itSMF International
The IT Service Management Forum

IT Service Management
GLOBAL BEST PRACTICES

Collector's Edition

Metrics

Chapter 9

9.1 Introduction

If we wish to improve our services, we first need to know exactly what we actually deliver to our customers, how these customers feel about the services delivered, and what kind of improvement would have the greatest impact on their satisfaction. For all of this, we need to measure our performance, and investigate our customer's needs. This is exactly what this chapter is all about.

First, we need to find a way to get metrics working in our IT service management organization. To this end, David Smith introduces a measurement framework, which can help us create a "roadmap to improvement."

Another way to measure our organization's performance is by benchmarking it against peer organizations of the same type. Jan Sonneveld et al explain how the itSMF benchmark helps to check the performance of your organization against ITIL®, and ISO/IEC standards, and how this compares to other organizations.

Although Smith also touches on the idea that metrics should be relevant to the business, Linh C. Ho and Bryce Dunn completely focus on this aspect of performance measurement, in their article on selecting business relevant metrics. By presenting a clear step-by-step approach, illustrated by two case studies, they show the reader how to get the right metrics for the right organization.

In their second article, Ho and Dunn illustrate why the statistical improvement method, Six Sigma, makes the perfect fit for ITIL Continual Service Improvement, because of its focus on making improvements that really matter to the business. And that is, after all, what IT service management should be all about.

CONTENTS

This chapter contains the following articles on measuring and improving quality:

SHORT SUMMARIES

An organization needs to be able to identify, measure and communicate the metrics that reflect the benefits that IT is delivering to the business units. They should be able to prove that the business' investment in IT service management results in tangible and relevant improvements. In his article, **David Smith** provides the reader with a measurement framework to align IT with the business objectives, creating value through continual improvements. He first provides the basic concepts around measurements for business and IT alignment, achieving compliance and driving operational excellence. Then, he explains how to implement such metrics, by introducing a phased approach to measuring and reporting. Finally, reporting techniques show how an IT service management organization can communicate effectively with the customer on its achievements.

The itSMF benchmark described by **Sonneveld, Boyle, Van Selm, Verstralen, Bos and Alofs** covers the subjects of ISO/IEC 20000, ITIL version 2, process maturity, Total Cost of Ownership (TCO), project management and tools. It asks simple questions that can be answered with simple answers, indicating the extent to which the process is being followed. This results in an overview of an organization's competences and opportunities for improvement. As exactly the same questions are also asked of other participating organizations, and the answers are limited to percentages, the overviews can be easily compared. This enables organizations to learn from each other, and to start working according to best practices in the truest sense of the word: practices that have actually been developed in practice and have proven to be best.

Ho and Dunn state that there is still a major disconnect between business and IT, which is exacerbated by too much data and not enough information or knowledge to make informed business decisions. If organizations are really serious about integrating business and IT, they need to select the right metrics for reporting, to enable a common foundation for dialog, and ensure that the right expectations are set on each side. Ho and Dunn explain how IT and the business can select the most appropriate metrics. Then, they can move away from technical IT metrics, such as CPU utilization, to metrics that provide decision makers - at every level of the organization - with the information they need to make informed decisions.

In their second article, **Ho and Dunn** focus on the importance of ITIL Continual Service Improvement (CSI) *where it matters most*. To find out which improvements are most likely to be actually noticed by the business, a statistical improvement approach such as Six Sigma makes the perfect fit. Ho and Dunn introduce the concept of Six Sigma and explain the basics, introducing some key Six Sigma techniques, such as the control chart, the voice of the customer survey and the cause and effect diagram. Then, they map the improvement steps from the CSI seven step process to Six Sigma's Define-Measure-Analyze-Improve-Control (DMAIC) approach. The case study, which focuses on a leading European financial institution, shows how Six Sigma helps to find the improvements that are most likely to benefit the business.

9.2 How to implement metrics for IT service management

We are often too busy to ask for directions. Implementing a measurement framework should help align IT with the business objectives and create value through continual improvements. This helps us create a roadmap and keeps us from getting lost. In this article, David A. Smith presents such a framework.

INTRODUCTION

It's often been said that "you can't manage what you don't measure", which is still true to this day. Without purpose and a course to follow, the destination is uncertain and almost always unpredictable. Many management books have been written on this subject, ranging from personal development to organizational leadership. They all agree in principle that a purpose, goal or destination must be determined in order to chart a course and path to achieve them. Once the path or roadmap has been defined, the journey must be carefully planned to guide the traveller safely to the desired destination in the prescribed time within planned costs.

Measurements are like navigational aids. They help identify the destination, the roadmap to follow, hazards to avoid, milestones to reach, fuel consumption, constraints or limitations, expected time of arrival, and so on. Without navigational aids, one could get lost, end up anywhere, get stranded, fall off a cliff, run out of fuel, get in an accident, or fall asleep at the wheel.

The challenge for information technology (IT) providers is that the destination can change quickly, frequently and without notice. The information age fuelled by IT has made it possible to accelerate the pace of businesses. Product and service lifecycles have been reduced from years to days in extreme cases. The business must now lead the marketplace or stay close behind. If the business doesn't manage to do so, it will vanish as a result of heightened global competition. This has resulted in a run-away feedback loop: IT enables the business to evolve more quickly; competition requires IT to change more rapidly, efficiently and effectively. Continual change has become "the nature of the beast".

IT is quickly becoming one of business' most costly, critical and strategic assets. Of late, the money spent on IT is in question, business leaders are continually asking for proof of value delivered. This has put more strain on IT leaders to demonstrate value, reduce costs and improve services, or else be outsourced.

IT providers need navigational aids, more so than ever. This presents somewhat of a conundrum. Most IT providers are too busy to figure out how to implement measurements, let alone become experts in their use to control and manage the business of IT.

Goal of this article

The goal of this article is to endow IT providers with a flexible and scaleable measurement framework which is easy to learn, implement, manage and improve. The goal of this framework is to provide process metrics and techniques to help align IT with the business objectives in order to create value. The framework is based on a continual improvement lifecycle and helps align IT with the business objectives and create value, making processes and services more "efficient and effective". It helps the reader determine ways to:

- align IT with business objectives and verify the results
- maintain compliance requirements for business operations
- drive operational efficiencies, effectiveness and quality

The measurement framework can be implemented as a comprehensive measurement program for all processes and services, or selectively for individual process or services. It is aligned with the IT Infrastructure Library (ITIL®), also a set of best practices. The framework is compatible with the Control Objectives for IT (CobiT®) framework and supports the ISO/IEC 20000 standard for IT service management.

More details can be found in the book "Implementing Metrics for IT Service Management" (Smith, 2008). The book provides methods, concepts, examples, techniques, checklists and software templates to accelerate adoption through a "how to" based approach.

What you will learn

By reading this article, the reader will gain an insight into:

- a basic overview on how to apply Information Technology Service Management (ITSM) metrics and where to find more information
- basic measurement framework concepts
- the measurement process of monitoring, analysis, tuning, process improvement, administration and reporting
- typical measurement costs, benefits and common problems
- steps for implementing and optimizing the measurement system
- common reporting techniques

Scope

Although this measurement framework can be applied to any process, service or technology metric, the scope of this best practice document is in the context of process- and service-based measurements. Figure 1 provides an illustration of process- and service-based measurements from the "Metrics for IT Service Management" book (Brooks, 2006) and includes additional references to quality, efficiency and effectiveness measures.

Table 1 provides an example of strategic, tactical and operational processes based on the ITIL® version 2 (V2) set of best practices. Further information and specific metrics for each of these processes can be found in the book "Metrics for IT Service Management" (Brooks, 2006).

The measurement framework can be implemented as a comprehensive measurement program for all processes and services, or selectively for individual process or services.

Who should read this article

This article is intended for all levels of IT management. Specific interest by role includes:

- IT executive management

- process/service owners and managers
- measurement owner and manager
- IT team leaders
- quality managers
- service level managers

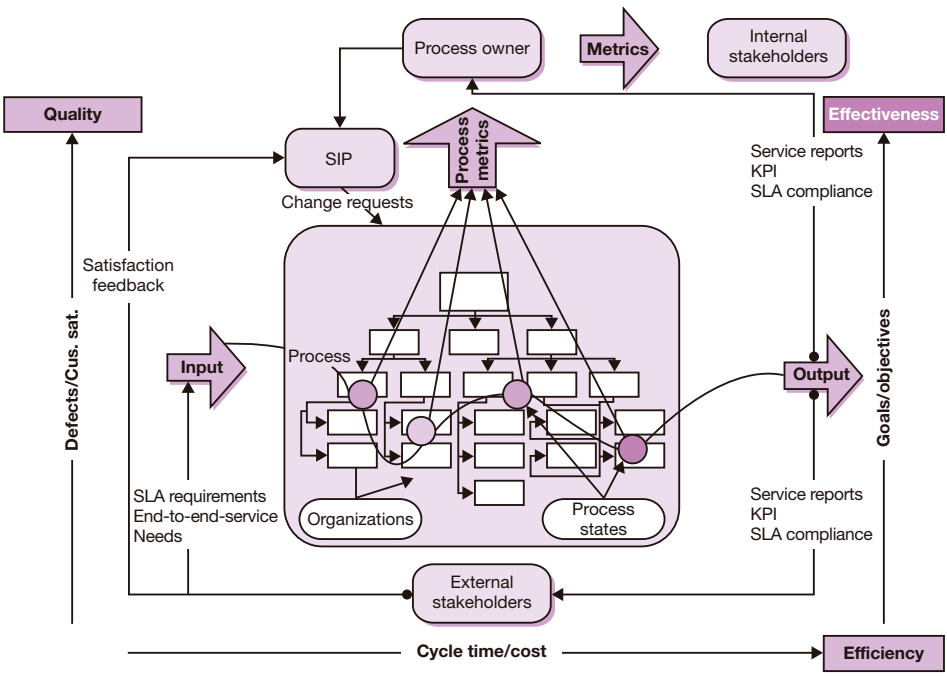


Figure 1 Process & service based measurements

Strategic	Tactical	Operational
Business perspective	Service level management	Service desk
Service improvement program	Problem management	Incident management
Risk Management	Financial management	Configuration management
Document management	Availability management	Change management
Competence, awareness & training	Capacity management	Release management
Program and project management	Service continuity management	Application development
	Security management	Application support
		Operations management

Table 1 Strategic, tactical and operational processes

HOW TO IMPLEMENT ITSM METRICS

What metrics are all about

Based on the book “Metrics for IT Service Management”, a “metric” is just another term for a measure. Metrics define what is to be measured. For IT, this includes technology, processes and services. Metrics provide the feedback mechanism allowing management to steer,

control and guide IT toward strategic objectives. The book further explains that metrics help to:

- align business and IT objectives
  - accounting of IT processes and deliverables
  - inform stakeholders
  - understand issues
  - influence behaviour
- achieve compliance
  - IT operations strategy
  - ISO/IEC 20000, CobiT®, service levels
  - critical success factors
  - minimize interruptions
- establish operational excellence
  - measure, control, and manage cost effectiveness
  - improve effectiveness and quality
  - service level improvements
  - maximize value creation

Implementing metrics

Metrics for IT service management need to measure process and service effectiveness in addition to the functions and technologies that provide them. Metrics in IT have traditionally been measured in functionally-oriented silos like the help desk, server technical services or the operations department. Information technology departments are shifting to process- and service-centric organizational models requiring metrics which report beyond the functional boundaries to determine success. For example, both the application development and IT operations departments are functionally very mature and when independently measured, appear successful. However, they don't work well with each other and together frequently fail to deliver deployments.

Metrics have been very mature for measuring technology availability on a discrete component basis, but in many cases without consideration for the end-to-end user experience. For example the application server was available 99.99% of the time but the network was not measured and turns out to be frequently not available or not responsive. Therefore, the measure of system availability (server plus network) does not match the user experience.

To solve this, a new and improved approach for implementing metrics is needed, using a continual improvement framework. This must meet new and changing compliance requirements and provide a means to gain operational excellence. The measurement framework reference model presented in this article can be quickly implemented, adapted and evolved to meet the organization's needs. Some of the key features of this measurement framework reference model include:

- continual improvement, that is, W. Edward Deming's Plan-Do-Check-Act cycle (Deming, 1986)[1]
- top-down design approach for aligning goals and objectives
- process- and service-based IT service management approach

[1] *Edwards Deming has been inspired by Walter Shewhart, one of his teachers already advocating a "learning and improvement cycle" (Shewhart, 1980). The PDCA-cycle of Edwards Deming is also known as the PDSA-cycle, which stands for "Plan-Do–Study-Act". In this case, the results are studied instead of checked.*

- scaleable and flexible fit-for-purpose model with hundreds of sample metrics and scorecards
- bottom-up reporting of facts, metrics, indicators, scorecards and dashboards
- aggregation of metrics to formulate key performance indicators
- accountability and role-based matrix models
- techniques for comparative, causal and predictive analysis
- method for filtering improvement initiatives and tracking performance status
- ability to report performance improvements and derived value-based benefits
- multiple implementation methods and scenarios
- how-to check lists for planning and implementing metrics
- scorecard accelerator templates to demonstrate principles and techniques, and to help kick-start the implementation of a measurement program

Basic concepts

There are four critical success factors for an effective measurement framework:

- enable validation of the strategy and vision
  - aligned with the IT goals and objectives
  - validation that alignment is working
  - confirm goals and objectives are met
- provide direction with targets and metrics
  - set targets through metrics
  - control and manage the processes
  - verify targets are being met
- justify with a means to gauge value realized
  - justify performance improvements with a solid fact base
  - quantify benefits realized
  - communicate value realized with factual evidence
- intervene and provide corrective actions
  - identify deviations when they occur
  - understand the root causes
  - intervene with corrective actions to minimize consequences

Figure 2 provides an outline of the measurement framework.

The measurement process

The measurement process comprises four main sub-processes which repeat to form a continual improvement feedback loop based on W. Edward Deming's Plan-Do-Check-Act cycle. The sub-processes of the measurement process are:

1. **Tuning (Plan)** - The tuning sub-process is responsible for identifying improvement opportunities and recommendations for the subject process or service which is being measured. Note that the tuning sub-process can also act as the entry point for planning the measurement program and framework.
2. **Implementation (Do)** - The implementation sub-process is responsible for implementing the recommended changes through normal change management processes. Note that the implementation sub-process can also act as the entry point for implementing the measurement program and framework.
3. **Monitoring (Check)** - The monitoring sub-process is responsible for the data gathering, calculations and validation of the required measurements.
4. **Analysis (Act)** - The analysis sub-process is responsible for comparative, causal and predictive analysis of the measurements to determine what corrective actions may be required.

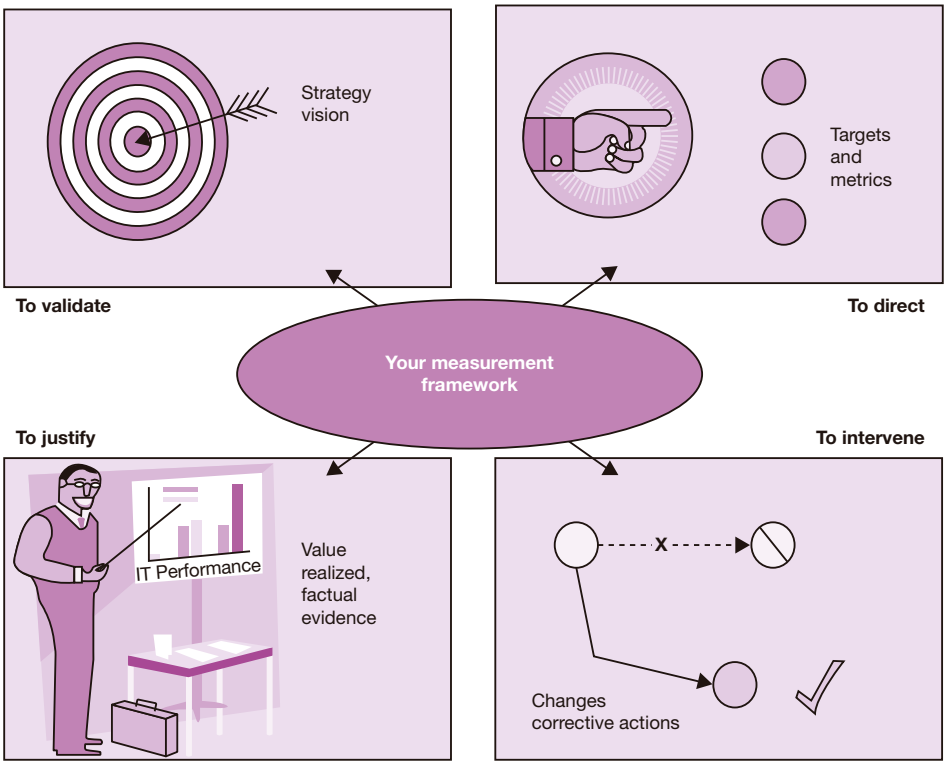


Figure 2 Measurement framework

There are two additional supporting sub-processes which provide administration and reporting:

1. **Administration** - This sub-process is responsible for the administration of the activities associated with the maintenance of the metrics and measurement database (MDB).
2. **Reporting** - This sub-process is responsible for reporting the findings and recommendations to management and various stakeholder groups, keeping them informed and aware.

There are a number of sources of information that are relevant to the measurement process. Some of these *inputs* are as follows:

- the organization's business plans, strategy and financial plans
- the IT/IS strategy, plans and current budget
- any goals and objectives set by business or IT management
- any targets and thresholds to maintain or achieve service levels
- service level agreements, service level requirements and service catalogs
- initiatives to be monitored as a result of service reviews or improvement activities
- the rolling business- and IT-program and project calendar

The *outputs* of the measurement process are used to report the status, findings and recommendations of various service management processes and services to key stakeholder groups within the organization. Some of these are as follows:

- process- and service-based performance reports
- exception handling reports

- notices and alerts
- root cause analysis and observations
- predictive analysis and observations
- change requests
- status of new and existing service improvement initiatives
- benefits or value derived from processes, services, service assessments, audits and reviews

Figure 3 shows the inputs to, the activities within, and the outputs from the measurement process.

