal to organizational success is effective and efficient process management. The EFQM Excellence Model® in Figure 6.3 clearly illustrates these principles and the importance of processes as an enabler of results.

However, on first encounter, the EFQM Excellence Model® appears to suggest that processes are separate from Leadership, People, Policy and Strategy, Partnerships and Resources because Processes are placed in a box with these factors shown as “inputs”. This also suggests that the processes are more concerned with the “engine room” than the “boardroom”. In reality, there are

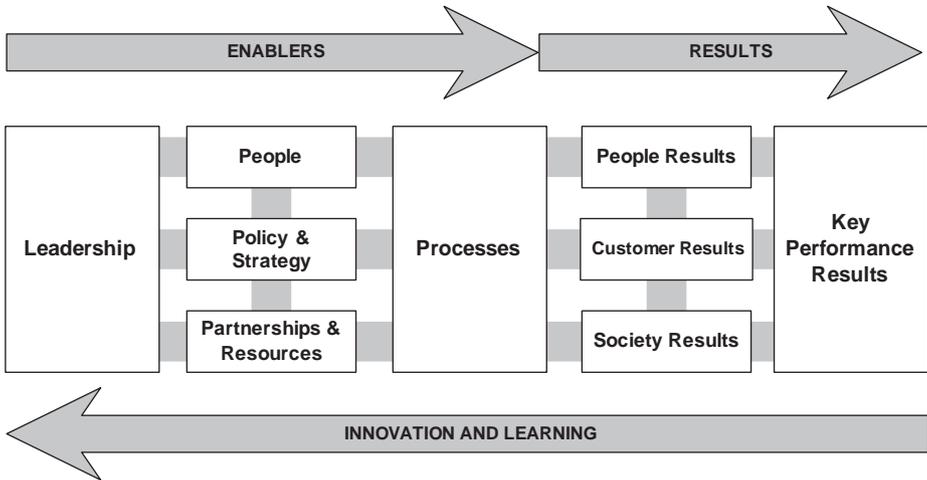


Figure 6.3 The EFQM Excellence Model

processes in the boardroom as well as the engine room. Clearly there must be strategic planning processes, policy-making processes, resource management processes, processes for building and maintaining partnerships and above all processes for leading the organization towards its goals. However, we must not forget that fundamentally the EFQM Excellence Model® is an assessment tool. It was not intended to be a design tool. It is used in assessing an organization's commitment to the excellence principles and to allow comparison of such commitment and performance between organizations.

Finding a definition

There are different schools of thought on what constitutes a process.

A process is defined in ISO 9000 as *a set of interrelated or interacting activities which transforms inputs into outputs* and goes on to state that *processes in an organization are generally planned and carried out under controlled conditions to add value*. The inclusion of the word *generally* tends to suggest that organizations may have processes that are not planned, not carried out under controlled conditions and do not add value and indeed they do!

Juran defines a process⁴ as a systematic series of actions directed to the achievement of a goal. In Juran's model the inputs are the goals and required product features and the outputs are products possessing the features required to meet customer needs. The ISO 9000 definition does not refer to goals or objectives.

Hammer defines a process⁵ as a collection of activities that takes one or more kinds of inputs and creates an output that is of value to the customer. Hammer places customer value as a criterion for a process unlike the ISO 9000 definition.

Davenport defines a process⁶ as a structured measured set of activities designed to produce a specified output for a particular customer or market.

Procedures versus Processes

The procedural approach is about doing a task, conforming to the rules, doing what we are told to do.

The process approach is about understanding needs, finding the best way of fulfilling these needs, checking whether the needs are being satisfied and in the best way and checking whether our understanding of these needs remains valid.

The concept of adding value and the party receiving the added value is seen as important in these definitions. This distinguishes processes from procedures.

It is easy to see how these definitions can be misinterpreted but it doesn't explain why for many it results in flowcharts they call processes. They may describe the process flow but they are not in themselves processes because they simply define transactions. A series of transactions can represent a chain from input to output but it does not cause things to happen. Add the resources, the behaviours, the constraints and make the necessary connections and you might have a process that will cause things to happen. Therefore any process description that does not connect the activities and resources with the objectives and results is invalid. In fact any attempt to justify the charted activities with causing the outputs becomes futile. The process

approach would therefore be more accurately expressed as an approach to managing work in which the activities, resources and behaviours function together in such a relationship as to produce results consistent with the process objectives.

Process models

In the context of organizational analysis, a simple model of a process is shown in Figure 6.4. This appeared in ISO 9000-1:1994 but clearly assumes everything other than inputs and outputs are contained in the process. The process transforms the inputs into outputs but the diagram does not in itself indicate whether these outputs are of added value.

Figure 6.5 reminds us that processes can produce outputs that are not wanted therefore if we want to model an effective process we should modify the information displayed.

Another model (Figure 6.6) taken from BS 7850:1992⁷ shows resources and controls to be external to the process implying that they are drawn into the process when needed and yet without either a process cannot function. So can a process be a process without them? If it can't, the label on the box should either be "activities" or these inputs should be removed. Some controls might be an output of another process as are resources but controls would be built-in to the process during process design and resources would be acquired when building a process other than any output specific resources. Therefore in this respect the diagram is misleading but it has been around for many years.

The process model adopted by ISO/TC 176 did show procedures as an external input to a process⁸ but the updated version in 2003⁹ (Figure 6.7) shows resources as inputs and qualifies the outputs as being "Requirements Satisfied" which is a far cry from simply outputs. The central box is also different. The



Figure 6.4 Simple process model



Figure 6.5 Unwanted process outputs

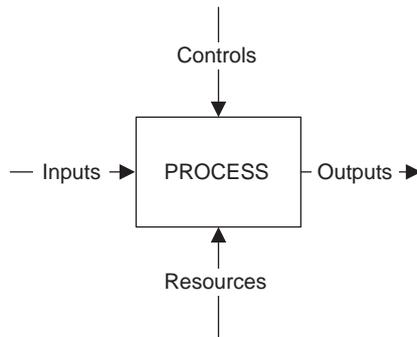


Figure 6.6 BS 7850 process model

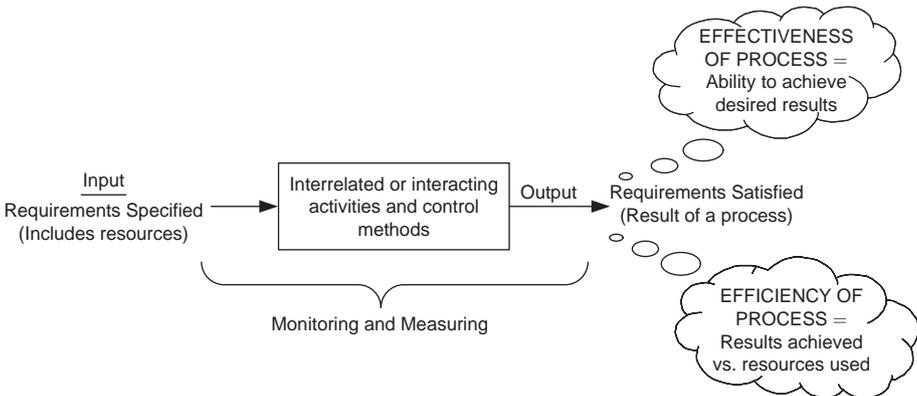


Figure 6.7 ISO 9000 process model

process label has now changed to activities which is more accurate. However, the diagram implies that as the resources are inputs they are all transformed into outputs or consumed by the process which clearly cannot be the case. People and facilities are resources and are not transformed or consumed by the process (assuming the process is functioning correctly!).

Therefore there would appear to be a difference between a process that transforms inputs into outputs and one that takes a requirement and produces a result

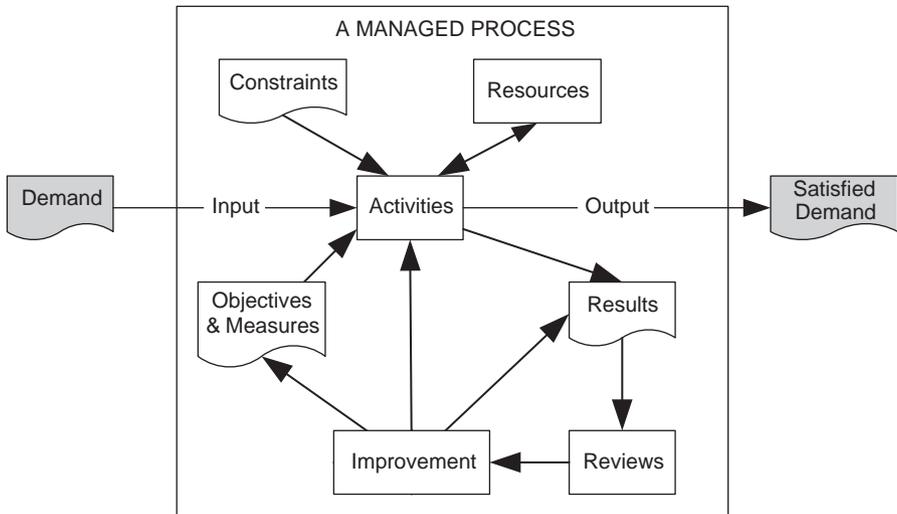


Figure 6.8 Advanced process model

that satisfies this requirement. If we accept that a process is a series of interrelated activities, behaviours and resources that delivers a result and an effective process as being one that achieves an objective, a more useful model might be that of Figure 6.8. This model shows that the process is resourced to receive a demand and when a demand is placed upon the process a number of predetermined activities are carried out using the available resources and constrained in a manner that will produce an output that satisfies the demand as well as the other stakeholders. These activities have been deemed as those necessary to achieve a defined objective and the results are reviewed and action taken where appropriate to

- a) Improve the results.
- b) Improve the way the activities are carried out.
- c) Improve alignment of the objectives and measures with current and future demands.

Process management principles

As a result of the foregoing a set of seven principles has begun to emerge on which effective process management is based. They all begin with the letter “C” but that was not intentional until five of the seven turned out that way and then it seemed possible that “7C”s were within reach.

