

*The following white paper examines the operational support system (OSS) infrastructure of telecommunications service providers in terms of their operational maturity based on the Operations Maturity Model (OMM). It is expanded from an article that was first published Telecommunications® magazine.*

*A service provider's operational environment is a key to both overall cost and product differentiation; in other words, it is a crucial factor in staying competitive in today's challenging communications marketplace.*

*We would be pleased to receive any feedback about this paper. Please send your comments or questions to [info@eftia.com](mailto:info@eftia.com).*

## **How to Measure the Effectiveness of Your OSS Infrastructure**

A service provider's operational environment can be its single most effective sustainable differentiator or its greatest liability. To be successful, an operator must classify the current environment and stipulate the goals of the required target environment.

The effectiveness of an operational environment is determined by three factors: processes, personnel and the underlying OSS infrastructure. Any of these factors, if improperly implemented, can limit the effectiveness of the environment. Consequently, before establishing an environment, it is important to understand what constitutes a mature telecommunications operation and to establish the operational goals for the organization.

Once the current situation and goals are established, the service provider should work with its vendors, consultants, investors and other telecom business experts to establish a plan for selecting, evolving or replacing the OSS infrastructure, business processes and personnel.

In order to help establish the operational goals of a service provider, the software industry has long recognized the value of characterizing the maturity of software development processes. The Software Engineering Institute (SEI) Capability Maturity Model® (CMM), which ranks a company's software processes within five levels, has become a de facto standard. This paper proposes a similar five-level operations maturity model (OMM) to classify telecommunication operations.

# The Operational Environment

To determine an overall OMM level, the operational environment must be analyzed from three interrelated dimensions: Running the Business, Defining the Business and Evolving the Business.

Dimension 1: **Running the Business** addresses the business processes and procedures that are in place, the most important being business processes, people and the OSS infrastructure. The ultimate goal is to run the business in zero time and at zero cost. This of course is not fully achievable, but it should be the target.

Some of the factors that are used to determine the maturity ranking include

- Completeness of the process definitions
- Repeatability of the process
- Degree of process automation
- Methods used for measuring the effectiveness and cost of processes
- Degree of continuous process optimization based on business targets and measurements
- How well the process satisfies customer servicing goals

**Dimension 2: Defining the Business** captures the maturity of the data aspects within the OSS infrastructure. Business processes operate on data; it is data that defines, and is at the core of, the business. Data captures the services a company sells, their customers, their inventory and billing information. The ultimate goal is to be able to continually redefine the business without incurring OSS infrastructure costs. For example, the infrastructure should be able to accept new service offerings, networking technology, customer types and other changing business variables.

Factors used to determine definition maturity include

- Completeness of the data model (all important aspects of the business are captured)
- Accuracy of the data
- Consistency of the data model (the business is described with a unified data model)
- Completeness of the data definitions
- Ability to map or correlate between different data views
- Ability to maintain temporal views of the data (past, present and future views)
- Ability to define and optimize data relationships
- Ability to extend data model

**Dimension 3: Evolving the Business** measures the ability to adapt to change. Operational environments need to be engineered for change. An environment that meets today's requirements without the ability to evolve is of little worth. Change can occur at many levels. For example, an increase in the number of customers or an expansion of a network affects scalability; the introduction of a new technology inspires new ways of providing service; new service types are continually being defined; and new business processes need to be introduced. The ultimate goal is to be able to evolve the business at no cost.