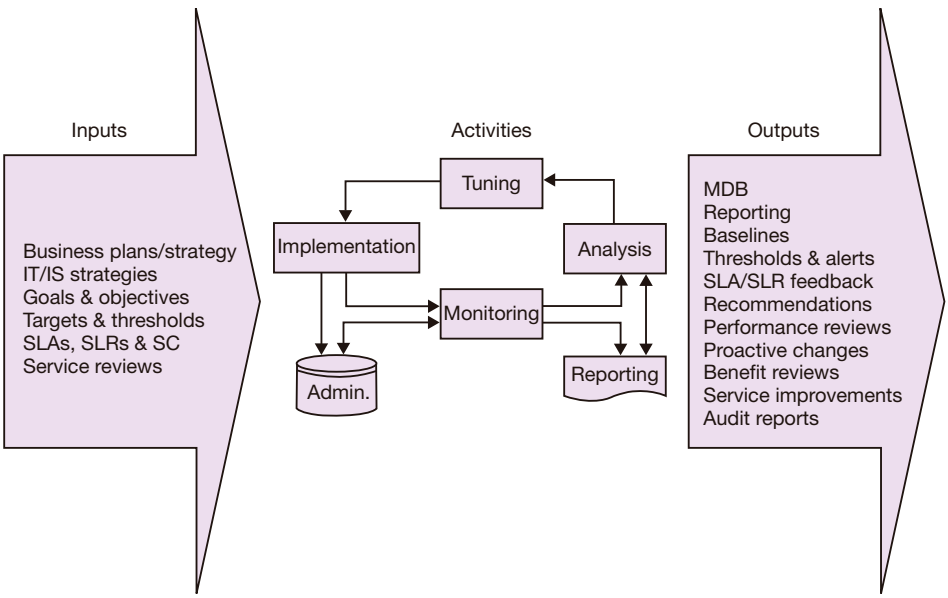


Figure 3 Measurement process inputs, activities and outputs

Measurement activities

This section describes activities for each sub-process of the measurement process. The sub-processes are carried out on a sequential basis, normally on a predefined and agreed schedule (for example monthly). Each sub-process:

- requires inputs
- performs activities
- produces outputs

These outputs provide the inputs to the next sub-process in the sequence. The sub-processes are performed on a cyclical basis. This forms a feed-back loop providing a basis for continual improvement. Like ITIL's capacity and problem management processes, some activities in the measurement process are reactive, while others are proactive.

A powerful feature of how the sub-processes can be used with the same data is the perspective from which it is analyzed, in terms of reactive (prescriptive) versus proactive (preventive).

For example, the decline of a service level or a critical process measure could set off a series of reactive event triggers. The triggers set an alert which automatically starts an investigation to determine the root cause and initiate corrective actions (prescriptive).
Another example might be where a decline of a service level or a critical process measure could set off a series of proactive event triggers. The triggers set an alert and start an impact analysis to determine which dependent services or processes are at risk and initiate preventive actions (preventive). These event triggers and actions are similar to the ITIL® event management process.

The proactive (preventive) activities of the measurement process should:
- provide the information necessary for actions to be taken before the issues occur
- produce trends of the current process or service workload (utilization) and estimate the future resource requirements
- improve change planning for IT services
- identify the changes that need to be made to the appropriate processes to maintain service levels
- actively seek to improve the service performance and provision

A number of the activities need to be carried out iteratively and form a natural lifecycle as illustrated in figure 4.

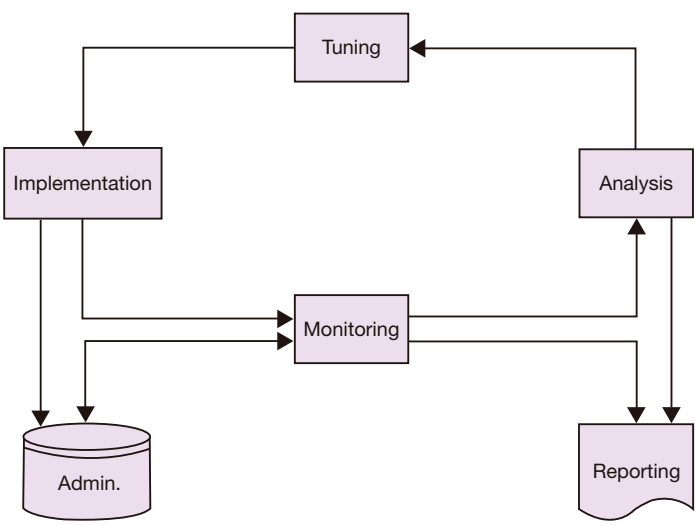


Figure 4 Measurement process lifecycle

Data collection extraction should be established and automated, where possible, for each of the processes or services being measured. The data should be transformed, loaded and analyzed, using systems to compare actual values against performance thresholds. The results of the analysis should be included in reports, and recommendations made as appropriate.

Decision analysis and management control mechanisms may then be put in place to act on the recommendations. This may take the form of:
- renegotiating service levels

- modifying policies
- making process improvements
- implementing tools
- developing new scorecards and metrics
- adding or removing resources

The cycle then begins again, monitoring any changes made to ensure they have had a beneficial effect and collecting the data for the next day, week, or month. The suggested frequency for managing the sub-processes is:

- **on an on-going basis** - main sub-process activities and the storage of data in a measurement database (MDB)
- **ad hoc** - proactive and reactive activities to initiate improvements to strategic, operational or tactical processes or services
- **regularly** - the production of the service reports, review of benefits realized and improvement initiatives

Figure 5 shows the sub-process activities together with the other activities of the measurement process that need to be carried out.

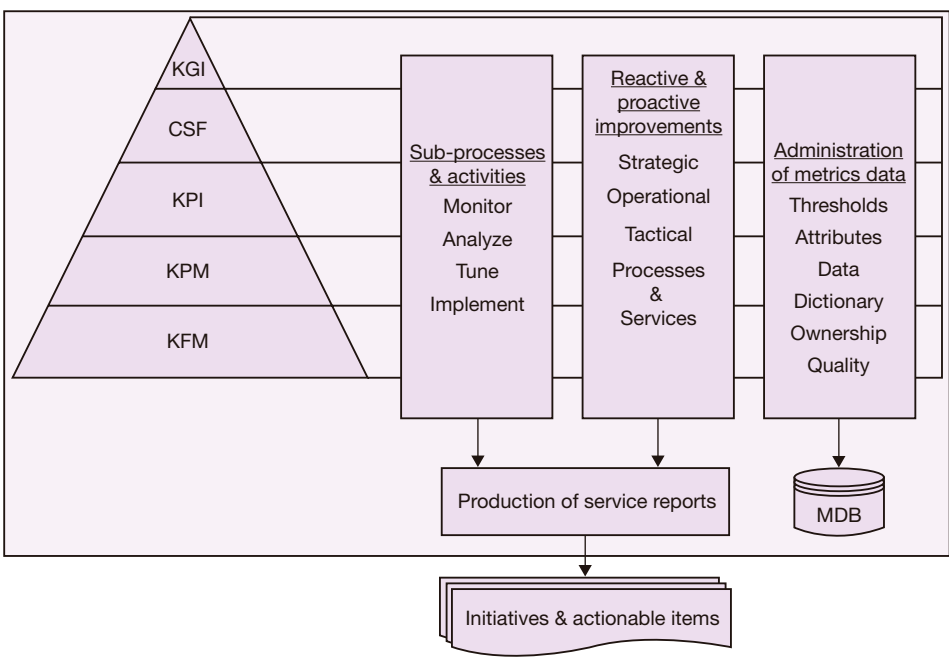


Figure 5 Measurement sub-process activities

Costs, benefits and possible problems

A well planned and implemented measurement program is one of the better investments an organization can make. Most mature organizations have well established measurement programs in their financial, human resources, sales & marketing and business operations departments where measurements are just common sense and part of the normal operating practices. Justifying the implementation of a measurement program will require examination of the costs, benefits and risks to determine the right scope and fit-for-purpose.

Costs
The first step is to estimate the project implementation costs and ongoing maintenance costs required for the measurement program.

Project implementation costs:
- **hardware and software** – metrics database, design and reporting tools
- **project management** - should be treated as a project
- **staff costs** – training and consultancy

Ongoing maintenance costs:
- hardware and software maintenance costs
- ongoing staff costs such as:
  - salaries
  - training
  - ad-hoc consulting
- storage
- upgrades
- licenses

Benefits
Measurements help improve performance, align goals and realize value. The positive benefits can be weighed against the negative consequences of not having a measurements program.

Benefits of a measurement program:
- provides the instrumentation necessary to control an organization
- direct focus on specific performance and control objectives
- easier to spot danger in time to correct it
- improves morale in an organization
- stimulates healthy competition between process owners
- helps align IT with the business goals and verify results
- drives efficiency, effectiveness and quality
- inspires continual improvements
- helps reduce Total Cost of Ownership (TCO)

Negative consequences of not having a measurements program:
- reduced visibility resulting in loss of control
- focus on “noise” instead of “what’s important”
- reactive fire-fighting mode
- low morale in organization
- unhealthy political competition
- benefits not apparent or realized
- cost effectiveness not understood
- customer complaints drive improvements
- TCO not optimized
- increasing risk

Effect on Total Cost of Ownership (TCO)
A measurement program can help reduce the Total Cost of Ownership (TCO). TCO was developed by Gartner and has become a key performance measurement for efficiency and effectiveness. TCO is the total cost of owning networked information assets throughout their

lifecycle, from acquisition to disposal. It is a measure of efficiency and cost effectiveness which can be reduced through improved IT processes and services. This entails improving the efficiency, effectiveness and quality of IT processes and services. Gartner's TCO studies revealed that the TCO for an average PC could range anywhere from $6,000 to $12,000 per user per year.

TCO measures both the "hard" and "soft" costs of information assets. Direct costs include items such as capital, operations and management costs. These costs are considered "hard costs" because they are tangible and easily accounted for. However, even more significant in many IT environments are the indirect or "hidden costs" related to user peer support, training and downtime. Because they don't occur at acquisition time, they are often overlooked in budgets. Ineffective performance causes a transfer of management and support responsibility to end users resulting in higher costs and dissatisfaction.

Figure 6 illustrates the TCO of technology assets throughout their lifecycle.

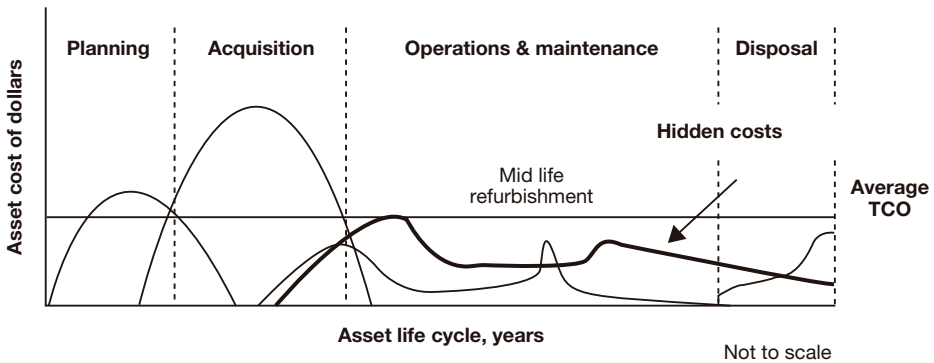


Figure 6 TCO cycle

Improving the efficiency of IT processes and services will positively impact the direct costs. Improving the effectiveness and quality of IT processes and services will positively impact the indirect or hidden costs.

Possible problems

Potential problems can be identified, prepared-for and dealt-with in advance. The following provides a list of potential problems that could be encountered and their possible solutions:

1. **no senior management sponsorship** – increase management commitment
2. **metrics conflicting with organizational goals** – align metrics to goals
3. **lack of understanding** – increase communication and check interpretations
4. **too much or not enough detail** – assess which level is needed
5. **lack of education and training** – check what is needed and take action
6. **difficulty obtaining input data** – adjust time and resources available
7. **inadequate measurement tool** – improve MDB or add sub-systems
8. **unclear goals and objectives** – increase communication
9. **unclear roles and responsibilities** – identify stakeholders
10. **takes too long to demonstrate benefits** – create quick wins

Implementing a measurement program

You need to consider the following prior to implementing a measurement program:

- where to start
- why do it
- who to involve
- what are the steps
- when to expect results
- how to make it happen

The following sections provide general guidelines, questions to be answered, ideas and best practices to help answer some of these questions. In most cases, the planning and implementation approach must be tailored and fit-for-purpose for your organization. To develop the implementation plan for the measurement program, start with the following planning activities:

- review what already exists
- plan the approach
- implement the measurement process
- optimize the measurement process
- review and audit

Review what already exists

To review what already exists, you can conduct assessments, interviews or workshop meetings in order to answer the following questions (together with any of your own):

- Is there senior management commitment?
- Who is the implementation champion?
- Does a budget exist?
- Are resources available?
- Are the skills and knowledge in place?
- What is the culture and organization structure?
- What is the business and IT vision/strategy?
- Are measurement tools and technology already in place?
- Are there demands for "business as usual"?
- Which processes are in scope?
- What are the current and desired requirements of each process (scope, goals and objectives)?
- Which processes would most benefit from this program?
- Who are the ITSM process owners and key stakeholders?
- Who is the proposed measurement process owner?
- What is the maturity level of people, processes and tools?
- What metrics and targets are in use?
- What are the potential roadblocks?

Use the answers to these questions to formulate a list of gaps. This list can then be prioritized for the next step: plan the approach.

Plan the approach

The right approach for the organization depends on many variables, like:

- internal and external business drivers
- volume of change already taking place
- the readiness of the organization (list of gaps)

- senior management involvement
- resistance to change
- current workload
- skills and capability

Information from the initial review session can be used to select the best implementation approach. There are a number of questions to consider and answer:

- **Implementation phasing** – Are we going to implement one or more processes at the same time?
- **Structure of the measurement process and metrics** – Which processes and services will best help align IT with business goals and objectives?
- **Roles and responsibilities** – Who will be responsible and accountable for the measurement process?
- **Establishing policies and procedures** – Will new policies and procedures need to be considered?
- **Communication strategy and plan** – Who are the key stakeholders and what messages need to be crafted?
- **Data collection** – What data will be necessary for the measurement and metrics?
- **Establishing baselines** – How will the baselines be determined?
- **Setting targets and thresholds** – How will targets and thresholds be determined?
- **Storage of metrics data** – Where and how will the metrics data be stored?
- **Monitoring the metrics** – How will the metrics data be monitored?
- **Performance analysis** – How will the performance of the metrics be analyzed?
- **Performance tuning** – What are the criteria for conducting performance tuning?
- **Service improvement initiatives** – What is the selection process for improvement initiatives?

Implement the measurement process

Implementing the measurement process is best treated as a project. It should complete at least one process lifecycle before being transferred to operations. The high level steps are outlined as follows:

- train staff
- conduct the initial planning phase
- initiate communications plan
- create, install and configure MDB
- design, install and configure dashboards, scorecards, KGIs, CSFs, KPIs, KPMs and facts
- establish monitoring
- analyze results
- produce reports
- process tuning
- initiate service improvements
- transfer control to operational staff
- audit and review for compliance, effectiveness, efficiency and quality

This should be customized to meet organizational requirements

Optimize the measurement process

The measurement process should be reviewed internally for effectiveness and efficiency at regular intervals. This should help determine areas for improvement and optimization. The review should assess and report on the following subjects:

- if measurement program goals, CSFs and objectives are being met
- the quality of information (completeness, accuracy, validity)
- whether benefits have been realized and communicated
- the cost effectiveness of the measurement program
- the satisfaction of the users of the measurement program

Furthermore, service improvement initiatives should be assessed and recommended.

Based on the assessment and review of the measurement process, recommendations should be acted upon for improvement and optimization of the measurement process. These should include:

- where to initiate measurement program improvements
- when to add new or improved processes
- what to update (core attributes, targets, thresholds, benchmarks)
- what to automate (data collections, reporting)
- how to improve reporting and communications

Review and audit

Like all ITSM processes, the measurement process should be reviewed for compliance, effectiveness, efficiency and quality. Audits should be performed by an independent person or group rather than the measurement process owner or manager. The general intent of the review and audit is to determine:

- what was done right
- what went wrong
- what could be done better next time
- how to prevent issues from happening again
- the causes of the issues that occurred
- how we can learn from experiences and improve

Measurement program reviews and audits should be considered at the following times:

- shortly after implementation of a new measurement system
- before and after major changes to the measurement process
- at random intervals
- at regular intervals

Reporting techniques

The data gathered in the monitoring phase of the measurement process should be analyzed. A report on the information acquired should be given to the proper (management) audience. There are many techniques for the effective reporting of metrics. At the lowest level, classification of measures by themes helps improve reporting. Trending of individual metrics provides detailed information to operational management about the state of the process or service activities. Using aggregation methods, metrics are classified and grouped together by themes for process owners and senior management to determine the health of a process or service. At the highest level, using dashboards and scorecards, reporting techniques can help to visualize the end-to-end process or service in order to quickly determine value realized and opportunities for improvement. This section discusses some commonly used techniques.

Classification of measures

Measures can be grouped by themes and classified to produce strategic and tactical types of key indicators and metrics. Classification is a method of categorizing measures into groups that help steer, control, direct, justify, verify, correct and optimize value. Some examples of classification are as follows:

- **Key Goal Indicator (KGI)** - A KGI is used to confirm (after the fact) that a business or IT goal has been achieved.
- **Critical Success Factor (CSF)** – A CSF is a business term for an element which is necessary for an organization to achieve its mission.
- **Key Performance Indicator (KPI)** - KPIs are metrics used to quantify objectives to reflect the performance of a process or service.
- **Key Performance Metrics (KPM)** - Key performance metrics are a system of parameters or ways for undertaking the quantitative and periodic assessment of a process or service that is to be measured.
- **Key Fact Metrics (KFM)** – Key fact metrics are the quantitative data which provide fact-based information on the process activities during a period of time.

Figure 7 illustrates the classification of metric themes and their relative impact, from the tactical to the strategic level.