Consistency of purpose

Processes will deliver the required outputs when there is consistency between the process purpose and the external stakeholders. When this principle is applied the process objectives, measures, targets, activities, resources and reviews will have been derived from the needs and expectations of the stakeholders.

Clarity of purpose

Clear measurable objectives with defined targets establish a clear focus for all actions and decisions and enable the degree of achievement to be measured relative to stakeholder satisfaction. When this principle is applied people know what they are trying to do and how their performance will be measured.

Connectivity with objectives

The actions and decisions that are undertaken in any process will be those necessary to achieve the objectives and hence there will be demonstrable connectivity between the two. When this principle is applied the actions and decisions that people take will be those necessary to deliver the outputs needed to achieve the process objectives and no others.

Competence and capability

The quality of process outputs is directly proportional to the competence of the people, including their behaviour, and is also directly proportional to the capability of the equipment used by these people. When this principle is applied personnel will be assigned on the basis of their competence to deliver the required outputs and equipment will be selected on the basis of its capability to produce the required results.

Certainty of results

Desired results are more certain when they are measured frequently using soundly based methods and the results reviewed against the agreed targets. When this principle is applied people will know how the process is performing.

Conformity to best practice

Process performance reaches an optimum when actions and decisions conform to best practice. When this principle is applied work is performed in the manner intended and there is confidence that it is being performed in the most efficiency and effective way.

Clear line of sight

The process outputs are more likely to satisfy stakeholder expectations when periodic reviews verify whether there is a clear line of site between objectives, measures and targets and the needs and expectations of stakeholders. When this principle is applied, the process objectives, measures and targets will periodically, change causing realignment of activities and resources, thus ensuring continual improvement.

Using the principles

Whether you design, manage, operate, or evaluate a process you can apply these principles to verify whether the process is being managed effectively and

is robust. You simply take one of the principles and look for evidence that it is being properly applied.

You will note that each principle has two parts. There is the principle and a statement of its application. So if we wanted to know whether there was consistency of purpose in a particular process, we review the principle, note what it says about its application and then examine in this case the process objectives, measures, targets, activities, resources and reviews to find evidence that they have been derived from the needs and expectations of the stakeholders. Clearly we would need to discover what the process designers established as the needs and expectations of the stakeholders. It would not be sensible for us to define stakeholder needs and expectations as this would more than likely yield different results. We are more interested in what data the process designers used. It is therefore more effective if questioning is used as the investigatory technique rather than a desk study.

Processes in context

If we regard Figure 3.2 as a realistic portrayal of the business cycle and we view the organization as a collection of interconnected processes we can derive a clear context for business processes. From this diagram we can conclude that

- The mission arises out of an analysis of stakeholder needs (there would certainly be little point in having a mission that conflicted with these needs).
- The mission is accomplished by the organization which as we have stated is a set of interconnected processes therefore the business processes exist to fulfil that mission.
- The results the stakeholders are looking for to satisfy their needs must equate to the business outputs.
- Business outputs are generated by business processes therefore the objectives for these processes are the business objectives (deliverable results).
- The business processes should therefore be designed to produce outputs that satisfy stakeholder needs.
- Within business processes we will find all the lower level processes because there should be no process or activity which exists outside this envelope.
- There is therefore only one system – a system of interconnected processes.
- Over time stakeholder needs and expectations change which in turn will modify the demands upon the business and its mission, and consequently the business processes and so the cycle continues.

Process classification

There are two classes of organizational processes – macro-processes and micro-processes. Macro-processes are multi-functional in nature consisting of numerous micro-processes. Macro-processes deliver business outputs and have been referred to as *Business Processes* for nearly a decade or more. For processes to be

Table 6.2 Relationship of business process to work processes

<i>Scope</i>	<i>Business process</i>	<i>Work process</i>
Relationship to organization hierarchy	Unrelated	Closely related
Ownership of process	No natural owner	Departmental head or supervisor
Level of attention	Executive level	Supervisory or operator level
Relationship to business goals	Directly related	Indirectly related and sometimes (incorrectly) unrelated
Responsibility	Multi-functional	Invariably single function (but not exclusively)
Customers	Generally external or other business processes	Other departments or personnel in same department
Suppliers	Generally external or other business processes	Other departments or personnel in same department
Measures	Quality, cost delivery	Errors, quantities, response time
Units of measure	Customer satisfaction, shareholder value, cycle time	% Defective, % Sales cancelled, % Throughput

classified as business processes they need to be in a chain of processes having the same stakeholder at each end of the chain. The input is an input to the business and the output is an output from the business. This is so that the outputs can be measured in terms of the inputs. If the outputs were a translation of the inputs they could not be measured against the inputs.

Micro-processes deliver departmental outputs and are task oriented. In this book these are referred to as *Work Processes*. A management system is not just a collection of work processes, but also the interconnection of business processes. The relationship between these two types of processes is addressed in Table 6.2.¹⁰

The American Quality and Productivity Centre published a Process Classification framework in 1995 to encourage organizations to see their activities from a cross-industry process viewpoint instead of from a narrow functional viewpoint. The main classifications were as follows:

1. Understand markets and customers.
2. Develop vision and strategy.
3. Design products and services.
4. Market and sell.
5. Produce and deliver for manufacturing.
6. Produce and deliver for service organizations.
7. Invoice and service customers.
8. Develop and manage human resource.
9. Manage information resources.

10. Manage financial and physical resources.
11. Execute environmental management program.
12. Manage external relationships.
13. Manage improvement and change.

This classification was conceived out of a need for organizations to make comparisons when benchmarking their processes. It was not intended as a basis for designing management systems. We can see from this list that several processes have similar outputs, e.g. there are a group of processes with resources as the output. Also, some of these processes are not core processes but themes running through core processes, e.g. the process for executing an environmental management program has a process design element but its implementation will be embodied in other result producing processes as it does not on its own form part of a chain of processes. Similarly with managing external relations, there will be many processes that have external interfaces so rather than one process there should be objectives for external relationships that are achieved by all processes with external interfaces.

There is a view that product design is not a business process because the stakeholders are different at each end. On the input end could be sales and the output end could be produce and deliver. Under this logic, produce and deliver would not be a business process because on the input could be product design and the output could be the customer. Therefore the business process flow is: customer to sales; sales to product design, product design to produce and deliver; produce and deliver to customer and customer to bank. Using this logic we could combine another group of these processes so that the business process is "order to cash". The important point here is that the measure of success is not whether a design is completed on time, or a product meets its specification but whether the products designed, produced and delivered satisfy customer requirements to the extent that the invoice is paid in full.

With this approach, there would be one process that creates a demand for the organization's products and services. This is often referred to as marketing but this is also the label given to a department, therefore we need a different term to avoid confusion. A suitable name might be Demand creation process.

Having created a demand, there must be a process that fulfils this demand. This might be production but if the customer requirement is detailed in performance terms rather than in terms of a solution, it might also include product design. There are many other ways of satisfying a demand and once again to avoid using labels that are also names of departments, a suitable name might be a Demand fulfilment process.

Both these processes need capable resources and clearly the planning, acquisition, maintenance and disposal of these resources would not be part of demand creation or fulfilment as resources is not an output of these processes. There is therefore a need for a process that manages the organization's resources and so we might as well call this the Resource management process.

Lastly, all the work involved in determining stakeholder needs, determining the mission, the vision and strategy, the business outputs and designing the processes to deliver these outputs is clearly a separate process. It is also important that the performance of the organization is subject to continual review and improvement and this is clearly a process. But neither can exist in isolation, they are in fact a continuum and when brought together would have the same stakeholder at each end. We have a choice of names for this process. We could call it a business management process but we might call the system the business management system so this could cause confusion. As the process plans the direction of the business and reviews performance against plan we could call this process the mission management process. The main classifications from the process classification framework can therefore be combined as shown in Table 6.3.

We have identified four processes into which we could place all an organization's activities therefore there will be only four business processes in most organizations but many work processes. These are displayed diagrammatically in Figure 6.9 and the purpose of each process explained as follows with Table 6.4 showing the stakeholders.

Process naming

Processes can be named using the verb focused convention e.g. Create demand, or the noun focused convention e.g. Demand creation. The advantage of verb focused naming is that the name of the process defines the action or process purpose whereas with the noun focused convention, the action or purpose could be obscured. It may also be confused with department names such as naming a process "Marketing".

Mission management process	Determines the direction of the business, continually confirms that the business is proceeding in the right direction and makes course corrections to keep the business focused on its mission. The business processes are developed within mission management as the enabling mechanism by which the mission is accomplished
Resource management process	Specifies, acquires and maintains the resources required by the business to fulfil the mission and disposes of any resources that are no longer required
Demand creation process	Penetrates new markets and exploits existing markets with products and a promotional strategy that influences decision-makers and attracts potential customers to the organization. New product development would form part of this process if the business were market driven
Demand fulfilment process	Converts customer requirements into products and services in a manner that satisfies all stakeholders. New product development would form part of this process if the business were order driven (i.e. the order contained performance requirements for which a new product or service had to be designed)

Table 4.3 Process classification alignment

<i>Process Classification Framework (Main classifications)</i>	<i>Business Processes</i>
Understand markets and customers	
Develop vision and strategy	
Manage improvement and change	Mission management
Execute environmental management program	
Manage external relationships	
Design products and services	Demand creation
Market and sell	
Produce and deliver for service organizations	
Produce and deliver for manufacturing	Demand fulfilment
Invoice and service customers	
Develop and manage human resource	
Manage information resources	Resource management
Manage financial and physical resources	

