5 Continual service improvement methods and techniques

5.1 METHODS AND TECHNIQUES

A wide variety of methods and techniques can be used in the continual service improvement (CSI) activities ranging from 'soft and vague' to 'factual and scientific', often providing either both or a mixture of qualitative and quantitative measurement results. To ensure consistency of execution and effective measurement, especially for the activities of gathering and processing data, the techniques and methods that are used should be clearly documented in advance and communicated to the staff who will be responsible for their execution. To increase the trustworthiness of the factual data delivered to these processes it may be required for these processes to be audited for compliance to the agreed and prescribed methods and techniques.

An effective choice of methods and techniques for the analysis, presentation and use of the measurement information is highly dependent on the particular circumstances in which these tasks are performed and can generally not be documented in advance. A goal-oriented attitude and professional expertise and education of the individuals are required.

5.1.1 Effort and cost

CSI improvement activities can require a considerable amount of effort and money for larger-scale improvement projects to minimal time and effort for some incremental improvements. If the effort is going to be costly then the organization, both IT and the business, has to ask whether it is worth it. So the business case including an analysis of the return on investment (ROI) will have to be made.

Let's first look at the costs of implementing and operating a measurement framework for IT service provision. Possible major cost topics are:

- **Labour cost** Salaries of the organization's staff who are involved in implementing the measurement framework or who spend effort on performing one of the activities in operating or maintaining the measurement framework, including costs associated with managing it. If (part of) IT is outsourced, the external provider costs should be included here too.
- **Tooling cost** Purchase, licences, installation and configuration, maintenance costs of hardware, software and other equipment specifically used for the measurement activities. Tools could be a cost on the provider, which they will pass on back to you.
- **Training cost** Cost of training and coaching staff in the use of measurement methods, techniques, tools and procedures.
- **Expertise cost** Payments to hired experts and consulting firms, typically for the planning, implementation and maintenance activities pertaining to the measurement framework. Also includes the out-of-pocket costs of acquiring information used in the measurement framework that is not in the possession of the organization itself such as benchmarking data.

When deciding whether the measurement framework is worth the effort, consider the amounts to spend on:

- **Implementation** Initial costs of the measurement framework, and if it changes. In practice these types of costs can be reliably estimated and controlled by using a project-oriented approach.
- **Operation** The level of costs associated with the operation of the measurement framework is largely fixed as a result of the way it is designed and equipped.
- **Maintenance** The level of these types of cost depends mainly on the expected rate at which the measurement framework will require adaptation to changing circumstances and on the quality of its implementation.

5.1.2 Implementation review and evaluation

Implementation review and evaluation is key to determining the effectiveness of a CSI improvement programme. Some common questions for review include:

- Were we correct in our assessment of the current situation and in defining the problem statement?
- When defining the goals for improving IT services did we commit to the right goals?
- When developing our strategy for improving the use and management of IT services, did we make the right choices and take the right decisions?
- When implementing our strategy, did we do it right?
- In the new situation, have we improved the provision of IT services?
- And finally, what are the lessons learned and where are we now?

Review and evaluation of a CSI initiative fall within two broad categories:

- Issues closely tied to the original problem situation for IT service provision to the business and ensuing business aims and strategy for the improvement thereof
- Issues in relation to the planning, implementation and proceedings of the IT improvement programme itself and associated projects such as measurements, problems, actions and changes.

The issues in the first category are closely related to the characteristics of the original problem situation, following which staff instigated the actions for understanding and improvements. These actions will therefore include:

- The ability of IT services to meet business needs
- Business satisfaction with the service provision
- Business benefits in the area of productivity, effectiveness, efficiency and economy
- Financial issues such as understanding the costs of IT service provision, control of IT costs to the business, and accountability of IT costs to the business
- The quality of IT service provision and support of IT use
- Communication between the business and IT service provider and the degree of mutual understanding
- The degree of understanding and control of the management of the IT infrastructure and IT service provision on the part of the business.

For the second category the following issues should be reviewed and evaluated:

- Costs of staff involved in the improvement programme and costs of implementing and maintaining the measurement framework
- Project management such as planning, performance, timeliness of achieving results and milestones, amount of replanning
- Adequacy of methods and techniques used
- Problems, bottlenecks, causes of progress performance problems, improvements and changes
- Communication, information gathering, reporting.

5.2 ASSESSMENTS

Assessments are the formal mechanisms for comparing the operational process environment to the performance standards for the purpose of measuring improved process capability and/or to identify potential shortcomings that could be addressed. The advantage of assessments is they provide an approach to sample particular elements of a process or the process organization which impact the efficiency and the effectiveness of the process.

Just by conducting a formal assessment an organization is demonstrating its significant level of commitment to improvement. Assessments involve real costs, staff time and management promotion. Organizations need to be more than just involved in an assessment; they need to be committed to improvement.

Comparison of the operational environment to industry norms is a relatively straightforward process. The metrics associated with industry norms are typically designed into the process control structure. Sampling and comparison then can be considered an operational exercise. Dealing with gaps apparent from such monitoring and reporting are addressed as an element of the check stage of the improvement lifecycle. An assessment based on comparison to a maturity model has been common over the last few years.

A well-designed maturity assessment framework evaluates the viability of all aspects of the process environment including the people, process and technology as well as factors affecting overall process effectiveness within the business – culture of acceptance, process strategy and vision, process organization, process governance, business/IT alignment, process reporting/metrics and decision-making. The balance of this section focuses on this form of assessment. However the principles of maturity assessment can easily be extended to assessments based on industry norms.

The initial step in the assessment process is to choose (or define) the maturity model and in turn the maturity attributes to be measured at each level. A suggested approach is to turn to the best-practice frameworks such as Capability Maturity Model Integration (CMMI), Control OBjectives for Information and related Technology (COBIT), ISO/IEC 20000 or the process maturity framework. These frameworks define maturity models directly or a model can be inferred. The frameworks are also useful in the definition of process maturity attributes.

5.2.1 When to assess

Assessments can be conducted at any time. A way to think about assessment timing is in line with the improvement lifecycle:

- **Plan (project initiation)** Assess the targeted processes to form the basis for a process improvement project. Processes can be of many configurations and design, which increases the complexity of assessment data collection.
- **Plan (project midstream)** A check during process implementation or improvement activities serves as validation that process project objectives are being met and, most importantly, provides tangible evidence that benefits are being achieved from the investment of time, talent and resources to process initiatives.
- **Do/check (process in place)** Upon the conclusion of a process project, it is important to validate the maturation of process and the process organization through the efforts of the project team. In addition to serving as a decisive conclusion for a project, scheduling periodic reassessments can support overall organizational integration and quality efforts.

5.2.2 What to assess and how

The assessment's scope is one of the key decisions. Scope should be based on the assessment's objective and the expected future use of service and process assessments and assessment reports. Assessments can be targeted broadly at those processes currently implemented or focused specifically where known problems exist within the current process environment. There are three potential scope levels:

- Process only Assessment only of process attributes based on the general principles and guidelines of the process framework which defines the subject process.
- People, process and technology Extend the process assessment to include assessment of the organizational structure, skills, roles and talents of the managers and practitioners of the process as well as the ability of the process-enabling technology deployed to support the objectives and transaction state of the process.
- Full assessment Extend the people, process and technology assessment to include an assessment of the culture of acceptance within the organization, the ability of the organization to articulate a process strategy, the definition of a vision for the process environment as an 'end state', the structure and function of the process organization, the ability of process governance to assure that process objectives and goals are met, the business/IT alignment via a process framework, the effectiveness of process reporting/metrics, and the capability and capacity of decision-making practices to improve processes over time.

All these factors are compared to the maturity attributes of the selected maturity model.

Assessments can be conducted by the sponsoring organization or with the aid of a third party. The pros and cons of these differing approaches are listed in Table 5.1. The advantages of conducting a self-assessment is the reduced cost and the intellectual lift associated with learning how to objectively gauge the relative performance and progress of an organization's processes. Of course the downside is the difficulty associated with remaining objective and impartial during the assessment.

The pitfall of a lack of objectivity can be eliminated by using a third party to conduct the assessment. There are a number of public 'mini-assessments' that are available on various websites, which provide a general perspective of maturity. However a more detailed assessment and resulting report can be contracted through a firm specializing in an assessment practice. Balancing against the obvious increased cost of a third-party assessment is the objectivity and experience of an organization that performs assessments regularly.

Whether conducted internally or externally, the assessment should be reported using the levels of the maturity model. A best-practice reporting

Table 5.1 Pros and cons of assessment approaches

Pro	Con
Using external resources for assessments	
Objectivity	Cost
Expert ITIL knowledge	Risk of acceptance
Broad exposure to multiple IT organizations	Limited knowledge of existing environments
Analytical skills	Improper preparation affects effectiveness
Credibility	May not be there to see it through to the end – witness the results, good or not
Minimal impact to operations	
Performing self-assessments	
No expensive consultants	Lack of objectivity (internal agendas)
Self-assessments available for free	Little acceptance of findings
Promotes internal cooperation and communication	Internal politics
Good place to get started	Limited knowledge or skills
Internal knowledge of environment	Resource intensive
Can repeat exercise in future at minimal cost, using newly acquired skills	Inability to see the wood for the trees; assessment often needs a fresh set of eyes
	Detracts from the day job; unless back-filled could inadvertently reduce service effectiveness and efficiency during assessment

method is to communicate assessment results in a graphical fashion. Graphs are an excellent tool as they can fulfil multiple communication objectives. For instance, graphs can reflect changes or trends of process maturity over time or reflect comparison of the current assessment to standards or norms.

5.2.3 Advantages and risks of assessments

The advantages include:

- They can provide an objective perspective of the current operational process state compared with a standard maturity model and a process framework. Through a thorough assessment, an accurate determination of any process gaps can be quickly completed, recommendations put forward and action steps planned.
- A well-planned and well-conducted assessment is a repeatable process. Thus the assessment is a useful management process in measuring progress over time and in establishing improvement targets or objectives.
- Using a common or universally accepted maturity framework, applied to a standard process framework, can serve to support comparing company process maturity to industry benchmarks.

The risks include:

- An assessment provides only a snapshot in time of the process environment. Therefore it may not reflect current business or cultural dynamics and process operational issues.
- If the decision is to outsource the assessment process, the assessment and maturity framework can be vendor or framework dependent. The proprietary nature of vendor-generated models may make it difficult to compare to industry standards.
- The assessment can become an end in itself rather than the means to an end. Rather than focusing on improving the efficiency and effectiveness of processes through process improvement, organizations can adopt a mindset of improving process for the sake of achieving maturity targets.

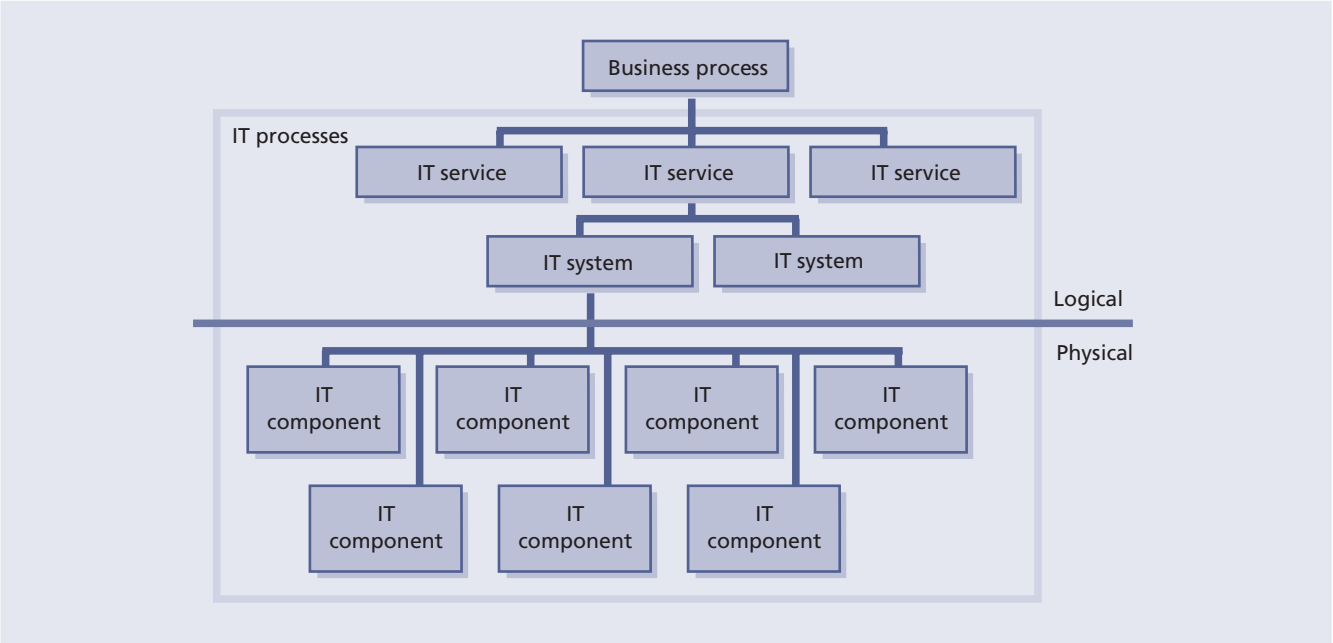

Figure 5.1 The relationship of services, processes and systems

- Assessments are labour-intensive efforts. Resources are needed to conduct the assessments in addition to those responding such as process or tool practitioners, management and others. When preparing for an assessment, an honest estimate of time required from all parties is in order.
- Assessments attempt to be as objective as possible in terms of measurements and assessment factors, but ultimately assessment results are still subject to the opinion of assessors. Thus assessments themselves are subjective and the results can have a bias based on the attitudes, experience and approach of the assessors themselves.

Assessments are an effective method of answering the question 'Where are we now?' Understanding how an existing service is performing, or how effective and efficient service management processes are, is important for identifying the gap between where we are and where we want to be. As we begin our discussion of assessments, we need to look at the relationship between business processes, IT services, IT systems and components that make up an IT system. IT service management processes support the IT services, IT systems and components. CSI will need to review the results of each one of these areas for effectiveness and efficiency. This will help identify the areas for improvement. This relationship is shown in Figure 5.1.

In the CSI journey, the decisions on what to improve are critical to the overall results that can be achieved. Any discussion on improvements has to begin with the services being provided to the business. This could lead to improvements on the service itself or to process improvements supporting the business service.

Improvement activities require the investment of human, financial and technological resources in the quest for continual improvement. These resources are allocated from other uses (e.g. customer support initiatives, new product development) to the improvement work. The business rationalizes decisions to allocate resources on the basis of the greatest ROI or value on investment (VOI). An important consideration then becomes understanding and articulating improvement needs and the benefits of improvement.

The goal of service improvement for an organization is two-fold:

- First, the organization seeks to achieve service objectives in a cost-efficient manner. The objectives can (and should) be linked to the overall strategy of the business. The efficiency issue for an organization is determining that the process is achieving its objectives with the most cost-efficient use of resources. There is potential for cost savings through elimination of unnecessary, redundant, overlapping or manual process activities and procedures, which

in turn can be a significant benefit driver for justifying a process improvement.

- Second, the organization identifies those elements of process that detract from meeting service objectives effectively. Effectiveness relates to the ability of the process to achieve or exceed its principles and goals. In other words, a process would be considered effective if, through the implementation of the process, the organization meets, sustains and potentially exceeds the strategic goals and tactical objectives of the organization. Thus service improvements focus on addressing perceived or measurable process deficiencies, impacting specific organizational objectives, and can be quantified as delivered improvement benefits.

Service improvements are governed by the improvement lifecycle, which is modelled on the PDCA cycle of Plan, Do, Check, Act (see Figures 3.2 and 3.1 for the CSI approach and Chapter 4 for interfaces with the seven-step improvement process). The model establishes a clear pattern for continual improvement efforts:

- **Plan** Establishes goals for improvement including gap analysis, and defines action steps to close the gap and establish and implement measures to ensure that the gap has been closed and benefits achieved.
- **Do** Development and implementation of a project to close the gap. Implementation or improvement of processes and establishing the smooth operation of the process.
- **Check** Comparison of the implemented environment to the measures of success established in the Plan phase. The comparison determines if a gap still exists between the improvement objectives of the process and the operational process state. Gaps don't necessarily require closure. A gap may be considered tolerable if the actual performance is within allowable limits of performance.
- **Act** The decision process to determine if further work is required to close remaining gaps, and allocation of resources necessary to support another round of improvement. Project decisions at this stage are the input for the next round of the lifecycle, closing the loop as input in the Plan phase.

5.2.4 Value of processes versus maturity of processes

Figure 5.2 illustrates the value of a process in comparison to its maturity. For service management process improvement projects, one of the questions asked should be on how mature we need our processes to be. The answer to this is tied directly back to the business. In other words how important is a process to the business.

Let us say that a particular organization has gone through an assessment and found that three key processes, service level management (SLM), availability management and capacity management, shown in Figure 5.2, are not very mature. This particular organization is changing its strategy for selling and delivering products and services to a web-based strategy. Because of the importance of capacity management and availability management to any organization that provides products and services over the web, this company has to implement an improvement programme for increasing the maturity of both processes. Without any improvement initiatives this particular organization is putting itself at risk. We have all read about companies that have experienced larger than planned for usage and how they often create catastrophic results for organizations. The lack of proper capacity planning has in many cases created availability issues that have shut down an organization's ability to sell its products.

Having a low SLM process maturity also will create some issues for CSI activities. How do we know the new business requirements? What is currently being monitored and how well are we doing against targets? Do we have roles identified for reporting and analysing data?

The maturity of a process should ideally fall in the 'safe' areas. If a process is immature but the business heavily depends on it there is a significant danger to the organization. If a process is very mature yet provides very little to the business, then an organization may be over-investing resources and money. When CSI is looking at improving processes in support of IT services, understanding the value of processes to a business is critical.

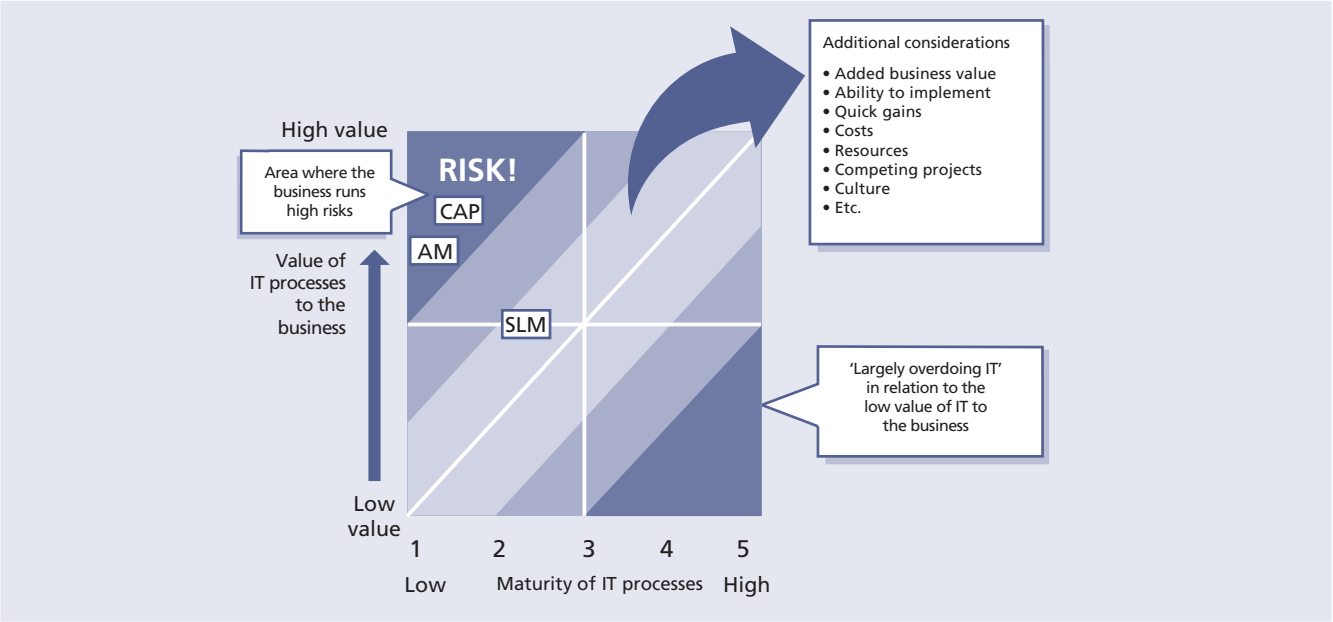

Figure 5.2 The value of a process versus the maturity of a process

5.2.5 Gap analysis

Gap analysis is a business assessment tool enabling an organization to compare where it is currently and where it wants to go in the future. This provides the organization with insight to areas that have room for improvement. This can be used to determine the gap between 'What do we want?' and 'What do we need?', for example.

The process involves determining, documenting and approving the variance between business requirements and current capabilities. Gap analysis naturally flows from benchmarking or other assessments such as service or process maturity assessments. Once the general expectation of performance is understood, then it is possible to compare that expectation with the level of performance at which the company currently functions. This comparison becomes the gap analysis, which can be performed at the strategic, tactical or operational level of an organization.

Gap analysis can be conducted from different perspectives such as:

- The organization, including organizational structure and capabilities of the people
- Business direction
- Business processes
- Information technology.

