A Practical Approach to Improving
IT Service Delivery with
Service Assurance Tools

Whitepaper
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August 2006

Abstract

With profitability on the line, organizations must invest into methods and solutions that promise uptime and good performance of the IT infrastructure that is driving business processes. ITIL, eTOM [1, 2] and other best practice guidelines attempt to help IT managers achieving these goals. However, making the step from theoretical concepts to practical implementation is challenging. This whitepaper lays out a practical approach how service assurance tools can be deployed to manage business critical IT systems in-line with best-practice recommendations.
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1. IT Service Delivery

The Challenge

Companies are dependent on IT processes for their business success. The IT department is a key enabler for implementing and driving business priorities. Poor application performance is costing enterprises billions of dollars every year. Unscheduled downtime not only consumes resources but costs money and customers.

Managers who try to tackle these issues face the complexity of today's distributed and multi-layered applications. Resources, expert knowledge and planning are required to consistently deliver the required levels of availability and performance that are needed to drive a business forward. Best practice frameworks promise accurate guidelines and assistance. Yet, many managers find implementing ITIL or eTOM best practice concepts to be intimidating or even impossible. Regulatory pressures for Sarbanes-Oxley, Basel II [5, 6] and the likes, aggravate the problem.

Best Practice: ITIL and eTOM

Initially developed in the UK in 1992, the IT Infrastructure Library (ITIL) consists of a set of eight books that contain best practices aimed at helping to organize an IT department. The Enhanced Telecom Operations Map (eTOM) is a guidebook designed by the Tele Management Forum. It describes the full scope of business processes required by a provider of a service and defines key elements and how they interact. eTOM is a common companion of ITIL.

Because ITIL and eTOM are meant to be useful to every IT department, no matter what level of sophistication, they can only make general recommendations. Managers intending to implement these are confronted with difficult questions:

- How to translate generic industry standard models to their own circumstances and ongoing operations?
- How to ensure that implemented practices actually result in improved delivery of reliable, available, and secure IT services?
- Which tools to buy and what functionality do these tools have to provide?

As a result, the IT department will be more responsive to business needs and help accelerating the growth of an organization.

Some do better than others

Under intense competitive pressures, businesses everywhere are aiming to improve their IT management. Yet, it can be observed that not all achieve equality good results. So why do some better than other? How can one improve?
Trying to implement most or all of the recommendations made by ITIL and eTOM is overkill and will lead to failure. It is advisable to implement only selected and relevant concepts and to do so in stages together with the introduction of the required tools.

Successful enterprises create a cohesive strategy with well defined and relevant requirements. The focus is on aligning IT management with business goals:

1. Establish requirements
2. Develop an implementation plan
3. Obtain commitment to the plan
4. Executing the plan

Successful enterprises first embarked on implementing those concepts that deliver the greatest positive impact for their business. Speed is of importance, too, to maintain the momentum within the organization. Getting results quickly is mainly a result of selecting the right set of tools and of staying focused. The following key factors are crucial to the successful improvement of IT service delivery in any organization:

- Processes: Are the current workflows and structures suitable?
- People: Do you have taken corporate culture and available skills into account?
- Technology: Are software tools ready to support implementation?

Any misalignment between these three elements will result in sub-optimal outcome or even failure. This whitepaper will hence address all three aspects.

Moving towards improved service delivery

With the information at hand, IT managers are able to develop an understanding of what their IT systems are doing and how this relates to the business goals of the organization.
Best practice concepts have grown into a global industry standard for aligning IT services with business requirements. ITIL drives business value by helping IT organizations share a common set of data and integrate IT service management processes across the IT organization. eTOM places important to focus on processes that can be integrated and automated.

The process of adopting of best practice concepts goes hand-in-hand with a more effective IT governance structure. Incorporating an ordered process also improves accountability and transparency. The process consists of five distinct stages:

- **Definition:** Identify those IT services and systems which are most important to the operation of your enterprise. Then define clearly what is required for this service to be delivered.
- **Measurement:** Define Key Performance Indicator (KPI) baselines on the current service delivery for future reference and comparison. Collect data that is required for decision making. Map this data to onto our critical IT services.
- **Analyze:** Verify relationship and causality of factors. What is the relationship between IT performance and business impact? See if there are factors that have not been considered?
- **Improve:** Based upon the analysis, dedicate resources to those areas where they provide the greatest benefits for and the biggest business impact.
- **Control:** Continuously measure the process and institute control mechanisms to ensure that variances are corrected before they result in defects.