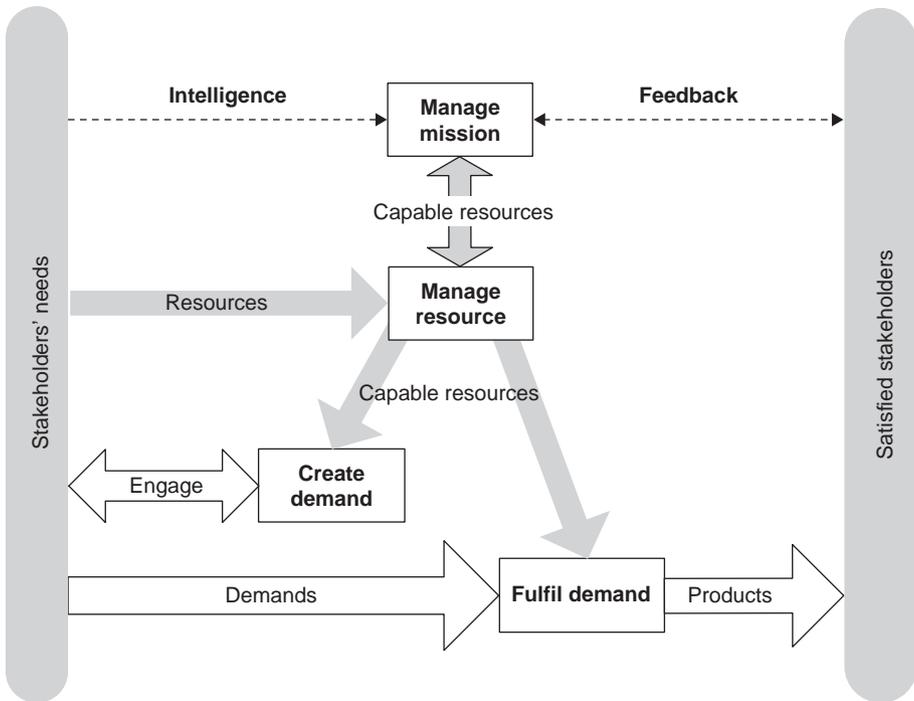


Figure 6.9 Generic system model (the organization as a set of interconnected processes)

Table 6.4 Business process stakeholders

<i>Business process</i>	<i>Input stakeholder (Inputs)</i>	<i>Output stakeholder (Outputs)</i>
Mission management	Shareholders, Owners (Vision)	Shareholders, Owners (Mission accomplished)
Demand creation	Customer (Need)	Customer (Demand)
Demand fulfilment	Customer (Demand)	Customer (Demand satisfied)
Resource management	Resource user (Resource need)	Resource user (Resource satisfies need)

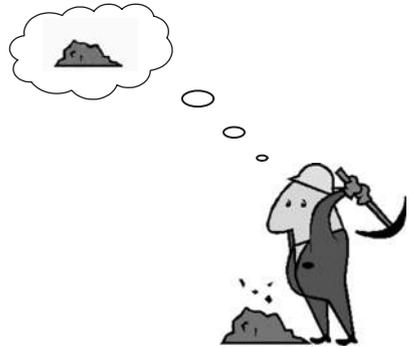
Previously we said that all work is a process but as we have seen what we regard as a process depends on our perception. If we were to ask the same question of three workers cutting stone on a building site we might be surprised to get three different answers.

We approach the first stone cutter and ask,

“What are you doing?”

“Breaking stone” he replies rather abruptly

This stone cutter appears to have no vision of what he is doing beyond the task and will therefore be blind to its impact



We approach the second stone cutter and ask,

“What are you doing?”

“I’m making a window” he replies with enthusiasm

This stone cutter sees beyond the task to a useful output but not where this output fits in the great scheme of things

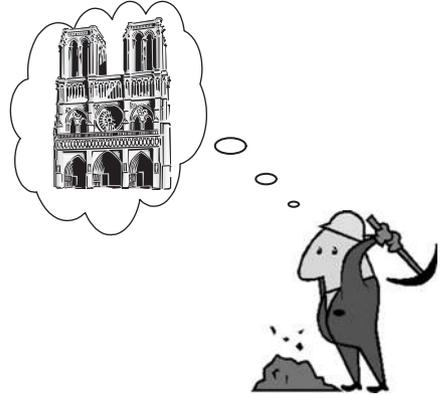


We approach the third stone cutter and ask,

“What are you doing?”

“I am building a Cathedral” he replies with considerable pride

This stone cutter sees himself as part of a process and has a vision of what he is trying to achieve that will influence what he does.



If we allow ourselves to be persuaded that a single task is a process, we might well deduce that our organization has several thousand processes. If we go further and try to manage each of these nano-processes (they are smaller than micro-processes) we will lose sight of our objective very quickly. By seeing where the task fits in the activity, the activity fits within a process and the process fits within a system, we create a line of sight to the overall objective. By managing the system we manage the processes and in doing this we manage the activities. However, system design is crucial. If the processes are not designed to function together to fulfil the organizational goals, they can't be made to do so by tinkering with the activities.

So, in which process do you work?

Characteristics of a process

Process purpose

From the definitions of a process it is clear that every process needs a purpose for it to add value. The purpose provides a reason for its existence. The purpose statement should be expressed in terms of what the process does and in doing so identify what if anything is to be converted. The purpose of a sales process may be to convert prospects into orders for the organization's products. Instead of calling the process a sales process you could call it the *prospect to order process*. Similarly the purpose of a design process may be to convert customer needs into product features that satisfy these needs.

Process outputs

The outputs of a process are considered to be the tangible or intangible results such as a product or result. The principal process outputs will be the same as the process objectives.

However, for a process output to be an objective it has to be predefined – in other words it has to be something you are aiming for, not necessarily something you are currently achieving. An example may clarify this. A current process output might be 50 units/week but this does not mean that 50 units/week is the objective. The objective might be to produce only 20 conforming units/week so of the 50 produced, how many are conforming? If all are conforming the process is producing surplus output. If less than 20 are conforming the process is out of control. Therefore doing what you are currently doing may not be achieving what you are trying to do.

The outputs from business processes should be the same as the business outputs and these should arise out of an analysis of stakeholder needs and expectations. If we ask *“What will the stakeholders be looking for as evidence that their needs and expectations are being satisfied?”* the answers constitute the outputs that the business needs to produce. From this we ask, *“Which process will deliver these outputs?”* and we have now defined the required process outputs for each business process.

Process outcomes

In addition to outputs, processes have outcomes. There is an effect that the process has on its surroundings. An outcome of a process may be a detrimental affect on the environment. Satisfaction of either customers or employees is an outcome not an output. However, processes can only be designed to deliver outputs because the outputs are measured before they emerge from the process, whereas, outcomes arise long after the process has delivered its outputs and therefore cannot be used to control process performance. Any attempt to do so would induce an erratic performance. (See process measures) Outcomes are controlled by process design – i.e. you design the process to deliver the outputs that will produce the desired outcomes.

Process objectives

As the objective of any process is to deliver the required results, it follows that we can discover the process objectives from an analysis of its required outputs. All that is required is to construct a sentence out of the output. For example, if the output is growth in the number of enquiries the process objective is to grow the number of enquiries. Clearly the output is not simply enquiries as is so often depicted on process flowcharts. The process measurements should determine growth not simply whether or not there were enquiries.

In some cases the wording might need to be different whilst retaining the same intent. For example, a measure of employee satisfaction might be, staff turnover and management style may be considered a critical success factor. The output the employee is looking for as evidence that management have adopted an appropriate style is a motivated workforce. Motivation is a result but there is no process that produces motivation. It is an effect not an output. Instead of

expressing the objective of the process as to motivate the workforce, it becomes “To maintain conditions that sustain worker motivation.”

Process measures

Measures are the characteristics used to judge performance. They are the characteristics that need to be controlled in order that an objective will be achieved. Juran refers to these as the control subject.

There are two types of measures – stakeholder measures and process measures. Stakeholder measures respond to the question: “*What measures will the stakeholders use to reveal whether their needs and expectations have been met?*” Some call these key performance indicators. Process measures respond to the question: “*What measures will reveal whether the process objectives have been met?*” Profit is a stakeholder measure of performance (specifically the shareholders) but would be of no use as a process measure because it is a lagging measure. Lagging measures indicate an aspect of performance long after the conditions that created it have changed. To control a process we need leading measures. Leading measures indicate an aspect of performance while the conditions that created it still prevail (e.g. response time, conformity).

There are also output driven measures and input driven measures. Measures defined in verbs are more likely to be input driven. Those defined by nouns are more likely to be output driven, e.g. in an office cleaning process we can either measure performance by whether the office has been cleaned when required or by whether the office is clean. The supervisor asks, “Have you cleaned the office?” The answer might be yes because you dragged a brush around the floor an hour ago. This is an input driven measure because it is focused on a task. But if the supervisor asks, “Is the office clean?” You need some criteria to judge cleanliness – this is an output driven measure because it is focused on the purpose of the process.

The word “measures” does have different meanings. It can also refer to activities being undertaken to implement a policy or objective, e.g. a Government minister says “You will begin to see a distinct reduction in traffic congestion as a result of the measures we are taking”. Clearly, traffic congestion has not been reduced by measuring it but by the provisions made to alter traffic flow.

Process measures are not the same as Stakeholder measures. Process measures need to be derived from stakeholder measures. A typical example of where they are not was the case in the UK National Health Service. Performance of hospitals was measured by waiting time for operations but the patient cares more about total unwell time. Even if the hospital operation waiting time was zero, it still might take 2 years getting through the system from when the symptoms first appear to when the problem is finally resolved. There are so many other waiting periods in the process that to only measure one of them is totally misleading. Other delays started to be addressed once the waiting time for

operations fell below the upper limit set by Government but in the interim period time was lost in addressing other bottlenecks.

Process measurement methods

The integrity of the process measurement depends on the method of measurement. If we use crude measurement methods such as gut feel, perceptions or hearsay evidence the results will be suspect. Results need to be obtained using soundly based measurement methods that extract facts from the process. Some thought needs to go into:

1. Installing a sensor in the process at the appropriate stage to measure the prescribed aspect of performance.
2. Taking measurements at predetermined intervals.
3. Collecting data pertinent to the aspect of performance measured.
4. Transmitting the data to appropriate locations for analysis.
5. Analysing data to reveal meaningful information.
6. Presenting the results to the decision-makers in a format that displays with the required accuracy and precision a true measure of performance relative to the desired results.