Gap analysis provides a foundation for how much effort in time, money and human resources is required to achieve a particular goal (e.g. how to bring a service from a maturity level of 2 to 3).

5.3 BENCHMARKING

Benchmarking is a specific type of assessment and is a process used in management, particularly strategic management, in which organizations evaluate various aspects of their processes in relation to best practice, usually within their own sector. This then allows organizations to develop plans on how to adopt such best practice, usually with the aim of increasing some aspect of performance. Benchmarking may be a one-time occurrence, but it is often treated as a continuous process in which organizations continually seek to challenge their practices.

Organizations have a growing need to get a clear view on their level of quality and performance compared with that of their competitors and in the eye of their customers. It isn't sufficient any more to have internal self-assessment reports on the status of IT performance; it is equally important to test and compare it with the view the market has on the performance of the organization. A positive result of this test and comparison can give a competitive edge to the organization in the marketplace and generates trust with its customers. The results of benchmarking and self-assessments lead to identification of gaps in terms of people, process and technology. A benchmark

can be the catalyst to initiating prioritization of where to begin formal process improvement. The results of benchmarking must clearly display the gaps, identify the risks of not closing the gaps, and facilitate prioritization of development activities and communication of this information.

Benchmarking is actually a logical sequence of stages that an organization goes through to achieve continual improvement in its key processes. It involves cooperation with others as benchmarking partners learn from each other where improvements can be made. It will be necessary to:

- **Ensure senior management support**
- **Take an external view** Bring together business intelligence and internal performance to draw conclusions about the way internal resources and processes must be improved to achieve and surpass the performance of others.
- **Compare processes, not outputs** Comparisons with organizations in the same sector are unlikely to identify the significant improvements that have been made elsewhere or overturn the conventions of the sector.
- **Involve process owners** Their involvement encourages acceptance and buy-in by those who will be affected immediately by the changes which will be required to improve performance.
- **Set up benchmarking teams** As a benchmarking culture develops, people will apply the method as part of the normal way in which they manage their work.
- **Acquire the skills** People who undertake benchmarking require a small amount of training and guidance; an experienced in-house facilitator or external consultant will probably be required to provide technical assurance and encouragement in the application of the method.

Organizations should plan their benchmarking process based on their improvement needs, and should understand that this may require measurement of other companies. Some cross-industry figures may be published by the international research organizations, but will not necessarily include the assumptions and measurements a given organization needs. A research organization may, however, be a valuable benchmarking partner, for example, if target companies are competitors.

There is a general expectation that benchmarking is a process of comparing an organization's performance to industry-standard figures. By extension, having such benchmark figures available is often seen as the first hurdle in a benchmarking exercise. However, as this section will show, benchmarks are only relevant when the comparison is of the same performance measures or indicators, and is with organizations of similar size, industry and geography.

5.3.1 Benchmarking procedure

Identify your problem areas. Because benchmarking can be applied to any business process or function, a range of research techniques may be required, including:

- Informal conversations with customers, employees, or suppliers
- Focus groups
- In-depth marketing research
- Quantitative research
- Surveys
- Questionnaires
- Re-engineering analysis
- Process mapping
- Quality control variance reports
- Financial ratio analysis.

5.3.2 Benchmarking costs

Benchmarking is a moderately expensive process, but most organizations find that it more than pays for itself. The three main types of costs are:

- **Visit costs** This includes travel- and accommodation-related expenses for team members who need to travel to the site.
- **Time costs** Members of the benchmarking team will be investing time in researching problems, finding exceptional companies to study, visits and implementation. This will take them away from their regular tasks for part of each day so additional staff might be required.
- **Benchmarking database costs** Organizations that institutionalize benchmarking into their daily procedures find it is useful to create and maintain a database of best practices and the companies associated with each best practice.

5.3.3 Value of benchmarking

Benchmarking is often used as a driver to make changes when the organization is reluctant to change the way of working. This is discussed in section 5.3.4.

To summarize, a benchmark is the basis for:

- Profiling quality in the market
- Boosting self-confidence and pride in employees as well as motivating and tying employees to an organization; this is relevant with today's staff shortages in the IT industry – IT personnel want to work in a highly efficient, cutting-edge environment
- Trust from customers that the organization is a good IT service management provider.

Optimizing service quality is key to all IT organizations to maximize performance and customer satisfaction and provide value for money. Organizations will be required to focus on end results and service quality, rather than simply on their business activities and processes.

5.3.4 Benchmarking as a lever

Consider the following 'paradigm blindness': 'The way we do it is the best because this is the way we've always done it.'

Benchmarking is sometimes the only way to open an organization to new methods, ideas and tools to improve their effectiveness. It helps break through resistance to change by demonstrating other methods of solving problems than the one currently employed, and demonstrating that they are irrefutably better, because they are being used successfully by others.

5.3.5 Benchmarking as a steering instrument

Benchmarking is a management technique to improve performance. It is used to compare performance between different organizations – or different units within a single organization – undertaking similar processes. Benchmarking is an ongoing method of measuring and improving products, services and practices against the best that can be identified in any industry anywhere. It has been defined as 'the search for industry best practices which lead to superior performance'.

5.3.6 Benchmarking categories

Benchmarking is a tool to identify improvement opportunities as well as to verify the outcome of improvement activities. Organizations can conduct internal or external benchmark studies. Improving service management can be as simple as asking: 'Are we better today than we were yesterday?', and looking at incremental improvements.

Here are some benchmarking categories:

- Internal benchmarks – where an organization sets a baseline at a certain point in time for the same system or department and measures how it is doing today compared with the baseline originally set; this type of benchmark is often overlooked by organizations (service targets are a form of benchmark)
- Comparison with industry norms provided by external organizations
- Direct comparisons with similar organizations
- Comparison with other systems or departments within the same company.

5.3.7 Benefits

Benchmarking often reveals quick wins – opportunities for improvement that are relatively easy and inexpensive to implement while providing substantial benefits in process effectiveness, cost reduction or staff synergy. The costs are clearly repaid through the improvements realized when organizations use benchmarking successfully. Using benchmark results will help deliver major benefits in achieving:

- Economy in the form of lower prices and higher productivity on the part of the service provider
- Efficiency by comparing the costs of providing IT services and the contribution these services make to the business with what is achieved in other organizations, helping the organization to identify areas for improvement
- Effectiveness of business objectives realized compared with what was planned.

Benchmarking helps the organization to focus on strategic planning by identifying the relative effectiveness of IT support for the business. The economy is the easiest area to investigate although efficiency and effectiveness may deliver the most benefit to the business. To obtain the maximum benefit, it is necessary to look at all of these three areas, rather than focusing on one to the exclusion of the others.

5.3.8 Who is involved?

Within an organization there will be three parties involved in benchmarking:

- **The customer** The business manager responsible for acquiring IT services to meet business objectives. The customer might demonstrate an interest in benchmarking by asking: 'How can I improve my performance in procuring services and managing service providers, and in supporting the business through IT services?'
- **The user or consumer** Anyone who uses IT services to support his or her work. The user might demonstrate an interest in benchmarking by asking: 'How can I improve my performance by exploiting IT?'
- **The internal service provider** Providing IT services to users under service level agreements (SLAs) negotiated with and managed by the customer. The provider might demonstrate an interest in benchmarking by asking: 'How can we improve our performance in the delivery of IT services which meet the requirements of our customers and which are cost-effective and timely?'

There will also be participation from external parties:

- **External service providers** Providing IT services to users under contracts and SLAs negotiated with and managed by the customer
- **Members of the public** Ordinary people are increasingly becoming direct users of IT services
- **Benchmarking partners** Other organizations with whom comparisons are made in order to identify the best practices to be adopted for improvements.

5.3.9 What to benchmark?

Differences in benchmarks between organizations are normal. All organizations and service-provider infrastructures are unique, and most are continually changing. There are also intangible but influential factors that cannot easily and objectively be measured, such as goodwill, image and culture.

Direct comparison with similar organizations is most effective if there is a sufficiently large group of organizations with similar characteristics. It is important to understand the size and nature of the business area, including the geographical distribution and the extent to which the service is used for business or time-critical activities.

Comparison with other groups in the same organization normally allows a detailed examination of the features being compared, in order to establish whether or not the comparison is of like with like.

Hints and tips

When benchmarking one or more services or service management processes, the IT organization has to ascertain which of these the organization should focus on first, if all cannot be implemented simultaneously. Determine which services and supporting processes to compare. Benchmarking of a service management process is used to find out if a process is cost-effective, responsive to the customer's needs and effective in comparison with other organizations. Some organizations use benchmarking to decide whether they should change their service provider.

It is essential in planning for service management to start with an assessment or review of the relevant service management processes. The results of this can provide a baseline for future comparison.

Example of a poor management decision

One large company started with the implementation of all service management processes. Senior management never explained why all these processes should be implemented. It sounded like a good thing to do: 'Everybody else is doing service management so why don't we?' After two years the whole project had to be stopped because customers were complaining about poor service. It was decided to restart the service management project. This time senior management decided to implement only a part of service management (the processes where the pain was most felt) and conducted an assessment to provide a baseline of results for future comparison.

Benchmarking techniques can be applied at various levels from relatively straightforward in-house comparisons through to an industry-wide search for best practice. Benchmarking comprises four basic stages: planning, analysis, action and review, or one can apply the seven-step improvement process to benchmarking:

1 Identify the strategy for improvement.
2 Define what you will measure.
   - Select the broad service or service management process or function to benchmark (such as service desk) in relation to stakeholder needs.
   - Draw up a preliminary list of potential benchmarking partners (these may be within the organization or outside).
   - Identify possible sources of information and methods of collection to confirm the suitability of potential partners.
   - Within that process, define the activities to be benchmarked (such as incident lifecycle).
   - Identify the resources required for the study.
   - Confirm the key performance measures or indicators to measure the performance in carrying out the activity.
   - Document the way the activities are currently completed.
   - Agree the plan and its implementation.
3 Gather the data.
   - Collect information to identify the most likely potential benchmarking partner to contact.
4 Process the data.
5 Analyse the information and data.
   - Confirm the best potential benchmarking partner and make a preliminary assessment of the performance gap.
   - Establish contacts and visits, if appropriate, to validate and substantiate the information.
   - Compare the existing process with that of the benchmarking partner to identify differences and innovations.
   - Agree targets for improvement that are expected as a result of adopting the benchmarking partner's ways of doing things.
6 Present and use the information.
   - Communicate the results of the study throughout the relevant parts of the organization and to the benchmarking partner.
   - Plan how to achieve the improvements.
7 Implement improvement.
   - Review performance when the changes have been embedded in the organization.
   - Identify and rectify anything which may have caused the organization to fall short of its target.
   - Communicate the results of the changes implemented to the organization and the benchmarking partner.
   - Consider benchmarking again to continue the improvement process.

Ideally, benchmark reviews should be built into an ongoing service management lifecycle so that regularly scheduled reviews or benchmarks are conducted. The formality and rigour with which they are conducted will vary depending on the environment, rate of business change, complexity of the environment and elapsed time since the last review. Conducting these reviews regularly provides valuable metrics and trend analysis with which to judge improvements (or lack thereof) and take corrective action as early as possible to maximize performance gains.

5.3.10 Comparison with industry norms

ITIL is itself an industry-recognized best practice, increasingly providing a framework for service management worldwide. The ITIL core publications provide documented guidance on detailed process assessment and service benchmarking that can be used as checklists and templates for organizations doing their own service reviews and benchmarks. Additionally, many IT service organizations around the world provide consulting and professional expertise in the process of conducting service management benchmarks and assessments to compare the current processes with published best practices and the ITIL recommendations. It may be worthwhile to investigate using these services if the scope of an assessment is very large or complex.

In addition, organizations may wish to compare their own processes against international standards, especially ISO/IEC 20000, ISO/IEC 27001 and ISO/IEC 19770.

5.3.10.1 Process maturity comparison

Conducting a process maturity assessment is one way to identify service management improvement opportunities. Often when organizations conduct a maturity assessment they want to know how they compare to the other organizations. Table 5.2 reflects average maturity scores for over 100 separate organizations that went through a maturity assessment using the scoring system detailed in Table 5.3.

As you can, see SLM, which is a key process in support of CSI, is at a fairly low maturity level in the organizations used in the above example. The lack of a mature SLM process that provides for identification of new business requirements, monitoring and reporting of results can make it difficult to identify service improvement opportunities. A prime target for improvements in this example would be first to mature the SLM practice to help achieve measurable targets to improve services going forward.

Table 5.2 Average results of over 100 process assessments before improvement

Financial management	2.67
Incident management/service desk	2.49
IT service continuity management (ITSCM)	2.42
Change management	2.36
Release management	2.26
Capacity management	2.02
Availability management	1.97
SLM	1.96
Problem management	1.83
Service asset and configuration management	1.66

Table 5.3 CMMI maturity model

0. Non-existent	Nothing present
1. Initial	Concrete evidence of development
2. Repeatable	Some process documentation but some errors likely
3. Defined	Standardized and documented
4. Managed	Monitored for compliance
5. Optimized	Processes are considered best practices through improvement

5.3.10.2 Total cost of ownership

The total cost of ownership (TCO), developed by Gartner, has become a key measurement of the effectiveness and the efficiency of services. TCO is defined as all the costs involved in the design, introduction, operation and improvement of services within an organization from its inception until retirement. Often, TCO is measured relating to hardware components. The TCO of an IT service is even more meaningful. CSI needs to take the TCO into perspective when looking at service improvement plans (SIPs).

TCO is often used to benchmark specific services in IT against other organizations – managed service providers.

5.3.11 Benchmark approach

Benchmarking will establish the extent of an organization's existing maturity with best practice and help in understanding how that organization compares with industry norms. Deciding what the key performance indicators (KPIs) are going to be and then measuring against them will give solid management information for future improvement and targets.

A benchmark could be either:

- **An internal conducted benchmark** Completed internally using resources from within the organization to assess the maturity of the service management processes against a reference framework
- **An external conducted benchmark** Completed by an external third-party company; most have their own proprietary models for the assessment of service management process maturity.

The results and recommendations contained within the benchmarking review can then be used to identify and rectify areas of weakness within the IT service management processes.

Viewed from a business perspective, benchmark measurements can help the organization to assess IT services, performance and spend against peer or competitor organizations and best practice, both across the whole of IT and by appropriate business areas, answering questions such as:

- How does IT spend compare to other similar organizations – overall, as a percentage of revenue, or per employee?
- How does IT spend compare for similar functions, e.g. payroll functions either within an organization or with other organizations?

- How does IT spend compare across business units or business processes?
- How does IT spend compare across locations or technologies?
- How effective is IT service delivery (and identify opportunities and measures for improvement)?
- How efficient is IT service delivery (and identify opportunities and measures for improvement)?
- Which is the most appropriate sourcing option?
- Is the value of a long-term sourcing contract being maintained year on year?

Benchmarking activities need to be business-aligned. They can be expensive exercises whether undertaken internally or externally, and therefore they need to be focused on where they can deliver most value. For internal service providers, cost benchmarking can assess the efficiency and effectiveness of the IT organization. For external service providers, especially outsourced services, they can help to ensure the right IT services for the right price. Results of benchmarking not only provide a statement of performance, but can also be used to identify, recommend and plan improvements. They can also demonstrate value to the business and set targets for improvement levels, with subsequent benchmarking to assess achievement.

Comparisons of service performance and workload characteristics between peer organizations, the effectiveness of business process and the IT contribution to IT are also of value as part of a TCO assessment. Third-party specialists are available to conduct benchmarking and assessments, giving the business an external perspective and helping to lend credibility to the results and recommendations for improvements.

There is a variety of IT benchmarking types available separately or in combination, including:

- Cost and performance for internal service providers
- Price and performance for external service providers
- Process performance against industry best practice
- Financial performance of high-level IT costs against industry or peers
- Effectiveness considering satisfaction ratings and business alignment at all levels.

The context for benchmarking requires information about the organization's profile, complexity and relative comparators. An effective and meaningful profile contains four key components:

- **Company information profile** The company profile defines the landscape of an organization – basic information on the company size, industry type, geographic location and types of user are typical of data gathered to establish this profile.
- **Current assets** The IT assets mix within the organization may include production IT, desktop and mobile clients, peripherals, network and server assets.
- **Current best practices** These include policies, procedures and/or tools that improve returns, and their maturity and degree of usage.
- **Complexity** This includes information about the end-user community, the types and quantities of varied technologies in use and how IT is managed.

5.4 SERVICE MEASUREMENT

For all sizes of businesses, private and public organizations, educational institutions, consumers and the individuals working within these organizations, IT services have become an integral means for conducting business. Without IT services many organizations would not be able to deliver the products and services in today's market. As reliance on these IT services increases so do the expectations for availability, reliability and stability. This is why having the business and IT integrated is so important. No longer can they be thought of separately. The same holds true when measuring IT services. It is no longer sufficient to measure and report against the performance of an individual component such as a server or application. IT must now be able to measure and report against an end-to-end service.

The seven-step improvement process described in Chapter 4 discussed the need to define what you will measure after looking at the requirements and the ability to measure.

For services there are three basic measurements that most organizations utilize, which *ITIL Service Design* covers in more detail. They are:

- Availability of the service
- Reliability of the service
- Performance of the service.

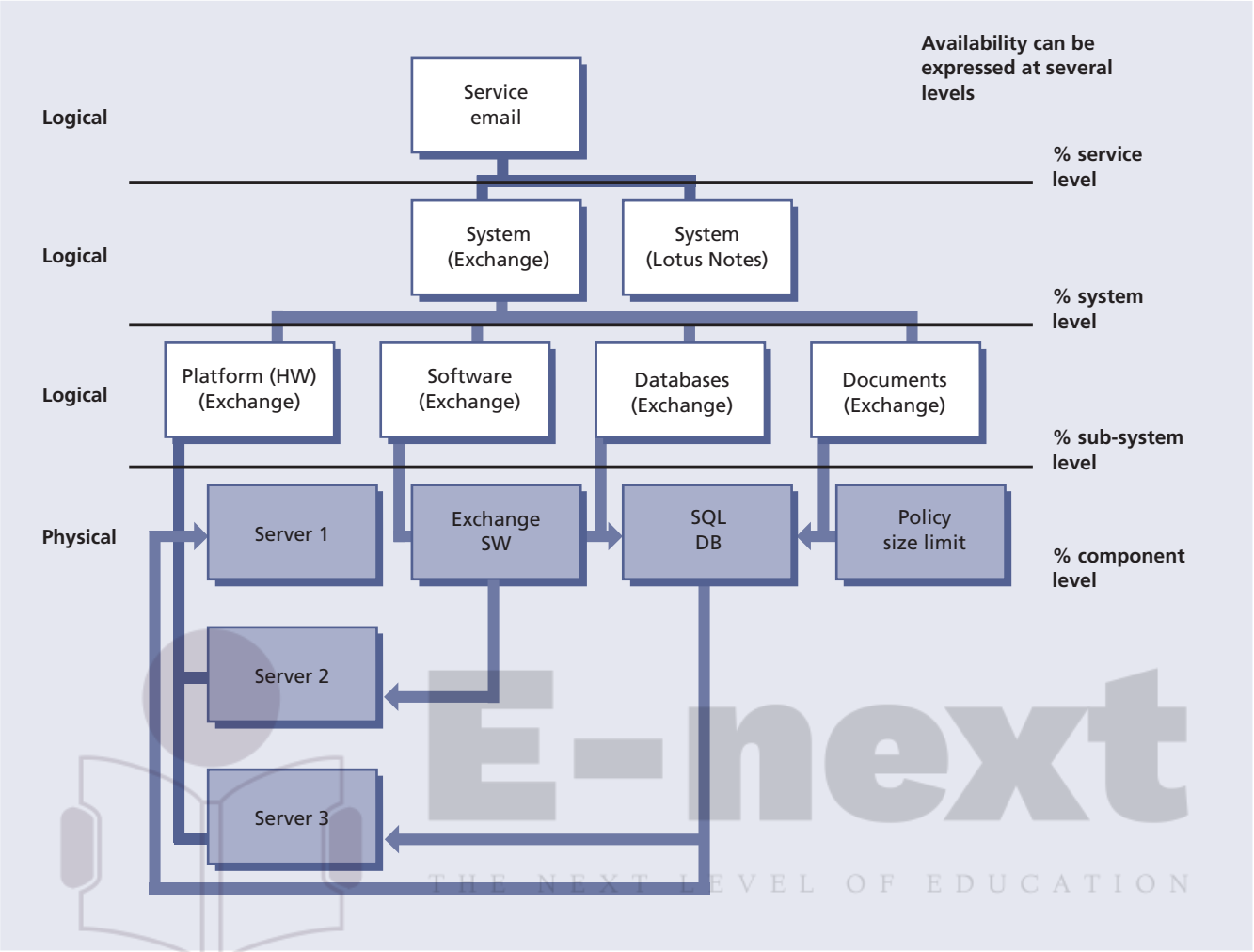

Figure 5.3 Availability reporting

In many cases, when an organization is monitoring, measuring and reporting on component levels it is doing so to protect itself and possibly to point the blame elsewhere – 'My server or my application was up 100% of the time.' Service measurement is not about placing blame or protecting oneself but instead provides a meaningful view of the IT service as the customer experiences it. The server may be up, but because the network is down, the customer is not able to connect to the server. Therefore the IT service was not available even though one or more of the components used to provide the service was available the whole time. Being able to measure against a service is directly linked to the components, systems and applications that are being monitored and reported on.