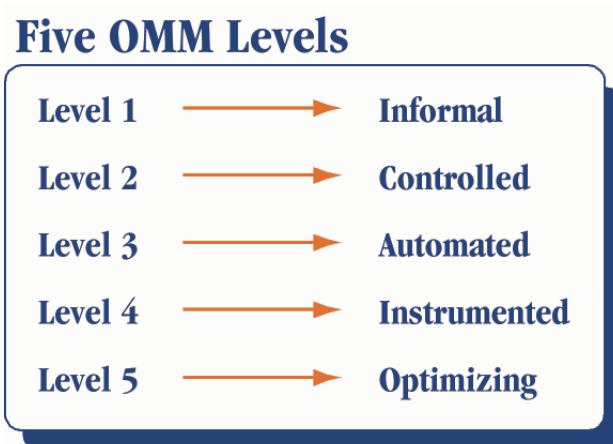
Some factors that help to determine this ranking include

- Ability to handle new business models (such as E-commerce)
- Ease with which new processes can be added, changed and removed
- Ease with which new data definitions can be added, changed and removed from the environment
- Ability to adopt new and emerging technology within the environment (such as the Web)
- Ability to adapt to handle growth in the environment (such as increased customers, services, locations or networks)

## The Five OMM Levels

The five proposed OMM levels are: 1–Informal, 2–Controlled, 3–Automated, 4–Instrumented and 5–Optimizing. The following is a summary of the main characteristics of each level, including a simple scenario for each one to exemplify their operational differences. (see figure 1:)

**Figure 1:**



## 1. OMM Level 1–Informal

As the name implies, Level 1 organizations have no overall operations strategy and essentially operate in an informal manner. Specific point solutions are deployed as new business requirements emerge. Level 1 operators have the following characteristics:

### Running the Business

- Many point solutions are used (no consistent OSS infrastructure)
- Processes are highly manual
- Processes are poorly documented
- Process performance is unpredictable

### Defining the Business

- Data models are not cohesive
- Duplicate information kept in several databases
- Data accuracy is a problem

### Evolving the Business

- New technology cannot be easily adopted
- Evolution strategy is not planned
- Data definitions are costly to add or change (add new services)
- Scaling requires reengineering

**Scenario:** A traditional Internet service provider (ISP) wishes to offer a voice over IP service. The OSS infrastructure and processes are geared towards Web access services. The OSS requires changes that are too costly and time consuming. The only viable solution is to deploy another point solution, further exacerbating the problem. This catch-22 is typical of a Level 1 operator; it's too expensive to change or evolve the existing structure, and too expensive to support an additional OSS point solution.

## 2. OMM Level 2–Controlled

Level 2 organizations have well-defined processes and have an OSS infrastructure that is capable of managing their workflow and adapting to new requirements. Level 2 operators have the following characteristics:

### Running the Business

- A mixture of manual and automated tasks is used
- Processes are well documented
- A combination of point solutions and integrated solutions is used
- Processes are predictable and repeatable within a relatively wide range

### Defining the Business

- Single master template is used for each data type
- Adaptation is used to map between disparate data sources

### Evolving the Business

- New processes are easily implemented
- New data definitions (services) are relatively expensive due to the lack of a unified data model
- Scalability has been addressed in the OSS infrastructure
- New technology is not easily adopted

**Scenario:** A traditional ISP wishes to offer a voice over IP service. The company's processes are supported by a workflow engine that can be easily modified to accommodate the required changes. A point solution may be required for service activation, but the service definition can be accommodated by the existing service catalog model. Adaptation software is required to manage and load data into the new voice directory technology that was introduced into the network to deliver the service. Overall, the new service can be accommodated within the existing infrastructure with the addition of some point solutions for certain functions (such as service activation).

### 3. OMM Level 3–Automated

Level 3 service providers have eliminated unnecessary manual intervention and have largely automated their processes. A corporate-wide standardized environment is in place and OSS integration technology is used to adapt to the legacy point solutions. A strong cohesive business object model exists and can be expanded to accommodate new requirements. Other characteristics include

#### Running the Business

- Processes are automated with little human intervention
- Processes are well defined and take into account interdependencies among departments
- Integrated solution with adaptation to point solutions exists
- Processes are predictable and repeatable within a relatively small range

#### Defining the Business

- Cohesive and unified business object model aligns with industry standards

#### Evolving the Business

- Processes are easily changed
- The processes and the environment gracefully adapt to new data requirements
- Infrastructure is highly scalable
- Infrastructure is designed for technology independence in key areas (GUI, database, communication infrastructure)

**Scenario:** A traditional ISP wishes to offer a voice over IP service. The company's processes are largely automated and the underlying business object model is designed to accept the required new business objects. The new service can be accommodated within the existing infrastructure. The technology purchased to implement the service in the network adheres to international standards and can therefore be integrated into the OSS infrastructure with minimal impact.