The sensor should be accommodated as part of process design and the other stages should be a process activity.

Process targets

Measurements will produce data but not information. Managers need to know whether the result is good or bad. So when someone says “Are we on target?” the target obviously needs to be known and related to what is being measured which is why the targets are set only after determining the measurement method. Setting targets without any idea of the capability of the process is futile. Setting targets without any idea what process will deliver them is incompetence – but it is not uncommon for targets to be set without any thought being given to the process that will achieve them. Staff might be reprimanded for results over which they have no control; staff might suffer frustration and stress trying to achieve an unachievable target.

A realistic method for setting targets is to monitor what the process currently achieves, observe the variation, then set a target that on an 80:20 basis the process can deliver. There is clearly no point in setting a target well above current performance unless we are prepared to redesign the whole process. However, performance measurement should be iterative.

Targets within reach

Managers can only expect average results from average people and perhaps there are not enough extraordinary people to go round to produce the extraordinary results they demand!

Process inputs

In Figure 6.9 the input is the demand placed upon the process rather than some material that needs to be transformed. If we were to look into the process activities we would probably find activities where the input was material which is transformed by the activity but this is at the micro-process level. If we take the ISO 9000 definition of a process we will see that the process transforms inputs into outputs of added value but it is not clear what the inputs are. If we regard instructions, requirements, objectives or any documents as inputs we know they are not transformed by the process. If we regard resources as inputs we know that some resources such as the people operating the process are not transformed. Therefore it is incorrect to simply say that processes transform inputs into outputs because you need to define what inputs you are referring to.

Process activators

Processes need to be activated in order to produce results. The activator or trigger can be event based, time based or input based. With an event activated process operations commence when something occurs e.g. a Disaster Recovery Process. With a time activated process operations commence when a date is reached, e.g. an Annual Review Process. With an input activated process operations commence on receipt of a prescribed input, e.g. printed books are received into the binding process.

The concept of process activators enables us to see more clearly how processes operate and better understand the realities of process management.

Process activities

Process activities are the actions and decisions that collectively deliver the process outputs. They include all the activities in the PDCA cycle. Deming's Plan, Do, Check, Act cycle is a good model with which to determine the activities needed. At a high level the sequence might be as follows:

- a) On receipt of a demand there will be planning activities to establish how the deliverables will be produced and delivered.
- b) There will be doing activities that implement the plans.
- c) There will be checking activities to verify the plans have been implemented as intended and that the output conforms with the prescribed requirements.
- d) There will be activities resulting from the checking in order to correct mistakes or modify the plans.

In principle it should be possible to place all activities needed to achieve an objective into one of these categories. In reality there may be some processes where the best way of doing something does not follow exactly in this sequence.

Depending on the level within the process hierarchy, an activity might be as grand as “Design product” or as small as “Verify drawing”. There are several Activity Levels. If we examine this hierarchy in the Demand Creation Process (see Fig 6.13 on pages 146, 147) the result might be as follows:

A Level 1 Activity might be “Develop new product”. If we view this activity as a process we can conceive of a series of activities that together produce a new product design. These we will call Level 2 Activities.

A Level 2 Activity might be “Plan new product development”. If we view this activity as a process we can conceive of a further series of activities that together produce a new product development plan. These we will call Level 3 Activities.

A Level 3 Activity might be “Verify new product development plan”. If we view this activity as a process we can conceive of a further series of activities that together produce a record of new product development plan verification. These we will call Level 4 Activities.

A Level 4 Activity might be “Select verification record blank”. Now if we were to go any further in the hierarchy we would be in danger of noting arm movements. Therefore in this example we have reached the limit of activities at Level 4.

If we now examine these series of activities and look for those having an output that serves a stakeholder’s needs we will find that there are only two. The Demand creation process has “demand” as its output. This serves the customer and the New product development process has “Product design” as its output and this also serves the customer. The series of New product development planning activities has an output which is only used by its parent process so remains a series of activities. The activity of “Verify product design plan” and “Select verification record blank” only have any meaning within the context of a specific process so cannot be classed as processes.

Process flow

A process is often depicted as a flowchart representing a sequence of activities with an input at one end and an output at the other. When the process activator is an input this might well be the case but it is by no means always the case. If we examine the Demand Creation process illustrated in Figure 6.13, page 147, we find that while the activity of converting enquiries follows that of promoting product, by presenting these activities as a flow it implies not only that one follows the other but the latter does not commence until the former has been completed. This is clearly not the case. Product promotion continues well after the first enquires are received and enquires may well come in before the first promotion activity has started.

Where the output depends upon work being executed in a defined sequence then it can be represented as a flowchart but when activities are activated by events or by time as opposed to inputs, there may be no flow between them.

Process resources

The resources in a process are the supplies that can be drawn on when needed by the process. Resources are classified into human, physical and financial resources. The physical resources include materials, equipment, plant and machinery but also include time. Human resources include managers and staff including employees, contractors, volunteers and partners. The financial resources include money, credit and sponsorship. Resources are used or consumed by a process. There is a view that resources to a process are used (not consumed) and are those things that don't change during the process. People and machinery are resources that are used (not consumed) because they are the same at the start of the process as they are at the end, i.e. they don't lose anything to the process. Whereas materials, components and money are either lost to the process, converted or transformed and could therefore be classed as process inputs. People would be inputs not resources if the process transforms them.

For a process to be deemed operational it must be resourced. A process that has not been resourced remains in development or moribund. There is a view that resources are acquired by the process when required and indeed, input specific resources are, but resources that are independent of the inputs such as energy, tooling, machinery, people etc. and the channel along which they flow will have been established during process development. Resources are often shared and depleted and have to be replenished but the idea that a process can exist on paper is not credible. A process exists when it is ready to be activated. Those processes that are activated infrequently need to be resourced otherwise they will not be capable of delivering the desired outputs on demand. For instance, you would not set out to acquire back-up software after there had been a computer failure unless you were managing by the seat of your pants!

Process constraints

The constraints on a process are the things that limit its freedom. Policies, procedures, codes of practices etc. all constrain how the activities are carried out. Actions should be performed within the boundaries of the law and regulations impose conditions on such aspects as hygiene, emissions and the internal and external environment. They may constrain resources (including time), effects, methods, decisions and many other factors depending on the type of process, the risks and its significance with respect to the business and society. Constraints may also arise out of the PEST and SWOT analysis carried out to determine the Critical Success Factors (see later in this Chapter). Values, principles and guidelines are also constraints that limit freedom for the benefit of the organization. After all it wouldn't do for everyone to have his or her own way! Some people call these things **controls** rather than constraints but include among them, the customer requirements that trigger the process and these could just as well be inputs. Customer requirements for the most part are objectives not constraints

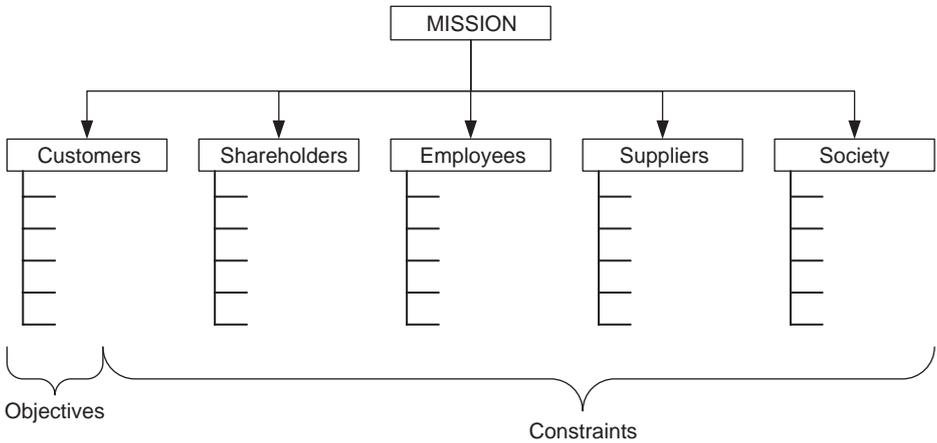


Figure 6.10 Identifying constraints and objectives

but they may include constraints over how those objectives are to be achieved. For instance they may impose sustainability requirements that constrain the options open to the designer.

To determine the objectives and constraints pass the mission through the stakeholders and ask *What are this stakeholder's needs and expectations relative to our mission?* The result will be a series of needs and expectations that can be classified as objectives or constraints. The objectives arise from the outputs the customer requires and the constraints arise from the conditions the other stakeholders impose relative to these outputs as illustrated in Figure 6.10. The important thing to remember about constraints is that they only apply when relevant to the business, e.g. if you don't use substances hazardous to health in your organization the regulations regarding their acquisition, storage, use and disposal are not applicable to your organization.

Views differ and whilst a purist might argue that requirements are controls not inputs, and materials are inputs not resources, it matters not in the management of quality. All it might affect is the manner in which the process is described diagrammatically. The requirements would enter the process from above and not from the side if you drew the chart as a horizontal flow.

Process results

The results of a process arise out of measuring performance using the planned methods for the defined measures, at the planned frequency and against the planned targets.

If the planned measurement methods have been implemented there should be sufficient objective evidence with which to compare current performance against the agreed targets. Therefore one would expect the results to be presented as graphs, charts, and figures. These might show performance to be improving, declining or remaining unchanged relative to a particular process parameter.

The scale is important as are trends over time so that decision-makers can see the whole picture and not be led into a knee jerk reaction.

Process reviews

There are three dimensions of process performance that can be expressed by three questions:

- a) *How are we doing against the plan?*
- b) *Are we doing it in the best way?*
- c) *How do we know it's the right thing to do?*

The first question establishes whether the objectives are being achieved in the way that had been planned to achieve them. This means that not only are planned outputs being produced but when you examine the process throughput over the last week, month, year or even longer, the level and quality of the output is consistent and these outputs are being produced in the way you said you would produce them i.e. you are adhering to the specified policies and procedures etc.