Measuring at the component level is necessary and valuable, but service measurement must go further than the component level. Service measurement will require someone to take the individual measurements and combine them to provide a view of the true customer experience. Too often we provide a report against a component, system or application but don't provide the true service level as experienced by the customer. Figure 5.3 shows how it is possible to measure and report against different levels of systems and components to provide a true service measurement. Even though the figure references availability measuring and reporting, the same can apply for performance measuring and reporting.

5.4.1 Design and develop a service measurement framework

A challenge many organizations face is the creation of a service measurement framework that leads to value-added reporting.

One of the activities documented in *ITIL Service Design* is the design of the measurement methods

and metrics for the services, the architectures, their constituent components and the processes. These measurements are documented in the service design package and handed over to the service transition stage for the testing and validation of the measurement framework and methods during early life support.

Setting up a framework is as much an art as a science. It may prove difficult at first but the results over time are worth the effort. An organization may go through some trial and error in the beginning so it should not be afraid to admit mistakes on particular measures or targets and make adjustments to the framework.

Keep in mind that service measurement is not an end in itself. The end result should be to improve services and improve accountability.

One of the first steps in developing a service measurement framework is to understand the business processes and identify those that are most critical to the delivery of value to the business. The IT goals and objectives must support the business goals and objectives. There also needs to be a strong link between the operational, tactical and strategic level goals and objectives, otherwise an organization will find itself measuring and reporting on performance that may not add any value.

Service measurement is looking at not only the past but also the future – what do we need to be able to do and how can we do things better? The output of any service measurement framework should allow individuals to make operational, tactical or strategic decisions.

Selecting a combination of measures is important to provide an accurate and balanced perspective. The measurement framework as a whole should be balanced and unbiased, and able to withstand change – the measures are still applicable (or available) after a change has been made.

Whether measuring one or multiple services, the following steps are key to a successful service measurement framework:

- Origins:
  - Defining what success looks like. What are we trying to achieve and how will we know when we've achieved it?
- Building the framework and choosing measures:
  - Ask what we need to measure that will provide us with useful information that allows us to make strategic, tactical and/or operational decisions
  - Ask what measures will provide us with the data and information we need
  - Set targets for all measures by SLAs or service level targets/objectives that have been agreed internally within IT
- Critical elements of a service measurement framework. These should be:
  - Integrated into business planning
  - Focused on business and IT goals and objectives
  - Cost-effective
  - Balanced in their approach on what is measured
  - Able to withstand change
- Performance measures. These should:
  - Be timely
  - Be accurate and reliable
  - Be well-defined, specific and clear
  - Be relevant to meeting the objectives
  - Not create a negative behaviour
  - Lead to improvement opportunities
- Defined roles and responsibilities:
  - Who defines the measures and targets?
  - Who monitors and measures?
  - Who gathers the data?
  - Who processes and analyses the data?
  - Who prepares the reports?
  - Who presents the reports?

5.4.2 Different levels of measurement and reporting

Creating a service measurement framework will require the ability to build upon different metrics and measurements. The end result is a view of the way individual component measurements feed the end-to-end service measurement which should support KPIs defined for the service. This will then be the basis for creating a service scorecard and dashboard. The service scorecard will then be used to populate an overall balanced scorecard or IT scorecard. Figure 5.4 shows there are multiple levels that need to be considered when developing a service measurement framework.

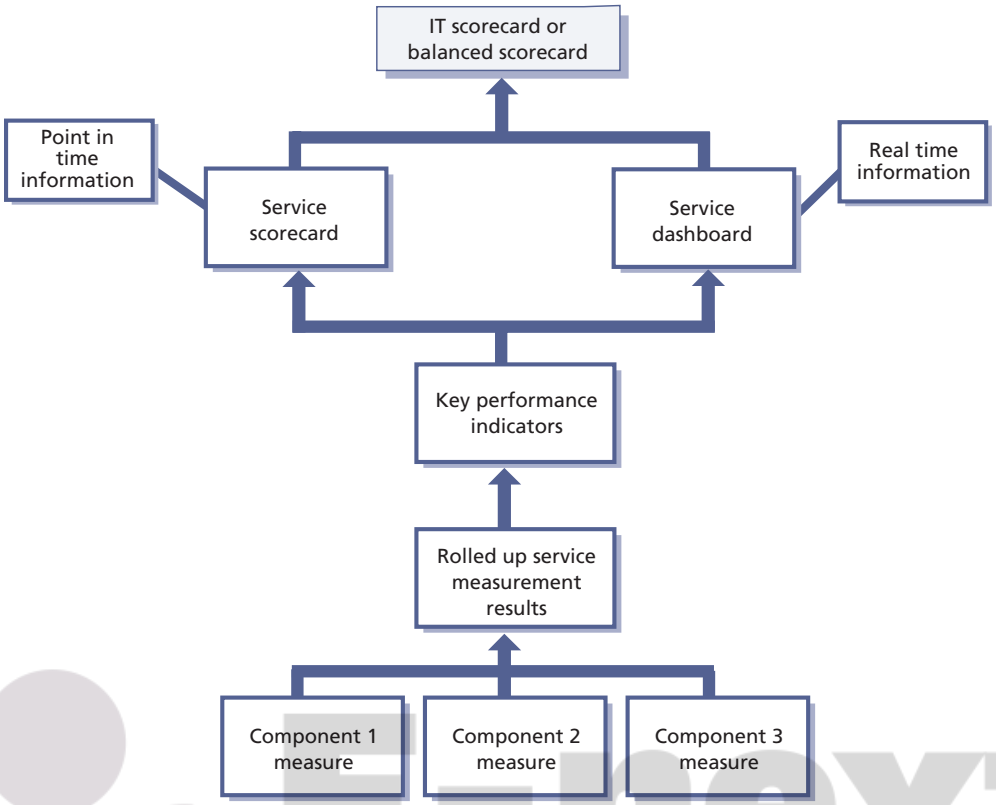

Figure 5.4 Service measurement model

What gets reported at each level is dependent on the measures that are selected.

Starting at the bottom, the technology domain areas will be monitoring and reporting on a component basis. This is valuable as each domain area is responsible for ensuring the servers are operating within defined guidelines and objectives. At this level, measurements will be on component availability, reliability and performance. The output of these measurements will feed into the overall end-to-end service measurement as well as the capacity and availability plans. These measurements will also feed into any incremental operations improvements and into a more formal CSI initiative.

A part of service measurement is then taking the individual component measurements and using them to determine the true service measurement for an end-to-end service derived from availability, reliability and performance measurements.

As an example let us use messaging as a service that is provided. Figure 5.5 shows we have four technology domains that often are monitored and reported on:

- Mainframe availability 99.96%
- WAN availability 98%
- LAN availability 97.5%
- Desktop availability 96%.

The availability numbers are examples provided only for illustrative purposes.

Note the end-to-end service availability in this example is not 96% because it is the lowest availability number. Since all the failures that led to decreased availability did not occur at the same time within each technology domain the availability numbers have to be multiplied together. So the calculation is 99.96% × 98% × 97.5% × 96%. This provides a minimum availability the customer can expect of the email service at 91.69% assuming all components break at different times; 91.69% would therefore be the target that could be agreed although it may end up being higher.

When developing a service management framework it is important to understand which are the most suitable types of report to create, who they are being prepared for, and how they will be used.

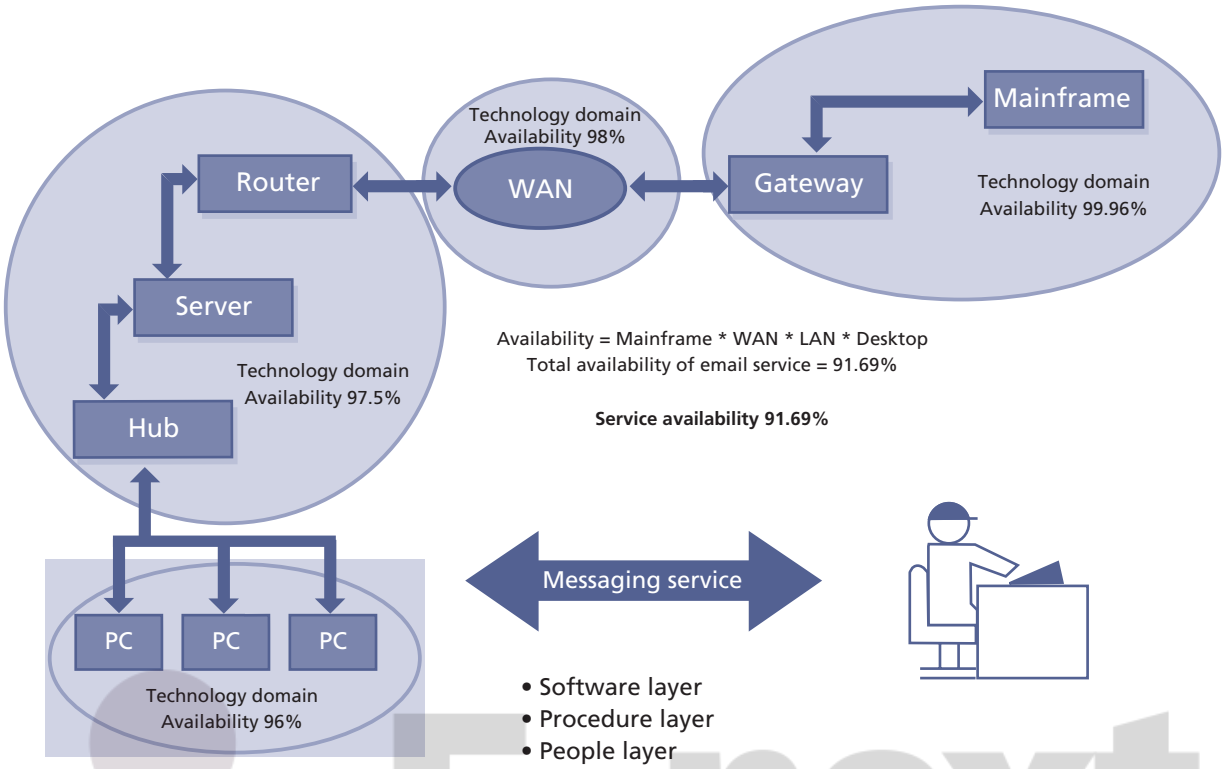

Figure 5.5 Technology domain versus service management

5.4.3 Service management process measurement

The same principles apply when measuring the efficiency and effectiveness of a service management process. As Figure 5.6 shows, you will need to define what to measure at the process activity level. These activity measures should support the process KPIs. The KPIs need to support higher-level goals. In Figure 5.6, the higher-level goal for change management is to improve the service quality. One of the major reasons for service quality issues is the downtime caused by failed changes. And one of the major reasons for failed changes is often the number of urgent changes an organization implements with no formal process. Therefore it would be advisable to capture the following key activity metrics:

- The number of urgent changes
- The number of failed urgent changes
- Unauthorized changes that failed.

There are four major levels to report on. The bottom level contains the activity metrics for a process and these are often volume type metrics such as number of requests for change (RFCs) submitted, number of RFCs accepted into the process, number of RFCs by type, number approved, number successfully implemented etc. The next level contains the KPIs associated with each process. The activity metrics should feed into and support the KPIs. The KPIs will support the next level, which is the high-level goal such as improving service quality, reducing IT costs or improving customer satisfaction. Finally, this high-level goal will feed into the organization's balanced scorecard or IT scorecard. When first starting out, be careful to not pick too many KPIs to support the high-level goal(s). Additional KPIs can always be added at a later time.

Table 5.4 identifies some KPIs that reflect the value of service management. The KPIs are also linked to the service management process or processes that directly support the KPI. This table is not inclusive of all KPIs but simply an example of how KPIs may be mapped to processes.

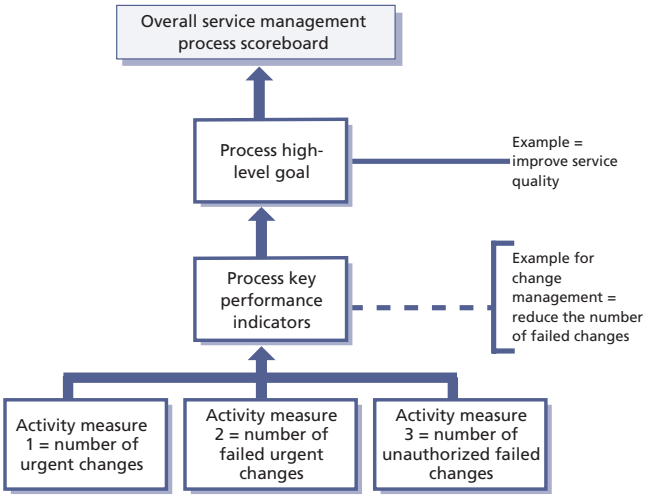

Figure 5.6 Service management model

5.4.4 Creating a measurement framework grid

It is recommended to create a framework grid that will set out the high-level goals and define which KPIs will support the goal and also which category the KPI addresses (see Table 5.5).

KPI categories can be classified as:

- **Compliance** Are we doing it?
- **Quality** How well are we doing it?
- **Performance** How fast or slow are we doing it?
- **Value** Is what we are doing making a difference?

Table 5.4 Key performance indicators of the value of service management processes

KPI	Service management process	Comment
Improved availability (by service/systems/ applications)	Availability management Capacity management Incident management Problem management Change management Service level management	Improved monitoring and reporting on service availability Expanded incident lifecycle, removing errors from the infrastructure, and reduction of failed changes; improved understanding of business requirements and IT capability – proactive planning.
Reduction of service level breaches (by service/systems/ applications)	Availability management Capacity management Incident management Problem management Change management Service level management	Improved monitoring of services Priority model, incident ownership, monitoring and tracking; removal of errors from the infrastructure Reduction of failed changes; explicit SLAs
Reduction of mean time to repair (MTTR) (this should be measured by priority level, and not on a cumulative basis)	Incident management Event management Problem management Availability management Change management	Improved escalations, improved knowledge, improved prioritization Priority model and operational level agreements (OLAs)
Reduce percentage of urgent and emergency changes (by business unit)	Change management Service level management	Creating lead time policies Improved planning and scheduling reduces the need for urgent and emergency changes Communicating change lead times to the business
Reduction of major incidents	Problem management Incident management Change management Service level management Capacity management Availability management Access management	Removing errors from the infrastructure, and reduction of failed changes; improved understanding of business requirements and IT capability – proactive planning

Table 5.5 High-level goals and key performance indicators

High-level goal	KPI	KPI category	Measurement	Target	How and who
Manage availability and reliability of a service	Percentage improvement in overall end-to-end availability of services	Value Quality	End-to-end service availability based on the component availability that makes up the service AS 400 availability Network availability Application availability	99.995%	Technical managers Technical analyst Service level manager

5.5 METRICS

It is important to remember that there are three types of metrics that an organization will need to collect to support CSI activities as well as other process activities:

- **Technology metrics** These metrics are often associated with component and application-based metrics such as performance, availability etc.
- **Process metrics** These metrics are captured in the form of critical success factors (CSFs), KPIs and activity metrics for the service management processes. They can help determine the overall health of a process. KPIs can help answer four key questions on quality, performance, value and compliance of following the process. CSI would use these metrics as input in identifying improvement opportunities for each process.
- **Service metrics** These metrics are a measure of the end-to-end service performance. Individual technology and process metrics are used when calculating the end-to-end service metrics.

In general, a metric is a scale of measurement defined in terms of a standard, i.e. a well-defined unit. Metrics are a system of parameters or ways of quantitative assessment of a process that is to be measured. Metrics define what is to be measured. Metrics are usually specialized by the subject area, in which case they are valid only within a certain domain and cannot be directly benchmarked or interpreted outside it. Generic metrics, however, can be aggregated across subject areas or business units of an enterprise. Figure 5.7 shows the full hierarchy from measurement through to the business vision.

Metrics are used in several business models including CMMI, COBIT and Six Sigma. These measurements or metrics can be used to track trends, productivity, resources and much more. Typically, the metrics tracked are KPIs.

5.5.1 How many CSFs and KPIs?

Section 4.1.12 details CSFs and KPIs of the seven-step improvement process. It is recommended that no more than two to five KPIs are defined per CSF at any given time and that a service or process has no more that two to five CSFs associated with it at any given time.

It is recommended that in the early stages of a CSI initiative only two to three KPIs for each CSF are defined, monitored and reported on. As the maturity of a service and service management processes increase, additional KPIs can be added. Based on what is important to the business and IT management, the KPIs may change over a period of time. Also keep in mind that as service management processes are implemented, this will often change the KPIs of other processes. As an example, increasing first-contact resolution is a common KPI for incident management. This is a good KPI to begin with, but when you implement problem management this should change. One of problem management's objectives is to reduce the number of recurring incidents. When these types of recurring incidents are reduced it will reduce the number of first-contact resolutions. In this case a reduction in first-contact resolution is a positive trend.

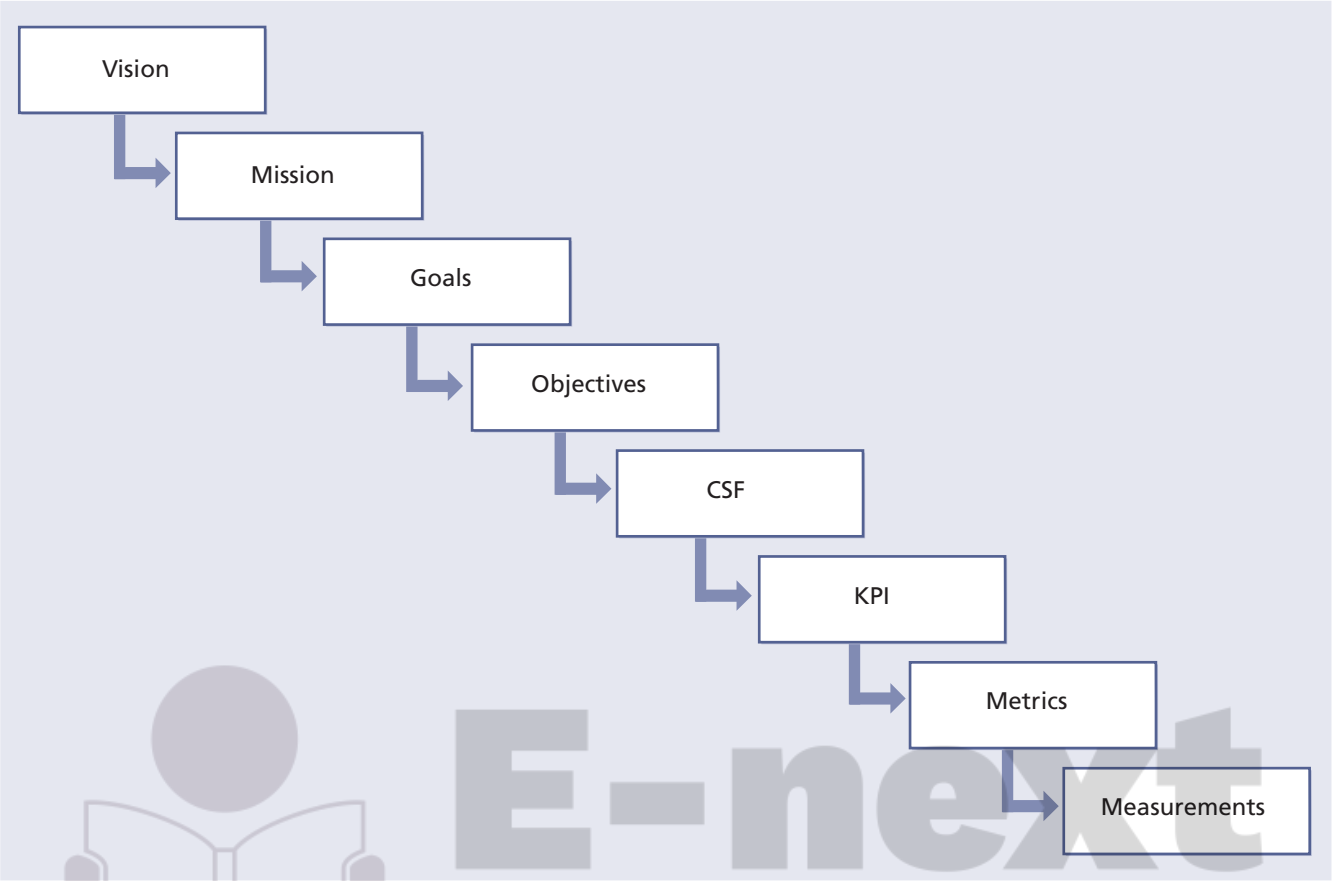

Figure 5.7 From vision to measurement

The next step is to identify the metrics and measurements required to compute the KPI. There are two basic kinds of KPI, qualitative and quantitative.

5.5.1.1 Qualitative KPIs

Here is a qualitative example:

- CSF: Improving IT service quality
- KPI: 10% increase in customer satisfaction rating for handling incidents over the next six months.

Metrics required:

- Original customer satisfaction score for handling incidents
- Ending customer satisfaction score for handling incidents.