### 4. OMM Level 4–Instrumented

A Level 4 service provider environment is focused on quality management. Problems are proactively avoided by taking advantage of a highly instrumented OSS infrastructure. Trend analysis predicts future requirements. Processes are in place to ensure that data integrity and quality are paramount.

#### Running the Business

- A single operational environment exists
- Automated processes proactively avoid problems (defects, traffic congestion, inventory depletion)



- OSSs have strong trending capability
- Process performance is tightly monitored and well understood
- Processes exist for data discrepancy resolution and synchronization
- Processes are predictable and repeatable within a very narrow range

#### **Defining the Business**

- Data integrity and quality are strictly managed
- Performance and real-time state information are associated with relevant aspects of the data model

#### **Evolving the Business**

- Programs are in place to evolve the environment and regularly adopt new technology
- OSS infrastructure is predeployed/expanded in anticipation of projected growth in customer base or network infrastructure.

**Scenario:** A traditional ISP wishes to offer a Voice Over IP service. Not only can the new service be accommodated within the existing infrastructure, but the highly instrumented environment enables the provider to avoid network congestion problems and properly deploy the network infrastructure, thereby ensuring a higher quality of service.

## **5. OMM Level 5-Optimizing**

A Level 5 company is in a position to approach the ultimate goal of a zero cost, zero time operation. Business processes are fully automated and instrumented, and process measurements are fed back into the environment to enable continual optimization. Services are ordered directly by the end-customer with no operator intervention required. Level 5 operators have mastered the management of continual change.

#### **Running the Business**

- Zero-touch, self-serve environment exists
- Continual process optimization is pursued

#### **Defining the Business**

- Strong synchronization with network and business data ensures accuracy

#### **Evolving the Business**

- Environment is planned to be constantly evolving and regularly adopting new technology

**Scenario:** A traditional ISP wishes to offer a voice over IP service. The service is deployed with full instrumentation and is made available to the market for self-serve purchase, via the Web or Interactive Voice Response, and immediately turned up. In addition, sophisticated measurement mechanisms are built into the deployment and initial service delivery processes. The data gathered by these mechanisms is actively used to improve all aspects of the deployment of the next service.

## Conclusion

Any telecom service provider today knows that business operations are in a state of continuous change as companies try to adapt to a never-ending stream of new technology and business requirements. Of all the investments that go into providing a telecom service, operational cost is the single largest controllable factor.

A poor operational environment adds costs (and time) to service delivery and undermines a company's competitiveness. Conversely, an optimal operational environment allows a service provider to minimize the overall cost of delivering a service and to differentiate from the competition. Achieving a mature business operation translates into faster time-to-market, differentiated service offerings and, ultimately, higher profitability.

## References

Paulk, Mark C., et al. February 1993. Key Practices of the Capability Maturity Model. 93-178, Version 1. CMU/SEI.

Published: March 2000

*Eftia is a leader in developing, deploying and managing OSS products designed to meet the service management and delivery needs of tier one, wireless and next-generation service providers.*

*The Eftia Master.Scribe® Suite of integrated OSS products provides comprehensive order provisioning and fulfillment; problem management; telecom circuit and asset inventory management; and Internet protocol (IP) address and telephone number management. Eftia also offers Master.Xchange, a configurable OSS interconnection gateway.*

*If you would like to learn more about Eftia's OSS solutions, please visit [www.eftia.com](http://www.eftia.com) or contact us at 1-888-423-3842.*