The second question establishes whether the ways in which the planned results are being achieved are best practice, e.g. optimizing resources (time, finance, people, space, materials etc.) such that they are utilized more efficiently and effectively. This would mean that you are satisfied that you are achieving your objective using no more than the allocated resources but can reduce the operating cost by optimizing the resources or using more appropriate resources such as new technologies, new materials, new working practices. These improvements arise out of doing things better not by removing waste. If planned output were being achieved there would be no unavoidable waste. A technique often used in this context is Value Engineering.

The third question establishes whether the planned outputs are still appropriate and relevant to meeting stakeholder needs and expectations. This would mean that irrespective of the planned results being achieved and irrespective of utilizing best practices we could be wasting our time if the goal posts have moved. Maybe the needs and expectations of stakeholders have changed. Maybe they no longer measure our performance in the same way. Some objectives remain unchanged for years, others change rapidly. As all our outputs are derived from stakeholder needs and expectations it is vital to establish that the outputs remain continually relevant and appropriate.

The answers to each of these questions require a different approach because the purpose, method and timing of these reviews are different. This results in there being three specific and independent process reviews.

Making the connections

It is important to visualize the complete picture when setting out to define and manage your processes. Processes exist in a context to deliver against an objective

that also serves to deliver a strategic objective. As illustrated in Figure 3.3, there is a continuum from stakeholders to mission through the system to results and back to the mission. The arrows form connections so that there is a clear line of sight from the results to the mission and this will only be accomplished if those carrying out strategic planning realize that processes cause results. Processes will not cause the right results unless the process objectives have been derived from the mission. The measures employed to indicate work process performance need to relate to the measures employed in the related business process so that when all the measures indicate that the system is performing as it should, the strategic objectives are being achieved.

Process effectiveness

A process should be effective but what determines its effectiveness? How would you know whether a process is effective? Effectiveness is about doing the right things – so what should a process do? Firstly and most obviously the process should deliver the required output, namely a decision, a document, a product or a service. But there is much more. It is not sufficient merely to deliver output. Output that is of poor quality is undesirable as is output that is late. But even when the output is of good quality and on time there are other factors to be considered. If in producing the output the laws of the land are breached, the process is clearly not effective. If in producing the output, the producers are exploited, are forced to work under appalling conditions or become de-motivated and only deliver the goods when stimulated by fear, the process is again not effective. So we could fix all these factors and deliver the required output on time and have satisfied employees.

Employees are but one of the stakeholders and customers are the most important but although an output may be of good quality to its producers, it may not be a product that satisfies customers. The costs of operating the process may not yield a profit for the organization and its shareholders, and even if in compliance with current environmental laws, it may waste natural resources, dissatisfy the community and place unreasonable constraints on suppliers such that they decline to supply the process's material inputs. There is therefore only one measure of process effectiveness – that the process outcomes satisfy all stakeholders.

Developing a process-based management system

Every organization is different but has characteristics in common with others. Even in the same industry, the same market, producing the same type of products, each organization will be different in what it wants to do, how it goes about doing it and how it perceives its stakeholders and their needs. It is therefore not possible to design one system that will suit all organizations. Each has to be tailored to the particular characteristics of the organization and their

stakeholders. However, just as human beings have the same organs and processes that differ in size and capability, organizations will have similar functions and processes that differ in size and capability.

In Figure 3.2 we showed that the mission is achieved by the organization that produces results that delight the stakeholders that place demands that shape the mission – and on it goes through a continuous cycle. In Figure 6.9 we showed how the organization (shown in Figure 3.2 in the cycle) could be viewed as a set of interconnected processes. These processes are present in all organizations – hence the label – Generic System Model. All organizations seek to *create a demand* – even non-profit organizations. All organizations seek to fulfil the demand, again even non-profit organizations and all organizations need resources to create and fulfil the demand and therefore have a resource management process. Finally all organizations have a purpose and a mission (even if it is not well defined) and seek to develop and improve their capability and their performance so as to achieve their mission – thus all organizations have a mission management process. This is of course at a very high level. The differences arise within the detail of each business process.

Whilst the generic purpose of these processes might be common in all organizations, the structure of them may well be different for each organization but a pattern of actions has emerged that can be used to flush out the information necessary to design these processes. Who or which function performs these activities is not important – in fact letting the function get in the way, often changes the outcome such that instead of developing a process based management system, you end up with a function-based management system that simply mirrors the organization structure.

Establishing the goals

Every organization has goals or what it wants to achieve, how it wants to be perceived and where it is going. These goals are often formed by looking both inwards and outwards and are expressed relative to the needs and expectations of stakeholders or benevolent interested parties. There are four distinct steps to establishing goals:

1. Clarify the organization's purpose, mission and vision (goals). – This is what the organization has been formed to do and the direction in which it is proceeding in the short and long term. It is the "organization purpose" that is referred to in Clause 5.3a) of ISO 9001.
2. Confirm the values and principles that will guide the organization towards its goals. – These are addressed by Clause 5.3 of ISO 9001 under the heading *Quality policy*.
3. Identify stakeholder needs relative to the purpose, mission and vision. – This is addressed by Clause 5.2 of ISO 9001 under the heading *Customer focus*.
4. Identify stakeholder satisfaction measures relative to these needs. – These are addressed by Clause 5.4.1 of ISO 9001 under the heading *Quality objectives*.

Purpose is clarified by top management confirming why the organization exists or for what purpose it has been established such as to exploit the gap in the market for personal communicators.

Mission is clarified by top management confirming the direction in which the organization is currently proceeding such as to provide personal communicators that are high on reliability, security, safety and data accessibility.

Vision is clarified by top management confirming what they want the organization to become in the years ahead, what they want it to be known for or known as such as being a world-class brand leader in personal communications.

Values are confirmed by top management expressing what they believe are the fundamental principles that guide the organization in accomplishing its goals, what it stands for such as integrity, excellence, innovation, reliability, responsibility, fairness etc. These values characterize the culture in the organization. It is ironic that even ENRON had values. They were: Respect, Integrity, Communication and Excellence.

Stakeholder needs

As explained previously all organizations have stakeholders, those people or organizations on which the organization depends for its success. They include customers, shareholders, employees, suppliers and society as a number of discrete groups rather than individuals. In order to identify the stakeholder needs, you need to examine the stakeholders relative to the purpose, mission, vision and values and the results will be a distinct set of needs and expectations.

Customers might need on-time delivery, high reliability, low life cycle cost, disposable product, prompt after-sales response etc. If customer focus were an organizational value (the 1st Quality Management Principle), customers might expect sales staff to frequently test their understanding of requirements.

Shareholders might need financial return on investment and above average growth. If a factual approach to decision making were an organizational value (the 7th Quality Management Principle), shareholders might expect business results to have been derived from facts and not have been massaged to make them look better than really they were.

Employees might need competitive pay and conditions, flexible working hours and crèche. If responsibility were an organizational value, the employees might expect to be delegated authority and provided with the resources for them to use as they see fit to achieve their assigned objectives and to be trusted to use the resources wisely.

Suppliers might need prompt payment of invoices, loyalty in exchange for flexibility. If mutually beneficial supplier relationships were an organizational value (the 8th Quality Management Principle), suppliers would not expect the relationship they had with the organization to be adversarial.

Society might need compliance with statutory laws and regulations, corporate responsibility, employment prospects for the local community. If inclusion

were an organizational value, the local community would expect consultation before a decision was taken that affected the quality of life in the community.

Stakeholder satisfaction measures

Each of the stakeholders will be looking for certain outcomes as evidence that their needs have been met. These become the organization's performance indicators (KPIs) or outcomes and hence the corporate objectives that need to be achieved. So if customers were expecting a prompt after-sales response, how would the degree of promptness be measured? What might constitute an after-sales service? What would be the characteristics that would put the prompt after-sales service in a competitive position?

Determine critical success factors

Whatever you set out to achieve, you will not get very far unless you are conscious of the factors critical to your success. Many people do this subconsciously – always being aware of waste, relationships, customers etc. But you can be a little more scientific about this. Our question here is: *“What factors affect our ability to get it right?”* The answers identify the critical success factors – the factors upon which our success depends. They are the drivers and barriers to success. Get these wrong and you will undoubtedly fail. Drivers will help you succeed, they will propel you towards your goal. Barriers will get in the way and stop you achieving your goal. Some of these are external to the organization and out of your control. Others are internal to the organization and within your control. You can change these should there be the motivation to do so. This is where we enter the arena of the management of change. It is not only technological change but changes in attitude, behaviour, belief etc. that may be needed depending on what the goal is and the environment in which this goal is to be achieved.

These are not the same as stakeholder measures that are pertinent to what stakeholders are looking for or Key Performance Indicators. Critical success factors (CSF) are pertinent to the survival of the organization and although this does depend largely on satisfying stakeholders and meeting business objectives, there will be other factors that influence the organization's ability to do this. These factors will impose constraints on the processes established to accomplish the mission.

The CSFs can be determined simply by asking the question of the organization or a particular business proposition, *“What factors affect our ability to get it right?”* but the result might be a mixed bag of things, some of which may be more relevant to a process risk assessment. Two techniques have emerged that are more methodical, one is a PEST analysis and the other is a SWOT analysis. It is important when using these tools to:

- Identify the relevant factors that apply to your organization.

- Rate your organization relative to the factors.
- Draw conclusions from this information relative to the mission, objective or business proposition i.e. is it critical or non-critical to success.
- Validate these conclusions with others.

PEST (Political, Economic, Social and Technological) analysis measures the market relative to a particular organization or business proposition. It serves to identify what is going on in the external environment that could affect the future direction of the organization or the success of a business proposition. The significance of the four factors may vary depending on the nature of the business. Some principal factors to consider are shown in Table 6.5. More factors can be found on the Internet.

The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis looks at the organization itself or a business proposition or indeed a competitor. The PEST affects the SWOT but not vice versa. Without a clear understanding of an organization's strengths, weaknesses, opportunities and threats business plans may fail, goals will be missed and new product or service development programmes will fail to live up to their potential. The SWOT is akin to a capability assessment. The result enables management to act in a manner that does not leave the organization vulnerable. Strengths and weaknesses are internal to your organization whereas opportunities and threats are external. The results are often very subjective and will vary depending on who does the analysis. SWOT should be used as a guide but use of weighting factors can improve its validity. Some principal factors to consider are shown in Table 6.6. More factors can be found on the Internet.