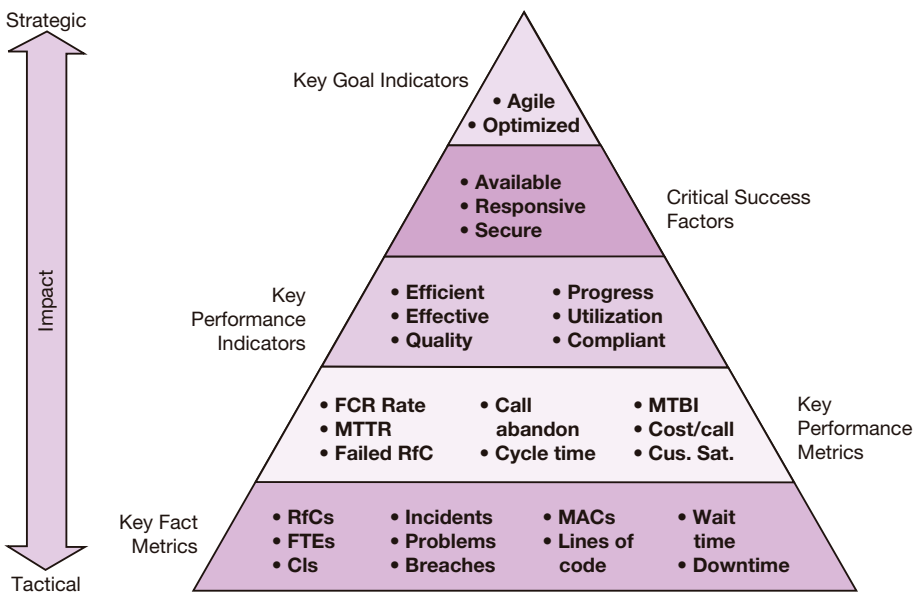


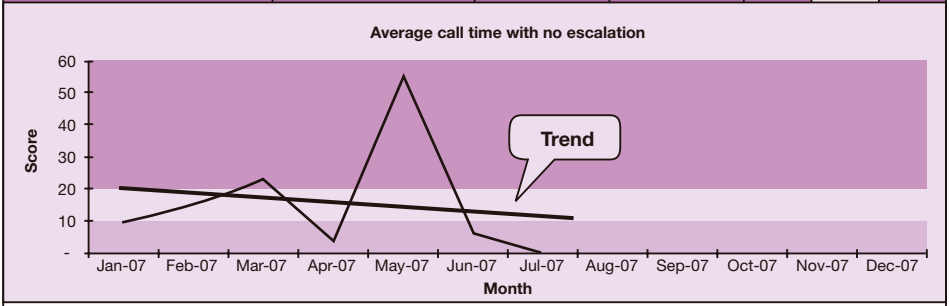
Figure 7 Sample classification of measures

Trending

Monitoring and reporting trends of individual metrics helps identify potential problem areas within a process or service. Trending helps pinpoint the hot-spots or weak links throughout the process or service. It typically includes monitoring the inputs, activities and outputs of the process over time. Thereby, it indicates variations over time and whether these variations are moving in the desired direction (better or worse). It also shows if improvements are required and if corrective actions are making a difference. Trending can be used to trigger alerts to

the metric owner. This person should then initiate a set of prescribed corrective actions or remedies. Figure 8 provides an example trending report for an incident management metric.

Incident management	Feb-07	Previous	10.0	Actual	15.0	Progress worse	Status	Yellow	IM002



Legend	Yr.	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
———	Actual	10	15	23	4	55	6						
———	Target	10	10	10	10	10	10	10	10	10	10	10	10
	Caution	10	10	10	10	10	10	10	10	10	10	10	10
	Danger	20	20	20	20	20	20	20	20	20	20	20	20

Figure 8 Sample trending report

Aggregation of metrics

Metrics can be aggregated together using indexing techniques. Then, they can be viewed as a group-theme to create key performance indicators. For example, a key performance indicator for quality may require looking at defect rates throughout the process and include the reported level of customer satisfaction. Figure 9 provides an example of quality for the change management process.

Alignment of key measures

Aligning the key measures requires a top-down view of what is important to the organization and its stakeholders. Then, a bottom-up build of the facts, metrics and indicators to support the desired outcomes. Executive management is most interested in executing strategy and vision to meet the goals and objectives. For them, KGIs, CSFs and KPIs that support strategy attainment are most important. Senior management are concerned with justifying, directing and controlling process and service delivery to meet the strategy and vision requirements. They need KGIs, CSFs, KPIs and KPMs that support operational excellence. Managers and staff are focused on process and service delivery execution, within the guidelines specified by senior and executive management. CSFs, KPIs, KPMs and KFMs help them tactically to stay-the-course, see figure 10.

Dashboards

Dashboard reporting helps provide the instrumentation for management control. Summarized and visual in nature, dashboards make it easier to concentrate on what's important. Dashboards can also identify successes and problem areas at a glance. Dashboards can be configured and personalized to provide strategic, operational and tactical views of the organization, technology, processes, services and activities. For example, Figure 11 provides an example overview of performance, goals, benefits and initiatives for all IT service management processes.

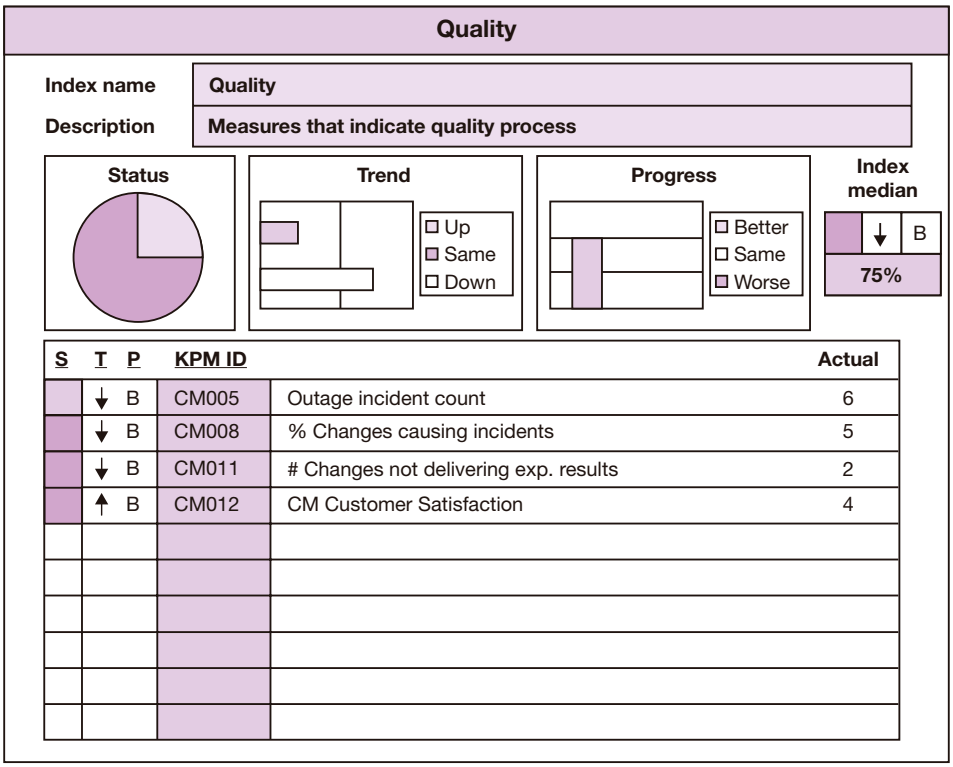


Figure 9 Sample aggregation of metrics

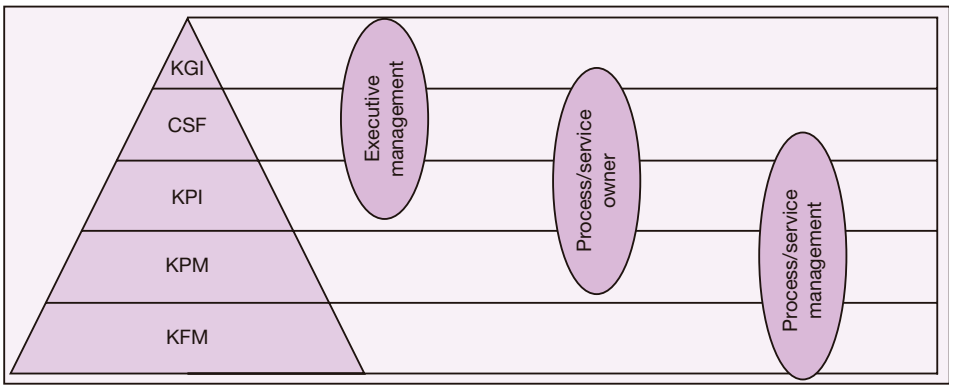


Figure 10 Alignment of key measures

Role-based dashboards

Role-based dashboards help make it easier to view, map and align relevant information by role. Figure 12 provides an example of mapping strategic information for a CIO, summarized IT service management results for senior IT management and specific process- and service-based results by process and service owners.

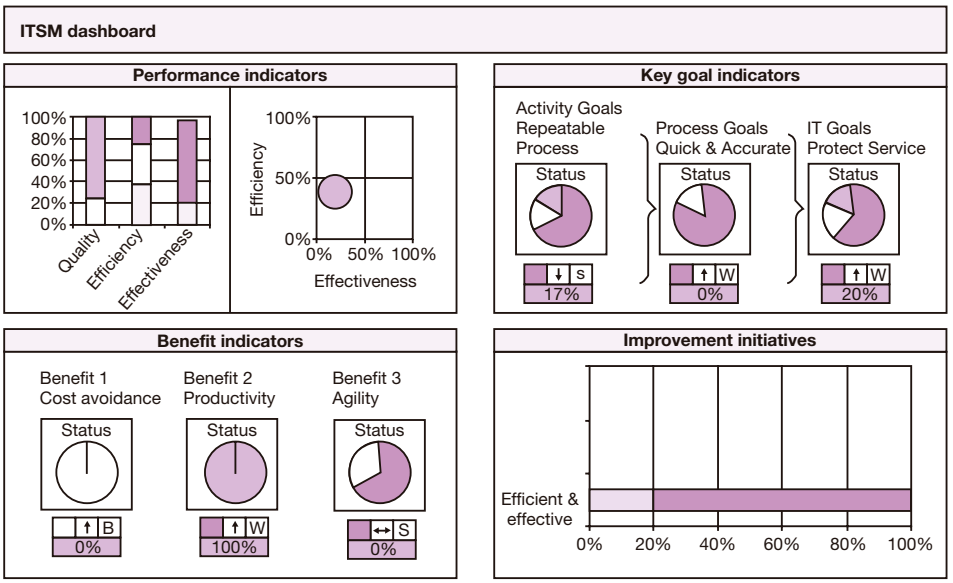


Figure 11 Sample ITSM dashboard report

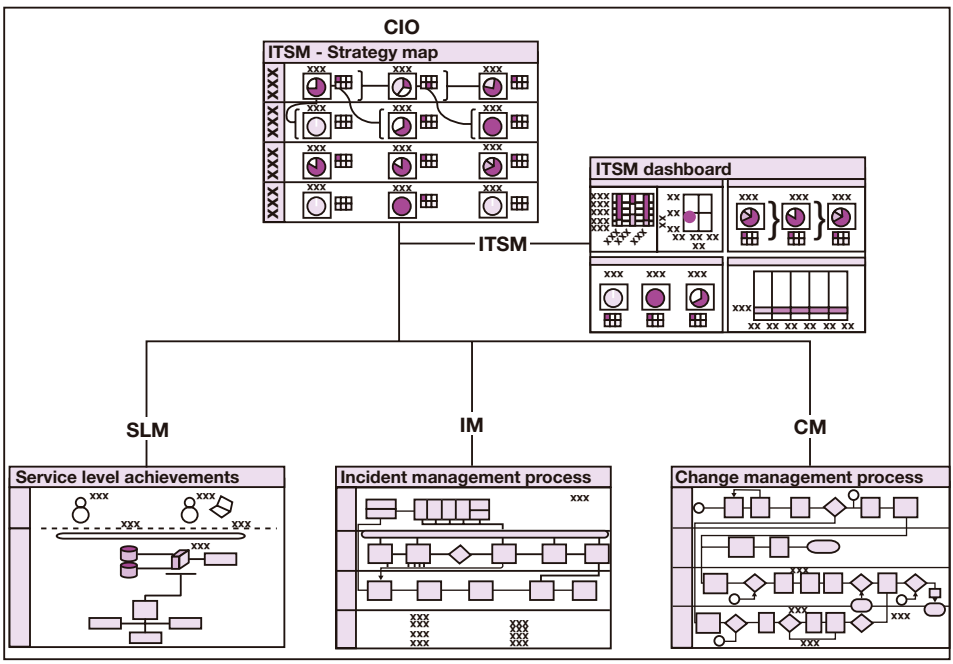


Figure 12 Sample roles-based dashboard hierarchy

Balanced scorecards

The balanced scorecard (BSC) is a methodology developed by Robert Kaplan and David Norton (1992). The balanced scorecard helps translate the organization's strategy into performance objectives, measures, targets and initiatives. This popular methodology

prescribes breaking the strategy down into perspectives using cause and effect linkages; then developing and using objectives, measures and initiatives to support each perspective. Figure 13 provides an example of four BSC perspectives.

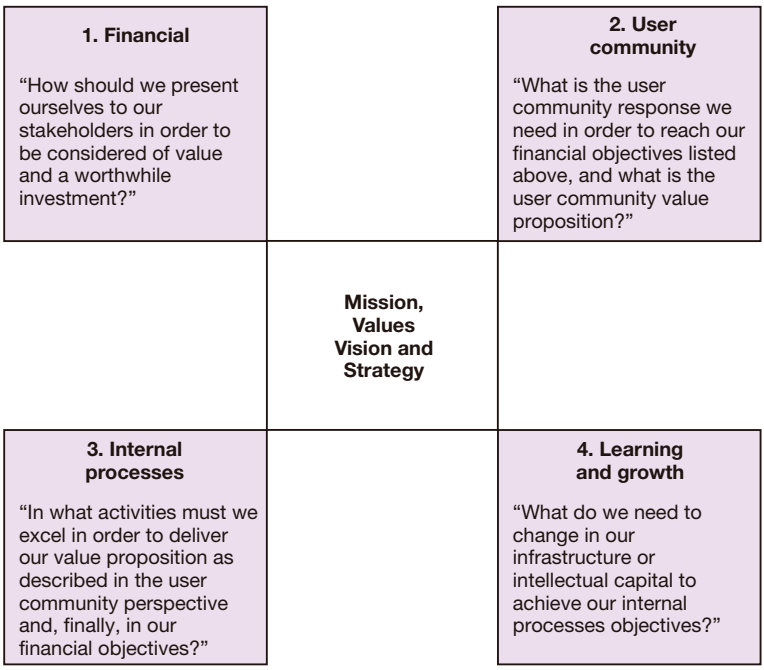


Figure 13 Sample BSC perspectives

General scorecards

General scorecards are used to present specific and summarized information by groups, themes or initiatives. Figure 14 provides an example of a series of scorecards related to a performance theme.

Cascading of scorecards

Using a cascading approach, scorecards should be designed top-down with the business goals and objectives in mind, then built bottom-up. This approach clarifies cause-and-effect linkages and helps ensure there is alignment and cohesiveness from top to bottom, see figure 15.

Strategy maps

Strategy maps are another form of a scorecard. They visually display the cause-and-effect relationships necessary to achieve the organization's vision and mission. Figure 16 provides an example of a strategy map designed to increase the value of IT to the business.