Measurements:

- Incident-handling survey score
- Number of survey scores.

5.5.1.2 Quantitative KPIs

Here is a quantitative example:

- CSF: Reducing IT costs
- KPI: 10% reduction in the costs of handling printer incidents.

Metrics required:

- Original cost of handling printer incidents
- Final cost of handling printer incidents
- Cost of the improvement effort.

Measurements:

- Time spent on the incident by first-level operative and their average salary
- Time spent on the incident by second-level operative and their average salary
- Time spent on problem management activities by second-level operative and their average salary
- Time spent on the training first-level operative on the workaround
- Cost of a service call to third-party vendor
- Time and material from third-party vendor.

5.5.1.3 Is the KPI fit for use?

An important aspect to consider is whether a KPI is fit for use. Key questions are:

- What does the performance indicator really tell us about goal achievement? If we fail to meet the target set for a performance indicator, does that mean we fail to achieve some of our goals? And if we succeed in meeting certain targets, does this mean we will achieve our goals?
- How easy is it to interpret the performance indicator? Does it help us to decide on a course of action?
- When do we need the information? How often? How rapidly should the information be available?
- To what extent is the performance indicator stable and accurate? Is it sensitive to external, uncontrollable influences? What amount of effort is needed for a change in result that is not marginal?
- How easy is it to change the performance indicator itself? How easy is it to adapt the measurement system to changing circumstances or changes in our goals for IT service provision?
- To what extent can the performance indicator be measured now? Under which conditions can measurement continue? Which conditions impede measurement? Which conditions render the result meaningless?
- Who owns this KPI? Who is responsible for collecting and analysing the data? Who is accountable for improvements based on the information?

5.5.2 Tension metrics

The effort from any support team is a balancing act of three elements:

- Resources – people and money
- Functionality – the product or service and its quality
- The schedule.

The delivered product or service therefore represents a balanced trade-off between these three elements. Tension metrics can help create that balance by preventing teams from focusing on just one element – for example, on delivering the product or service on time. If an initiative is being driven primarily towards satisfying a business driver of on-time delivery to the exclusion of other factors, the manager will achieve this aim by flexing the resources and service features in order to meet the delivery schedule. This unbalanced focus will therefore either lead to budget increases or lower product quality. Tension metrics help create a delicate balance between shared goals and delivering a product or service according to business requirements within time and budget. Tension metrics do not, however, conflict with shared goals and values, but rather prevent teams from taking shortcuts and shirking on their assignment. Tension metrics can therefore be seen as a tool to create shared responsibilities between team members with different roles in the service lifecycle.

Example of tension metrics

An organization may focus on increasing the number of incidents handled by each member of the service desk but fail to examine the impact on the resolution rate. If the resolution rate reduces because staff are rushing to deal with more incidents, the overall service quality has been damaged. In this case 'the number of incidents handled per service desk analyst' and 'the incident resolution rate' are the tension metrics that need to be examined together to see the true impact.

5.5.3 Goals and metrics

Each stage of the service lifecycle requires very specific contributions from the key roles identified in service design, service transition and service operation, each of which has very specific goals to meet. Ultimately, the quality of the service will be determined by how well each role meets its goals, and by how well those sometimes conflicting goals are managed along the way. That makes it crucial that organizations find some way of measuring performance – by applying a set of metrics to each goal.

5.5.3.1 Breaking down goals and metrics

It is outside the scope of this publication to dig too deeply into human resources management, and there is no shortage of literature already available on the subject. However, there are some resource specific items that can be said about best practices for goals and metrics as they apply to managing services in their lifecycle.

Table 5.6 Examples of service quality metrics

Measure	Metric	Quality goal	Lower limit	Upper limit
Schedule	Variation against revised plan (%)	Within 7.5% of estimate	Not to be less than 7.5% of estimate	Not to exceed 7.5% of estimate
Effort	Variation against revised plan (%)	Within 10% of estimate	Not to be less than 10% of estimate	Not to exceed 10% of estimate
Cost	Variation against revised plan (%)	Within 10% of estimate	Not to be less than 10% of estimate	Not to exceed 10% of estimate
Defects	Variation against planned defect (%)	Within 10% of estimate	Not to be less than 10% of estimate	Not to exceed 10% of estimate
Productivity	Variation against productivity goal	Within 10% of estimate	Not to be less than 10% of estimate	Not to exceed 10% of estimate
Customer satisfaction	Customer satisfaction survey result	Greater than 8.9 on a range of 1 to 10	Not to be less than 8.9 on a range of 1 to 10	

Many IT service organizations measure their IT staff in an abstract and high-level manner. During appraisal and counselling, most managers discuss such things as 'taking part in one or more projects/performing activities of a certain kind', or 'fulfilling certain roles in projects/activities' and 'following certain courses'. Although accomplishing such goals might be important for the professional growth of an individual, it does not facilitate the service lifecycle or any specific process in it. In reality, most IT service organizations do not use more detailed performance measures that are in line with key business drivers, because it is difficult to do, and do correctly.

But there is a way. In the design phase of a service, key business drivers were translated into service level requirements (SLRs) and operations level requirements, the latter consisting of process, skills and technology requirements. This constitutes a translation from a business requirement into requirements for IT services and IT components. There is also the question of the strategic position of IT. In essence, the question is whether IT is viewed as an enabler or a cost centre, the answer to which determines the requirements for IT services and IT components. If IT is viewed as a cost centre, services might be developed to be used centrally in order to reduce TCO. Services will have those characteristics that will reduce total costs of ownership throughout the lifecycle. On the other hand, if IT is an enabler (which it has to be), services will be designed with the ability to adjust to changing business requirements and meet early time-to-market objectives.

Either way, the important point is that those requirements for IT services and IT components would determine how processes in the lifecycle are measured and managed, and thus how the performance and growth of professionals should be measured.

Metrics can be classified into three categories: financial metrics, learning and growth metrics, and organizational or process effectiveness metrics. An example of financial metrics is the expenses and total percentage of hours spent on projects or maintenance, while an example of learning and growth is the percentage of education pursued in a target skill area, certification in a professional area, and contribution to knowledge management.

Some examples of service quality metrics are shown in Table 5.6. Process quality metrics are the quality metrics related to efficient and effective process management.

Note: The figures in Table 5.6 are for illustrative purposes only and are not intended as generic

targets. Organizations should consider and set their own targets.

5.5.3.2 Using organizational metrics

To be effective, measurements and metrics should be woven through the complete organization, touching the strategic as well as the tactical level. To successfully support the key business drivers, the IT services manager needs to know what and how well each part of the organization contributes to the final success.

It is also important, when defining measurements for goals that support the IT services strategy, to remember that measurements must focus on results and not on efforts. Focus on the organizational output and try to get clear what the contribution is. Each stage in the service lifecycle has its processes and contribution to the service. Each stage of the lifecycle also has its roles, which contribute to the development or management of the service. Based on the process goals and the quality attributes of the service, goals and metrics can be defined for each role in the processes of the lifecycle.

5.5.4 Interpreting and using metrics

Results must be examined in the context of the objectives, environment and any external factors. Therefore after collecting the results, organizations will conduct measurement reviews to determine how well the indicators worked and how the results contribute to objectives.

Before starting to interpret the metrics and measures it is important to identify if the results that are being shown even make sense. If they do not, then instead of interpreting the results, take action to identify the reasons the results appear the way they do. The example used earlier in the chapter was of an organization that provided data for the service desk in which the data showed there were more first-contact resolutions at the service desk than there were incidents opened by the service desk. This is impossible and yet this organization was ready to distribute this report. When this kind of thing happens some questions need to be asked, such as:

- How did we collect this data?
- Who collected the data?
- What tools were used to collect the data?
- Who processed the data?
- How was the data processed?
- What could have led to the incorrect information?

When beginning to interpret the results it is important to know the data elements that make up the results, the purpose of producing the results and the expected normal ranges of the results.

Simply looking at some results and declaring a trend is dangerous. Figure 5.8 shows a trend that the service desk is opening fewer incidents over the last few months. One could believe that this is because there are fewer incidents or perhaps it is because the customers are not happy with the service that is being provided, so they go elsewhere for their support needs. Perhaps the organization has implemented a self-help knowledge base and some customers are now using this service instead of contacting the service desk. Some investigation is required to understand what is driving these metrics.

One of the keys to proper interpretation is to understand whether there have been any changes to the service or if there were any issues that could have created the current results.

The chart can be interpreted in many ways so it would not be wise to share it without some discussion of the meaning of the results.

Figure 5.9 is another example of a service desk measurement. Using the same number of incidents we have now also provided the results of first contact resolution. The figure shows that not only are fewer incidents being opened, but the ability to restore service on first contact is also going down. Before coming to hasty conclusions, some questions need to be asked:

- What has happened that could drive down the number of incidents?
- What would impact our ability to restore service on the first contact?
- Did we hire new service desk analysts?
- Did we remove some services?
- Have we provided other means to access our services?
- Have other processes been implemented that could impact incident volume and first contact resolution?

In the case illustrated in Figure 5.9, the organization had implemented problem

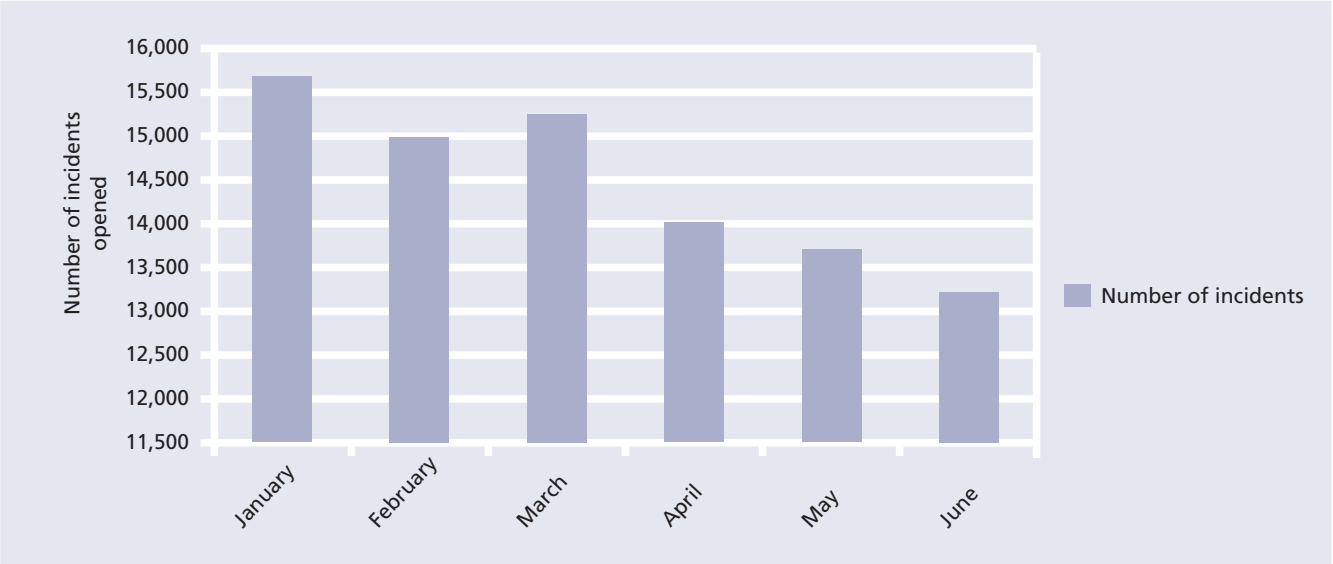

Figure 5.8 Number of incidents opened by service desk over time

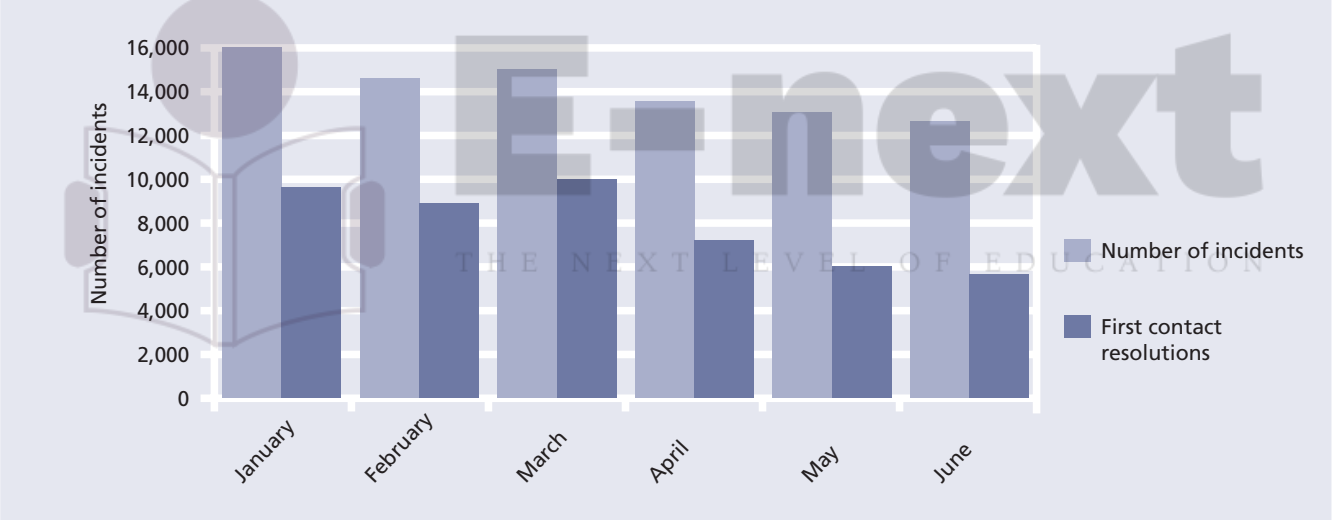

Figure 5.9 Comparison of incidents opened and resolved on first contact by the service desk

management. As the process matured and through the use of incident trend analysis, staff were able to use problem management to identify a couple of recurring incidents that created a lot of incident activity each month. Through root cause analysis and submitting a RFC, a permanent fix was implemented, thus stopping the recurring incidents. Through further analysis it was found that these few recurring incidents were able to be resolved on the first contact. By removing these incidents the opportunity to increase first contact resolution was also removed. During this time period the service desk also had some new hires.

Table 5.7 provides a current view and year-to-date (YTD) view for response times for three service desks. It provides a transaction count for each service, the minimum response time measured in seconds, the maximum response time measured in seconds and the average for the month. The table also provided the YTD average for each service. In order to understand if these numbers are good or not it is important to define the target for each service as well as the target for meeting the SLA.

When looking at the results for the three services it may appear that Service 2 is the best, and this might be because it handles fewer transactions each month than the other two services.

Table 5.7 Response times for three service desks

Service measurement response time							
Service	Response times (seconds)						
	Current month				YTD	Percentage within SLA (99.5% is the target)	
	Count	Min	Max	Avg		Monthly	YTD
Service 1 Target = 1.5 seconds	1,003,919	1.20	66.25	3.43	1.53	99.54%	98.76%
Service 2 Target = 1.25 seconds	815,339	0.85	21.23	1.03	1.07	98.44%	99.23%
Service 3 Target = 2.5 seconds	899,400	1.13	40.21	2.12	2.75	96.50%	94.67%

Interpreting that Service 2 is the best by only looking at the numbers is dangerous, however. Investigations will find that Service 2 is a global service that is accessed 24 × 7 and the other two services have peak time utilization between 8 am and 7 pm. This is no excuse because the services are not hitting targets so further investigation needs to be conducted at the system and component levels to identify any issues that are creating the current response time results. It could be that the usage has picked up, which was not planned for, and some fine tuning on components can improve the response time.

5.5.5 Using measurement and metrics

Metrics can be used for multiple purposes such as to:

- Validate – are we supporting the strategy and vision?
- Justify – do we have the right targets and metrics?
- Direct – based on factual data, people can be guided to change behaviour
- Intervene – take corrective actions such as identifying improvement opportunities.

Service measurements and metrics should be used to drive decisions. Depending on what is being measured the decision could be strategic, tactical or operational. This is the case for CSI. There are many improvement opportunities but often only a limited budget to address the improvement opportunities, so decisions must be made. Which improvement opportunities will support the business strategy and goals, and which will support the IT goals and objectives? What are the ROI and VOI opportunities? ROI is also discussed in Chapters 2 and 4.

Another key use of measurement and metrics is for comparison purposes. Measures by themselves may tell the organization very little unless there is a standard or baseline against which to assess the data. Measuring only one particular characteristic of performance in isolation is meaningless unless it is compared with something else that is relevant. The following comparisons are useful:

- Comparison against the baseline
- Comparison against a target or goal
- Comparison with other organizations – be sure to understand that the strategy, goals and objectives of other organizations may not align with yours so there may be driving factors in the other organization that you don't have or it could be the other way around
- Comparison over time such as day to day, week to week, month to month, quarter to quarter, or year to year
- Comparison between different business units
- Comparison between different services.

Measures of quality allow for measuring trends and the rate of change over a period of time. Examples could be measuring trends against standards that are set up either internally or externally and could include benchmarks, or they could be measuring trends with standards and targets to be established. This is often done when first setting up baselines.

A minor or short-term deviation from targets should not necessarily lead to an improvement initiative. It is important to set the criteria for the deviations before an improvement programme is initiated.

Comparing and analysing trends against service level targets or an actual SLA is important as it allows for early identification of fluctuations in service delivery or quality. This is important not only for internal service providers but also when services have been outsourced. It is important to identify any deviations and discuss them with the external service provider in order to avoid any supplier relationship problems. Speed and efficiency of communication when there are missed targets is essential to the continuation of a strong relationship.

Using measurements and metrics can also help define any external factors that may exist outside the control of the internal or external service provider. The real world needs to be taken into consideration. External factors could include anything from language barriers to governmental decisions.

Individual metrics and measures by themselves may tell an organization very little from a strategic or tactical point of view. Some types of metrics and measures are often more activity based than volume based, but are valuable from an operational perspective. Examples include:

- The services used
- The mapping of customers to services
- Frequency of use of each service
- Times of day each service is used
- The way each service is used (internally or externally through the web)
- The performance of each component used to provide the service
- The availability of each component used to provide the service.

Each of these measures by themselves will provide some information that is important to IT staff including the technical managers who are responsible for availability management and capacity management as well as those who may be responsible for a technology domain such as a server farm, an application or the network, but it is the examination and use of all the measurements and metrics together that delivers the real value. It is important for someone to own the responsibilities not only to look at these measurements as a whole but also to analyse trends and interpret the meaning of the metrics and measures.

5.5.6 Creating scorecards and reports

Service measurement information will be used for three main purposes:

- To report on the service to interested parties
- To compare against targets
- To identify improvement opportunities.

Reports must be appropriate and useful for all those who use them.

There are typically three distinct audiences for reporting purposes.

- **The business** Is it really focused on delivery to time and budget?
- **IT management** IT managers will be interested in the tactical and strategic results that support the business.
- **IT operational/technical managers** These managers will be concerned with the tactical and operational metrics that support better planning, coordination and scheduling of resources. The operational managers will be interested in their technology domain measurements such as component availability and performance.

Many organizations make the mistake of creating and distributing the same report to everyone. This does not provide value for everyone.

5.5.6.1 Creating scorecards that align to strategies

Reports and scorecards should be linked to overall strategy and goals. Using a balanced scorecard approach is one way to manage this alignment.

Figure 5.10 illustrates how the overall goals and objectives can be used to derive the measurements and metrics required to support the overall goals and objectives. The arrows point both ways because the strategy, goals and objectives will drive the identification of required KPIs and measurements, but it is also important to remember that the measures are input in KPIs and the KPIs support the goals in the balanced scorecard.

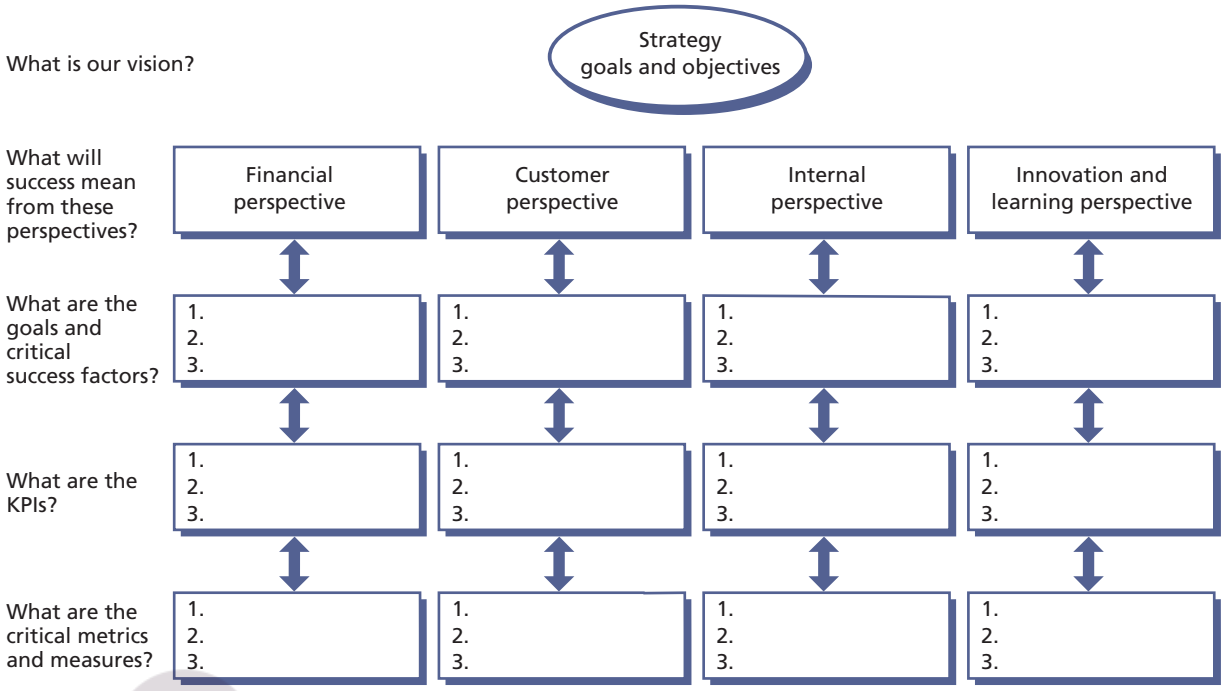

Figure 5.10 Deriving measurements and metrics from goals and objectives

It is important to select the right measures and targets to be able to answer the ultimate question of whether the goals are being achieved and the overall strategy supported. The balanced scorecard is discussed in more detail in section 5.5.8.