Develop the processes

Having identified the organizational goals, the drivers and barriers (the critical success factors) we would then develop the business processes that are required to achieve these goals. This involves us in identifying these processes, establishing the process outputs, the units of measure and the targets that will indicate that the outputs are acceptable. This approach also goes under the name Quality Function Deployment (QFD) – a somewhat unfortunate expression as it can imply that it is about deploying people from quality departments.

Processes deliver results and effective processes achieve objectives therefore they make things happen. The key question therefore is, "Knowing the goals, the drivers and the barriers, how will we make it happen?" The relationship between all the key elements in developing the goals, the success factors and the processes is illustrated in Figure 6.11. This puts all the terms in context.

There are eight distinct steps to developing processes:

1. Identify the processes that will deliver the business outputs i.e. the *Business processes*.

Table 6.5 PEST Factors¹¹

<i>Political</i>	<i>Economic</i>
<ul style="list-style-type: none"> ● Environmental, health and safety and consumer-protection legislation ● Freedom of press, discrimination, trading ethics, levels of corruption ● Funding, grants and initiatives ● Legal, ethical and law enforcement issues ● Local, national and international pressure groups ● Prevailing Government values and stability ● Regulation and de-regulation trends, levels of bureaucracy ● Social and employment legislation, minimum wage ● Strength and credibility of opposition parties ● Tax policy, trade and tariff controls, regional issues 	<ul style="list-style-type: none"> ● Business and sales taxation issues ● Exchange rates, overseas economic situation, trends and potential changes ● Impact of globalization ● Inflation, interest rates, unemployment, immigration, GDP and trends ● Labour availability, movement, costs and trends ● Levels of disposable income and income distribution ● Local and global climatic issues ● Market and trade cycles, routes and distribution trends ● Raw material availability, costs and trends ● Specific industry factors
<i>Social</i>	<i>Technological</i>
<ul style="list-style-type: none"> ● Brand, company, technology image, preferences ● Buying access, patterns and trends, advertising and publicity ● Consumer attitudes and opinions, language differences and preferences, environmental influences ● Demographics, age, sex, wealth, marriage, children, location profiles and trends ● Ethnic and religious influences, attitudes to work, employment patterns ● Fashion and role models, roles of men and women within society ● Law changes affecting social factors ● Lifestyle choices, leisure time trends, mobility, health and education ● Major events and influences (natural and manmade disasters) ● Media views, attitudes and influences, public opinion, social attitudes and social taboos 	<ul style="list-style-type: none"> ● Associated/dependent technologies ● Consumer buying mechanisms and distribution channels ● Development of competing and replacement technologies ● Impact and maturity of existing and emerging technologies ● Information, communication and security ● Intellectual property issues ● Process maturity, capability and capacity ● Research and development funding ● Sustainability issues and emerging technological solutions ● Technology access, transfer, licensing, patents

Table 6.6 SWOT Factors

<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> ● Core competences ● Competitive advantages ● Culture, management style, core values ● Resource availability, capacity and capability ● Innovation, flare and imagination ● Location and geography ● Marketing – reach, expertise, brand identity ● Price, quality, delivery, reputation ● Process capability, communications ● Relevant qualifications, certifications 	<ul style="list-style-type: none"> ● Data reliability and integrity ● Gaps in capabilities, capacity and competencies ● Internal communication ● Location of business ● Management style, commitment, flexibility and adaptability, ● Process control and capability ● Qualifications, certifications ● Quality and delivery record ● Resource availability, capability and capacity ● Timescales, deadlines and pressures
<i>Opportunities</i>	<i>Threats</i>
<ul style="list-style-type: none"> ● Changes in government policy, regulations etc. ● Changes in social patterns, population profiles, lifestyle changes, etc. ● Competitors’ vulnerabilities ● Geography, export, import, grants, initiatives ● Industry or lifestyle trends ● Information availability ● Mergers, joint ventures, partnerships or strategic alliances ● New markets, developing markets ● New technologies, innovations, major government contracts ● Volumes, production, economies 	<ul style="list-style-type: none"> ● Change in Government policy, lifestyle and trading standards ● Competitor intentions, new competitors, price wars ● Economy – home, abroad ● Environmental effects ● Insurmountable weaknesses ● Legislative, taxation effects ● Loss of key staff, approvals, concessions, distribution channels ● New technologies, services, ideas ● Sustainable financial backing ● Sustaining internal capabilities and capacity

2. Derive the measures of success, method of measurement and target values for each business process i.e. the *Process Control Parameters*.
3. Identify the processes that will deliver the outputs required by the business processes i.e. the *Work Processes*.

4. Determine the activities required to produce the work process outputs as measured including counter measures for eliminating, reducing or controlling risks to success i.e. detailed *Process Flow Charts and Risk assessments*.
5. Determine the competences and capabilities required to carry out the activities in a manner that will produce acceptable outputs i.e. *Resource Budgets and specifications*.
6. Equip the processes with the necessary human and physical resources to enable it to deliver the required outputs i.e. *Resourcing and installing the processes*.
7. Run the processes as designed, manage a change in the environment, eliminate special cause variation and verify and validate process performance i.e. *Process commissioning, integration and capability assessment*.
8. Monitor the interfaces between processes and verify and validate system effectiveness i.e. *System integration and acceptance*.

Identifying business processes

In Figure 6.4, we showed the organization as a set of interconnected processes, four to be precise. It is these processes that deliver stakeholder satisfaction. The names can be different for specific organizations – it matters not what they are called but it is important what they deliver.

Deriving process control parameters

We need to control the processes so that they deliver the results required,

Repeatedly – we get the same result every time we run the process with the same set up conditions.

Consistently – the results we get are those needed to meet the stakeholder needs.

Continually – the process runs as planned without unexpected interruption.

In order to do this we need to define the process parameters that need to be controlled.

By examining the objectives and constraints we identified at the stage above and asking, “*What outputs would we look for as evidence that the objectives have been achieved?*” we derive the process outputs.

If we now recall the basic principles of quality control, we addressed previously by asking, “*How would we establish that these outputs are correct?*” we reveal the units of measure and by asking, “*What criteria will indicate whether our outputs are acceptable?*” we identify the performance standard which will indicate whether our performance is good or bad.

Taking an example; customers are likely to need products that perform like the specification that are delivered on time and represent value for money. This represents three objectives. By asking the questions above we deduce that there are four outputs as shown in Figure 6.12 and that the Demand Fulfilment process can deliver these outputs. We also deduce that there are 11 different measures

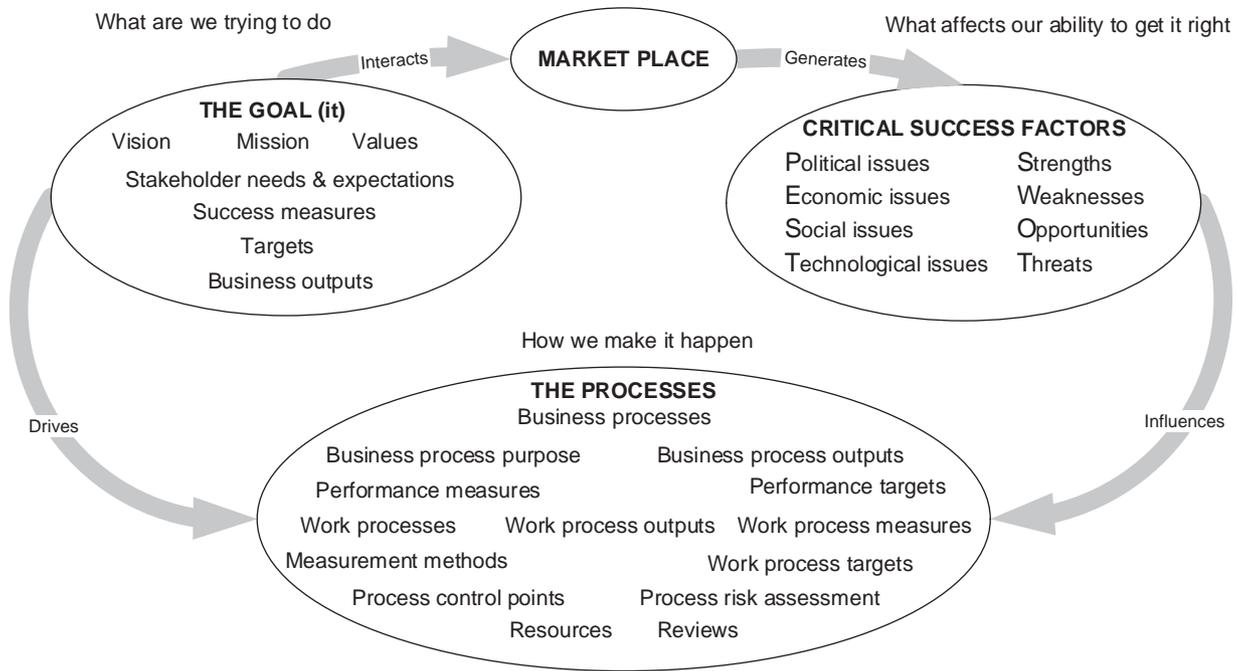


Figure 6.11 Strategic trilogy

requiring sensors or measurement methods and different standards or targets to aim for. Alternative names for the parameters are given in parenthesis.

In reality there may be hundreds of things to measure but they all need to be linked to the stakeholder outcomes.

An approach for aligning the mission, vision and values with the needs of the stakeholders and for defining appropriate performance indicators is the Balanced Scorecard¹² which covers four perspectives:

- Learning and Growth.
- Business Process.
- Customer.
- Financial Perspective.

Another approach is Stakeholder Analysis which goes further than the Balanced Scorecard and addresses all stakeholders and links stakeholder needs with the processes that deliver outputs that satisfy them.