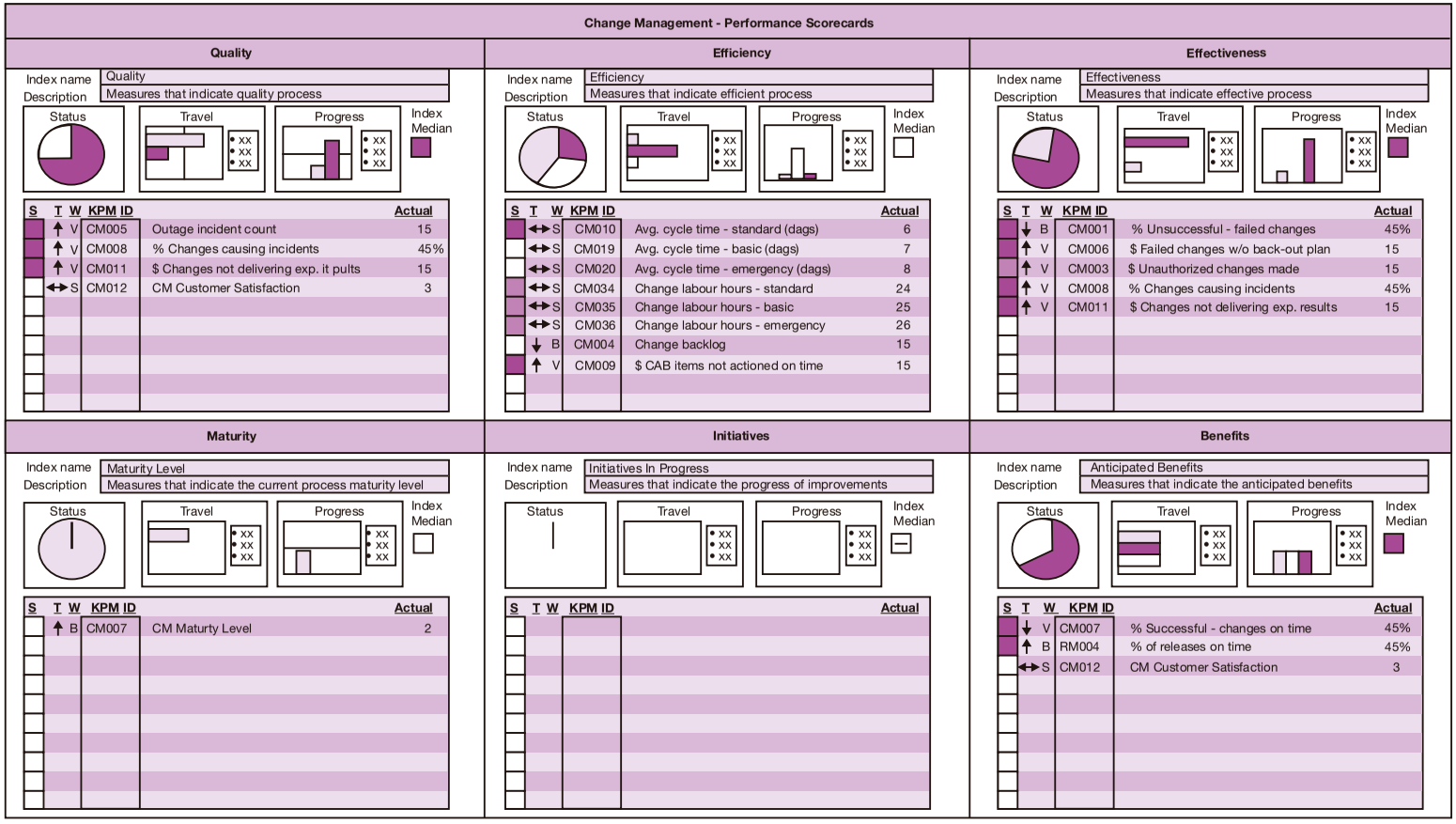


Figure 14 Sample general scorecards by themes

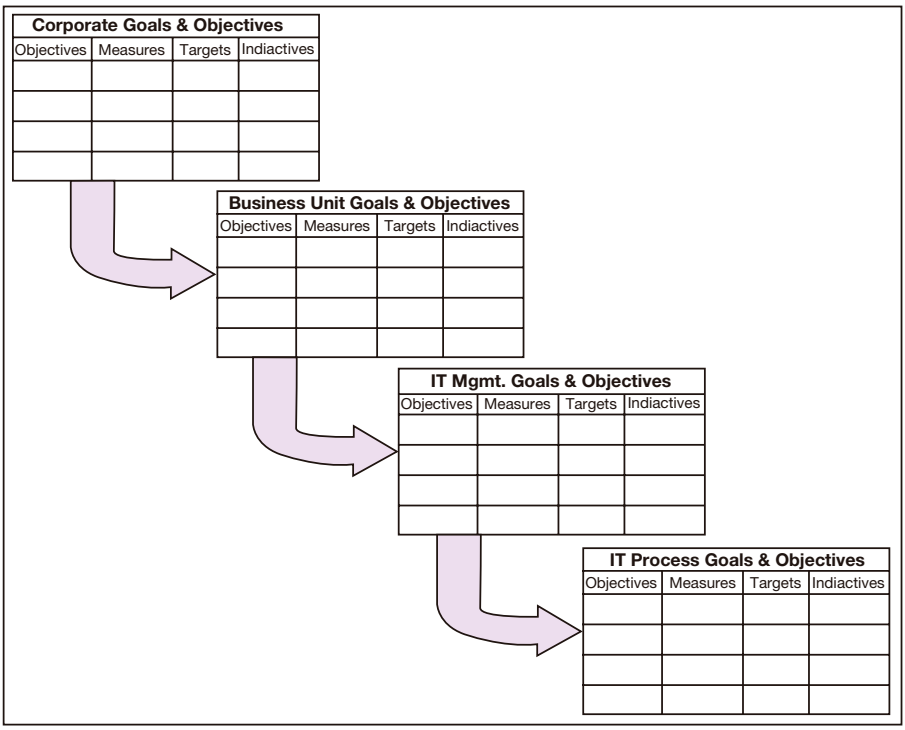


Figure 15 Cascading of scorecards

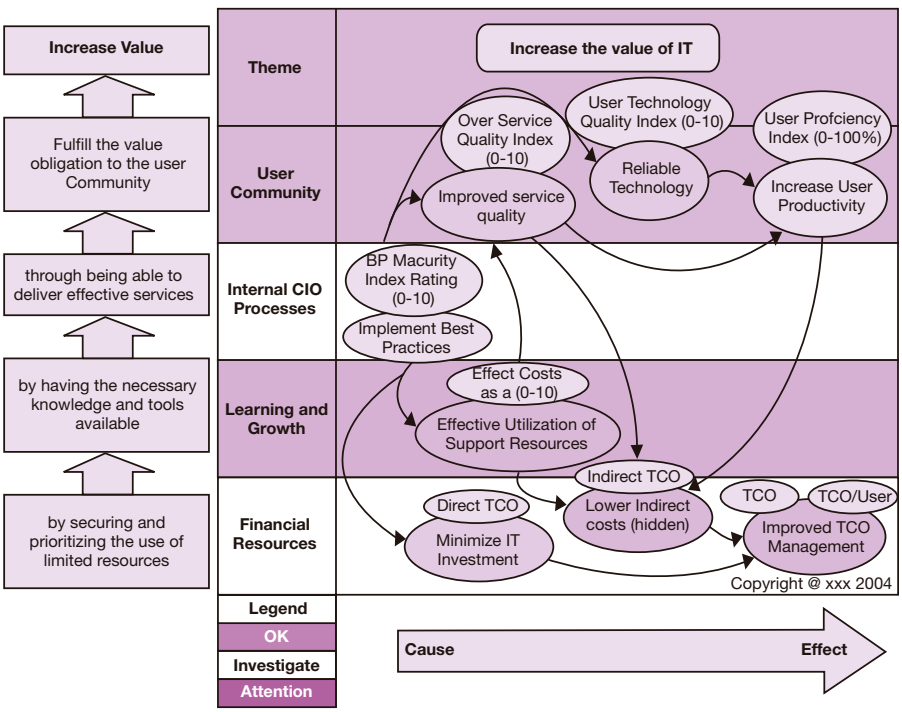


Figure 16 Sample strategy map for IT

Process map scorecards

Process map scorecards are another type of scorecard which help to:

- summarize the health of a process or service
- steer and control the process or service
- pinpoint hot-spots requiring attention
- predict where areas of improvement are required

Process map scorecards help view an end-to-end process or service as a whole. They are process- or service-centric regardless of who is responsible for the individual tasks or activities. Figure 17 provides an illustration of a process map scorecard for a change management process.

Summary

Implementing a measurement framework should help align IT with the business objectives and create value through continual improvements. It helps us to create a roadmap and keeps us from getting lost.

The measurement framework acts as the map; meeting the business goals and objectives are the destination, the critical success factors provide the directions and the metrics provide the sign posts to keep you on course.

The measurement framework presented by this article helps determine ways to:

- align IT with business objectives and verify results
- maintain compliance requirements for business operations
- drive operational efficiencies, effectiveness and quality

The framework is based upon Deming's continual improvement cycle, and comprises the following phases:

- **Tuning (Plan)** - The tuning sub-process is responsible for identifying improvement opportunities and recommendations for the subject process or service which is being measured.
- **Implementation (Do)** - The implementation sub-process is responsible for implementing the recommended changes through normal change management processes. As discussed, this phase contains the following sub-phases:
  - review what already exists
  - plan the approach
  - implement the measurement process
  - optimize the measurement process
- **Monitoring (Check)** - The monitoring sub-process is responsible for the data gathering, calculations and validation of the required measurements.
- **Analysis (Act)** - The analysis sub-process is responsible for comparative, causal and predictive analysis of the measurements to determine what corrective actions may be required.

After gathering and analyzing data, we should administer the information gathered and report on it. Commonly used reporting techniques that might be used for this are:

- classification of measures
- trending
- aggregation of metrics
- alignment of key measures

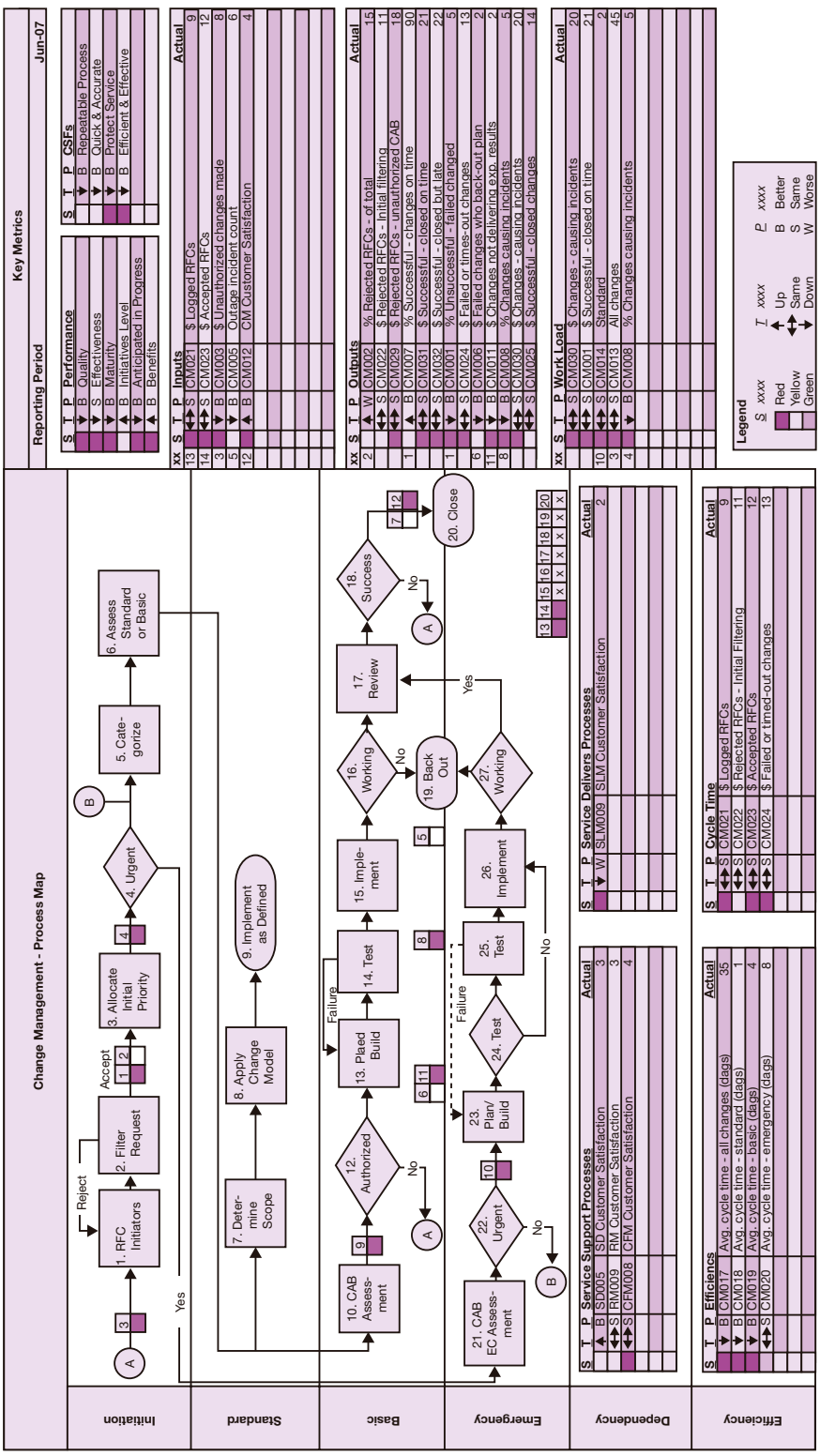


Figure 17 Sample process map scorecard

- dashboards
- role-based dashboards
- balanced scorecards
- general scorecards
- cascading of scorecards
- strategy maps
- process map scorecards

The measurement framework can be implemented as a comprehensive measurement program for all processes and services, or selectively for individual process or services.

Each organization may use this approach and the techniques discussed to create its own tailor-made measurement framework to improve its performance.

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9.3 The itSMF benchmark

Benchmarking is a best practice for everyone, including less mature organizations. It can help to improve practices and services significantly. In September 2006, itSMF Netherlands began developing a benchmarking model, which is now mature and available to all itSMF members. Jan Sonneveld et al. describe how they have designed and utilised this model, using best-in-class peers and proven benchmarking techniques.

Every reasonably large IT service management vendor (including consultancies and suppliers) has developed its own model to analyze customer performance and perhaps even measure and benchmark its operation. However, changing from one consultancy to another may cause problems in analyzing trends, due to different definitions and algorithms. Comparing apples and oranges does not yield valid results. This lack of standardization restricts some companies from measuring their IT functions in a structural way.

The itSMF benchmark provides a simple industry standard solution. The joint member model is being shared with business sectors and countries, enabling the whole of the itSMF community to learn from each other. This offers organizations the opportunity to set long-term targets, resting assured that whoever they use for advice can conform to the itSMF benchmarking standard.

To ensure the participation of many organizations, this model needs to be up-to-date with the most popular current frameworks, quality standards and maturity models. The model will have a periodic independent third party audit to ensure its quality and accuracy. Key to any benchmark is the data's integrity. Client data must be stored and managed by a reliable organization which keeps it safe and anonymous.

The itSMF Netherlands (itSMF NL) has accepted the responsibility to support and sponsor the itSMF benchmark model on behalf of the wider community. The model should be, and is, relevant to in-house IT functions, vendors and outsourcing service providers. It is especially important for this last category of vendors to use a generally accepted "open source" standard for measuring performance and cost efficiency.

The operation of the itSMF benchmark has been outsourced and revenues will be used to further improve and expand the model. Participating local chapters will receive database analyses reports, which they can publish for their members.

With the approval of the itSMF members we have decided to focus on the following main parts of the benchmarking model:

- ISO/IEC 20000
- process maturity
- total cost of ownership

- performance
- tooling

This article will initially outline the main benefits of IT benchmarking. Then, it will explore the key parts of the model and explain how they are used. Finally, it will provide some examples of the itSMF benchmarking data collection tools and show how results are being presented.

THE MAIN BENEFITS OF IT BENCHMARKING

Management and measurement go hand-in-hand. A recent survey from Bains Company (Rigby & Bilodeau, 2007), shows benchmarking as the second most commonly used management tool in large parts of the world.

Many large IT service management organizations use benchmarking as a tool to optimize IT service based on the performance of leading peers. IT benchmarking is often employed as a response to external pressures concerned with efficiency or effectiveness, forcing an organization to show how their own performance compares to their peers.

Enlightened organizations are using benchmarking in the context of continual service improvement. They are able to demonstrate improvement as well as slippage over time, alongside their Service Improvement Plan (SIP).

The main strength of benchmarking is the detailed comparison with similar best practice peers. This entails attention to detail, understanding the differences and taking action to meet upper quartile performance levels.

Benchmarking can show levels of quality that are available in the market against given unit costs.

The analysis of gaps between an organization's performance and that of benchmark peers results in the identification of strengths and opportunities. These strengths may be used to boost the confidence of IT staff and build trust with external service providers.

TEN REASONS FOR BENCHMARKING

1 Specified actions for improvement

Wouldn't it be great to have a detailed checklist of steps to become a "best practice" IT service management organization? Or, at the least, an organization with a sufficiently well performing delivery function given the cost limitations, as it is difficult to be best in all areas.

The itSMF benchmark asks the right questions and provides an organization with the answers, based on performance elsewhere within the itSMF community. The performance gaps become an organization's improvement checklist to become even better than they are today.

2 Step-by-step plan for ISO/IEC 20000

The appearance of the ISO/IEC 20000 norm led to the creation of the itSMF benchmark. We are convinced that this norm will be fully embraced by many itSMF members by the end of

2008. Gartner Research predicted in January 2006 that, by 2008, ISO/IEC 20000 would play an increasing role in the IT sourcing market.

With the ITIL® certificates, it was only possible to certify individuals for their IT service management skills. ISO/IEC 20000 certifies the IT service management organization as a whole. And that is what it is really all about.

The benchmark includes an ISO/IEC 20000 assessment, using scores and evidence to verify an organization's true position. For each process, we have identified detailed questions about whether or not an organization complies to the standard. For an example of this please refer to the section on the process benchmark. We have also identified the part of the standard to which the questions relate. This simplifies the prioritization of those items which score insufficiently.

A self assessment only relates an organization's position to the ISO/IEC 20000 standard. The itSMF benchmark also shows how its performance relates to its itSMF peers, in what respect they are ahead and where they fall behind. This helps in setting priorities as well.

3 Choose whether or not to improve

Even if an organization has a service improvement list, it would be too much to ask them to work on all items at the same time. Implementing these types of improvements is, typically, additional to daily operations. We often see a budget for operations, but rarely a budget for process improvements. Organizations look at these types of improvement projects on a case-by-case basis.

The benchmark also helps organizations to determine how much they should improve and prioritize their improvement work.

4 Choose investments

Business applications need to be available. In case of an outage, staff need to respond in a manner that re-instates the service within, or close to, service level targets. This means that we need to follow pre-determined minimum levels while working on a number of processes. The itSMF benchmark establishes these minimum maturity levels and helps prioritize process improvement projects.

An organization that still runs its IT fully in-house, can easily determine its Total Cost of Ownership (TCO). This helps identify strengths and weaknesses and offers a list of quantified action points. To clarify costs involved, we look at the number of staff employed in each process.

5 Options for cost reduction

To do more with less is the continuing challenge for IT managers. Automation tools, process design and user self-service are key to delivering high quality service at low cost. Measurement is vital to managing the IT function. This means an organization knows its assets and how to use them. A TCO survey will answer many questions on unit cost, personnel productivity and service quality.

The itSMF benchmark is all about discovering and describing best practices. As soon as processes become reasonably mature we see higher levels of cost efficiency and maturity.

6 Baseline measurement (the perfect picture)

A baseline created by a benchmark will result in a detailed picture of an IT service management organization. The high level of detail of the process questionnaires, in combination with the performance metrics and high level costs, offer a number of interesting views:

- cost versus maturity
- cost versus performance
- maturity versus performance

Such a study will uncover true strengths and weaknesses and offer detailed process improvement opportunities.

When the benchmark is repeated, the trend charts show the improvement as well as the slippage of the organization over time. Note that the peer organizations also improve over time, which continually alters the reference points.

7 Simplify management decisions

Benchmarking and gap analysis provide essential facts for sound management decisions. A study that includes various IT staff with detailed data collection enables management to identify shop-floor changes in order to improve key performance indicators.

8 The right priorities

The information from the benchmark study will help prioritize improvement projects based on peer comparisons. This way, an organization can put greater weighting on key aspects within the model to reflect areas of greater importance to them.

9 Help an organization to be effective (do the right things)

Every organization changes over time and the project portfolio is under continual pressure. Indeed, many projects don't even make it to the end. This is why organizations continually need to check and test the relevance of their current plans.

An evidence-based and prioritized project list is a solid basis for management to decide whether projects are on track or not.

10 Performance dashboard

Eventually we will be able to offer every participating member of itSMF who are benchmarking their own performance, a dashboard on their own internet pages, activated by online software with an annual subscription. The questionnaires will be online available throughout the year and after external validation (needed for quality assurance) the database will be updated. Every three- or six-months we will freeze the results and update the online dashboard. This will show current and past performance and the results of the selected reference group.

Of course, the standardized PDF reports will still be available for individual review and analysis by the external consultant to summarize the recommendations and add their views and comments.

WHO WILL BENEFIT FROM THE ITSMF BENCHMARK?

Each IT service management organization

The itSMF benchmark is a practical and comprehensive toolset to create evidence- based performance improvement plans that lead to improved ITIL processes and improved cost efficiency. It provides standardized definitions and metrics for key performance indicators and best practices. As all consultancies can use it, there will no longer be a requirement to compare apples and oranges.

This low-cost analysis makes benchmarking available to small and medium sized organizations. By completing the itSMF benchmarking questionnaires, with onsite assistance and validation, an organization will benefit from peer comparisons which will help them identify their local strengths and improvement opportunities.

The itSMF benchmark is the only available independent benchmark that enables organizations to choose the assisting (accredited) consultancy themselves. In order to gain accreditation, consultancies need to be an itSMF member and should have qualified ITIL consultants. This means the consultants should be ITIL service managers who have received ISO 20000 training.

The itSMF benchmark assures constant quality, and independent and anonymous storage of data.