The process is aimed at focusing on what matters to the business. This helps improving both the quality of service and the customer satisfaction. Hence, the approach laid out in this document for improving service delivery is relevant for companies who are going to invest into their IT as well as those who intend to improve on the ROI of their previous investments.
2. The Role of People

People play an important role in the improvement of IT service delivery. Both, process and tools must be suitable for a given corporate culture and for the available skill sets.

The process of improvement must be initiated and driven by people. Improving IT service delivery is a goal that concerns everyone. The “lone-ranger” approach to implementing best-practice concepts will fail. You need to get the commitment of everyone involved. This is best done by clearly indicating how individuals will benefit from the process:

<table>
<thead>
<tr>
<th>Role</th>
<th>Advantages</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIO</td>
<td>Can better plan and support strategic business initiatives</td>
<td>Improve Business</td>
</tr>
<tr>
<td>IT Planer</td>
<td>Can more accurately plan capacity and reduce the costs of last-minute purchases and changes in plans</td>
<td>Save Costs</td>
</tr>
<tr>
<td>Systems Manager</td>
<td>Can anticipate and avoid problems before they turn into crises</td>
<td>Increase MTBF</td>
</tr>
<tr>
<td>Business Manager</td>
<td>Can benefit from more reliable business services</td>
<td>Increase revenue</td>
</tr>
<tr>
<td>Systems Administrators</td>
<td>Can pinpoint the locations of immediate problems and take corrective actions faster</td>
<td>Reduce MTTR</td>
</tr>
</tbody>
</table>

Therefore, service delivery quality is the cumulative result of decisions being made at different levels with an organization. It becomes a part of the wider area of IT governance. Exploring opportunities, maximizing competencies and managing risks are part of IT governance. Forrester Research defines IT governance as:

- How decisions are made
- Who makes decisions
- Who is held accountable
- How results of decisions are being measured and monitored

It is advisable to assign the task of improving IT service delivery and implementation best practice concepts to a team rather than putting an individual in charge. Then doing this, one should take the following considerations into account:

- Team size
- Team membership
- Team structure
- Decision making
- Preparation

The team has responsibility to drive the implementation of best practice principles. As such, it has to consist of people who have the authority to make the relevant decisions. They must be knowledgeable, from their organization’s perspective, about the services the IT department provides and what the business goals of the organization are.
3. The Process of continuous Improvement

The basic approach was indicated before. Now, we take a closer look at each of the steps and see what it means in practice. The process aims at linear and incremental improvement of the IT service delivery. It is an ongoing effort rather than a once off task. Ideally, it does become an intrinsic part of the corporate culture.

**Definition Stage**

The aim is to document critical relationships between business and IT services. The question to ask here is: *Which are the IT services that enable key business functions and which assets power these services?* This includes:

- Reviewing existing services
- Consulting with the users
- Reviewing the underpinning contacts with 3rd party service providers

Understanding those relationships, will later allow the IT department to prioritize based on business metrics and requirements. This analysis is best done in written tabular form.

For example, for an organization that relies heavily on email for communication with internal and external entities, the electronic mail service would be business critical. ERP and CRM are other examples for services that are of vital importance to many organizations for conducting business processes. A typical organization has between five and ten critical services.

Once the critical services have been documented, one has to identify all components needed to support these services. This includes applications, hardware and network items. For example, an email service may depend on a server with a storage subsystem, SMTP, IMAP and LDAP applications, switches, routers, firewalls, the internet connection and the DNS service. This list may even include virus scanners and spam filters.
A review of the analysis will show that particular elements of your IT infrastructure are dedicated to a particular service while others are shared and therefore support multiple services. These shared components are of particular interest. A failure here cause symptoms in multiple other parts of you infrastructure.

You may also encounter some that some elements of your IT are only critical at particular days. Think of a server this is only used during some a few days every quarter to generate financial reporting. During these days, the server is utmost important. During any other day, downtime doesn’t particularly matter.

**Measurement Stage**

As “Quality” is not a precise concept, it is not possible to directly measure it. Instead, quality indicators must be established which can be supported by objective and precise measurements. The question at this stage is: *Which key performance indicators determine a user’s quality of experience and how are these measured?*

Selecting appropriate measurements for each component of you IT infrastructure can be challenging. Good software tools have built in knowledge to do this. Measurement should be done with the end-user in mind. Standard factors include:

- Availability: for all services
- Latency: for transaction based services
- Utilization: for data transfer services

When this stage is completed, it should be clear how to measure each of the IT services and components that have been identified during the previous step. This can also serve as a basic requirement specification for a suitable service level management tool.