Identifying work processes

Once we know the process outputs and how success will be measured we can determine the main work processes. The work processes can be identified from asking the question, “*What affects our ability to deliver the process outputs?*” If understanding customer requirements is key to success there will be a work process that focuses on understanding customer needs. If product innovation is key to success there will be a work process that focuses on product innovation – probably called product design. Using this method, outlines of each of the four business processes are given in Figure 6.13. Although every organization is different, the differences tend to be at the work process level rather than the business process level.

In the same way we derived the outputs, measures and targets for the business process we can take the business process objective and derive work process, outputs, measures and targets.

Determining work process activities

Once we have the defined work process parameters the next step is to determine the activities required to deliver the work process outputs. This can be accomplished by brainstorming, observation, past experience or theoretical analysis. It is also necessary at this stage to carry out a risk assessment against the process objectives and a failure modes and effects analysis on each of the identified activities. The result will be a series of process flowcharts with details of specific inputs and outputs, failure prevention provisions, checks, feedback loops and critical control points (CCP).

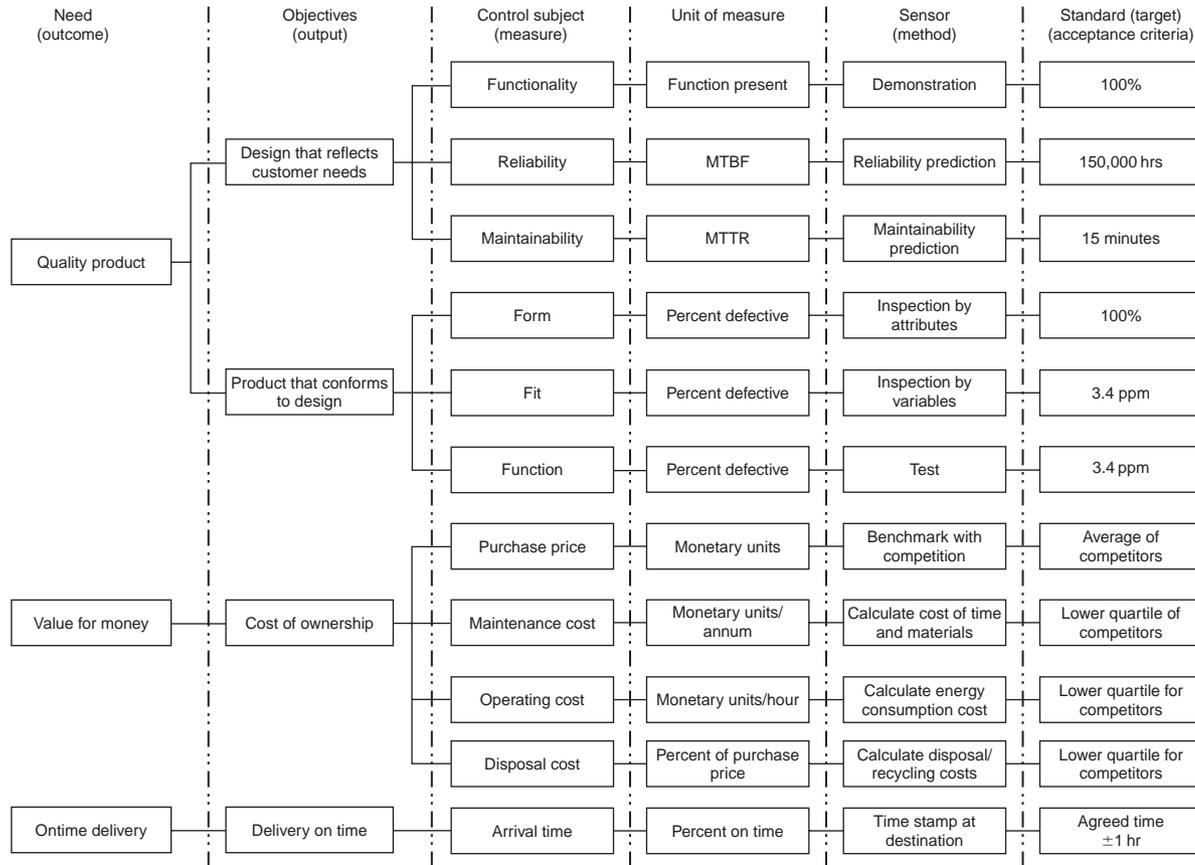


Figure 6.12 Derivation of process parameters

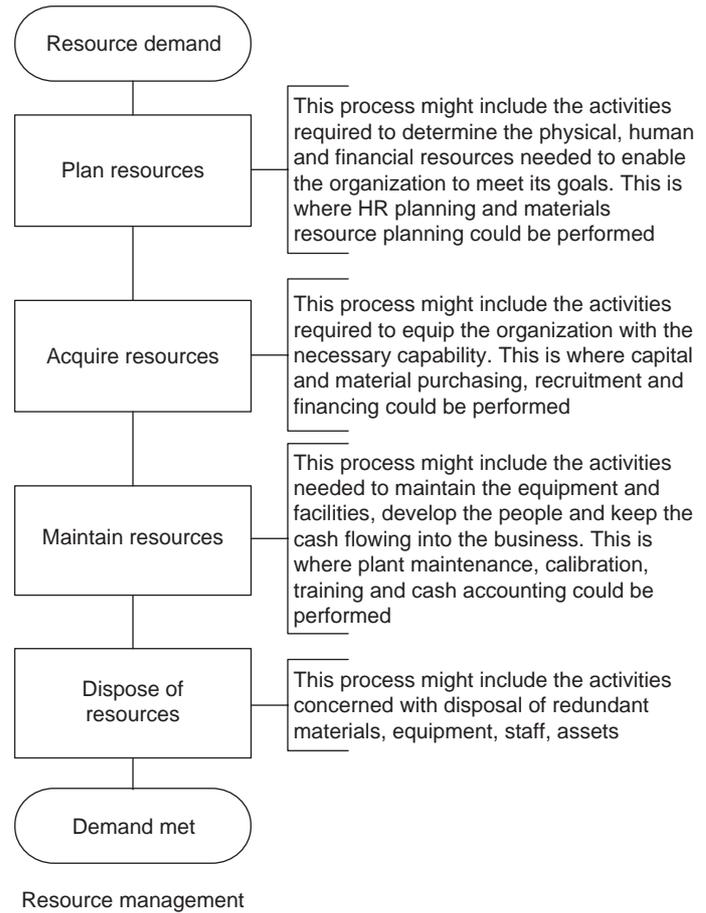
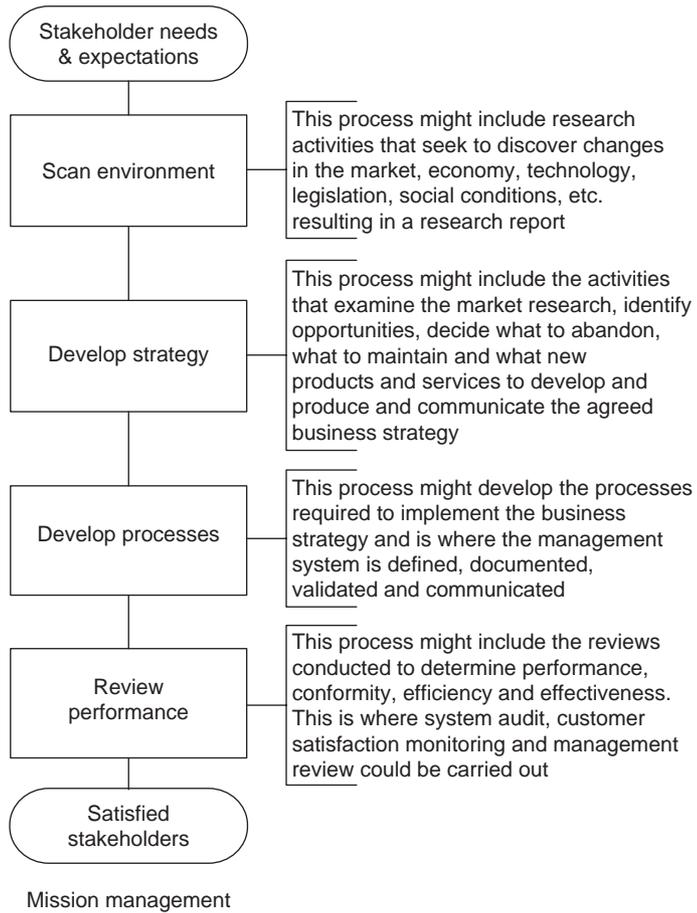