Consultancies

The itSMF benchmark is a shared service centre for IT service management assessments and benchmarks. The data is stored in a central database. High quality benchmark reference groups will be created based on anonymous data within the growing database. Organizations participating in the benchmark project need to join as a partner in this initiative.

ITIL V2 and V3 recommend measurement and benchmarking as part of sound IT service management. Larger consultancies often have their own toolset to assist clients in identifying improvement opportunities. The itSMF benchmarking initiative enables smaller consultancies to also access similar tools. This enables the benefits of benchmarking to underpin more studies, leading to improved IT service quality projects and outcomes. The itSMF benchmark provides a practical assessment of IT processes as they are currently in use. The approach builds on and expands existing process frameworks. The project will expand and contract as our members dictate the direction of the service. This means that consultancies will have access to this practical tool-kit without the need for local resources and investment.

itSMF and local chapters

The Intellectual Property Rights of itSMF benchmarking are fully owned by itSMF Netherlands. This means that we can now share market trends and best practice with all of our itSMF colleagues around the world free of charge. This valuable research database will help itSMF identify performance gaps and, consequently, focus events on these specific areas. In turn, this will increase the overall quality of service management within all organizations, thus fulfilling our main goal.

Key to success is the combination of vendor and non-vendor members producing service improvement plans, based on a practical and collaborative model that is kept current by the itSMF community. Local itSMF chapters who embrace and support itSMF benchmarking will

share in the revenue of this service. They will also be able to contribute by analyzing local (anonymous) data to identify local trends. In addition, the local itSMF chapter will provide a stand and a presentation slot at their annual conference. This will enable local itSMF members to see the evidence of IT service management developments in their country, compared to what is happening across the world. The project initiators are keen to hear from members who want to contribute ideas and join the benchmarking committee.

THE MODEL

General questions

Besides obvious information such as contact details, the benchmark maps the customer's IT environment, to enable comparison to other companies. It is a widespread misunderstanding that companies can only be compared to other companies of the exact same type. Comparison of the dealing room of bank A with the branch network of bank B would prove inconsistent even though both are banks. The same can be said about comparing traveling sales staff with the administration at a large centrally oriented company. Not being able to share and compare generic parts of IT would make it impossible to have a healthy outsourcing business sector. That is why the benchmark compares generic parts of the IT organization, which is a big and important part of the day-to-day business. Creating reference groups will be a delicate but important role of the shared service center.

The benchmark also registers what type of policy is used (innovator, fast follower, follower). In the long run, this will enable an assessment of the policy's impact on cost and quality.

The most important point is that itSMF benchmarking is not self assessment. A registered external consultant validates the responses to the questions and performs audits to ensure the data is of high quality. It is important that all data is of high quality for benchmark accuracy purposes, sound strengths, opportunity assessment and credible recommendations.

Process benchmark

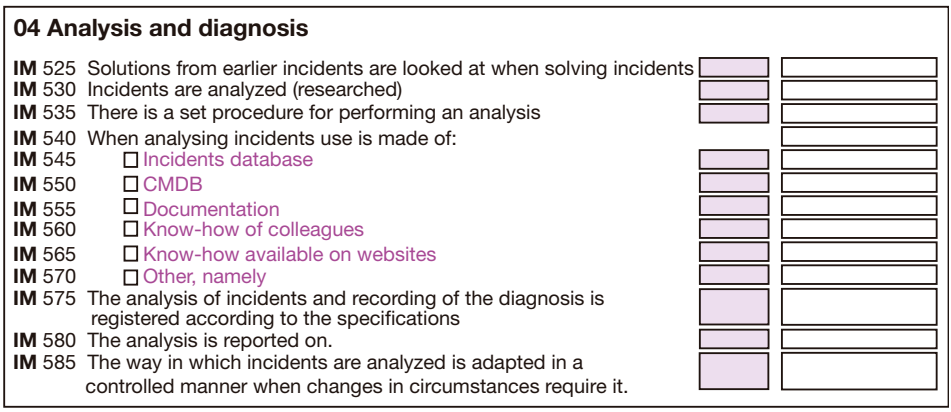
The process benchmark adopts ISO/IEC 20000, with some improvements. For example, continuity and availability management have been split into two separate processes and operations management has been added.

The process maturity component builds upon ISO/IEC 20000 and ITIL V2. It focuses on CMMI maturity levels 1 - 5. The comprehensive process study covers eighteen key IT processes. The itSMF benchmark provides simple questions that can be answered by simple answers, indicating to what extent the process is being followed:

- **0%** - no/nothing
- **25%** - little/some
- **50%** - halfway
- **75%** - many/mostly
- **100%** - yes/fully

This guarantees simplicity as well as sufficient granularity, while evidence will be checked by the selected consultant.

As figure 1 shows, the questions vary between a simple predefined list of answers in percentages, and a checklist of sub-questions which show what an organization does in more detail. The number of questions can be adjusted to the needs of the processes being developed in the marketplace. Sub-sets can be extracted to suit particular applications. The questions and format are under the control of the benchmarking committee. In 2008, the questionnaires will become available in an internet-based toolset.



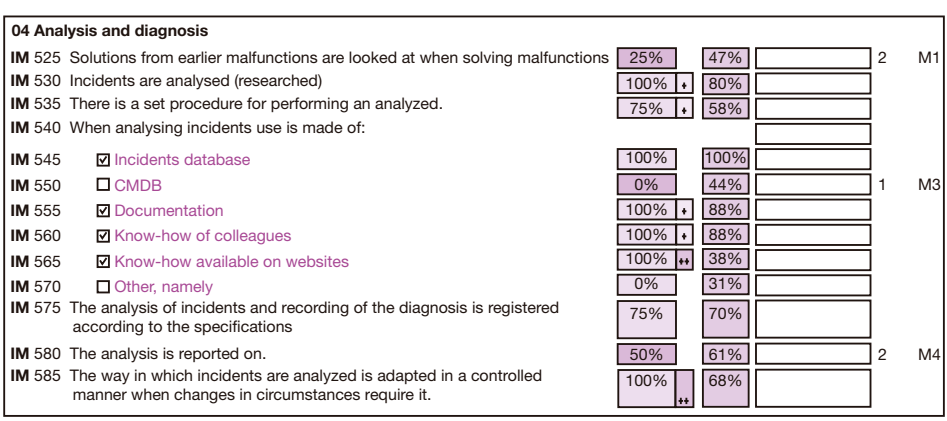
04 Analysis and diagnosis

IM 525 Solutions from earlier incidents are looked at when solving incidents
IM 530 Incidents are analyzed (researched)
IM 535 There is a set procedure for performing an analysis
IM 540 When analysing incidents use is made of:
IM 545 ☐ Incidents database
IM 550 ☐ CMDB
IM 555 ☐ Documentation
IM 560 ☐ Know-how of colleagues
IM 565 ☐ Know-how available on websites
IM 570 ☐ Other, namely
IM 575 The analysis of incidents and recording of the diagnosis is registered according to the specifications
IM 580 The analysis is reported on.
IM 585 The way in which incidents are analyzed is adapted in a controlled manner when changes in circumstances require it.

Figure 1 Example question sheet incident management

Every questionnaire ends with an overall question on the evidence and the quality of the answers. This helps the shared service centre to select high performing organizations for reference groups.

Figure 2 provides an example of an incident management result sheet. The first column shows the organization being benchmarked and the second columns shows the reference group, indicating the relative position of peer organizations. When a questions is scored below 75%, the response will be marked, indicating additional effort is required. On the right there is a priority indicator and the relevant maturity level. Indicators to the right will also show ISO/IEC 20000 part 1 or 2 questions.



04 Analysis and diagnosis

IM 525	Solutions from earlier malfunctions are looked at when solving malfunctions	25%	47%	2	M1
IM 530	Incidents are analysed (researched)	100%	80%		
IM 535	There is a set procedure for performing an analyzed.	75%	58%		
IM 540	When analysing incidents use is made of:				
IM 545	☑ Incidents database	100%	100%		
IM 550	☐ CMDB	0%	44%	1	M3
IM 555	☑ Documentation	100%	88%		
IM 560	☑ Know-how of colleagues	100%	88%		
IM 565	☑ Know-how available on websites	100%	38%		
IM 570	☐ Other, namely	0%	31%		
IM 575	The analysis of incidents and recording of the diagnosis is registered according to the specifications	75%	70%		
IM 580	The analysis is reported on.	50%	61%	2	M4
IM 585	The way in which incidents are analyzed is adapted in a controlled manner when changes in circumstances require it.	100%	68%		

Figure 2 Example result sheet incident management

Performance

Within the process maturity component, itSMF benchmarking includes a number of service quality measures. These help to develop and compare an organization's service level targets against leading organizations, in the appropriate reference group. A number of performance metrics have been taken from the popular book "Metrics for IT Service Management" (Brooks, 2006). The relevant pages from the book have even been included in the questionnaire. The most important performance metrics can be identified by an exclamation mark ("!") before the question. The benchmark also requests information on if and when organizations measure the performance metrics (standard, occasionally, sample) or whether it is an estimate (reliable, average, unsure). All questions marked with "!" must be answered.

10 Service Level Management

SLPF 0a		!	Number of operational SLAs
SLPF 0b		!	Percentage of services covered by SLAs
SLPF 001	131	!	Number of SLA targets missed
SLPF 002	131	!	Number of SLA targets threatened
SLPF 003	132	!	Percentage of SLAs that require changes
SLPF 004	132		Number of SLA reviews completed on time
SLPF 005	133		Number of SLA breaches caused by third party support contracts
SLPF 006	133		Service Delivery costs
SLPF 007	134		Number of services not covered by SLA
SLPF 008	134		Number of OLAs and Underpinning Contracts not yet agreed upon
SLPF 009	134		Customer Satisfaction
SLPF 010	135		SLA -> SLA turnaround

Figure 3 Sample questions with exclamation marks

Total cost of ownership

In order to obtain a balanced view on best practice, the itSMF benchmark also has a unit cost component. Total Cost of Ownership (TCO) is calculated by using standard and proven technology benchmarking. This TCO includes all IT staff and the main infrastructure hardware and software elements. Using a standard high level model, the itSMF benchmark enables unit cost comparisons between the organization that is being benchmarked and a similar sized reference group. We aim to get 80% of the benefits using 20% of the traditional data. The itSMF benchmark requires information on:

- workload
- staff
- current year IT revenue and capital budget
- ongoing infrastructure projects
- departmental IT budgets

This information enables the benchmark to define a high level unit cost (an organization's TCO) and a number of unit costs in areas such as service desk, client server, and data network. Figure 4 shows the reference group value as 100% and the organization's value relative to it.

Project management

Organizations invest heavily in projects to deliver business benefit. The project management benchmark enables projects to be measured and compared. Best practice within project

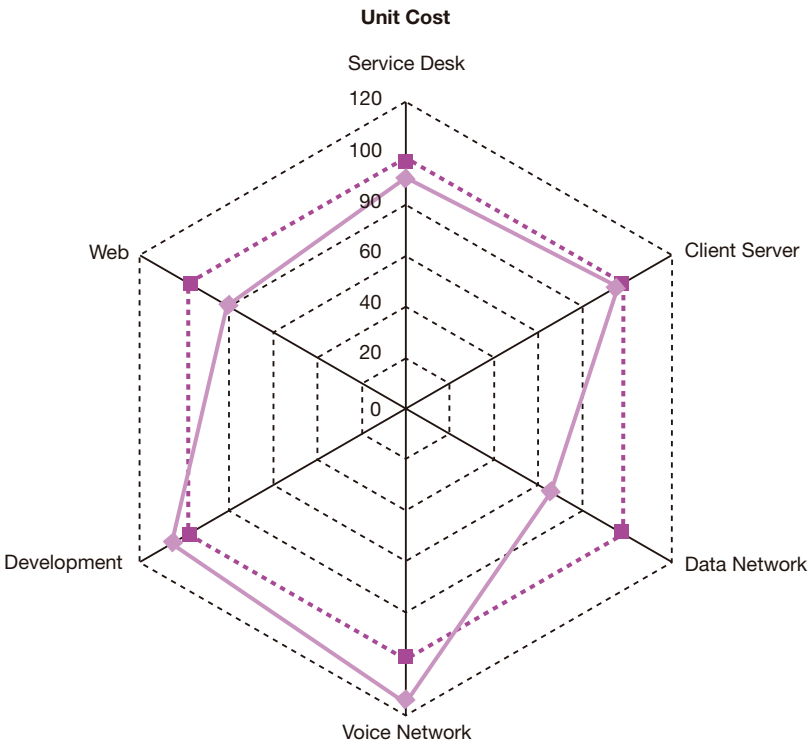


Figure 4 Reference group value (dotted line) against an organization's value (black line)

management will be identified and shared across the itSMF community. The itSMF benchmark offers a service that is designed to benchmark projects based on size and type (hardware migration, software migration, sourcing, process improvement, re-organization).

Tools

Tools play a critical role in providing day-to-day IT service management. For this reason the itSMF benchmark will collect information on which tools are in use at different kinds of organizations. This will be used to underpin process and TCO information. And in the (near) future partners will be able to offer an interface between the itSMF benchmark and the database of their tools so data can be collected continuously and easily.

THE BENCHMARKING PROJECT

When undertaking an itSMF benchmark, an organization selects an appropriately accredited consultancy to support them through the study. If their current preferred supplier is not accredited they can contact the shared service centre to become a partner. The lead consultant receives the itSMF benchmark questionnaire and is the single point of contact with the shared service center, in the Netherlands. The consultant ensures the correct answers are reported and provides local support for questions and answers. Once the questionnaires are completed and checked on-site, the lead consultant sends the information to the shared service center for processing. The results from the center will include the organization's data, plus processed information such as key performance indicators. This information is cross checked at a validation session, at which final data corrections are made.

The final version of the data will be processed again and the lead consultant will use the final itSMF benchmarking report to create the organization's report and presentation.

Quality assurance

The itSMF benchmark model has proven its quality and value for many organizations. The itSMF NL is keen to keep the model up-to-date and relevant. To do this, there is an established program for quality assurance. The benchmarking committee consists of leading consultancies in The Netherlands in the area of ISO/IEC 20000, ITIL, CMMI, TCO, tooling, project management and (international) benchmarking.

We now seek to increase the number of international members in the committee, not only consultancies but also IT service management organizations. We are specifically looking for operational process owners with an ITIL service management certificate and ISO 20000 experience.

The board of itSMF Netherlands currently acts as an advisory board ensuring that focus is maintained on the best strategy for the itSMF benchmarking service. They can invite the international board to join this board as well. The benchmarking committee aims to have periodic independent audits to highlight strengths and areas where we need to improve further. Auditors should have no links to benchmarking models now or in the future, as this would possibly violate their non-disclosure agreements.

At an operational level, two months after a benchmark has been completed we will send all organizations a client evaluation form. In this evaluation we invite feedback on the results of the itSMF benchmark, the model, the consultants and the process. A formal audit and complaint procedure is in place to understand and address any issues of conduct and duty. This will link with itSMF NL, which will provide adjudication as necessary. Over time, an itSMF benchmarking user group is envisaged as a community to share best practice and metrics-based innovation. In addition, a consultancy user group is also envisaged to provide colleague support for studies. All activities under the banner of itSMF benchmarking seek to serve one greater goal: to create the best possible IT service management measuring environment.

PITFALLS IN BENCHMARKING

In benchmarking, try to avoid the following pitfalls:

- **Garbage in, garbage out** - Try to get the best possible answers so the results and recommendations will reflect reality.
- **Do nothing** - A solid set of recommendations may be presented in a well defined report or presentation. If management decides not to take action, however, this will certainly demotivate staff and result in unsatisfied users.
- **Underestimating the impact** - Senior management understands the true value of benchmarking and will certainly look at the study results. It is important that the results reflect the actual situation and that appropriate action is taken to address issues that have been identified. If this is not the case, an organization will be doing the wrong things. Please note that the use of external consultants for quality assurance should minimize this.
- **Difference in scope** - If the benchmark study is looking at one part of the organization, ensure all people involved are clear about the specific scope of the study when answering the questionnaires.

- **Comparing against average performance** - This hardly ever leads to best practice.
- **Unavailable root-cause analysis** - You need to be able to track your recommendations to key performance indicators and the underlying data provided, in order to adjust the situation on the floor.
- **Weak project management** - Good data collection and validation are key to a successful benchmarking project. The project manager in charge needs to motivate the participants continually and manage the project within a short period of time in order to ensure that people stay focused. This, in turn, reduces the overall effort.

FINALLY

There is no better peer than yourself. Benchmarking your own performance over time shows the positive results of your service improvement plan and charts your route to becoming a best practice organization. This is particularly useful when you are audited and you can demonstrate sound management of your performance and unit costs over time.

As the database grows, we can share the results with the itSMF community in terms of industry trends and more reference groups. This is an itSMF initiative designed by itSMF members for itSMF members. It enables IT service organizations of all sizes to improve service provision at an affordable cost. This levels the playing field with the largest organizations that have used benchmarking for many years to improve their performance.

The initiative is about one year old and the amount of interest has astonished even ourselves. More and more organizations are joining the initiative. For more information please refer to www.itsmf-benchmarking.com.

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Martin Boyle *(United Kingdom) is director of IT Perceptions and specializes in IT service management, enterprise architecture and benchmarking.*
Leo van Selm *(The Netherlands) is director of Vaseom and a specialist in IT service management, especially ITIL, ISO/IEC 20000 and training/certification.*
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9.4 Selecting business-relevant metrics

It is no longer simply good enough to capture IT key performance indicators to measure service quality. Organizations must be able to showcase the business value of IT; but how? Selecting the most appropriate business metrics is the key. In this article, Linh C. Ho and Bryce Dunn give practical advice on how to work together with business stakeholders to select the most relevant business metrics that will enable better decision making by both business and IT staff.

INTRODUCTION

Businesses embrace technology for their own competitive advantage - to reduce costs, improve service, increase output or address market needs that would not be possible without that technology. They often experience difficulties in understanding how that technology supports their business objective and what the ramifications will be if that technology behaves in an unexpected manner. In order to take advantage of new technologies, businesses hire experts in utilizing that technology - enabling them to harness it to achieve their desired objective. The challenge is that these experts are experts in their particular technology and are unlikely to have a deep understanding of that particular business. Conversely, the business leaders understand the outcomes they desire, but do not fully understand how the technology works, and other potential benefits they could realize by harnessing it in different ways.

This lack of understanding or disconnect between business and IT means that the business often doesn't know all that is possible from the technology (what they can get and what they can't get). It may also mean that unrealistic demands are placed on it, or that the eventual solution is not exactly what is required. This disconnect between business and IT is exacerbated by decision makers having too much raw data and not enough real information presented in context to facilitate decision making.