5.5.6.2 Creating reports

When creating reports it is important to know their purpose and the details required. Reports can be used to provide information for a single month, or a comparison of the current month with other months to provide a trend for a certain time period. Reports can show whether service levels are being met or breached.

Before starting the design of any report it is also important to know the following:

- Who is the target audience of the report?
- What will the report be used for?
- Who is responsible for creating the report?
- How will the report be created?
- How frequently is the report to be created?
- What information will be produced, shared or exchanged?

One of the first items to consider is who is the target audience. Most senior managers don't want a report that is 50 pages long. They like to have a short summary report and access to supporting details if they are interested. Table 5.8 provides an example that will fit the needs of most senior managers. This report should be no longer than two pages but ideally a single page if that is achievable without sacrificing readability.

It is also important to know what report format the audience prefers. Some people like text reports, some like charts and graphs with lots of colour, and some like a combination. Be careful about the type of charts and graphs that are used. They must be understandable and not open to different interpretations.

Many reporting tools today produce canned reports but these may not meet everyone's business requirements for reporting purposes. It is wise to ensure that a selected reporting tool has flexibility for creating different reports, that it will be linked or support the goals and objectives, that its purpose is clearly defined, and that its target audience is identified.

Reports can be set up to show:

- **Results for a service** With supporting reports giving individual measurements on components
- **Health of a service management process** With certain process KPI results
- **Functional reports** Such as telephony reports for the service desk.

Table 5.8 An example of a summary report format

Report for the month of:	
Monthly overview	This is a summary of the service measurement for the month and discusses any trends over the past few months. This section can also provide input into [details to be inserted].
Results	This section outlines the key results for the month.
What led to the results	Are there any issues or activities that contributed to the results for this month?
Actions to take	What action have you taken or would like to take to correct any undesirable results? Major deficiencies may require CSI involvement and the creation of a SIP.
Predicting the future	Define what you think the future results will be.

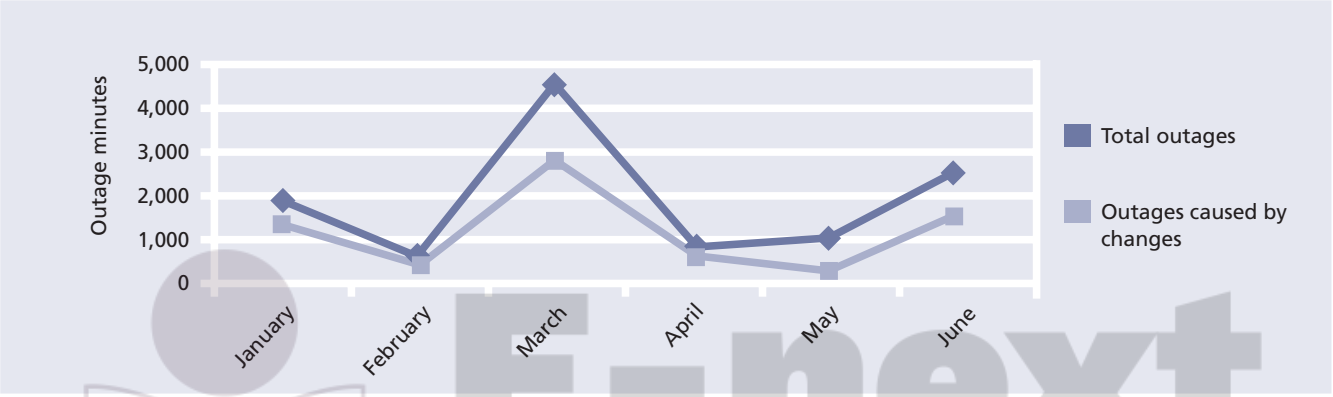

Figure 5.11 Reported outage minutes for a service

Figure 5.11 shows the duration of outages (in minutes) for a service. However, through analysis of the results, a direct relationship was discovered between failed changes and the duration of outages. Seeing this information together convinced an organization that it really needed to improve its change management process.

Table 5.9 is another example of a service measurement report. The report clearly states an objective and also provides a YTD status. The report compares this year's outage to last year's outage. The report also addresses the actual customer impact. Depending on needs, this report format can be used for many reporting purposes such as performance, SLAs etc.

Table 5.10 shows incident management data for the number of incidents by priority and the success of meeting the SLA for service restoration.

Table 5.11 provides some sample KPIs for different processes. This is not an all-inclusive list but simply an example. Each organization will need to define what KPIs to report on.

There are many techniques used today to measure the effectiveness and efficiency of IT and the services it provides. Often organizations use a combination of methods rather than just one individual technique. CSI should assume responsibility for ensuring that the quality of service required by the business is provided within the imposed cost constraints. CSI is also instrumental in determining if IT is still on course with the achievement of planned implementation targets and, if not, plotting course corrections to bring it back into alignment.

However, it must be remembered that although the measurement of progress is vital it is not the end product; rather, it is a means to an end. Often people gather measurements and produce reports as a full-time occupation. It is essential that the production of statistics is not seen as the sole objective of the strategy implementation but rather an indicator of its progress and success.

5.5.7 Setting targets

If you have nothing to aim for it is probable that is what you will hit. The CSFs and SLRs will give vital information as to what we are trying to achieve and it is important that we keep the targets in mind when measuring and reporting. Targets

Table 5.9 Service report of outage minutes compared to goal

Actual outage minutes compared to goal						
Objective	20% decrease in outages					
Status	18% decrease YTD					
Monthly report	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Previous year's outage minutes						
This year's outage minutes						
Running YTD reduction						
Monthly indicator	Positive	Negative	Positive	Positive	Negative	Positive
Reduction in customer impact						
Objective	Decrease in number of customers impacted (%)					
Status						
Next steps						

Table 5.10 Percentage of incidents meeting target time for service restoration

	Target	Month 1		Month 2	
		Number of Incidents	%	Number of Incidents	%
All incidents					
Within target		7,540	97.15	6,647	95.34
Missed target		221	2.85	325	4.66
Grand total		7,761		6,972	
Priority 1					
Within target	95% within 1 hour	24	77.42	17	77.27
Missed target		7	22.58	5	22.73
Grand total		31		22	
Priority 2					
Within target	90% within 4 hours	127	78.40	153	92.73
Missed target		35	21.60	12	7.27
Grand total		162		165	
Priority 3					
Within target	80% within 1 business day	2,532	89.66	2,176	90.03
Missed target		292	10.34	241	9.97
Grand total		2,824		2,417	
Priority 4					
Within target	70% within 2 business days	4,683	98.71	4,301	98.47
Missed target		61	1.29	67	1.53
Grand total		4,744		4,368	

Table 5.11 Sample key performance indicators

Process/function	KPI/description	Type	Progress indicator
Incident management	Incidents resolved within target time	Value	Meets/exceeds target times
Incident management	% of incidents closed – first call	Performance	Service desk only – target is 80%
Service desk	Abandon rate		Service desk with automatic call distribution (ACD). 5% or less goal (after 24 seconds)
Incident management	Count of incidents submitted by support group	Compliance	Consistency in number of incidents – investigation is warranted for (1) rapid increase, which may indicate infrastructure investigation, and (2) rapid decrease, which may indicate compliance issues
Problem management	% of repeated problems over time	Quality	Problems that have been removed from the infrastructure and have re-occurred. Target: less than 1% over a 12-month rolling timeframe
Problem management	% root cause with permanent fix	Quality	Calculated from problem start date to permanent fix found. This may not include implementation of permanent fix. Internal target: fix 90% of problems within 40 days. External target: fix 80% of problems within 30 days. External target = third party/vendor
Problem management	% and number of incidents raised to problem management	Compliance	Sorted by infrastructure (internal and external) and development (internal and external)
Change management	% of RFCs successfully implemented without back out or issues	Quality	Grouped by infrastructure/development
Change management	% of RFCs that are emergencies	Performance	Sort by infrastructure or development – and by emergency quick fix (service down) or business requirement
Service asset and configuration management	Number of configuration item (CI) additions or updates	Compliance	CI additions or updates broken down by group – configuration management database (CMDB) or change modules
Service asset and configuration management	Number of records related to CI	Performance	Number of associations grouped by process
Release and deployment management	% of releases using exceptions	Value	Exceptions are criteria deemed mandatory – identify by groups
Release and deployment management	% of releases bypassing process	Compliance	Identify groups bypassing release process
Capacity management	Action required	Value	Number of services that require action vs. total number of systems
Capacity management	Capacity-related problems	Quality	Number of problems caused by capacity issues sorted by group

set by management are quantified objectives to be attained. They express the aims of the service or process at any level and provide the basis for the identification of problems and early progress towards solutions and improvement opportunities.

Service targets are often defined in response to business requirements or they may result from new policy or regulatory requirements. SLM through SLAs will often drive the target that is required. Unfortunately, many organizations have had targets set with no clear understanding of the IT organization's capability to meet the target. That is why it is important that SLM looks at not only the business requirements but also IT capability to meet business requirements.

When first setting targets against a new service it may be advisable to consider a phased target approach, as the target in the first quarter may be lower than the second quarter. With a new service it would be unwise to enter into a SLA until overall capabilities are clearly identified. Even with the best service design and transition, no one ever knows how a service will perform until it is actually in production.

Setting targets is just as important as selecting the right measures. It is important that targets are realistic but challenging. Good targets will be SMART (specific, measurable, achievable, relevant and time-bound). Targets should be clear, unambiguous and easy to understand by those who will be working toward them.

Remember that the choice of measures and their targets can affect the behaviour of those who are carrying out the work that is being measured. That is why it is always important to have a balanced approach.

Let's look at an example of common measures that are captured for the service desk. It is common for the service desk to measure the average speed of answer, number of calls answered and call duration. These measures are often collected through telephony systems. If a service desk manager emphasizes the above measures more than others such as quality incidents, first contact resolution, customer satisfaction etc., it may be that the service desk analysts are focused on how many calls they can answer in a day and how quickly they can complete one call and start the next. When this happens, with no thought about the quality of service being provided, how well incidents are being handled or how well the customer is being treated, it will result in negative behaviour that is counter-productive to the goal of providing good service. The focus is only on volume and not quality.

When setting targets it is important to determine the baseline: this is the starting point from which you will measure improvement.

5.5.8 Balanced scorecard

This is a technique developed by Kaplan and Norton[4] in the mid-1990s and involves the definition and implementation of a measurement framework covering four different perspectives: customer, internal business, learning and growth, and financial. The four linked perspectives provide a balanced scorecard to support strategic activities and objectives, and can be used to measure overall IT performance.

The balanced scorecard is complementary to ITIL. Some of the links to IT include the following:

- **Client perspective** IT as a service provider, primarily documented in SLAs
- **Internal processes** Operational excellence utilizing incident management, problem management, change management, service asset and configuration management, and release and deployment management, as well as other IT processes; successful delivery of IT projects
- **Learning and growth** Business productivity, flexibility of IT, investments in software, professional learning and development
- **Financial** Align IT with the business objectives, manage costs, manage risks, deliver value; financial management for IT services is the process used to allocate costs and calculate ROI.

Kaplan and Norton first introduced the idea of a balanced scorecard in the early 1992 *Harvard Business Review*. The need for such a method emerged out of a growing recognition that financial measures alone were insufficient to manage the modern organization. Much of the emphasis in today's work environment is preparation to achieve financial goals, achieve process innovations, train workers, and create and maintain new kinds of relationship with customers.

[4] Kaplan, R. S. and Norton, D. P. (1992). The balanced scorecard: measures that drive performance. *Harvard Business Review* Jan–Feb, pp. 71–80.

The balanced scorecard is not simply a measurement system but a management system that enables organizations to clarify their vision, mission, goals, objectives and strategies and to translate them into action. When fully deployed, the balanced scorecard transforms strategic planning from an academic exercise into the nerve centre of an enterprise. It provides feedback on both the internal business processes and external outcomes in order to continually improve strategic performance and results.

The balanced scorecard, as an aid to organizational performance management, is a common method of tracking metrics and performing trend analysis. It helps to focus on not only financial targets but also internal processes, customers, and learning and growth issues. The balance should be found between four perspectives, which are focused around the following questions:

- **Customers** What do customers expect of IT provision?
- **Internal processes** What must IT excel at?
- **Learning and growth** How does IT guarantee that the business will keep generating added value in the future?
- **Financial** What is the cost of IT?

5.5.8.1 Cascading the balanced scorecard

Many organizations are structured around strategic business units (SBUs) with each business unit focusing on a specific group of products or services offered by the business. The structure of IT may match the SBU organization or may offer services to the SBU from a common, shared services IT organization or both. This last hybrid approach tends to put the central infrastructure group in the shared services world and the business solutions or application development group in the SBU itself. This often results in non-productive finger-pointing when things go wrong. The business itself is not interested in this blame-storming exercise but rather in the quality of IT service provision. Therefore, the balanced scorecard is best deployed at the SBU level (see Figure 5.12).

Once a balanced scorecard has been defined at the SBU level, it can be cascaded down through the organization. For each strategic business level measure and related target, business units can define additional measures and targets that support the strategic goal and target. In addition,

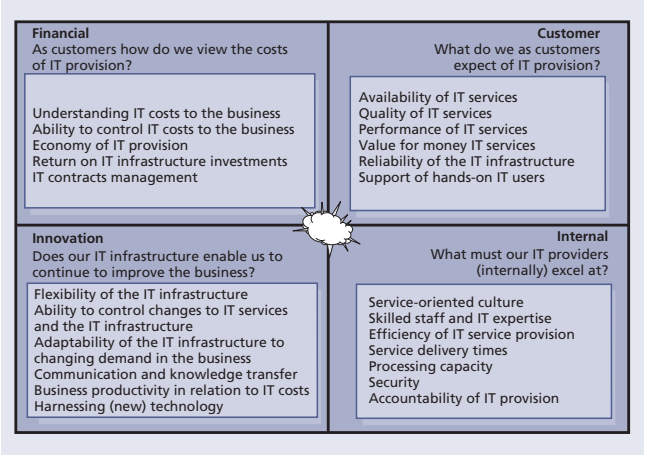

Figure 5.12 IT balanced scorecard

action plans and resource allocation decisions can be made with reference to how they contribute to the strategic balanced scorecard. As with any measurement system it is important to link the reward systems to the balanced scorecard objectives. Table 5.12 is an example of a balanced scorecard for a service desk.

The balanced scorecard is not an exclusive IT feature. On the contrary, many organizations use scorecards in other departments – even at the board level.

Start very conservatively when implementing the balanced scorecard. Start with two to three, maybe four, goals and metrics for each perspective. Organizations have to make choices; for many, this will be extremely difficult and time consuming.

Implementation is not the most difficult part of using the balanced scorecard – consolidation is. Usually, consultants are employed to assist in the introduction of the balanced scorecard. The challenge is to keep measuring once they are gone. The danger is in the temptation to fall back on prior measuring techniques or not measuring at all.

5.5.8.2 The balanced scorecard and measurement-based management

The balanced scorecard approach focuses on including customer-defined quality, continual improvement, employee empowerment, and measurement-based management and feedback.

The balanced scorecard incorporates feedback around internal business process outputs, as in total quality management (TQM), but also adds a feedback loop around the outcomes of business

Table 5.12 Service desk balanced scorecard example

Financial goal	Performance indicator	Customer goal	Performance indicator
Ability to control service desk costs	Accuracy of service desk cost forecasts	Quality of service desk services	Availability of service desk (in IT users' perception)
Economy of service desk	Competitiveness of service	Reliability of service desk	Compliance to SLAs
Value of service desk	Costs of service desk	Performance of service desk	Restoration of service
		Support of hands-on users	On-time service delivery
			Number of registered user complaints about IT
Innovation goal	**Performance indicator**	**Internal goal**	**Performance indicator**
Business productivity	Minimize mean time to restore service (MTRS)	Incident resolution	Percentage of first-time-right incident resolution
Service culture	Improvements in business turnover	Elapsed time for incidents	Time spent on resolution
Flexibility	Reduction in business costs ascribable to the service desk	Meetings SLAs	Incidents resolved within SLAs
	New ways to improve service	Professionalism	Treating customers with respect

strategies. This creates a double-loop feedback process in the balanced scorecard.

An old saying goes: 'You can't improve what you can't measure.' Metrics must be developed based on the priorities of the strategic plan, which provides the key business drivers and criteria for metrics that managers most desire to watch. Services and processes are then designed to collect information relevant to these metrics. Strategic management can then examine the outcomes of various measured services, processes and strategies and track the results to guide the company and provide feedback. The value of metrics is in their ability to provide a factual basis for defining:

- Strategic feedback to show the present status of the organization from many perspectives for decision makers
- Diagnostic feedback into various services and processes to guide improvements on a continual basis
- Trends in performance over time as the metrics are tracked
- Feedback around the measurement methods themselves, and which metrics should be tracked
- Quantitative inputs to forecasting methods and models for decision-support systems.

5.5.9 SWOT analysis

SWOT stands for strengths, weaknesses, opportunities and threats. This section provides guidance on properly conducting and using the result of a SWOT analysis, how to select the scope and range of this common assessment tool, as well as the common mistakes people make when using a SWOT analysis.

This technique involves the review and analysis of four specific areas of an organization: the internal strengths and weaknesses, and the external opportunities and threats. Once analysed, actions should be taken to:

- Develop, exploit and capitalize on the organization's **strengths**
- Reduce, minimize or remove **weaknesses**
- Take maximum advantage of **opportunities**
- Manage, mitigate and eliminate **threats**.

SWOT analyses can be performed quickly and can be used to target a specific area rather than looking at the entire enterprise.

5.5.9.1 Purpose

A SWOT analysis is a strategic planning tool used to evaluate the strengths, weaknesses, opportunities and threats involved in a project, business venture

or any other situation requiring a decision. Sizing up a firm's internal strengths and weaknesses and its external opportunities and threats provides a quick overview of a firm's strategic situation.

5.5.9.2 How to use

The first step is to define the desired end state or objective. This objective definition must be explicit and approved by all participants in the process.

Once the objective is identified, SWOT are discovered and listed:

- **Strengths** are internal attributes of the organization that are helpful to the achievement of the objective.
- **Weaknesses** are internal attributes of the organization that are harmful to the achievement of the objective.
- **Opportunities** are external conditions that are helpful to the achievement of the objective.
- **Threats** are external conditions that are harmful to the achievement of the objective.

Correct identification of the SWOT is essential because subsequent steps in the process are all derived from the SWOT. To ensure a successful SWOT analysis, it is a good idea to ensure that the objective follows the SMART principle which stands for specific, measurable, achievable, relevant and time-bound.

SWOT analyses are used as inputs to the creative generation of possible strategies, by asking and answering the following four questions many times:

- How can we use each strength?
- How can we stop each weakness?
- How can we exploit each opportunity?
- How can we defend against each threat?

5.5.9.3 Scope, reach and range

SWOT analyses can be performed at various levels, from an individual perspective to a departmental, divisional or even corporate perspective. It is important to consolidate the lower hierarchical management levels before proceeding to the next level.

For example, all the members of a functional team perform an individual SWOT analysis. Then a SWOT for the functional team is performed. Each functional team within the department does the same and a departmental SWOT is conducted and so on until a corporate SWOT is completed.

It is also possible to conduct a SWOT analysis for a service or a process. Table 5.13 provides a list of factors to consider in performing a SWOT analysis, while Table 5.14 gives an example of an analysis performed for CSI.

5.5.9.4 Common pitfalls of a SWOT analysis

The failure to correctly identify the end state will result in wasted resources and possibly failure. It is therefore important to align the SWOT analysis with the organization's vision, mission, goals and objectives. The following errors have been observed in published accounts of SWOT analysis. Making these errors can result in serious losses:

- Conducting a SWOT analysis before defining and agreeing on the desired end state
- Confusing opportunities (external to the company) with strengths (internal to the company); keep them separate
- Confusing opportunities with possible strategies; it may also be useful to keep in mind that SWOT is a description of conditions, while possible strategies define actions.