As single infrastructure items may support many devices, it would be uneconomically to measure them multiple times. Good NMS software supports a measure-once-report-many methodology. It is further important to consider where to measure. Especially time-based transaction measurements yield vastly different results depending on the point of measurement. For example, a service would respond much faster when being accessed from the datacenter compared to accessing the same service from a remote office. For practical reasons, monitoring should be done agent-less. That means you don’t have to install monitoring software on you production systems.

**Analyzing Stage**

Evaluate the business value of the delivered IT services. Monitoring typically provides only raw numbers that must be analyzed in order to determine their business impact. The question to ask here is: *Where do we stand and where is improvement most urgently needed?*

As service quality is volatile by nature it is necessary to consider systems and applications both in a real-time perspective and - in addition - as trend and historical reporting. Response time of any service is driven by usage patterns, which vary, according to time of day, day of the week, even season.
To facilitate this, the initial analysis should yield a baseline against which you can compare future data. Good NMS tools provide means for automating this. You should also choose a single NMS which can cover your entire IT. Having to deal with multiple silo-style application concurrently is rather unproductive and makes correlating data very difficult to impossible. A collection of separate and independent tools won’t provide a cohesive representation of your IT service delivery.

**Improvement State**

To ensure the IT infrastructure delivers the expected grade of service, the question to ask is: *How to cost effectively improve the quality to reach the desired target?* Based on actionable information from the pervious stage, improvements have to be made at the right time in the right volume and at the right place, while taking cost into account.

Some companies prefer to start at the top, alternating business processes and dependencies. Others start in the middle, putting new IT processes in place to assure a smooth-functioning IT organization. Other companies prefer a product approach - purchasing products that support their current IT functions. The last option is the easiest to implement and will deliver results fastest. Improvement does not always require capital investment. Sometimes it is sufficient migrating services to other hosts, or to move WAN traffic into different service class.

While improve ITSM will benefit everyone, you may require additional skills during implementation. Therefore the next thing to determine is whether you need extra help to improve and identify the type of help required, for example professional services, managed services, or consultants.

**Controlling Stage**

After implementing improvements, their effect on the business must be observed. One of the benefits that can typically be seen is a sharp reduction in the number of calls to the help-desk. The question to ask is: *Is the IT in alignment with business?*

Controlling includes testing, reviewing, and revising to prioritize based on the businesses requirements. It may also include conducting a Business Impact Analysis (BIA) to identify risk areas and develop counter strategies. The tasks typically conducted include:

- Establishing priorities
- Planning for service growth
- Involvement in the accounting process to cost services calculate ROI

It is important for the team conducting the controlling stage to be aware of the overall corporate strategy. The IT must not just support existing business requirements but plan for future expansion. For example, a business would discontinue a product line or a remote office then no improvements may be needed to the section of the IT infrastructure supporting it. On the other hand, if an expansion of services is planned it may be most economical to dimension investments in anticipation of these changes.
4. The Role of Tools

Not only do software tools generate performance data, which cannot be generated manually, or provide help with troubleshooting problems but they also form the central hub connecting method, people, process and IT infrastructure. Tools are required to integrate and automate daily processes based on ITIL and other best practice recommendations. Service Level Management tools provide operational support and deliver actionable data for the decision making processes.

With the right set of tools, problems can then be identified and resolved immediately, making the business more responsive and ultimately more successful. Without management software, you have no means to efficiently assess and assure the reliability of the various technologies and components underlying the IT infrastructure.

When selecting a vendor for a software tool, end-to-end intelligence should be a key factor. End-to-End analysis is needed to understand the key performance indicators that affect a service. This ensures a consolidated and concise view of an IT system, a 'single pane of glass' which allows correlating problems easily. The features that the software tool provides must be focused on what can be most effectively delivered to the end user, as well as how those components work together to deliver the service. A solution where the different functional components, such as fault management and performance management, are integrated is strongly preferable. Otherwise, integration must be done by user.