This article focuses on the ways in which IT departments are able to help their business counterparts understand how IT supports their business outcomes, by selecting and presenting metrics that facilitate business decision making, and promoting dialog between the business and IT.

THE CHALLENGES - DISCONNECT BETWEEN BUSINESS AND IT

While selecting and displaying business-relevant metrics does not integrate the business and IT overnight, it does help address one of the major issues causing this disconnect: poor communications.

Focusing on the information that business people need to make informed decisions that are related to technology produces a much better foundation for dialogue. If the metrics are

selected correctly, they are something that can be understood by both parties and are an objective measure rather than a subjective perception of service.

Some of the major challenges that can be either addressed or improved by selecting and presenting business-relevant metrics are:

- **No foundation for dialogue** - Business and IT people speak a different "language". Business-relevant metrics provide an objective measure of how the IT service is supporting (or not) business outcomes, allowing both sides to have a meaningful discussion.
- **Mismatched expectations** - Business people care about particular business services and require business processes to work correctly, while IT practitioners focus on infrastructure availability. If both sides agree on what should be measured and what is really important in business terms, this ensures that both sides have the right expectations.
- **Confusion around terminology** - A lack of common terminology is often a hindrance to good communication between IT and the business. For example, it is common for business people to talk about availability, but typically they are not talking about infrastructure availability, rather that fact that a business service or business process is available to its users or customers. Conversely, IT operators often refer to internal performance indicators as SLAs, even if they are not agreed measurements for IT service delivery.
- **Business stakeholders do not know what is possible** - Technology can be an important enabler for businesses, that's why business people need to understand what is possible in a cost effective way. While metrics are not the answer to this problem, the process described in this article does go a long way to improving communication between business and IT. This can lead to a much better understanding on the side of the business of what it possible. In addition, metrics based around capacity can be displayed to help the business understand their limitations - for example not scheduling a marketing campaign that is expected to increase orders by 25% if the underlying IT systems cannot yet support this.
- **IT is in the dark as to what the business objectives really are** - The poor communication between the business and IT is not one sided. It is important for business stakeholders to take the time to make sure that IT understands what the business objectives really are. This information allows them to ensure that they support these objectives. It's more likely that they will come up with alternate solutions that can meet the objectives more efficiently, or with reduced cost, if they understand them.
- **IT is reactive to internal issues rather than proactive** - It is common for IT departments to be in a reactive "fire-fighting" mode where they react to internal issues as and when they happen. While addressing this issue is more one of process than metrics, having the right metrics available to indicate what is important to the business helps IT plan proactive improvement projects based on measures that are actually relevant to the business.

THE GOALS - BETTER DECISION MAKING

The overall goal in selecting and presenting metrics is to facilitate decision making. In this context, decision making is not restricted to senior management. Decision makers exist at all levels of the organization. Every employee, as well as suppliers, partners and customers, makes decisions which impact the business every day. If the right information is displayed in the most appropriate way, then each type of decision maker can be "armed" to make the most informed decisions.

For each organization, the different types of decision makers can be identified and prioritized. Then, the types of decisions that they make can be examined to ensure that they have all the information they need to make an informed decision.
For example, an IT operator makes decisions around prioritizing IT issues and how best to address them. This means he needs real-time information about the current and potential impact of those issues, followed by detailed technical information about the problem symptoms, previous actions and system design.

Conversely, a business unit owner may be making decisions around spending priorities, product mix and business unit costs. This would require financial data about the business unit's profit and loss, sales figures, efficiency information and competitor information, in real-time and historical trends.

Service Level Agreements (SLAs) are a way to measure the quality of service delivered in business-relevant terms. They are used to ensure that the customer gets the appropriate level of service from their service provider (which could be internal or external) and, if not, some kind of penalty may be applied to make up for poor service.

The problem with SLAs is that they are rarely business-relevant. Because of the lack of business-relevant IT metrics, SLAs have been primarily constructed from an infrastructure perspective.

The analogy here would be if instead of an airline providing metrics about on-time arrivals and departures and lost baggage, they provided metrics to passengers on the oil temperature of the engines during flight, the number of baggage handlers that called in sick that day and their simulator usage rates for the month. Now there may be some link between these metrics and overall customer satisfaction, but the customer doesn't care about that. All they want to do is arrive at their destination safely and on-time, and with their baggage. IT is still, however, stuck in the mindset of measuring and reporting on these internal metrics and then supplying them to their customer.

This is why it is important that IT focuses on selecting good metrics that are relevant to the business. They should start measuring these metrics themselves, instead of measuring inward-focused metrics like server availability, CPU utilization and incident resolution rates.

In addition, the correct metrics can be used to set the right expectations with the business. By going through the process of selecting business-relevant metrics instead of internal technical metrics that the business does not understand, expectations about the level of service can be set and the cost of that level of service discussed. If expectations about the service levels are set in terms that business people understand, then it is much less likely that we will have a situation where IT believe they are providing a good service as the servers are all up and available, whilst the business people are all unhappy because they are unable to do their job.

Not all business services are created equally. Measuring those services from a business perspective and quantifying the cost of providing different levels of service enables a meaningful discussion about the business value of each service and what is an adequate service from a cost/benefit analysis, rather than business demanding a top level for each service.

THE PROCESS - HOW DO WE GET THERE?

While there are many ways to successfully select and display business relevant metrics, this section outlines a process that has been successfully used by multiple IT organizations working in conjunction with their business counterparts. Examples of its use can be found later in this article.

Successful projects commence by first prioritizing and focusing on which business service to start with. Selecting this service is normally done in conjunction with the business sponsors and is likely to be either the one that is most critical to the business, or one that has been most troublesome lately (i.e. the biggest area of pain). It should also be very technology-dependent. This focus is extremely important as enterprise-wide projects are not often successful.

For the selection step, and indeed for subsequent steps, having the right people in the room is important. The titles of people will differ in each organization, but in general we are looking for people who have responsibility for a service on the business side, whilst on the IT side there should be people who are responsible for interaction with the business, such as relationship managers, product managers or, if they do not exist, senior IT management.

Setting the right expectations is also an important step, once all the right people are involved in the project. Expectations are not just for the finished product, but also the project, for example the duration, costs and amount of time the business people will need to commit to it. Setting the right expectations up-front is crucial for success. The time expectations also ensure that the business people are suitably committed to the project. The project is unlikely to be successful if the business simply tells IT to get on with it and they will check back in a few months. In some organizations executive management sponsorship may be required to get the level of commitment needed. This is also useful to make sure that the team's time is being well spent. For example, there may be no need for the stakeholders to attend every meeting, but their presence is needed at least for regular review meetings to ensure that the project is on track.

Identifying the key decision makers to be targeted should now take place. While every employee in a company makes decisions and needs data to make good decisions, it's about priorities and focusing on the people whose decisions are having the biggest impact to the business, or are being made with the least amount of solid data. In most cases people start with business executives and IT management.

Now we have the target and the team, the next step is to actually select the metrics. In this step it is important to realize that less is more. For each business process we want the business people to help us understand what their key measures are for the success of that particular process, and how they can use that data to make better decisions. This is often in the form of comparisons to previous history, but may also involve comparisons with industry benchmarks. In this instance the metrics are not infrastructure availability or CPU utilization, but business metrics such as:

- **financial metrics** – revenue, cost
- **business volume** – number of orders, transactions, customers
- **customer satisfaction** – repeat business, surveys
- **end user response time** – how well the IT systems are responding to user requests

These metrics may be sensitive, so security requirements are often part of this step. The metrics should also be displayed in a way that makes the decisions easy. For example, metrics for monthly orders might be shown in a table or bar chart rather than a pie chart. The display mechanism is also part of facilitating the decision as visual correlation is a useful technique here. Once the metrics have been selected, they should be reviewed for priority and focus. Only the most important metrics that clearly drive decision making should be shown. If there is not a clear decision that can be driven from the metric, it should be removed. A review is a good way of ensuring that less important metrics are not included.

The next step is to identify some supporting IT metrics. For example, if specific metrics around orders have been selected, IT metrics that show the quality of the systems responsible for processing those orders can be considered. Again, in this case it is not about internal metrics such as infrastructure availability or CPU utilization, but metrics that can be clearly linked to the business metric. End user experience-type metrics are a great example of business-relevant IT metrics as they show the end-to-end picture as well as the performance of the service. These metrics are used by the IT people to help correlate how their systems are supporting the business. A good example is showing that poor performance on an online ordering system has caused a 20% decrease of orders. Further metrics that help isolate the root cause of key systems can also be considered.

Once the metrics have been selected and presented, it is not enough to simply end the project. The whole process is interactive and other business processes can be examined. Moreover, the selected metrics should be regularly reviewed to make sure they remain relevant within changing business needs.

The right metrics can then be used not only for active decision making, but also for selecting longer term improvement projects. In addition, the metrics selected are good candidates to be used for SLA measures, since they are business-relevant.

Ultimately, this process should help eliminate those “secret meetings” between business and IT, which are frequently more about assigning blame than understanding what is going on and proactively improving service.

We can summarize this process as follows:

- Select which service is going to be measured ("prioritize and focus").
- Get the right people in the room—from both IT and the business.
- Set the right expectations. Make sure both business and IT know how much time they will have to spend.
- Identify the key decision makers and their information needs. Ensure that you focus on business people here.
- Select the metrics, while focusing on business-relevant metrics. Refer to the business' information needs from the former step.
- Select supporting IT metrics. These should be metrics that can be clearly linked to the business metric.
- Present the metrics in a way that is useful to the business.
- Keep reviewing the selected metrics and their presentation to ensure their relevance to the business.
- Use the displayed metrics to select longer term improvement projects and as business-relevant SLA measures.
- Check what other processes might need appropriate metrics and start the cycle again.

The process described above focuses on engaging with the business and communicating, not selecting a set of generic metrics and showing them in a screen. There are no shortcuts to providing the right information for decision making. Whilst other companies' experiences or vendor suggestions can form a useful input, each company has its own decisions and own business priorities, and will want to examine a different set of metrics to enable them to make the best decisions possible.

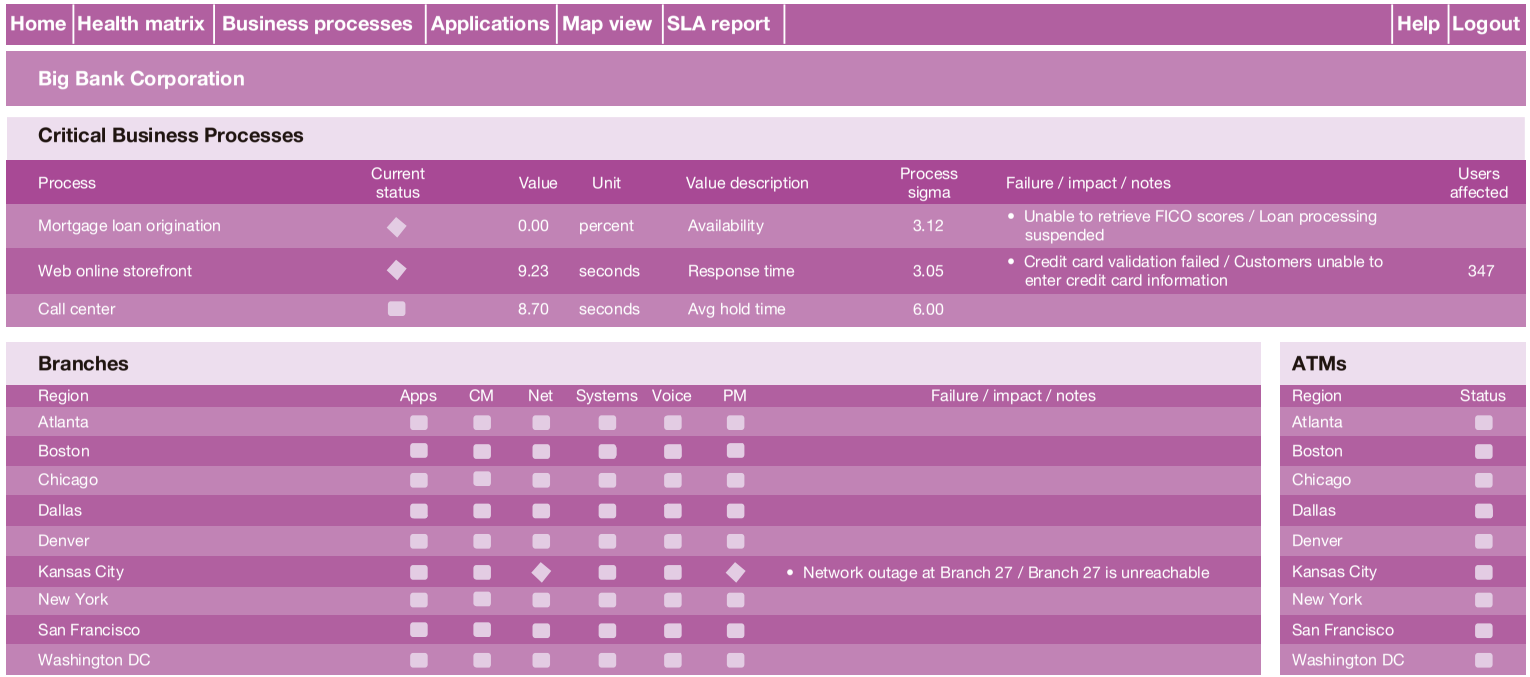
THE LESSONS - WHAT HAS BEEN DONE BEFORE?

Selecting the right metrics for decision making is an age old problem which has existed long before information technology. This provides many lessons learned—both successes and failures. Table 1 displays some of these "do's and don'ts".

Do	Don't
Engage the business – Engaging the business is critical to the success of a metrics projects. After all, the objective of selecting and presenting metrics is to understand and measure how IT is supporting the business. If the business are not engaged in the project then the metrics selected are unlikely to represent what is important to the business.	**Focus only on technical metrics** – It is common for projects that are led by the IT department to slip back into their comfort zone and focus only on internal technical metrics. Gathering and presenting these metrics merely exacerbates any problem It is virtually impossible to have a meaningful dialogue with the business around how IT can support their initiatives if the only information that can be provided is infrastructure availability and CPU utilization.
Set expectations – It is important to set the correct expectations with the business and stakeholders before the start of the project. Without expectation setting, the business may have unrealistic hopes of what is possible. This also allows for a re-check of the information that was gathered when working with the business sponsors to ensure that it is correct and that the metrics selected will provide business value.	**Assume the CMDB will provide the metrics** – The CMDB is useful to facilitate integration of products between IT management products by allowing them to talk a common language. But it does not provide business relevant metrics for decision making. Those companies that have embraced the CMDB could use it as a place to record the selected metrics.
Get management buy-in – Management buy-in is important because such a project requires support from multiple different departments/functions in the company. In addition, since business support is needed, management buy-in is often essential to obtaining this ongoing support.	**Focus only on graphics and flashy presentation layers** – In order to facilitate the metrics, they must be presented correctly and in context. However instead of examining how the metric should be displayed to make it meaningful, it is common for projects to be undertaken that utilize flashy "dashboards" (Figure 1) that detract from the decision making properties of a metric. For example, using dials and other flashy display widgets to show things that should be visually correlated. Information architecture experts could be consulted here, or for smaller projects there are a number of good publications on the subject.

Do	Don't
Focus on relevant information, not data – The focus should be on the decisions not on providing data. It is easy to overwhelm decision makers with more data than they need, and data that is not relevant to their decision. What they need is targeted information that they can use to make the decision.	**Focus on quantity** – It is very easy when selecting metrics for display to select too many. The overall goal here is decision making, so every metric needs to be considered in the context of how it can support appropriate decisions for the target audience. The focus should therefore be on *quality* instead of *quantity*. If a metric does not significantly add to the information that the target audience needs, then it should not be displayed. In this context "less is more" as it is important not to overload people with information that is not completely relevant to their decision. Metrics could also be classified as primary and secondary. This helps individuals who need more detail, without swamping the main user base with information.
Present the metrics correctly – It is not enough to simply display the metrics on a screen or report. They need to be put into context and with the necessary supporting information that facilitates decision making. For example, information about recent history, any thresholds, what the metric represents and any supporting or related metrics. In addition, information architecture should be considered, selecting the most appropriate display types—displays that help make decisions such as using tables and graphs to help visually correlate like metrics—instead of flashy displays.	
Learn from others – Industry articles and itSMF conferences and other such events are a great way to learn from the successes and failures of others with similar projects. itSMF local chapters are also a good way to talk to industry peers about their current projects and what has worked well for them.	
Always keep the priorities in mind – There are many projects that can be done and will undoubtedly provide benefit. That is why it is extremely important to be constantly focusing on the highest priorities to make sure that the money is well spent.	
Measure and report – When the right metrics are selected, do measure and report on them to the appropriate stake-holders. By communicating this to the business, it will help the business understand the value IT delivers. Ongoing measurement and reporting also helps IT keep track of those key metrics and improve on them.	

Table 1 Selecting metrics—"do's and don'ts"



Home | Health matrix | Business processes | Applications | Map view | SLA report | Help | Logout

Big Bank Corporation

Critical Business Processes

Process	Current status	Value	Unit	Value description	Process sigma	Failure / impact / notes	Users affected
Mortgage loan origination	◆	0.00	percent	Availability	3.12	• Unable to retrieve FICO scores / Loan processing suspended	
Web online storefront	◆	9.23	seconds	Response time	3.05	• Credit card validation failed / Customers unable to enter credit card information	347
Call center	■	8.70	seconds	Avg hold time	6.00		

Branches

Region	Apps	CM	Net	Systems	Voice	PM	Failure / impact / notes
Atlanta	■	■	■	■	■	■	
Boston	■	■	■	■	■	■	
Chicago	■	■	■	■	■	■	
Dallas	■	■	■	■	■	■	
Denver	■	■	■	■	■	■	
Kansas City	■	■	◆	■	■	◆	• Network outage at Branch 27 / Branch 27 is unreachable
New York	■	■	■	■	■	■	
San Francisco	■	■	■	■	■	■	
Washington DC	■	■	■	■	■	■	

ATMs

Region	Status
Atlanta	■
Boston	■
Chicago	■
Dallas	■
Denver	■
Kansas City	■
New York	■
San Francisco	■
Washington DC	■

Figure 1 Example metrics dashboard

THE SUCCESS - WHAT ARE SOME SUCCESSFUL STRATEGIES?

A number of organizations have successfully implemented business metrics systems. This section discusses two examples, one a European bank and the other a telecommunications provider.