Figure 6.13 Outline business processes – 1

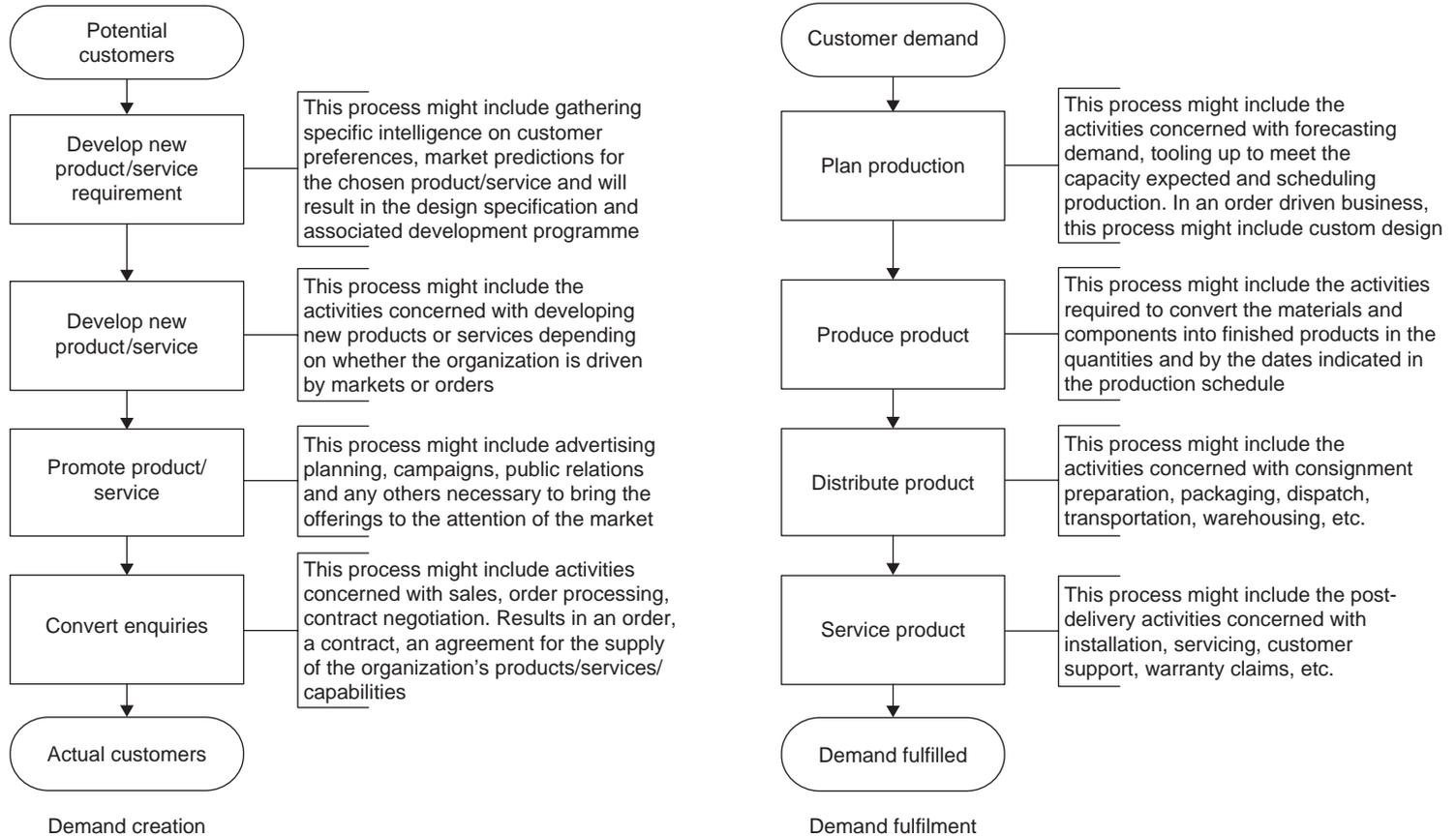


Figure 6.13 Outline business processes – 2

Determining the competence and capability

The next stage is to determine the competence required by those who are to carry out the actions and decisions on the flowcharts. Competence is related to the work process outputs determined previously. The numbers of people of differing competences and the quantity of equipment and size of facilities needed should be determined. The result will be specific resource budgets, personnel and equipment specifications.

Whilst many activities may be carried out using general office equipment and facilities, others may require specific capabilities and these need to be determined.

Resourcing and installing processes

Process installation is concerned with bringing information, human resources and physical resources together in the right relationship so that all the components are put in place in readiness to commence operation. In many cases the process will be installed already because it existed before formalization. In some cases process installation will require a cultural change. There is little point in introducing change to people who are not prepared for it. Installing a dynamic process-based system into an environment in which people still believe in an element-based system or in which management still manage performance through functions, is doomed to fail. Therefore, a precursor to *process installation* is the preparation of sound foundations. Everyone concerned needs to understand the purpose and objectives of what is about to happen – they all need to perceive the benefits and be committed to change and understand the concepts and principles involved.

The process of installing a new process or one that requires a change in practice is one that is concerned with the management of change. It has to be planned and resourced and account taken of attitudes, culture, barriers and any other resistance there may be.¹³ You must remember that not all those who are to use the process may have participated in its development and may therefore be reluctant to change their practices.

Process commissioning, integration and capability assessment

Process commissioning, integration and capability assessment is often iterative rather than three separate stages.

Process commissioning is concerned with getting processes working following installation. The people will have been through reorientation and will have received all the necessary process information. Any new resources will have been acquired and deployed and the old processes decommissioned. Installation and commissioning of new processes take place sequentially usually without a break so that current operations are not adversely affected.

Process integration is concerned with changing behaviour so that people do the right things right without having to be told. The steps within a process become routine, habits are formed and beliefs strengthened. The way people act and react to certain stimuli becomes predictable and produces results that are required. Improvement does not come about by implementing requirements – it comes about by integrating principles into our behaviour. Commissioning and integration continues until the process reaches a state of readiness for verification and validation of its capability.

Capability assessment is undertaken when results indicate that performance relative to a particular process characteristic is stable and predictable. With manufacturing processes or those processes dealing with large quantities of data this can be undertaken on a preproduction run of a specific product. With other types of processes it can often only be undertaken over several months. For instance, in the mission management process the work processes may only be cycled once a year. Capability assessment in such cases becomes problematical and only reveals meaningful data after several years by which time the mission as well as the technology may have changed.

System integration and acceptance

System integration is concerned with making the interconnections between the processes, ensuring that all the linkages are in place and that the outputs from a process feed the interfacing processes at the right time in the right quality. The system will not be effective if the process linkages do not function properly. Data is gathered relative to the system goals (step 1) and a degree of effectiveness determined. As any management system is a complex entity, there probably won't be a time when it is possible to declare that all the goals are being met consistently, repeatedly and continually. For one thing, the goals might change frequently and external forces may adversely impact performance. However, an acceptable level of effectiveness will be reached so as to mark a baseline from which all system changes may be referenced.

Review performance

There are several reviews that need to take place, some during system development and others afterwards on a planned frequency.

Reviews during development

Performance reviews are necessary to verify that development is proceeding to plan and the correct outputs have been generated for each of the stages above.

Risk assessments are necessary to verify that each of the process designs reflect a safe and cost effective way of producing the required process outputs in a manner that satisfies the constraints with adequate failure prevention features inherent in the design.

Reviews after development

Output reviews are necessary to establish whether the required outputs are being produced.

Process reviews are necessary to establish whether the process outputs are being achieved in the most effective way.

Effectiveness reviews are necessary to establish whether the outputs, measures and targets remain relevant to stakeholder needs.

Improve capability

Following each review, changes need to be made as necessary to bring about improvement by better control, better utilization of resources and better understanding of stakeholder needs.

Summary

In this Chapter we have examined process management concepts, explored the terminology, the various types of processes and we have introduced a system model that put processes in context relative to the business cycle. We have concluded that any organization has only four business processes but lots of work processes.

We have analysed various process models from the simple to the complex and drawn the conclusion that processes deliver results and effective processes achieve objectives so that any model that simply shows a process to take inputs and transform them into outputs is misleading. Using a more complex model, we have shown that people and other resources are part of the process as are the constraints rather than being inputs to it. From this model we have explained the characteristics of processes and provided key questions to tease out essential information for managing processes effectively.

We have introduced a set of principles on which effective process management can be based and shown how these can be used to test the robustness of processes. We have introduced a strategic trilogy that puts into context goals, critical success factors and processes and shown how to gather vital information relative to these elements using three simple questions – *What are we trying to do, what affects our ability to get it right and how do we make it happen?*. We go on to show how the various elements of a process-based management system can be developed top down from answers to these questions and finally we explained the various reviews needed during and after system development to keep the project on course and the system improving in performance, efficiency and effectiveness.

Throughout we have used some questions that will enable us to discover the process characteristics. These are put together in Table 6.7 to provide a handy reference.

Table 6.7 Process design questions

<i>To discover the:</i>	<i>Ask:</i>	<i>Notes</i>
Vision	What does the organization want to become or be known for?	This is the long term goal
Mission	What is the organization trying to do (right now)?	This is the journey currently being undertaken – the medium term goal
Values	What principles will guide us on our journey?	These are corporate values not personal values – i.e. These values characterize the culture in the organization
Stakeholders	For whom is the organization doing it? (the mission)	Primarily this will be customers and shareholders but ultimately if employees, suppliers and society do not want it, the organization will not survive.
Business outcomes	What do the stakeholders want from the organization?	These are the stakeholder needs and expectations
Stakeholder success measures (Key performance indicators)	What will the stakeholders look for to assess if their needs have been met?	Obtained by filtering the mission through each stakeholder’s needs and expectations
Critical success factors	What factors affect our ability to accomplish our goals?	Ask this question of the mission to reveal factors that might be turned into a set of corporate values and strategic objectives
Business outputs	What outputs will deliver successful outcomes?	You can’t control a process by measuring outcomes as they arise long after the process has delivered its output
Performance targets	What criteria will indicate whether our performance is acceptable?	These are the standards you need to achieve
Business processes	What processes deliver the business outputs?	There are probably only 4 of these so if you discover more, it is likely that two or more have a common output
Process purpose	What is the main function of this process?	Derived from an assessment of what the process outputs have in common – the essence

(Continued)

Table 6.7 (Continued)

<i>To discover the:</i>	<i>Ask:</i>	<i>Notes</i>
Process activities	What affects our ability to deliver process outputs?	If you are doing something that does not affect your ability to deliver a successful output – stop doing it
Risks	How could this process fail to achieve its objectives?	These are the failure modes or hazards inherent in the process that need to be eliminated, reduced or controlled
Process output	What outputs would we look for as evidence that the process objectives have been achieved?	Must match a stakeholder need
Process measures	What parameters will we control to ensure delivery of the process outputs?	These are the subjects for which you apply the universal steps of quality control
Process constraints	How do the expectations of the other stakeholders impact (influence or constrain) the process for achieving customer expectations?	The other stakeholders are shareholders, employees, suppliers and society
Competence	What skills, knowledge and behaviours are needed to produce these outputs?	The results that people can deliver under the stipulated conditions are more important than what people say they know or can do or once did
Performance review	How do we know we are doing things right?	Process outputs are reviewed resulting in improvement by better control
Efficiency review	How do we know we are doing things in the best way?	Practices are reviewed resulting in improvement by better utilization of resources
Effectiveness review	How do we know we are doing the right things?	Objectives are reviewed resulting in improvement by better understanding of stakeholder needs