5.6 RETURN ON INVESTMENT

5.6.1 Creating a return on investment

The ROI challenge needs to take into consideration many factors. On one side is the investment cost. This is the money an organization pays to improve services and service management processes. These costs will be internal resource costs, tool costs, consulting costs etc. It is often easy to come up with these costs.

On the other side is what an organization can gain in a return. These returns are often hard to define or quantify. In order to be able to compute these items it is important to know the following:

- What is the cost of downtime? This includes both lost productivity of the customers and the loss of revenue.
- What is the cost of doing rework? How many failed changes have to be backed out and reworked?
- What is the cost of carrying out redundant work? Many organizations that don't have clear

Table 5.13 SWOT analysis

Strength: things to consider	Weaknesses: things to consider
Core competencies	No clear strategic direction
Financial resources	Obsolete facilities
Reputable buyers	Low profitability
Acknowledged as market-leader	Lack of managerial depth and talent
Well-conceived functional-area strategies	Missing some key competencies
Access to economies of scale	Poor track record for performance
Little competitive pressure	Falling behind in R&D
Proprietary technology	Too narrow product line
Cost advantages	Weak market image
Strong campaigns	Weak distribution network
Product innovation	Below-average marketing skills
Proven management	Unable to finance needed changes
Ahead on experience curve	Higher overall unit costs
Better development/production capability	
Superior technology	
Opportunities: things to consider	**Threats: things to consider**
Ability to serve additional customer groups or expand into new market or segments	Entry of lower-cost foreign competitors
Ways to expand product line to meet broader range of customer needs	Rising sales of substitute products
Ability to transfer skills or technological know-how to new products or businesses	Slower market growth
Integrating forward or backward	Adverse shifts in foreign exchange rates and trade policies of foreign governments
Falling trade barriers in attractive foreign markets	Costly regulatory requirements
Complacency among rival firms	Potentially sudden deregulation
Ability to grow rapidly because of strong increases in market demand	Vulnerability to recession and business cycle
Emerging new technologies	Growing bargaining power of customers or suppliers
	Adverse demographic changes

Table 5.14 Sample SWOT analysis for CSI

Strengths	Weaknesses
People with the right attitude, values and commitment	Reactive organization
Management commitment to CSI	Immature processes
CSI manager in place	Lack of monitoring and reporting tools
	Insufficient data
Opportunities	**Threats**
Increased market share of current services	Competition
Become a third-party service provider	New regulatory requirements
Efficiencies through more integrated operations	New technology
Be quicker to market with new products	Lack of trained staff
	Lack of knowledge management

processes in place and good communication often find that redundant work is being done.
- What is the cost of non-value added projects? Many projects have been fully funded and resourced, but because of changing requirements they no longer add value. Despite this the project moves forward instead of being stopped.
- What is the cost of late delivery of an application? Does this impact on the ability to deliver a new service or possibly an additional way to deliver an existing service?
- What is the cost of escalating incidents to second and third level support groups instead of resolving incidents at the first level? There is often a difference in utilization staff in second level and third level support groups. The more we escalate incidents to these groups the less time they have to work on projects that they may also be assigned to.
- What is the fully allocated hourly cost for different employee levels?

These are only some of the things that have to be considered when creating a ROI statement. The cost of not implementing the improvement also has to be taken into account.

There are different approaches to measuring and reporting on availability. Availability is a good measure to understand the cost of lost productivity, the cost of not being able to complete a business transaction, or the true cost of downtime. Approaches include measuring:

- Impact by minutes lost – this is a calculation on the duration of downtime multiplied by the number of customers impacted. This can be used to report on lost customer productivity.
- Impact by business transaction – this calculation is based on the number of business transactions that could not be processed during the downtime. This measurement provides a better indication of business impact.
- The true cost of downtime that has been agreed on.

Other areas of warranty such as security, recoverability and ensuring there is sufficient capacity also have to be taken into account.

5.6.2 Establishing the business case

The business case should articulate the reason for undertaking a service or process improvement initiative. As far as possible, data and evidence should be provided relating to the costs and expected benefits of undertaking process improvement, noting that:

- Process redesign activities are more complex and therefore more costly than initially expected.
- Organizational change impact is often underestimated.
- Changed process usually requires changed competencies and tools, adding further to the expense.

In developing a business case, the focus should not be limited to ROI but also on the business value that service improvement brings to the organization and its customers (VOI), because ROI alone does not capture the real value of service improvement. Should an organization choose to focus solely on ROI, much of the potential benefit achievable will not be disclosed nor reviewed after the fact. This could in turn result in worthwhile initiatives not being approved, or a review of the initiative revealing apparent failure, when it was actually successful.

Not surprisingly, most business and IT executives expect a return on their investment. It is important to recognize that an investment in CSI, and realizing its benefits, can vary depending on the customer base, size of IT and maturity of the ITIL process implemented. Also benefits will cross existing organizational boundaries and true benefits can only be captured in collaboration with the users/customers and ITIL process owners. The focus is therefore to work with the stakeholders to develop business and IT specific indicators that link business value measures with contributions from IT. In other words, how does ITIL process improvement add value to the organization?

Examples of business value measures are:

- Time to market
- Customer retention
- Market share.

IT's contribution can be captured through:

- Gaining agility
- Managing knowledge
- Enhancing knowledge

- Reducing costs
- Reducing risk.

IT should begin by defining the types of business values that each improvement will contribute to.

As an example, the US Sarbanes-Oxley legislation and other international laws require that the business processes be certified to produce financial reports in addition to certifying the reports themselves. Sarbanes-Oxley is about improving transparency and accountability in business processes and corporate accounting to restore confidence in public markets. It regulates processes and business practices. Therefore having a higher level of ITIL maturity will facilitate regulatory compliance.

Without a mature process framework it is natural for organizations to take an ad hoc approach to compliance. They address requirements as they emerge, through a series of one-offs, just-in-time projects. Since compliance affects a lot of ongoing business activity, this is disruptive, increases the required effort and becomes time-consuming and very expensive.

If an investment is well conceived, solid and delivers results, it can lead to cost savings in the long run. Therefore it is important to choose the right investment and make sure they deliver. When presenting a business case for an ITIL process improvement project, it is important to help executives understand the business value of the ITIL process framework. The tendency for most IT executives is to over-emphasize technology and tools. Technology is a means to an end. The benefits are realized from the business changes. It is important to address how people and processes will change, from 'as is' to the 'to be' state.

The 'as is' stage can be defined as a baseline. Capturing the baseline of the performance measurements affected by the proposed implementation is paramount to the business case. The careful preparation of the baseline will facilitate meaningful business information and level setting about relevant business issues, allowing strategic alignment to take place. The focus should be to develop cause-and-effect metrics to link the benefits against the measurements selected along with the impact on other areas of the enterprise. The metrics should be monitored before, during and after the ITIL implementation to determine how the projected values are being delivered.

Another aspect to consider in business case development is situations where value will be lost by not undertaking process improvement activities. There will be situations where failure to take action will severely impact the business and IT – the value of process improvement may, in fact, not be value added, but value retained.

As a final note, care should be taken in developing the business case to ensure that the success criteria are clearly defined, showing how they are to be measured, and when they are going to be measured.

5.6.3 Expectations – what's in it for me?

Considerations for business executives include:

- The benefits of ITIL process improvements
- What impact it has on my business
- Revenue increase
- Cost reduction
- VOI.

Considerations for the chief finance officer include:

- The ROI
- Payback time.

Considerations for IT include:

- How ITIL benefits translate to business benefits. Find one or two compelling reasons why the organization should spend the time and money.

Determine the current or anticipated concern of the organization about IT. Estimate the cost if the status quo were to remain and subsequently estimate the savings that could be realized if the IT service management (ITSM) processes were put in place or improved. Examples include new lines of business overseas, poor response time or time taken to handle incidents and problems, and the number of incidents in the organization.

5.6.4 Business cases in a data-poor environment

Organizations intending to undertake service improvement activities may find themselves in a situation where the lack of process means that there is no viable body of data or evidence to quantify expected benefits, ROI or VOI. How, then, does such an organization justify process improvement, or recognize how much expenditure is appropriate to achieve cost-effective improvements?

An approach that circumvents this situation is to gain approval to establish basic measurement capabilities, as a means of gathering consistent data. This may be as simple as ensuring that all IT staff record data in a consistent fashion, or start measuring activities or outcomes that are not currently captured. After an agreed period of data capture, some evidence will exist to support (or perhaps not support) a process improvement initiative.

Another approach is to undertake a process maturity assessment of current processes, to identify which processes are most divergent from ITIL practices. It should, however, be noted that this activity will only identify the absence of process and/or data. A process maturity assessment will not in itself provide the data to justify how much to spend on improving process.

Where organizations establish a basic measurement and monitoring capability, some caution should be exercised regarding the quality of this data: be aware of limitations of new data. Even if the data doesn't make any sense, this is reason enough to explore the opportunity for improvements.

It is important that once the decision to start capturing and reporting on data is made, an initial baseline is created so improvements can be measured against it.

Example of good management

XYZ Limited has grown rapidly from a single-site to a multi-site environment and now employs 1,500 people, up from 250 people two years ago. The IT group has struggled to match the business growth with growth in process consistency and service delivery. The business is demanding that the IT group performs better as the shortcomings in IT service are now impacting the business bottom-line.

The IT manager identifies that lack of consistent process and business focus are the roadblock to delivering better service to the business. She realizes that the staff are working very hard, but are often doing re-work or repairing self-inflicted errors. While good technicians, they are averse to documenting activities or outcomes.

Data and measurement are currently inconsistent. While she knows average business and IT staff salary costs, the costs of service outage etc. are not known nor can they be calculated using current data.

Rather than requesting funding to undertake process improvements, the IT manager requests funding for a pilot project to establish a rudimentary measurement framework to start capturing data in a standard fashion, using more or less existing processes. This pilot initiative after three months provides clear evidence that the true failure rate of changes is much higher than previously expected, and a key contributor to business and IT loss of productivity.

Armed with this evidence, the IT manager prepares a business case detailing some of the current deficiencies and expected benefits and returns to be delivered from properly quantifying process gaps and undertaking appropriate process improvement.

5.6.5 Measuring benefits achieved

While the initial identification of benefits is an estimate of those likely to be realized by the proposed process improvement initiative, there is also a need subsequently to measure the benefits actually achieved. These measurements attest to whether the improvement activity achieved the intended outcomes and should consider whether:

- The envisaged improvements were realized
- The benefits arising from the improvements were achieved
- The target ROI was achieved
- The intended value-added was actually achieved (VOI)
- The outcomes of the preceding points lead to further process improvement actions being re-evaluated
- Enough time has passed before measuring the benefits. Some benefits will not be immediately apparent, and it is likely that benefits will continue to change over time, as ongoing costs and ongoing benefits continue to move.

A further consideration in the measurement of benefits is that data quality and measurement precision pre- and post-improvement could be different, thus giving rise to the direct comparison not being valid. If this is the case, the data will need to be normalized before validating benefits.

In 2006, the US state of North Carolina implemented some improvements based on the ITIL framework. The improvements took place in a

span of less than three months. ITS is the name of the state's IT organization. These are the results of tactical quick-win efforts targeted in tandem with the training programme and the state's awareness campaign. This information is reproduced with permission:

- IT has improved its ability to resolve incidents within its target timeframe by 32%.
- IT has improved its ability to resolve service requests within its target timeframe by 20%.
- Change management process compliance increased more than twofold resulting in fewer incidents and reduced downtime.

The first two processes to be developed and implemented were incident and change management. As with most organizations, the state of North Carolina already had an existing change and incident process. This organization started showing immediate improvement before any formal improvement programme was implemented simply by identifying and communicating the key metrics that were going to be reviewed by senior management. Staff began following their existing process simply because they knew reporting against certain performance measures had started and that these performance measures were discussed among senior managers. Not only were these discussions held but there was clear guidance that the performance measures had to improve. These improvements can easily be translated into overall business improvements.

5.7 SERVICE REPORTING

This section will look into the various aspects of reporting such as identifying the purpose, the target audience and what the report will be used for.

As discussed in Chapter 4 a significant amount of data is collated and monitored by IT in the daily delivery of quality service to the business; however, only a small subset is of real interest and importance to the business. Most data and its meaning are more suited to the internal management needs of IT.

The business likes to see a historical representation of the past period's performance that portrays its experience; however, it is more concerned with those historical events that continue to be a threat going forward, and how IT intends to militate against such threats.

Cross-referenced data must still be presented which align precisely to any contracted, chargeable elements of the delivery, which may or may not be technical depending on the business focus and language used within contracts and SLAs.

It is not satisfactory simply to present reports that depict adherence (or otherwise) to SLAs, which in themselves are prone to statistical ambiguity. IT needs to build an actionable approach to reporting: this is what happened, this is what we did, this is how we will ensure it doesn't impact you again, and this is how we are working to improve the delivery of IT services generally.

A reporting ethos that focuses on the future as strongly as it focuses on the past also provides the means for IT to market its wares directly aligned to the positive or negative experiences of the business.

5.7.1 Reporting policy and rules

An ideal approach to building a business-focused service-reporting framework is to take the time to define and agree the policy and rules with the business and service design about how reporting will be implemented and managed.

This includes:

- Targeted audience(s) and the related business views on what the service delivered is
- Agreement on what to measure and report
- Agreed definitions of all terms and boundaries
- Basis of all calculations
- Reporting schedules
- Access to reports and medium to be used
- Meetings scheduled to review and discuss reports.

5.7.2 Right content for the right audience

Numerous policies and rules can exist as long as it is clear for each report which policies and rules have been applied, e.g. one policy may be applied to manufacturing whereas a variant may be more suited to the sales team. However all policies and rules form part of the single reporting framework.

Once the framework, policies and rules are in place, targeting suitably styled reports becomes simply a task of translating flat historical data into meaningful business views (which can be automated). These need to be annotated around the key questions, threats, mitigations and

improvements such data provoke. Reports can then be presented via the medium of choice, e.g. paper-based hard copies, online soft copies, web-enabled dynamic HTML, current snapshot whiteboards, or real-time portal/dashboards.

Simple and effective customizable and automated reporting is crucial to a successful, ongoing reporting system that is seen as adding value to the business. Over time, many of the initial standard reports may become obsolete in favour of the regular production of custom reports which have been shaped to meet changing business needs and become the standard.

The end result is the targeted recipient having clear, unambiguous and relevant information in a language and style that they understand and like, accessible in the medium of their choice, and detailing the delivery of IT into their environment within their boundaries.

5.8 CSI AND OTHER SERVICE MANAGEMENT PROCESSES

CSI activities make extensive use of methods and practices found in many ITIL processes throughout the lifecycle of a service. Far from being redundant, the use of the outputs in the form of flows, matrices, statistics or analysis reports provides valuable insight into the service's design and operation. This information, combined with new business requirements, technology specifications, IT capabilities, budgets, trends and possibly legislation, is vital to CSI to determine what needs to be improved – prioritize it and suggest improvements if required.

5.8.1 Availability management

Availability management's methods are part of the measuring process explained in Chapter 4. They are part of the measuring process – gathering, processing and analysing activities. When the information is provided to CSI in the form of a report or presentation, it becomes part of CSI's gathering activity. For more details on each method, please consult *ITIL Service Design*.

Availability management provides IT with the business and user perspective about how deficiencies in the infrastructure and underpinning process and procedures impact the business operation. The use of business-driven metrics can demonstrate this impact in real terms and help quantify the benefits of improvement opportunities.

Availability management plays an important role in helping the IT support organization recognize where it can add value by exploiting technical skills and competencies in an availability context. The continual improvement technique can be used by availability management to harness this technical capability. This can be used with either small groups of technical staff or a wider group within a workshop environment. The information provided by availability management is made available to CSI through the availability management information system (AMIS).

This section provides practical usage and details on how each availability management method mentioned below can be used in various activities of CSI.

5.8.1.1 Component failure impact analysis

Component failure impact analysis (CFIA) identifies single points of failure, IT services at risk from failure of various CIs and the alternatives that are available should a CI fail. It should also be used to assess the existence and validity of recovery procedures for the selected CIs. The same approach can be used for a single IT service by mapping the component CIs against the vital business functions and users supported by each component.

When a single point of failure is identified, the information is provided to CSI. This information, combined with business requirements, enables CSI to make recommendations on how to address the failure.

5.8.1.2 Fault tree analysis

Fault tree analysis (FTA) is a technique that can be used to determine a chain of events that has caused an incident, or may cause an incident in the future. It offers detailed models of availability, and makes a representation of a chain of events using Boolean algebra and notation. Essentially FTA distinguishes between four events: basic events, resulting events, conditional events and trigger events.

When provided to CSI, FTA information indicates which part of the infrastructure, process or service was responsible in the service disruptions. This information, combined with business requirements,

enables CSI to make recommendations about how to address the fault.

5.8.1.3 Service failure analysis

Service failure analysis (SFA) is a technique designed to provide a structured approach to identify end-to-end availability improvement opportunities that deliver benefits to the user. Many of the activities involved in SFA are closely aligned with those of problem management. In a number of organizations these activities are performed jointly by problem and availability management. SFA should attempt to identify improvement opportunities that benefit the end user. It is therefore important to take an end-to-end view of the service requirements.

CSI and SFA work hand in hand. SFA identifies the business impact of an outage on a service, system or process. This information, combined with business requirements, enables CSI to make recommendations about how to address improvement opportunities.

5.8.1.4 Technical observation

A technical observation (TO) is a prearranged gathering of specialist technical support staff from within IT support. They are brought together to focus on specific aspects of IT availability. The TO's purpose is to monitor events in real time as they occur, with the specific aim of identifying improvement opportunities within the current IT infrastructure. The TO is best suited to delivering proactive business and end-user benefits from within the real-time IT environment. Bringing together specialist technical staff to observe specific activities and events within the IT infrastructure and operational processes creates an environment to identify improvement opportunities.

The TO gathers, processes and analyses information about the situation. Too often the TO is reactive by nature and is assembled hastily to deal with an emergency. Why wait? If the TO is included as part of the launch of a new service, system or process for example, a lot of the issues inherent to any new component would be identified and dealt with more quickly.

One of the best examples of a TO is the mission control room for a space agency. All the specialists from all aspects of the mission are gathered in one room. Space agencies don't wait for the rocket to be launched and experience a problem before gathering specialists to monitor, observe and provide feedback. They set it up well before the actual launch and practise monitoring, observing and providing feedback.

Certainly, launching a rocket is very costly, but so is launching a new service, system or process. Can the business afford a catastrophic failure of a new enterprise resource planning (ERP) application, for example? Incidentally, rocket launches are often aborted seconds before the launch. Shouldn't organizations (including yours) do the same when someone discovers a major potential flaw in a service or system? CSI starts from the beginning and includes preventing things from failing in the first place. Let's fix the flaw before it goes into production instead of fixing the fixes (what a concept!). This information, combined with business requirements, enables CSI to make recommendations about how to address the TO's findings.

5.8.1.5 Expanded incident lifecycle

First, let's define a few items:

- **Availability management** The process responsible for defining, analysing, planning, measuring and improving all aspects of the availability of IT services. Availability management is responsible for ensuring that all IT infrastructure, processes, tools, roles etc. are appropriate for the agreed service level targets for availability.
- **Expanded incident lifecycle** A technique to help with the technical analysis of incidents affecting the availability of components and IT services (see Figure 5.13). The expanded incident lifecycle is further made up of two parts: time to restore service (also known as downtime) and time between failures (also known as uptime). There is a diagnosis part to the incident lifecycle as well as repair, restoration and recovery of the service.

Let's assume that CSI has decided to improve the incident lifecycle by reducing the mean time to restore service (MTRS) and expanding the mean time between failures (MTBF).