Example 1: Financial metrics

The financial industry is one of the most reliant upon information technology for its daily operations. A European bank undertook a project to not only show how the IT systems supported the business processes, but also to illustrate how business metrics could help the business to understand IT's contribution to business success and prioritize issues when they occurred.

In this case, the most important business processes were identified first, with assistance from the business representatives on the project. This was one of the factors in the success of the project as it kept the scope of the project manageable and allowed early success to be shown, justifying the resources allocated.

After those processes were identified, the next task was to identify from the business perspective what the key metrics were. For example, one of the processes was centered around bank transfers, so metrics were selected about the number of transfers, the total amount of money and the average amount per transfer. These metrics were useful for both business and IT, and could be compared against baselines to see if operations were proceeding normally for that day. They were also very useful for IT to prioritize problem resolution during a fault.

During this process, each of the key stakeholders was identified and displays constructed that helped them put the metrics into context. The business people were more interested in seeing trends arising out of the business metrics, whereas the IT people were more interested in correlating the business metrics back to the IT metrics so they could see the true business impact of any IT failure.

The project was considered a success because it provided demonstratable benefits for both business and IT. IT can now prioritize and understand the impact of their efforts, and the business are now provided with real time information about how the business process is performing and how that compares to normal behaviour.

Example 2: Telecommunications provider

A major mobile telecommunications project already had an IT metrics dashboard that was used to understand the availability of key applications. This was a step in the right direction as it focused on applications rather than on infrastructure. The IT department, however, was keen to provide more relevant information to their business stakeholders to prove the success of some of their recent improvement projects.

In speaking with the business stakeholders, one of the current issues they were facing was compliance with an industry SLA around mobile number portability. This SLA dictated times to port-in and port-out new and old customers and was chosen as the focus of this particular project.

So, the key business metrics identified here were around ports-in and ports-out and how long each was taking. Additionally, they also tracked which competitor the customer came from or was going to. This allowed the business to measure the success of their current marketing campaigns, as well as the impact of their competitor's campaigns on them.

SLAs were also calculated based on the time taken for individual requests and metrics were calculated showing how many requests had met or failed SLAs for each reporting period. This allowed root cause analysis to take place since the application level metrics were available as well. If the SLA failure was caused by an IT failure it was easy to see exactly why that was the case.

The phased approach again paid off for this company, who have since expanded their system with other key business processes and their important metrics. Like the other example, business participation was key, as well as the way they displayed the metrics to show the SLA impact, and provided different views for IT and business people.

THE FUTURE - WHAT IS NEXT?

In the short term, focusing on business-relevant metrics provides good input to service improvement projects. The right metrics help to select projects that are likely to provide the biggest business benefit, but also enable the success of the project to be measured together with the overall return on investment. Doing improvement projects based on internal technical metrics is like shooting in the dark: the benefit and success of these projects is hard to quantify from a business perspective. For example, suppose a project to improve overall availability of Windows servers is undertaken and this project is successful from a technical perspective: the server uptime is reduced 75%. While this improvement sounds great, it may actually provide insignificant business benefit if the downtime was not causing significant impact.

One of the new additions to ITIL® V3 is the recognition that IT organizations should not just be seeking to align themselves with the business but rather be fully integrated with the business. This may seem like an insignificant change; however it is actually an important one. IT is one of many new "game changing" technologies that have emerged to provide competitive advantage to businesses. As IT continues to mature, as with previous revolutions in technology, so it becomes more of a standard way of doing business instead of something that must be kept separate as is often the case today. Focusing on measuring how IT supports the business is an important step in this evolution.

Business-relevant metrics are also an enabler for organizations attempting to embrace the utility model. In a model where business requirements drive IT activities in near real time, the ability to relate IT operations with the business becomes crucial. In order to respond to business needs in real time, IT organizations will need to understand much more than IT metrics. They'll need to know the current demands of their business and what will be expected from them in the future.

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9.5 The power of Six Sigma for ITIL Continual Service Improvement

As IT organizations mature, they are realizing that it is no longer adequate to just deliver IT services. They must transform and become a true business partner, effectively supporting business objectives in a cost competitive way. To this aim, ITIL version 3 (V3) has incorporated continual service improvement (CSI). In this article Linh C. Ho and Bryce Dunn explain how Six Sigma techniques can complement CSI, adding a case study as an example.

WHAT IS SIX SIGMA

Six Sigma is a business-driven quality method that brings focus to customer and business priorities while eliminating defects. A defect is defined as a failure to meet the specified requirements of a product or services delivered to the customer. In Six Sigma terms, the corresponding defects should be no more than 3.4 defects per million opportunities (DPMO). This means that 99.9997% of the product or service delivered to the customer is satisfactorily. See table 1 for the corresponding sigma values to the DPMO and yield percentage.

Yield	DPMO	Sigma value
30.9%	690,000	1
69.2%	308,000	2
93.3%	66,800	3
99.4%	6,210	4
99.98%	320	5
99.9997%	3.4	6

Table 1 Sigma values and their different results

Motorola in the 1980s conceptualized Six Sigma, and General Electric evangelized the method with much proven success. In 2006, Motorola has reported savings of seventeen billion dollars. This way, Six Sigma became a proven quality method. Though it has its roots in manufacturing, many industries are now adopting the method with considerable success, among them finance, banking, healthcare, government and, indeed, IT service management. Companies such as Getronics, Sun Microsystems, American Express, Bank of America, Lockheed Martin and Siemens have achieved and published significant returns from the use of Six Sigma in IT.

Like many quality management processes, Six Sigma uses statistical techniques to continuously measure, analyze and improve service quality. These techniques can be applied to any discipline, including service management processes based on ITIL®.

Tools from IT management vendors now automate Six Sigma techniques to analyze the volume of IT management data available. Leading service management vendors with this capability offer techniques such as the Pareto chart, control charts, and failure modes and effects analysis to help organizations improve IT service quality.

Today, Six Sigma is a recognized pragmatic approach for continual service improvement in IT service management. This topic is frequently covered by analysts, journalists, vendors and technology users who have seen success in combining the power of Six Sigma and ITIL.

Six Sigma differs from most quality management processes in that it does not focus on quality for quality's sake. It focuses quality improvement activities on those business processes that really matter to the business, pursuing quality where it matters. Improvement should provide a proven benefit to the business bottom line. Its concept of "CTQ" (Critical to Quality), brings priority to "what's critical" to the customer and the business.

This more pragmatic approach is one of the key reasons for Six Sigma's popularity. The combination of Six Sigma and ITIL provides the most comprehensive quality and service management solution, with a focus on delivering value to the business and customers.

Six Sigma enables organizations to streamline processes by eliminating variation. And variation causes costs. According to an article published in Quality America, companies traditionally accepted three to four sigma, meaning between 25% and 15% of their revenue is spent on fixing problems. At six sigma level, organizations are spending less than 5% of their revenue fixing problems (see figure 1). This difference is known as the Cost of Poor Quality (COPQ), and the dollar cost of this gap is colossal. The article points out that General Electric estimates that the gap between three or four sigma and six sigma was costing them between eight billion and twelve billion dollars per year.

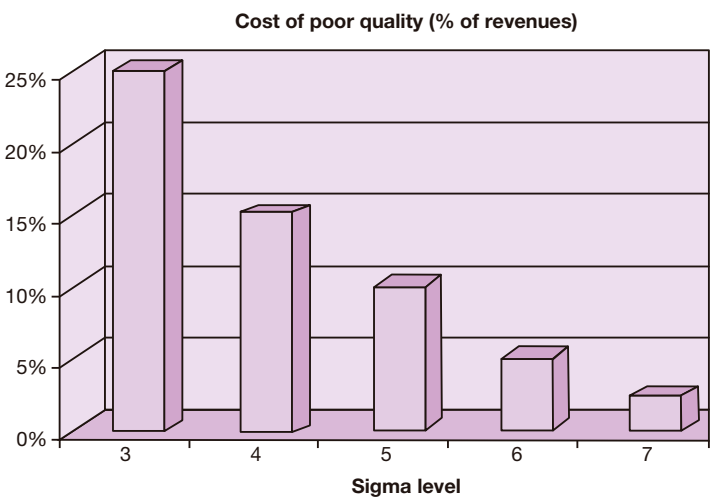

Figure 1 Cost of poor quality at different sigma levels

At the core of Six Sigma is its quality improvement model, called DMAIC, which stands for the key stages of Six Sigma: Define, Measure, Analyze, Improve and Control (although

other models exist for different circumstances such as DMAICV - Verify). Each of the DMAIC phases has clear objectives, tasks and proven techniques:

- **Define** - The key objective in the define phase is to scope a project in terms of the CTQ processes to be investigated and the current COPQ resulting from defects in a process. The tasks in this phase ensure that everyone involved understands the problem, the impact, and goals.
- **Measure** - Relevant data is collected in this phase on existing process quality. Tasks include identifying the CTQ measures and evaluating the availability of measures and the accuracy, integrity, capability and dependability of the measurement system.
- **Analyze** - Root causes of the problem are identified using the data collected in the previous phase. This enables the team to assess the impact, mitigate risks and provide the necessary information to design a solution.
- **Improve** - During the improve phase, action items are developed, solutions assessed and the best solution(s) are recommended and implemented.
- **Control** - The control phase ensures the stability and predictability of the improved process and, more importantly, meeting the customers' requirements. Documenting the new processes, training appropriate staff and undertaking continuous measurement and reporting to avoid slippage are all necessary.

This continual loop provides a quality improvement cycle for products and services, starting with defining key measurable objectives, and resulting in implementing solutions and sustaining improvement.

HOW SIX SIGMA COMPLEMENTS ITIL

Six Sigma is a widely accepted practical approach for service quality improvement that lends itself naturally to ITIL. ITIL highlights the need for service measurement and reporting through service management products. Moreover, ITIL acknowledges that other industry-accepted practices such as Six Sigma and Total Quality Management are complementary to further enhancing the best practice.

While ITIL establishes consistent processes, Six Sigma improves process quality. The two approaches are a powerful combination for continual IT service improvement. ITIL's service management lifecycle focuses on integrating IT with the business—in recognition that IT plays an important part in the business of today. It has five core books supporting this lifecycle:

- service strategy
- service design
- service transition
- service operation
- continual service improvement

Underpinning these five ITIL phases, there are twenty four processes, each with its own objectives and best practice guidelines for process efficiency and for delivering business value of IT services.

If we look at Six Sigma, each of the DMAIC phases has clear objectives, tasks and techniques. The techniques relevant for IT management will be discussed later in the chapter, but in short, Six Sigma brings business-focus to IT by giving priority to what's CTQ.

Moreover, Six Sigma provides IT with a way to baseline service quality levels, prioritize and focus on what's important to the business and customers, quantify improvement for return on investments, and control the improvement achieved.

Finally, Six Sigma comes from the business world with great success, whilst ITIL comes from the world of IT. Combining the two approaches helps IT to be more aligned with the needs of the business. Since Six Sigma is already widely accepted in the business community, it is far more likely to be accepted as a quality methodology by business stakeholders than an IT-specific framework. In addition to that, it also means that Six Sigma skills and consultants are widely available.

Table 2 provides an overview of how Six Sigma complements ITIL. ITIL answers "what?" and Six Sigma answers "how?" ITIL has the mindshare of IT and Six Sigma of the business; together the two industry practices help IT further integrate with the business.

ITIL	Six Sigma
Establishes consistent processes Focus on integration of IT and the business • service strategy • service design • service transition • service operation • continual service improvement	Improves process/service quality Focus on CTQ Reduce variation / costs • define • measure • analyze • improve • control
Guidelines (what?) 5 books 24 processes supporting the lifecycle	**Techniques (how?)** baseline service quality prioritize and focus on CTQ quantify improvement for ROI sustain improvement
Comes from IT	Comes from the business

Table 2 How Six Sigma complements ITIL

SIX SIGMA AND ITIL CONTINUAL SERVICE IMPROVEMENT (CSI)

Continual service improvement (CSI) is an important phase in the IT service management life cycle. Since business demands evolve and change over time, the ability to continually meet and exceed the business requirements becomes critical. ITIL V3 introduces the *seven step improvement process*:

1. Define what you *should* measure.
2. Define what you *can* measure.
3. Gather the data.
4. Process the data.
5. Analyze the data.
6. Present and assess the data.
7. Implement corrective actions.

This process goes hand-in-hand with Six Sigma's DMAIC model, as shown by figure 2.

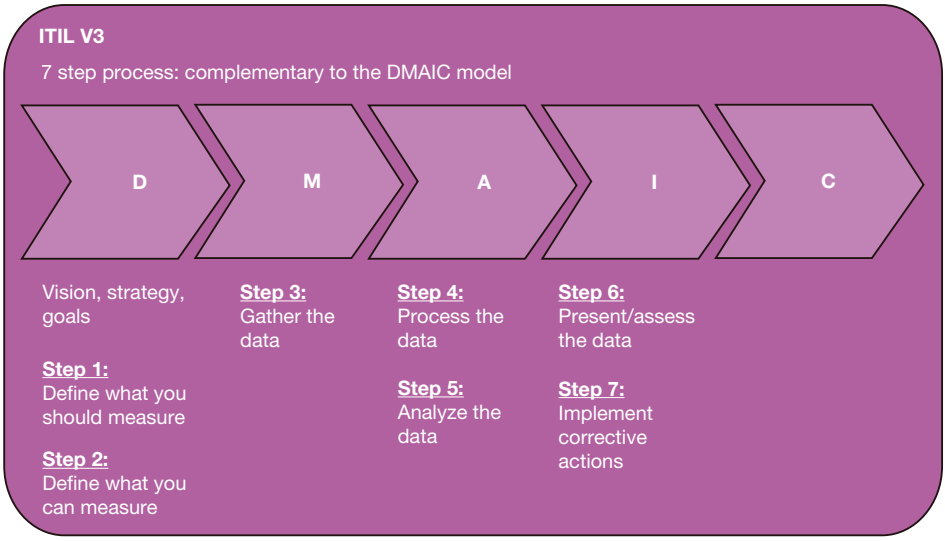

Figure 2 How the CSI improvement process complements the DMAIC model

Each of the seven steps fit under the DMAIC phases very well. As described above in the DMAIC section, each phase has its goals, tasks and tools. We can take a look at each one of these below:

- **Define** - ITIL advises in steps 1 and 2 to define what you should measure and to define what you can measure. This means that, in this stage of the cycle, it is important for the business and IT to come together, as the business drives what should be measured and IT is there to help the business understand what can be measured. If it cannot be measured, then further analysis could be done to see if it is possible to add this measurement capability, and the cost of doing so.
- **Measure** - ITIL suggests that once the definition of what should be measured and its availability are clear, step 3 is collecting the data. Essentially, this is the natural next action item that Six Sigma recommends under the measure phase.
- **Analyze** - In ITIL, steps 4 and 5 are to process the data collected and analyze it so that IT can the make decisions during the next steps.
- **Improve** - Steps 6 and 7 include presenting the data analyzed, and then assess and draw recommendations for improvement from the analyzed data. Step 7 ensures that corrective actions or the selected solutions are actually implemented.
- **Control** - Although ITIL does not provide an eighth step to sustain improvement, Six Sigma does complement it by adding the control phase to the seven step improvement process. Six Sigma provides the tools, such as control charts for ongoing measurement and reporting, to sustain improvement until further enhancements are required. This provides a true continual cycle for service quality improvement.

KEY SIX SIGMA TECHNIQUES

This section provides a sample list of Six Sigma techniques based on the Six Sigma for IT Management book (Den Boer et. al., 2006) and pocket guide (Van Bon, 2007). These are techniques that have been proved useful and are easily applicable to IT.

Pareto charts

The Pareto chart indicates which improvement initiatives result in the greatest return to the business. This is based on the famous “80/20 rule”, first coined by Vilfredo Pareto, an Italian economist. This means that 20% of the causes create 80% of the problems. In IT terms, this helps identify key components of the IT infrastructure that are causing the majority of the problems (see figure below).

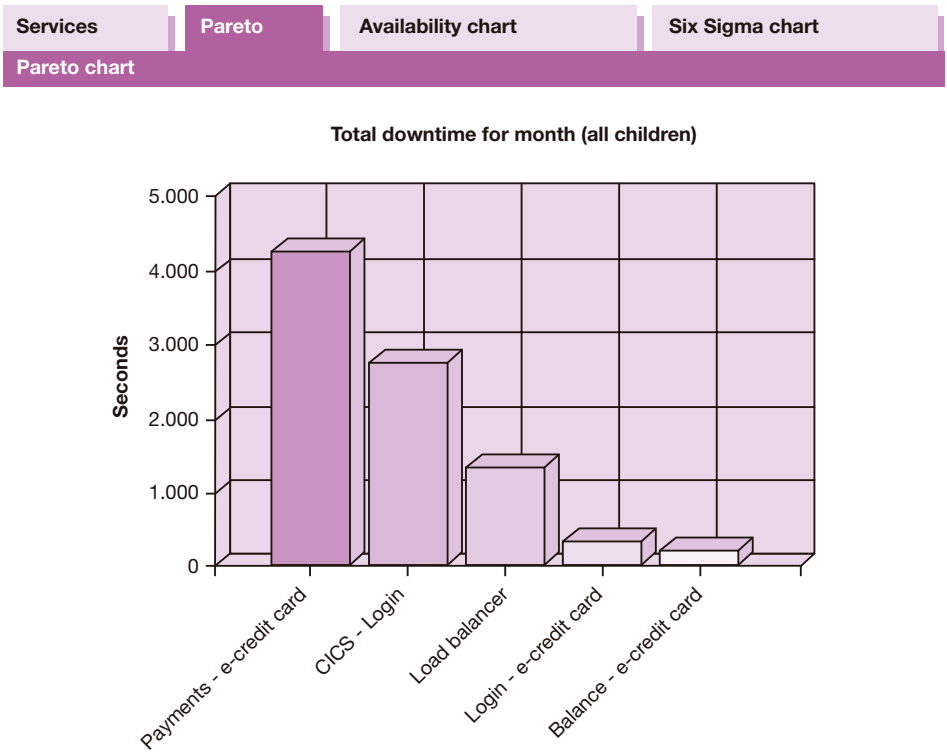

Figure 3 Pareto chart highlighting the most significant issues

Failure modes and effects analysis (FMEA)

FMEA helps mitigate risks by identifying potential failures and the effects of these failures on a process. It also prioritizes the problems using a risk rating system. The rating system consists of three components of failure:

- severity
- probability
- detectability

It uses a score of one to ten for each of these components to find the total Risk Priority Number (RPN) for the potential problem. The RPN is found by multiplying the three numbers together. This technique can easily be applied for risk management and compliance projects, to help identify and mitigate the risks of non-compliance. Specifically, the RPN helps to understand the current IT operational risks and alleviate those that underpin critical business services. Applying the FMEA lowers the risk of exposure to failures and disastrous consequences.