Selecting the right tools

As an operation support system, management software must provide at least the following capabilities:

- Manage Events to reduce the mean time to repair (MTTR)
- Collect Performance data to improve the mean time between failure (MTBF)

For business support, management software must provide at least:
Reporting Management (SLA reporting)
Business Impact Management (Service Management)

In addition, tools are expected to provide a configuration management database (CMDB) to show the relationships between the assets and how they work together to deliver business services. Unfortunately, the market for Service Level Management software is very crowded with many products being promoted. When evaluating solutions functional and non-functional aspects should also be taken into account. Examples include:

- Ease of use: Is the product simple, easy to understand and intuitive to use?
- Ease of deployment and configuration: Is it difficult is to install and configure the software?
- Cost of ownership: Is there a clear and simple pricing model where you know in advance what you have to pay thought the life cycle of the software?
- No software agents on monitored systems: Is an agent less approach for simplicity and streamlined operation supported?
- Multiplatform coverage: Can the product support multiple platforms and vendors and does not restrict future choice of platforms/vendors?
- Security: Is role-based security, that permits users to see only those tasks and information for which they are authorized, available?
- Proactive and reactive capabilities: Both are required, does a particular product support both?

An example for a tool that meets all above requirements is StableNet [3], an integrated easy to use solution for distributed multi-vendor environments.

**Event Management Capabilities**

Event management is concerned with responding to faults and errors. Its aim is to reduce the MTTR. Managing fault and issues on a day-to-day basis is also an intrinsic task of any IT department. Event management provides two main capabilities:

- Threshold monitoring (active checking of conditions)
- Log and Trap processing (passive listing to asynchronous events)

Common problems with event management include “event flooding” and “event storming”. Both refer to the cases where a large number of events are sent to the management team who are practically unable to make sense out of the large number of messages. Good systems therefore support technologies which prevent event flooding and only forward root-cause information.

One issue found in many IT departments is the events are responded to without consideration of their business values. For example, not all servers are equally important. Therefore, the response to a fault event must be different. Determine what it is actually worth to the business to remedy a fault within a certain time period and then decide if this service can be provided by IT, how much it will cost and whether it makes
sense to do so. The NMS you chose should be able support the concept of severity or importance for events from a business angle.

**Performance Management**

Performance Management is the key discipline in providing excellent service delivery. It is also ultimately responsible for ensuring that IT Services are provided in a secure manner, and the availability of the services is maximized within cost and efficiency constraints. It involves:

- Data gathering (key performance indicators, KPI)
- Report generation (network reports, management reports, inventory reports)
- Service level visualization (SLA management)

IT performance management itself demands a detailed perspective of all aspects of the IT infrastructure, the relationships between components, and information about their role in service support. In an “end-to-end” scenario, these include all components from the end-user’s PC to the Server. There are several ways to obtain needed measurements. In order to avoid errors, it is important to decide what type of data is needed, what other statistics are necessary, and the required degree of accuracy. The decisions will have a fundamental impact on the measurement methods which your NMS must provide.

It is not enough to find the correct measurement method. It is just as important to make the measurement in the right place. This will lead inevitably raise the need for a distributed measurement system. Distributed NMS can collect data from remote locations and consolidate them into a central data mart.

**Configuration Management Database**

Configuration Management is concerned with building and maintaining a database (Configuration Management Database – CMDB) that contains details of the organization’s IT elements that are used in the provision and management of its IT services.

Building the database is facilitated though device discovery and network discovery capabilities provided by the service level management software. It contains details about each element such as information on hardware, software, parameterization, and users as well as information on how these devices are interconnected.

Topology documentation helps in the understanding and supporting the IT infrastructure. It can be used to validate design guidelines in developing a better understanding the network for future design, change, or troubleshooting.
4. Conclusion

This whitepaper has shown a practical approach how can be deployed to manage business critical IT systems in-line with best-practice recommendations. ITIL and eTom, are gaining significant momentum in enterprise IT groups worldwide. A majority of adopters do achieve improved IT service delivery and see the following benefits:

- **Accountability.** Network visibility enables swift problem identification, resolution, and downtime avoidance.
- **Manage Expectations.** By clearly defined services enterprises can make more accurate commitments to departments and users.
- **Control Costs.** Enterprise may choose to pay more for higher availability levels where and when needed based on business priorities.
- **Verification.** Service-level reporting ensures that service paid for is actually delivered.
- **Communication.** Clear and well-defined SLAs help speed up the communication process between service provider and service consumer
- **Cost Containment.** Proactive planning helps service providers and service consumers get the most from their IT systems.
5. References

Infosim StableNet provides real-time end-to-end visibility and accurate troubleshooting. Businesses benefit from the assurance that their networks, systems and applications are up and service levels are met. StableNet give organizations the security that their IT systems do support vital business processes and revenue generation. StableNet provides end-to-end support spanning applications, systems, triple-play, switches and routers, and enterprise management systems.

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