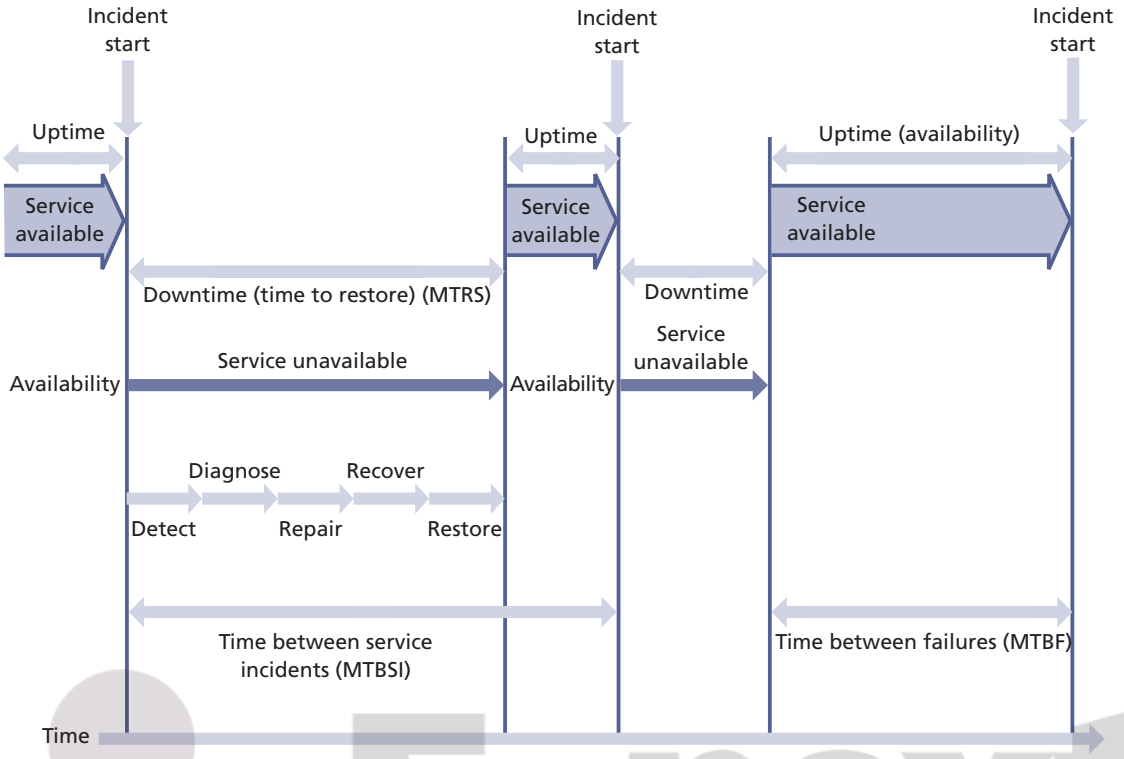

Figure 5.13 The expanded incident lifecycle

Here is an example of how availability management can assist in reducing downtime in the expanded incident lifecycle by using many techniques:

- **Monitoring (detection of incident)** By adequately monitoring for availability of vital business functions through automated monitoring tools (set at the right threshold) that record and escalate incidents, the time it takes to detect and record incidents is reduced.
- **Incident recording** Since one of availability management's goals is to 'optimize the … support organization', educating and training first-line staff as well as simplifying and/or automating incident recording helps reduce the time it takes to record incidents.
- **Investigation** Using the FTA method, availability management assists in reducing the time to investigate by creating proper investigation procedures for incident management staff. The same logic applies to the diagnosis of the incident cause, resolution and recovery.

Here is an example of how availability management can assist in increasing up-time in the expanded incident lifecycle by using many techniques:

- Using SFA, availability management can make recommendations to increase the reliability of components, thus reducing the likelihood of an incident occurring in the first place.
- Scheduling and performing adequate and required internal maintenance of components (maintainability), availability management can help to increase the resilience of components, thus reducing the likelihood of an incident causing an outage.
- Ensuring that external maintenance of components (serviceability) is properly scheduled and performed by external vendors, availability management can help to increase the resilience of components, thus reducing the likelihood of an incident causing an outage.
- Conducting a CFIA to predict and evaluate the impact on IT service availability arising from component failures assists in identifying single points of failure. Availability management will either submit recommendations for enhancements to the resilience and reliability of such components or provide better troubleshooting procedures to the support groups.
- Implementing security recommendations coming from information security management

regarding the confidentiality, integrity and availability of associated data helps reduce malicious or unauthorized access to data, ensuring data integrity, and thus reducing the likelihood of an incident occurring or decreasing the time it takes to respond to or resolve an incident.

5.8.2 Capacity management

This section provides practical usage and details about how each capacity management method mentioned below can be used in various activities of CSI.

The capacity management process must be responsive to changing requirements for processing capacity. New services are required to underpin the changing business. Existing services will require modification to provide extra functionality. Old services will become obsolete, freeing up capacity. Capacity management must ensure sufficient hardware, software and personnel resources are in place to support existing and future business capacity and performance requirements.

Similarly to availability management, capacity management can play an important role in helping the IT support organization recognize where it can add value by exploiting its technical skills and competencies in a capacity context. The continual improvement technique can be used by capacity management to harness this technical capability. This can be used with either small groups of technical staff or a wider group within a workshop environment.

The information provided by capacity management is made available to CSI through the capacity management information system (CMIS).

5.8.3 Business capacity management

A prime objective of the business capacity management sub-process is to ensure that future business requirements for IT services are considered and understood, and that sufficient capacity to support the services is planned and implemented in an appropriate timescale.

As a result, the ability to satisfy the customers' SLRs will be affected. It is the responsibility of capacity management to predict and cater to these changes. These new requirements may come to the attention of capacity management from many different sources and for many different reasons. They may be generated by the business or may originate from the capacity management process itself. Such examples could be a recommendation to upgrade to take advantage of new technology, or the implementation of a tuning activity to resolve a performance problem.

Information gathered here enables CSI to answer the question 'What do we need?'

5.8.4 Service capacity management

A prime objective of the service capacity management sub-process is to identify and understand the IT services, their use of resource, working patterns, peaks and troughs, as well as to ensure that the services can and do meet their SLA targets. In this sub-process, the focus is on managing service performance, as determined by the targets contained in the SLAs or SLRs.

The key to successful service capacity management is to pre-empt difficulties, wherever possible. This is another sub-process that has to be proactive and anticipatory rather than reactive. However, there are times when it has to react to specific performance problems. Based on the knowledge and understanding of the performance requirements for each service, the effects of changes in the use of services can be estimated, and actions taken to ensure that the required service performance can be achieved. Information gathered here enables CSI to answer the question 'What do we need?'

5.8.5 Component capacity management

A prime objective of the component capacity management sub-process is to identify and understand the capacity and utilization of each of the components of the IT infrastructure. This ensures the optimum use of the current hardware and software resources in order to achieve and maintain the agreed service levels. All hardware components and many software components in the IT infrastructure have a finite capacity, which, when exceeded, have the potential to cause performance problems.

As in service capacity management, the key to successful component capacity management is to pre-empt difficulties wherever possible. Therefore this sub-process has to be proactive and anticipatory rather than reactive. However, there are times when it has to react to specific problems

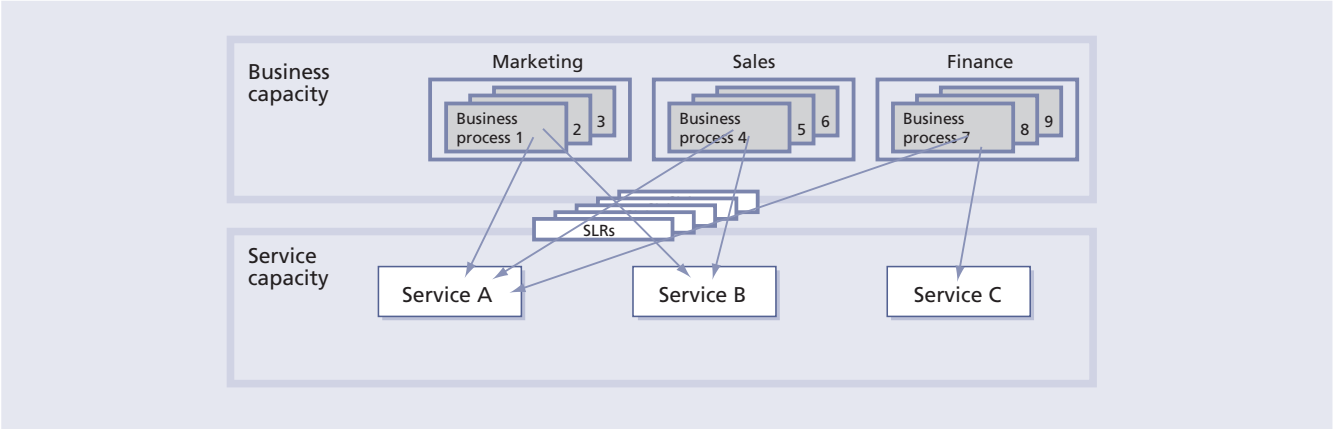

Figure 5.14 Connecting business and service capacity management

Table 5.15 Departmental requirements

	Marketing	Sales	Finance
Employees	15	40	5
Number of emails per day	100	200	50
Size of attachment	10 Mb	5 Mb	10 Mb
Frequency of large attachment	infrequent	very (contracts)	often
Requires remote access	No	Yes	Yes
Requires hand-held computer	No	Yes	No

that are caused by a lack or inefficient use of resources.

It is important to understand how the three sub-processes tie together. Let's look at the example in Figure 5.14.

There are three services: A, B and C; and three departments: Marketing, Sales and Finance. Service A is used by all three departments. Service B is used only by Marketing and Sales. Service C is used only by Finance.

The requirements for each service from each department are shown in Table 5.15.

From Table 5.15, the overall size of the email service can be computed. If email was the only service, it would be relatively simple. There are other services offered and each service makes use of four major components: hardware, software, documentation and people. Using the CFIA report from availability management it is possible to identify all the components of each service and which component is used by which service. From there optimizing the capacity of each component can be reviewed. This, in turn, enables the optimization of the service based on the usage and performance requirements from each customer.

This, however, only focuses on the current utilization. Future business requirements for this service also need to be reviewed. Growth can happen in one of three ways as shown in Figure 5.15. In this figure, curve 1 indicates a steady growth or deployment of the service over time; curve 2 indicates a big-bang approach where everyone starts using the new service at the same time and usage stabilizes over time; and curve 3 indicates a small number of people using the new service before it is eventually deployed to everyone.

You can predict which growth curve is correct as accurately as you can predict the weather a year from now. Looking at curve 2, it is important to ensure sufficient initial capacity for all components – hardware, software, documentation and people. Looking at curve 1 additional capacity is required but can wait if curve 3 is considered. Now what would happen if the business scenario predicts

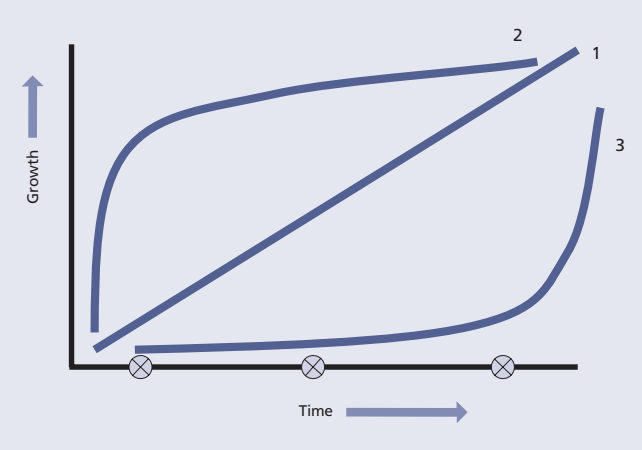

Figure 5.15 Business capacity growth model

curve 2 and curve 3 is what actually happens? The result is over-capacity and IT is blamed for poor planning and for overspending. Consider the opposite scenario where the business predicts curve 3 and curve 2 is what actually happens. The result is under-capacity and IT gets blamed for poor planning.

Remember that only one service was reviewed so far. There are three services in the example. You need to understand the service and business along with the component capacity requirements to be able to identify the true capacity requirements. More importantly business capacity can be computed since how much a business unit consumes a service is known. This is when the infrastructure required to deliver and support the services can be properly put in place (see Figures 5.16 and 5.17).

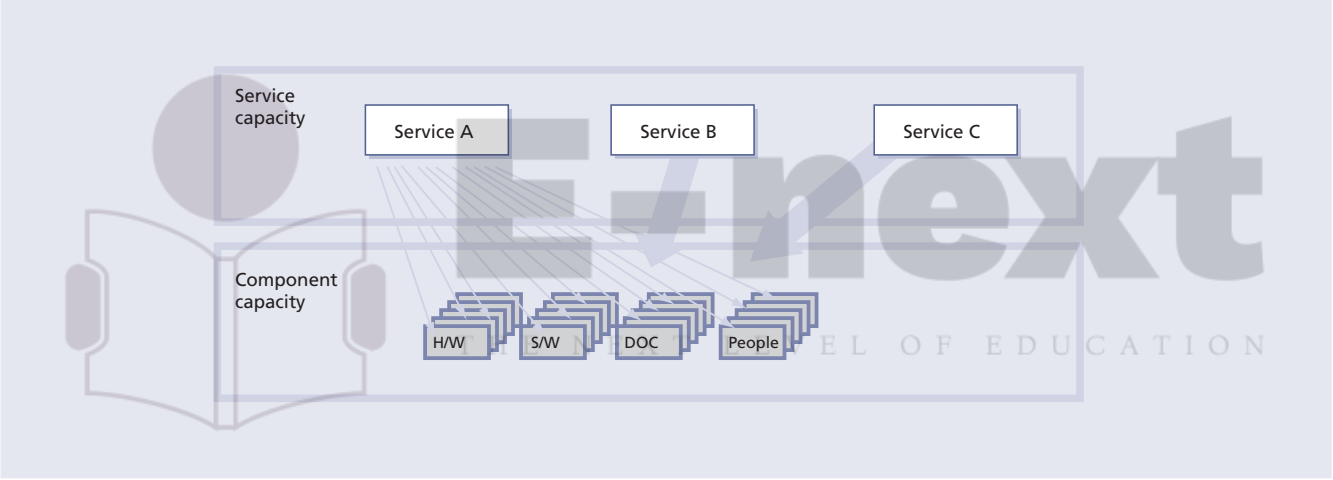

Figure 5.16 Connecting service and component capacity management

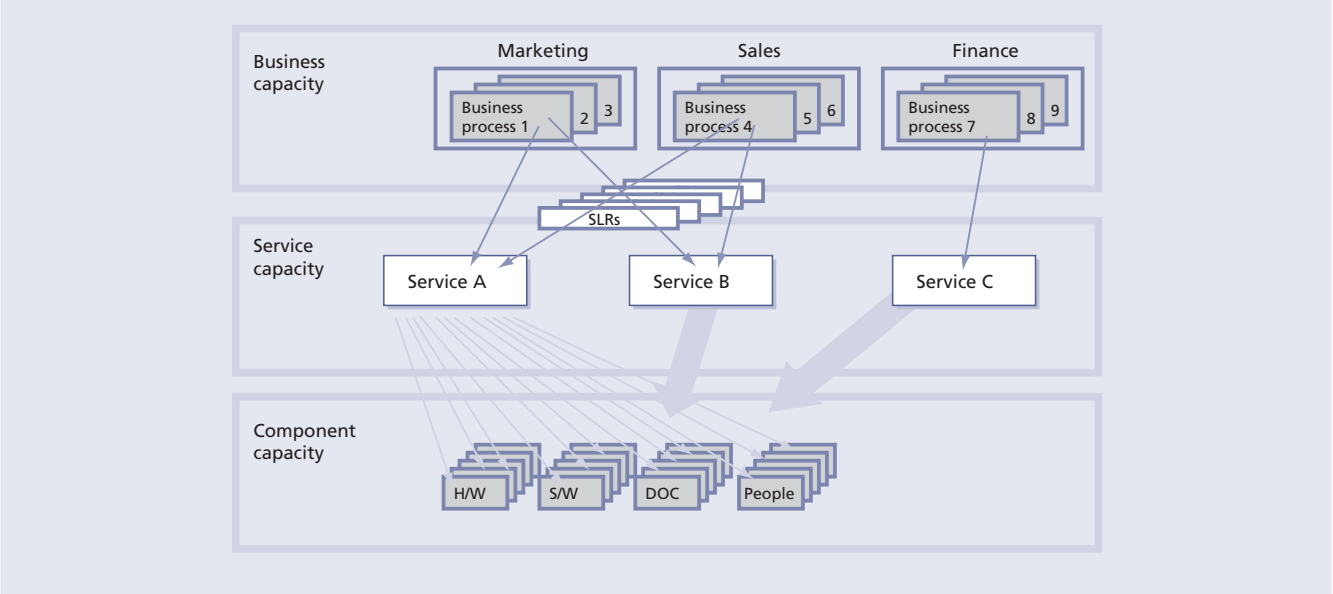

Figure 5.17 Connecting businesses, service and component capacity management

From this point, IT is in a better position to improve the service provision. In order to do this IT must start not only to measure but also to influence the business. Influencing the business is part of demand management.

5.8.6 Workload management and demand management

Workload management can be defined as understanding which customers use what service, when they use the service, how they use the service, and finally how using the service impacts the performance of a single or multiple systems and/or components that make up a service.

Demand management is often associated with influencing the end users' behaviour. By influencing the end users' behaviour an organization can change the workload thus improving the performance of components that support IT services. Using demand management can be an effective way of improving services without investing a lot of money. A full discussion of demand management can be found in *ITIL Service Strategy* and *ITIL Service Design*.

There are different ways to influence customer behaviour. Charging for services is an obvious way, but it is not always effective. Sometimes people still need to use the service and will use it regardless of the price. Putting in place policies regarding proper usage of the service is another way to influence customer behaviour; communicating expectations for IT and the business, educating people on how to use the service and negotiating maintenance windows are just as effective in influencing customers. Putting in place restrictions such as amount of space allocated for email storage is another way to influence behaviour.

Consider carefully how you try to influence a customer's behaviour and it may become a negative influence rather than a positive influence. As an example, if an organization chooses to charge for every contact to the service desk, this could create a negative behaviour in that end users no longer call or email the service desk, but call second-level support directly, or turn to peer-to-peer support, which ultimately makes the cost of support go up, not down. However if the goal is to move end users to using a new self-service web-based knowledge system, then with a proper communication and education plan on using the new self-service system this could be a positive influencing experience.

CSI needs to review demand management policies to ensure that they are still effective. A policy that was good a couple of years ago may not be workable or useful today. For example, a few years ago, large email attachments were uncommon. It made sense to limit attachments to 2 Mb. Today's reality is different.

5.8.7 Iterative activities of capacity management

5.8.7.1 Trend analysis

Trend analysis can be performed on the resource utilization and service performance information that was collected by the service and component capacity management sub-processes. The data can be held in a spreadsheet and the graphical, trend analysis and forecasting facilities used to show the utilization of a particular resource over a previous period of time, and how it can be expected to change in the future. Typically trend analysis only provides estimates of future resource utilization. It is less effective in producing an accurate estimate of response times, in which case either analytical or simulation modelling should be used.

This activity provides insight into resource utilization and is used by both CSI and problem management to identify opportunities for improvements. Trend analysis is rooted in the data analysis activity of the measuring process.

It is important to recognize that trend analysis is also an activity of proactive problem management (see section 4.4 in *ITIL Service Operation*). However, the focus is different. Whereas problem management focuses on trends in errors and faults (the past), capacity management is forward looking. It might be looking for innovation in storage management, or at expected growth versus real growth and recommend adjustments.

5.8.7.2 Modelling

Modelling types range from making estimates based on experience and current resource utilization information, to pilot studies, prototypes and full-scale benchmarks. The former are cheaper and more reasonable for day-to-day small decisions, while the latter are expensive but may be advisable when implementing a large new project.

Since it is impossible to have an exact duplicate of the infrastructure for testing purposes, CSI makes use of the information provided by the capacity management modelling activity to predict the behaviour of service improvements before the improvement is actually carried out. This may prevent costly implementations or problems later. Modelling results can be used by change management to assess the impact of a change on the infrastructure or may be used as part of release testing. Whether it is used by another process before the information makes its way to CSI, modelling is a valuable tool.

Modelling can also be used in conjunction with demand management to predict the possible effects of demand management efforts and initiatives. This allows IT to answer questions such as 'What happens if we fail?' and 'What happens if we are successful?'

5.8.7.3 Analytical modelling

Analytical models are representations of computer system's behaviour using mathematical techniques such as multi-class network queuing theory. When the model is run, the queuing theory is used to calculate computer system response times. If the response times predicted by the model are sufficiently close to the response times recorded in real life, the model can be regarded as an accurate representation of the computer system. The technique of analytical modelling requires less time and effort than simulation modelling, but typically gives less accurate results. Also the model must be kept up to date.

5.8.7.4 Simulation modelling

Simulation involves the modelling of discrete events, such as transaction arrival rates, against a given hardware configuration. This type of modelling can be very accurate in sizing new applications or predicting the effects of changes on existing applications. It can also be very time-consuming and therefore costly.

When simulating transaction arrival rates, have a number of staff enter a series of transactions from prepared scripts, or use software to input the same scripted transactions with a random arrival rate. Either of these approaches takes time and effort to prepare and run. However it can be cost-justified for organizations with very large systems where the cost, and associated performance implications, assume great importance.

5.8.7.5 Baseline models

Improvements are gradual and incremental by nature. How can one claim to have improved if a baseline is not established before the improvement takes place?

The first stage in modelling is to create a baseline model that accurately reflects the performance that is being achieved. When this baseline model is created, predictive modelling can be undertaken. If the baseline model is accurate, then the accuracy of the result of the predicted changes can be trusted.

Effective service and component capacity management together with modelling techniques enable capacity management to answer the 'What if?' questions: 'What if the throughput of service A doubles?' or 'What if service B is moved from the current processor onto a new processor – how will the response times in the two services be altered?'

Figure 5.18 illustrates how CSI can make use of the intricate relationships between capacity management and other processes and activities. At first glance the diagram seems very busy. However, it illustrates the inputs and outputs from other processes and activities into and out of the various sub-activities of capacity management. CSI will then use this information to assist capacity management in planning for future capacity and performance as well as identifying improvement opportunities.

5.8.8 IT service continuity management

This section provides practical usage and details about how each ITSCM method can be used in various activities of CSI.

5.8.8.1 Business continuity management, ITSCM and CSI

Any CSI initiative to improve services needs to also have integration with ITSCM as any changes to the service requirements, infrastructure etc. need to be taken into account for any changes that may be required for the continuity plan. That is why it is important for all SIPs to go through change management.