Control charts

Control charts ensure that a process or service performance is within an acceptable range, bound by an upper and lower limit. Should performance criteria act abnormally, the user can take immediate action. For example, a trend-line might deviate from the mean—known as centreline—or cross over specified limits.

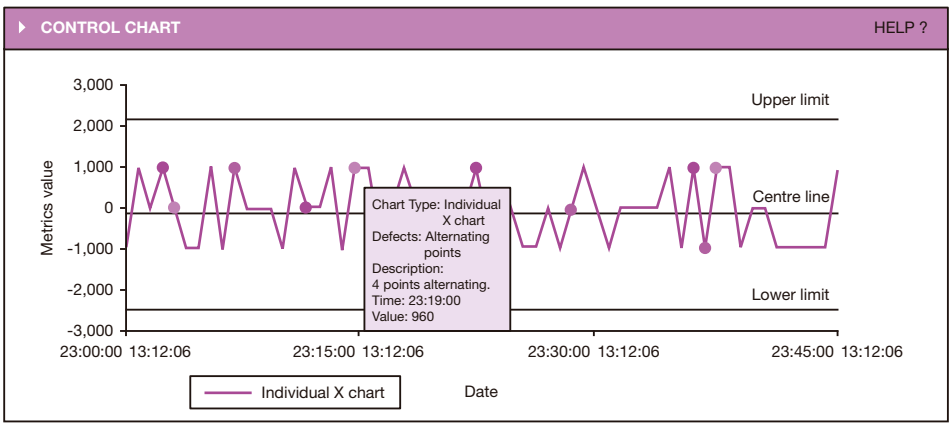

Figure 4 Control chart example

Process sigma value

This metric measures the number of defects per million opportunities (DPMO), providing a key measure of IT service availability and performance. The objective is to achieve the sigma level that is most appropriate to the organization's business needs. For example, an airline company should have a very low DPMO level, possibly even higher than six sigma. Other companies might be satisfied with a lower sigma level, especially for less critical services.

Process map

Process mapping helps to understand the people, processes, technology and their relationships. This provides an overview of how the IT service supports the process and what infrastructure is used by the IT service. It helps to collect data on how the process works and to identify data that is not currently available but needs to be located. The process map can also be used to map the critical to quality business processes and their underlying IT services and components. This information can then be used to create service models for business service management and service level management products or vice versa.

Figure 5 shows an example of a service model highlighting some of the key business services based on process map information.

Cause and Effect (C&E, Fishbone or Ishikawa) diagram

This helps to get a clear understanding of the causes and effects of problems in the define phase. It is used to find all the factors that influence an outcome. Potential problem areas are being mapped onto this diagram, for example during a brainstorming session. These results can be used as input for the FMEA.

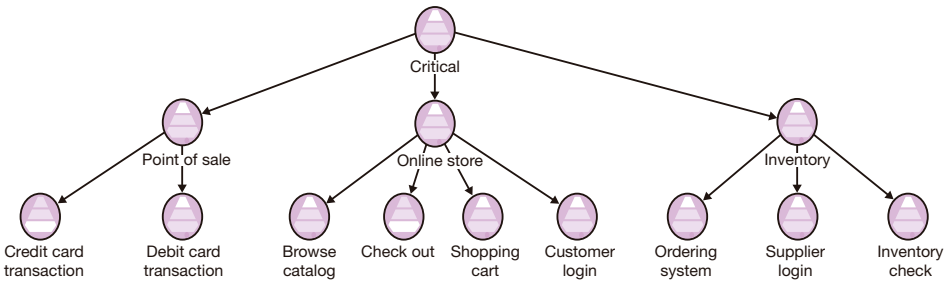

Figure 5 Service model with key business services based on process map information

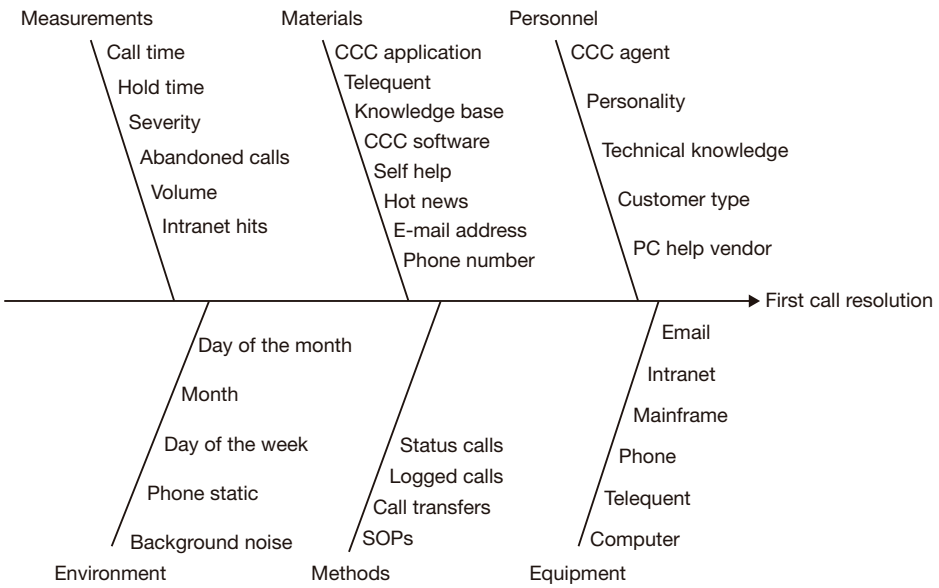

Figure 6 Cause and effect diagram service desk

The C&E Diagram helps focus on the causes of the issues that need to be resolved. Inputs include:

- the CTQs from the early "voice of the customer" surveys
- the CTQ components in the CTQ tree
- the controllable and non-controllable Key Process Input Variables (KPIVs) from the process map
- the metrics from the process assessments

Voice of the customer (VOC)

Both ITIL and Six Sigma strongly advocate listening to your customers. Voice of the customer assists in identifying appropriate service improvement programs (SIPs) to gather customer requirements and quantify the cost of poor quality, helping initiate the right SIP supporting CTQ processes.

This is an important survey in both the define ("what should be improved?") and the control phase ("does the improvement affect customer satisfaction as expected?"). It helps to capture ideas, opinions, and feedback, eventually resulting into CTQ requirements.

Also, participants with intimate knowledge of their respective processes might participate. Furthermore, supervisor participation is critical. After all, it is this group that will be tapped for resources and budget if the results of the exercise establish the direction for an improvement initiative. Taking part in the VOC enables participants to gain an understanding of the exercise and allows them to contribute.

Voice of the customer can be executed through:

- email
- websites
- phone calls
- conference calls
- face-to-face interviews
- group meetings or workshops

Correlation diagrams

Correlation calculations help indicate the relationships and dependencies between variables. This helps determine the degree of correlation between them. An example might be a high traffic and transaction volume for retail websites during holidays. Correlation charts help IT analyze the data points and its dependencies.

CASE STUDY

This case study is based on a leading financial institution in Europe, where the DMAIC model was used to improve service quality. To simplify things, the study focuses on only one business service: its online banking and, more specifically, the bank's e-credit card payment system. The case study also reflects the following ITIL disciplines: availability, capacity, incident and problem management.

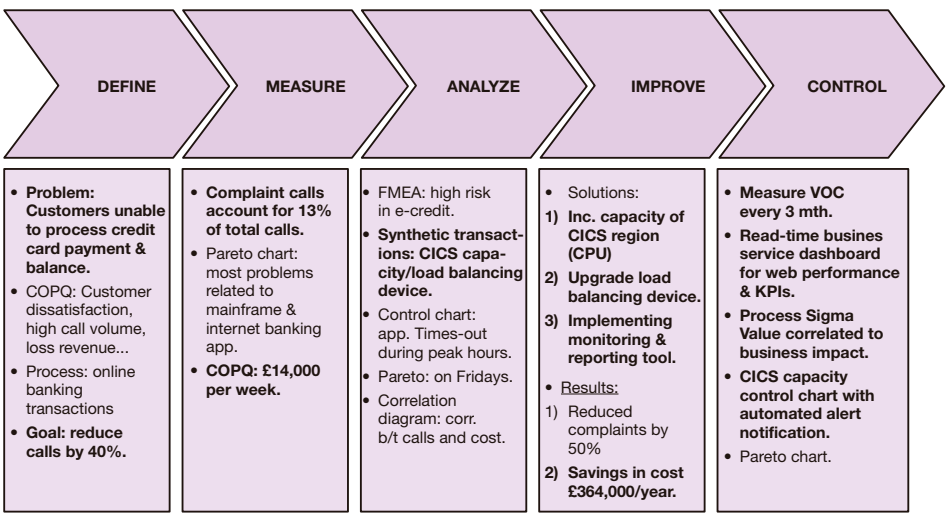

Figure 7 Case study overview

Define

The key objectives in the define phase are to identify the problem, client requirements, process, and measurable objectives (end results). The tasks include brainstorming to ensure that everyone involved understands the problem, impact, and end goal.

Problem: *Availability of the bank's online credit-card system. The bank's customers were unable to make credit-card payments over the internet.*

In order to define the problem, there were a number of different analyses undertaken. Incident and problem records were examined to determine which problems were causing the highest business impact at the bank. The service level manager was consulted and service level reports inspected to verify this target and assess the impact on the customer.

Impact on the organization:

- **customer dissatisfaction** - complaints flooding the call centre
- **cost of problem investigation** - £70 per complaint
- **revenue lost** and late payment interest fees waived

Process identified: e-credit card payment

Objective: *Reduce complaints associated with e-credit card process by 40%. This measurable objective came from a consensus by the project team that it was realistic and achievable, while it would have enough positive impact on the business.*

Measure

The measure phase is where information is collected on current process performance. Tasks include identifying and baselining the CTQ measures.

Metrics collected:

- e-credit card payment problems accounted for 13% of all customer complaints
- the number of incidents recorded against the e-credit card application in the period
- an average of 200 investigations per week

The cost of complaints was estimated at £14,000 per week.

The technique used was the Pareto chart, which identified that the areas needing investigation were the mainframe and the internet banking application.

Analyze

In the analyze phase, the root cause of the problems is identified using the data collected in the previous phase. To analyze the problem, the error control process is undertaken to identify the error, assess the impact and cost of error, and provide the necessary information to design a solution. The overall goal is to identify the root cause of the errors and provide justification for fixing them. The intended outcome is to reduce incident volume as the most common problems are solved.

Techniques used to process and analyze data (steps 4 and 5 of the CSI improvement process):

- **Failure mode and effects analysis (FMEA)** showed a high risk priority number (RPN) in the e-credit card business process.

- **Control charts** - Application timed-out during peak hours.
- **Pareto chart** showed high volume, particularly on Friday.
- **Correlation diagram** showed the higher the number of complaints (calls), the higher the cost (and the higher the impact on the business).

Improve

The improve phase involves instigating a service improvement program (SIP). This involves determining the areas of improvement, implementing the improvement, tracking it over time, and then performing a post implementation review to confirm the results. During this phase, action items are developed, solutions are assessed and the best solution(s) are recommended and implemented.

Recommended solutions:

- Increase CPU capacity in the mainframe Customer Information Control System (CICS) region.
- Upgrade load balancing device.
- Implement adequate monitoring and reporting tools, in particular a business service management solution to understand the impact of IT issues on the business users. One of the key metrics that was collected by this solution was end user experience to show the response time of the e-credit card system.

Results (measured over four weeks):

- 50% reduction in complaints related to e-credit card process
- £364,000 cost-avoidance in investigation per year, for e-credit card area only

Control

To control the improvement of the process, steps are taken to ensure the DMAIC cycle is a continuous closed-loop system. This ensures the stability and predictability of the newly improved process.

New control systems:

- **Voice of the customer (VOC)** - Measure client and internal call centre staff for “real world” feedback every month.
- Deploy a real-time business service dashboard for web performance and related key performance metrics.
- Implement a CICS capacity control chart with automated alert notification, also as part of capacity management.

The example dashboard reports in real time to the service managers on the average response time for each critical business service. This provides IT with an ongoing mechanism for measurement and reporting, helping it to control what’s important to the business.

Case study summary

The bank improved client satisfaction, as measured through positive feedback in the next VOC survey, and reduced client complaints from 13% to 6.5% (a reduction of l 50%). Moreover, by decreasing the number of investigations related to e-credit card, the costs avoided were estimated at *364,000 per year. From an IT perspective, communication between IT and the client service call centre improved by sharing real time business service dashboards.

SIX SIGMA KEY METRICS

Since Six Sigma emphasizes the need for a focus on business objectives and business outcomes, one of the key metrics for Six Sigma is not the statistical metrics mentioned in Six Sigma books. It is actually the need to start to measure what is important for that particular business process and evaluate the results of the improvement by examining changes in these metrics over time. The most important metric is the one that a successful Six Sigma project should be improving. For example, if the most important issue is customer loss, and it is possible to measure the loss of customers, it is through this metric that the success and failure of each iteration of the DMIAC model can be measured.

Six Sigma helps drive better metrics because it brings business context into IT. Six Sigma quantifies benefits and quality improvements that can help IT increase their credibility to the business. Examples of metrics that can be used are:

- **process sigma value for quality of service** - including yield percentage, DPMO and defect/opportunity counts
- **cost of poor quality** - in monetary value tied to CTQ service degradation or failure (to show business impact):
  - lost revenue
  - penalty fees
  - other costs associated with fixing service issues.
- **specification limits and control limits** - based on CTQ customer requirements to ensure client needs are met
- **risk metrics** - such as FMEA RPN to prioritize improvement targets
- **process capability indices** - to gage how close a process or service performance is to the specified limits
- **customer perception of service** - through VOC to measure client satisfaction
- **employee productivity** - number of users, business units and locations impacted due to IT outage (to show business impact)

ITIL also advocates a number of metrics ranging from service desk availability and capacity to service level management metrics. The question is which ones apply to your environment and why? Adopting a “less is more” approach, and carefully selecting the appropriate metrics is highly recommended. Not all metrics apply, what’s important is selecting CTQ metrics that show business value to the customers and the business. Many will recommend using monetary units whenever possible as they are easy to understand and widely valued.

SUMMARY

Improving the quality of service delivery will continue to be on the agenda for many IT executives. Six Sigma has already gained significant mindshare in the ITSM world, with global and fortune organizations embracing it for ITSM and proving its value. Even service management vendors (e.g. Compuware, IBM) are automating key Six Sigma techniques in their technologies to meet their customers’ needs. Currently, many tools are available to automate Six Sigma techniques and ITIL disciplines.

It is a step forward that ITIL V3 recognizes and emphasizes the need for continual service improvement, rather than a one off improvement project. Moreover, CSI also points out the need for other quality practices such as Six Sigma, Total Quality Management, Lean and ISO 9000 to complement ITIL.

Arguably, ITIL V3's CSI could have adopted Six Sigma as an industry practice for quality improvement that can easily be related to ITSM. This would have also addressed the lacking "control" step in the CSI seven step process to sustain momentum and improvement.

Six Sigma continues to be complementary to ITIL and its new CSI phase. However, Six Sigma can also be independent of ITIL, because ITIL provides a set of guidelines to manage and improve every facet of the IT organization, while Six Sigma provides the techniques to measure and improve IT service quality.

Combining both methods provides a powerful quality and service management solution, but they clearly do not need to be implemented in tandem. The power of Six Sigma for IT service management is a strong discipline for quality improvement with customer focus, as well as eliminating errors that impact critical business processes. While IT service providers (internal or external) continue to work hard towards aligning themselves with the business needs, Six Sigma is a business-driven approach to help IT do that. Together, they improve communication, drive better metric selection and prove the business value of IT services.

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Colophon

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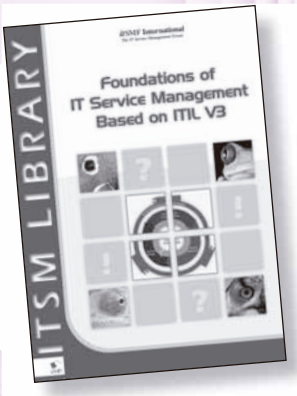

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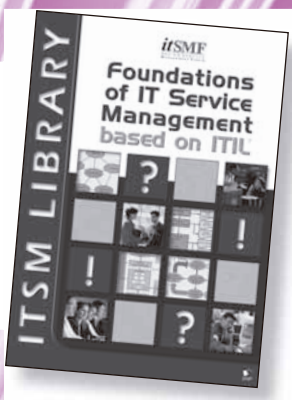

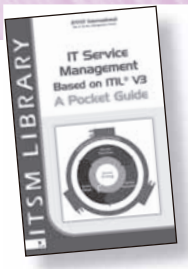

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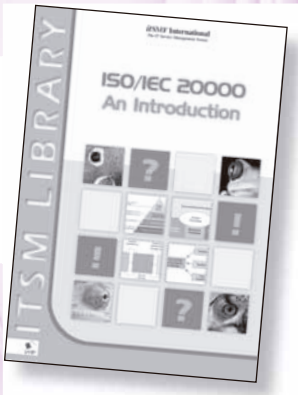

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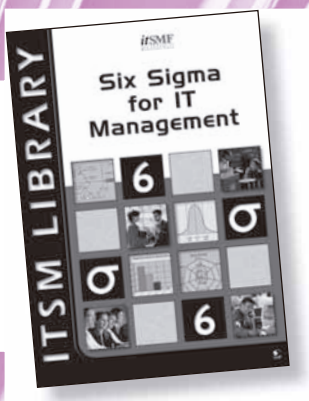

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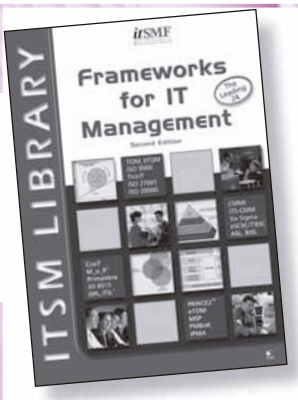

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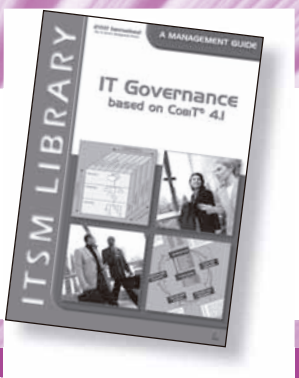

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