Business continuity management (BCM) is concerned with managing risks to ensure that

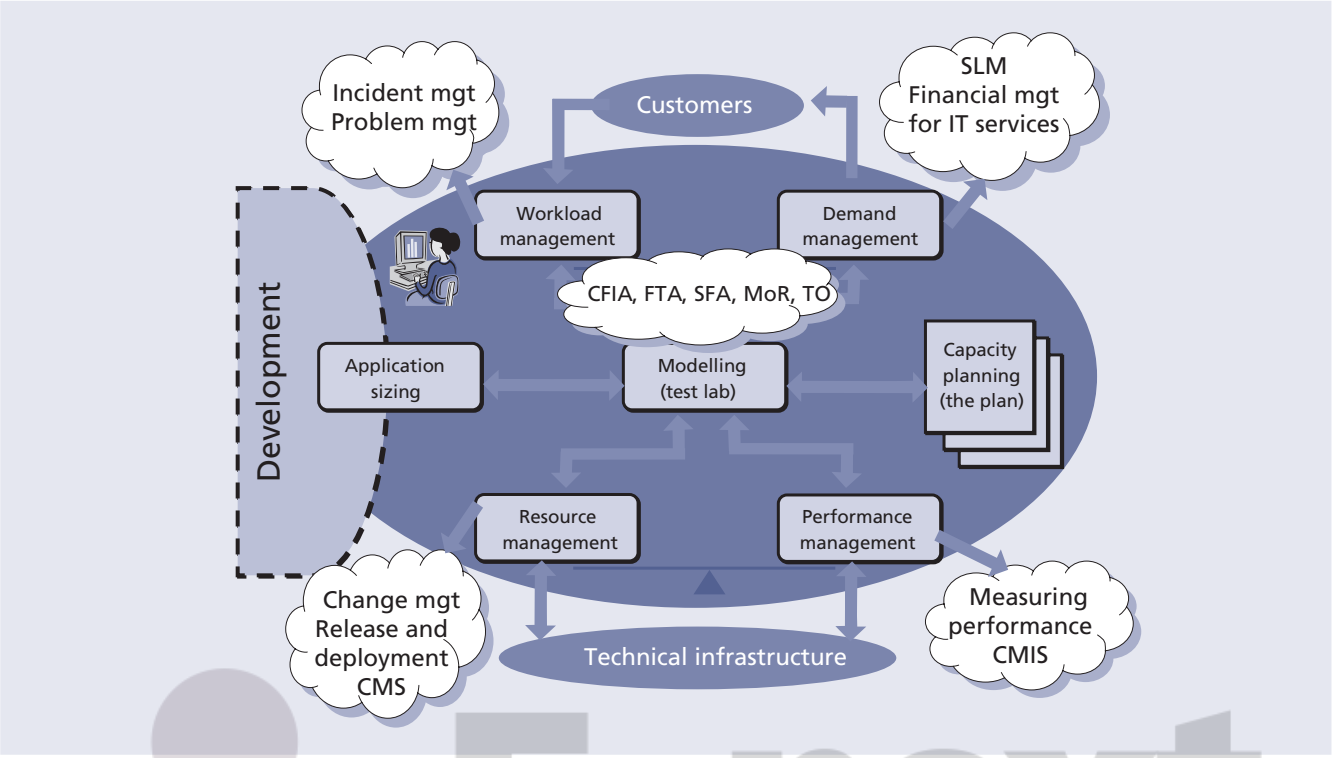

Figure 5.18 Capacity management activities

an organization can continue operating to a predetermined minimum level. The BCM process involves reducing the risk to an acceptable level and planning for the recovery of business processes should a risk materialize and a disruption to the business occur.

ITSCM allows an IT organization to identify, assess and take responsibility for managing its risks, thus enabling it to better understand the environment in which it operates, decide which risks it wishes to counteract, and act positively to protect the interests of all stakeholders (including staff, customers, shareholders, third parties and creditors). CSI can complement this activity and help to deliver business benefit.

5.8.9 Problem management

CSI and problem management are closely related as one of the goals of problem management is to identify and remove errors permanently that impact services from the infrastructure. This directly supports CSI activities of identifying and implementing service improvements.

Problem management also supports CSI activities through trend analysis and the targeting of preventive action.

Problem management activities are generally conducted within the scope of service operation and CSI must take an active role in the proactive aspects of problem management to identify and recommend changes that will result in service improvements.

Further information on the problem management process can be found in *ITIL Service Operation*.

5.8.10 Change management, release and deployment management

It is likely that all CSI improvement activities will fall under the scope of change management and release and deployment management. CSI's goal is to identify and implement improvement activities on IT services that support the business processes as well as to identify and implement improvements to ITSM processes. The improvement activities support the lifecycle approach through service strategy, service design, service transition and service operation.

CSI is an ongoing activity constantly monitoring, analysing and researching improvement opportunities, whereas release and deployment management depends on the change management process for its work.

There are many activities of the release and deployment management process that can be utilized by CSI. Once CSI has come up with a recommendation for improvement, a change request is submitted. The proposed change is then scheduled as part of a release. The release and deployment management process will identify any areas requiring improvement for new or updated services during the early life support phase.

5.8.10.1 Post-implementation review

As a part of change management a post-implementation review (PIR) is carried out on certain changes. CSI, working with change management, can require a PIR for all changes that CSI was a part of for improving a service (see *ITIL Service Transition*). CSI needs to participate in any PIR on changes that are implemented to improve a service. As part of a PIR it is important for CSI to identify if the change actually improved the service or if there are still some issues. If a change, once implemented, fails to improve the service as desired, then CSI activities need to continue working with service design, service transition and service operation.

5.8.11 Knowledge management

One of the key domains in support of CSI is knowledge management. Capturing, organizing, assessing for quality and using knowledge is great input in CSI activities. An organization has to gather knowledge and analyse what the results are in order to look for trends in service level achievements and/or results and output of service management processes. This knowledge is used to identify improvement opportunities for inclusion in the CSI register, for subsequent review and prioritization of the register, and for building SIPs.

Knowledge management in today's market is vastly different from what it was 10 years ago. Just in that short amount of time there has been:

- An increase in the rate of change in industry and market landscapes, as barriers to entry have decreased and new opportunities opened up
- An increase in employee turnover, as it has become more socially acceptable and often beneficial to change companies during a career to develop and share new experiences and perspectives
- An increase in access to information via the internet and a more open global economy
- Greater market competition forcing company employees to share knowledge between departments and subsidiaries.

5.8.11.1 Knowledge management concepts

Effective knowledge management enables a company to optimize the benefits of these changes, while at the same time:

- Enhancing the organization's effectiveness through better decision-making enabled by having the right information at the right time, and facilitating enterprise learning through the exchange and development of ideas and individuals
- Enhancing customer–supplier relationships through sharing information and services to expand capabilities through collaborative efforts
- Improving business processes through sharing lessons learned, results and best practices across the organization.

Knowledge management is key to the overall viability of the enterprise, from capturing the competitive advantage in an industry to decreasing cycle time and cost of an IT implementation. The approach to cultivating knowledge depends heavily on the make-up of the existing knowledge base, and knowledge management norms for cultural interaction.

There are two main components to successful knowledge management:

- An **open culture** where knowledge – best practices and lessons learned – is shared across the organization and individuals are rewarded for it. Many cultures foster an environment where 'knowledge is power' (the more you know that others do not, the more valuable you are to the company). This type of knowledge hoarding is a dangerous behaviour for a company to reward since that knowledge may leave the company at any time. Another tenet of an open culture is a willingness to learn. This is an environment where growing an individual's knowledge base is rewarded and facilitated through open support and opportunities.
- The **infrastructure** – a culture may be open to knowledge sharing, but without the means or infrastructure to support it, even the best intentions can be impaired, and over time this

serves as a demotivator, quelling the behaviour. This infrastructure can be defined in various ways; it may be a technical application or system which allows individuals to conduct online, self-paced training, or it may be processes such as post-mortems or knowledge sharing activities designed to bring people together to discuss best practices or lessons learned.

The identification of knowledge gaps and resulting sharing and development of that knowledge must be built into CSI throughout the IT lifecycle. This also raises the issues of dependencies and priorities. The IT lifecycle itself drives a natural priority of knowledge development and sharing. But regardless of the IT project's lifecycle stage, it is important to identify and develop the necessary knowledge base prior to the moment where the knowledge may be applied. This may seem obvious and yet the majority of organizations fail to recognize the need to train individuals until the process is halted due to a skills shortage. Knowledge sharing is an activity that should be fostered prior to, during and after the application of knowledge to the task.

Knowledge management could be seen at the opposite end of a spectrum from fully automated processes that have all the required knowledge built into the process itself. Service management processes fall somewhere between these two extremes, with the operational processes nearer to the automation of processes than the tactical or strategic processes. This should be taken into account when designing the ITSM processes. Knowledge management may very well enable quick wins on the more knowledge management intensive processes. This is not to imply that there would be a difference of levels of knowledge required for the people participating to the processes – rather that, in order to further develop SLM and vendor-management processes, the tactical knowledge needs to be harvested. It is easier to automate the operational level processes than the tactical or strategic processes, which require a greater breadth and depth of knowledge.

Throughout a CSI initiative, a lot of experience and information is acquired. It is important that this knowledge be gathered, organized and accessible. To ensure the ongoing success of the programme, knowledge management techniques must be applied.

All this knowledge comes from the service knowledge management system (SKMS) (see Figure 5.19). *ITIL Service Transition* explains the principles and structure of the SKMS.

5.8.12 Risk management

Although not an ITIL-defined ITSM process, risk management is part of many processes such as change management, ITSCM, availability management, information security management and strategic risk management. Risks to all elements of warranty and utility need to be assessed and mitigated where possible. While risk management is primarily conducted during design and transition stages of the service lifecycle, a good CSI initiative will assess the results of risk management activities to identify service improvements through risk mitigation, elimination and management.

Every organization manages its risk, but not always in a way that is visible, repeatable and consistently applied to support decision-making. The task of risk management is to ensure that the organization makes cost-effective use of a risk process that has a series of well-defined steps. The aim is to support better decision-making through a good understanding of risks and their likely impact.

There are two distinct phases: risk assessment and risk management. Risk assessment is concerned with gathering information about exposure to risk so that the organization can make appropriate decisions and manage risk appropriately. Risk assessment involves the identification and assessment of the level (measure) of the risks calculated from the assessed values of assets and the assessed levels of threats to, and vulnerabilities of, those assets.

Risk management involves having processes in place to monitor risks, access to reliable and up-to-date information about risks, the right balance of control in place to deal with those risks, and decision-making processes supported by a framework of risk assessment and evaluation. Risk management also involves the identification, selection and adoption of countermeasures justified by the identified risks to assets when considering their potential impact on services if failure occurs, and the reduction of those risks to an acceptable level.

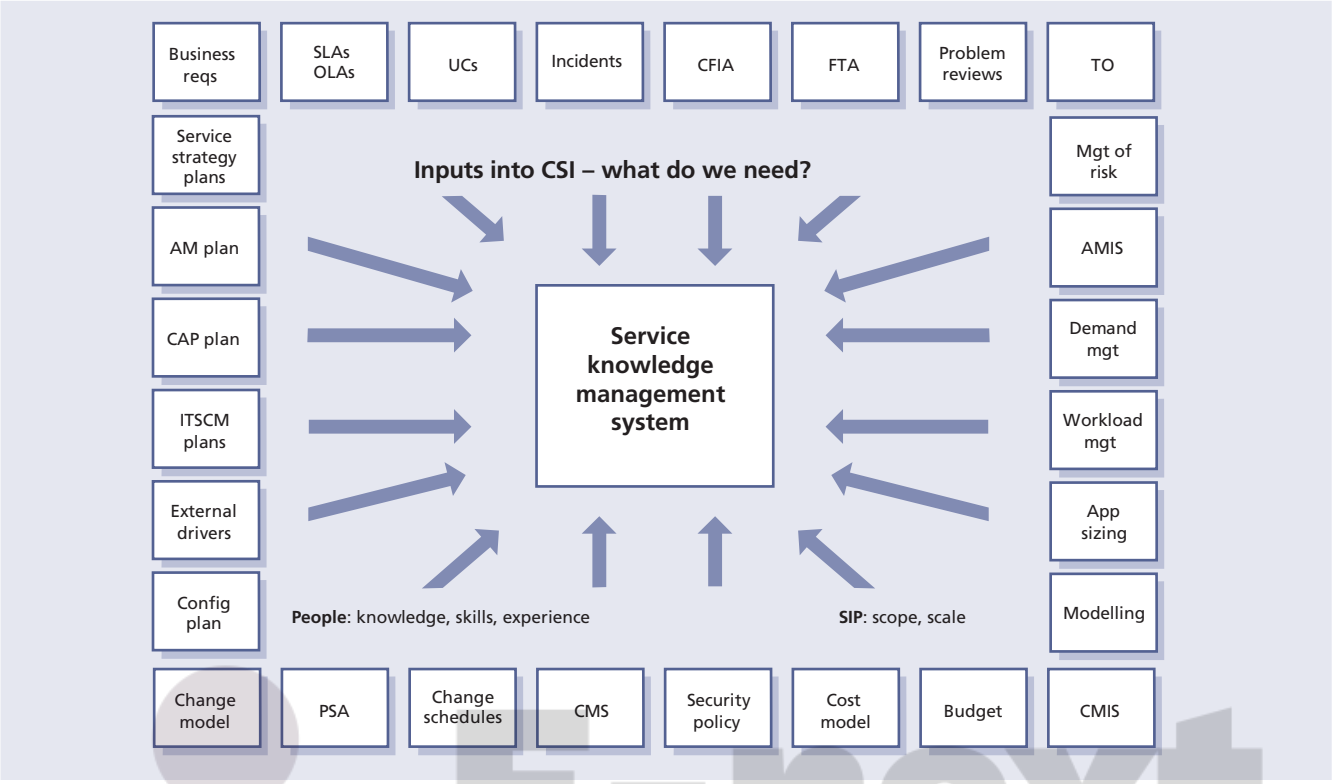

Figure 5.19 Sources of knowledge

Risk management covers a wide range of topics, including BCM, security, programme/project risk management and operational service management. These topics need to be placed in the context of an organizational framework for the management of risk. Some risk-related topics, such as security, are highly specialized and this guidance provides only an overview of such aspects.

A certain amount of risk taking is inevitable if an organization is to achieve its objectives. Effective management of risk helps to improve performance by contributing to:

- Increased certainty and fewer surprises
- Better service delivery
- More effective management of change
- More efficient use of resources
- Better management at all levels through improved decision-making
- Reduced waste and fraud, and better value for money
- Innovation
- Management of contingent and maintenance activities.

5.8.12.1 Relating management of risk to safety, security and business continuity

Management of risk should be carried out in the wider context of safety concerns, security and business continuity:

- **Health and safety** policy and practice is concerned with ensuring that the workplace is a safe environment.
- **Security** is concerned with protecting the organization's assets, including information, buildings and so on.
- **Business continuity** is concerned with ensuring that the organization could continue to operate in the event of a disaster, such as loss of a service, flood or fire damage.

Figure 5.20 illustrates the reasons for having a risk management process.

5.8.12.2 Business perspective on risk management

Risk management from the business perspective, in the context of working with suppliers, centres on assessing vulnerabilities in supplier arrangements that pose threats to any aspect of the business including:

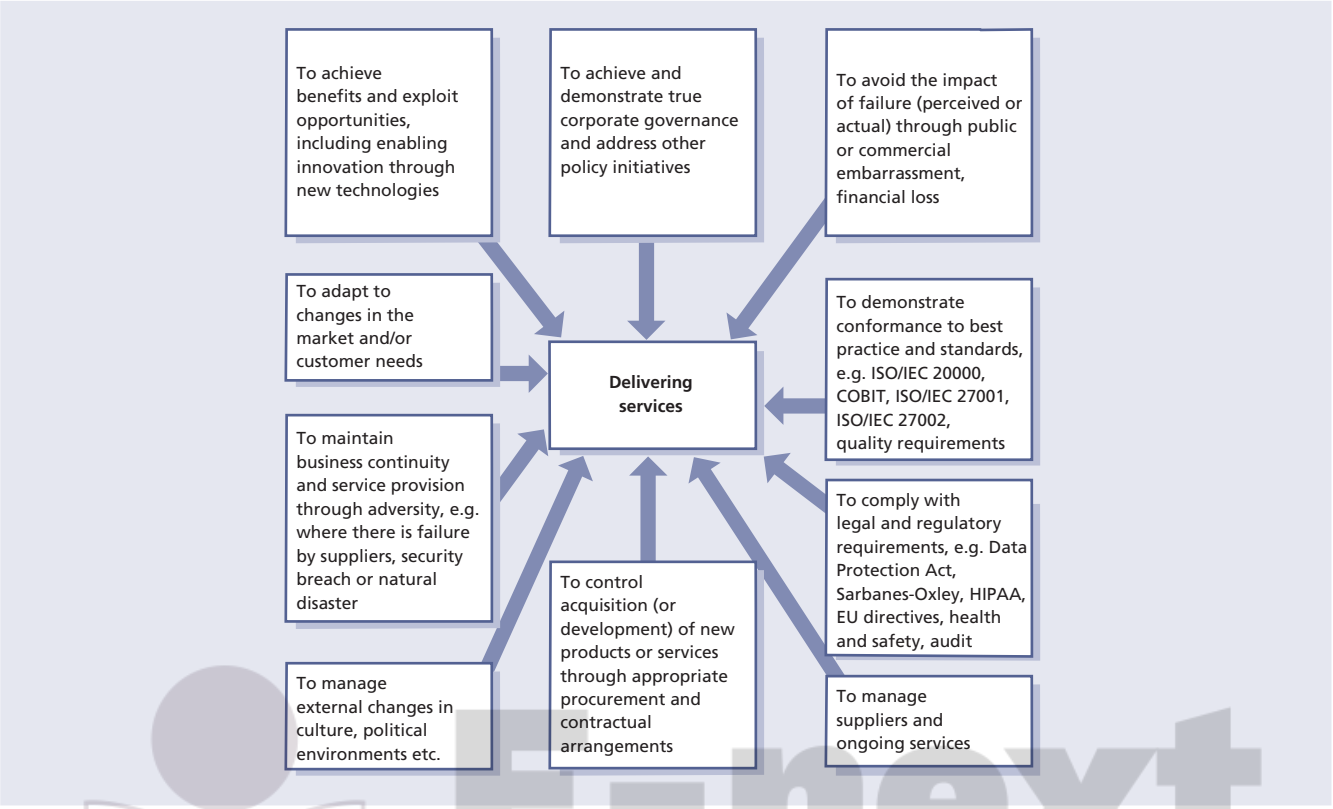

Figure 5.20 Reasons for a risk management process

- Customer satisfaction
- Brand image
- Market share
- Share price
- Profitability
- Regulatory impacts or penalties (in some industries).

The nature of the relationship affects the degree of risk to the business.

Risks associated with an outsourced supplier are likely to be greater in number, and more complex to manage, than those associated with an internal supplier. It is rarely possible to outsource risk. Blaming a supplier does not impress customers or internal users affected by a security incident or a lengthy system failure. New risks arising from the relationship need to be identified and managed, with communication and escalation as appropriate.

A substantial risk assessment should have been undertaken pre-contract, but this needs to be maintained in the light of changing business needs, changes to the contract scope or changes in the operational environment.

5.8.12.3 Risk profiles and responsibilities

The organization and the supplier must consider the threats posed by the relationship to their own assets, and have their own risk profile. Each must identify their respective risk owners. In a well-functioning relationship it is possible for much or all of the assessment to be openly shared with the other party. By involving supplier experts in risk assessments, the organization may gain valuable insights into how best to mitigate risks, as well as improving the coverage of the assessment.

Risk assessments typically consider threats which may exploit vulnerabilities to impact the confidentiality, integrity or availability of one or more assets.

The scope of risk assessments includes:

- Identification of risks (threats and vulnerabilities)
- Target – the assets under threat
- Impact of risks, qualitative and quantitative
- Probability of occurrence
- Possible mitigating actions or controls

Table 5.16 Risk register

Reference	Description	Weighted priority			Proposed actions or controls and costs	Owner
		Prob. HML	Impact HML	Prob. × impact = Exposure		
R1		H	H	9		
R2		H	M	6		
R3		M	L	3		
R4		L	L	1		

- Identification of stakeholders who are accountable for the risk, and responsible for selecting an appropriate action (including possibly accepting the risk with no control)
- Responsibility for implementing selected actions or controls
- Choice of actions or controls, based on an evaluation of impact versus the cost of action or control.

For outsourced operations, particular care needs to be taken when considering the ownership of the assets at risk. These will be different for each party.

Risk management processes need to be considered as cyclical, reviewing the suitability of previous actions, and reassessing risks in the light of changing circumstances. Risks are likely to be managed through a risk register such as the example provided in Table 5.16.

For further information on risk management, consult Appendix C.

5.9 SUMMARY

Many methods and techniques are used to support CSI activities. Each organization can choose what works best for them. However, you should never adopt only one as it takes a blend of different methods to have an effective CSI initiative.

CSI relies on the activities of all other service management processes. Don't overlook the value incident management, problem management, availability management and capacity management can provide to CSI. Of course SLM plays a key role and most organizations will be hard pressed to have an effective CSI initiative without some form of SLM in place.