



The enhanced Telecom Operations Map™ (eTOM) Business Process Framework

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ABSTRACT - AMONGST THE MANY INITIATIVES OF THE TELEMANAGEMENT FORUM¹, ONE OF THE MOST INTERESTING AND VALUABLE FOR INFORMATION AND COMMUNICATIONS SERVICE PROVIDERS (ICSP) IS THE DEFINITION AND DEVELOPMENT OF THE “eTOM BUSINESS PROCESS FRAMEWORK”.

THE ENHANCED TELECOM OPERATIONS MAP™ (eTOM)² IS A BUSINESS PROCESS MODEL OR FRAMEWORK THAT DESCRIBES ALL THE ENTERPRISE PROCESSES REQUIRED FOR A SERVICE PROVIDER, AND ANALYZES THESE TO DIFFERENT LEVELS OF DETAIL ACCORDING TO THEIR SIGNIFICANCE AND PRIORITY FOR THE BUSINESS.

THIS PAPER DESCRIBES THE eTOM FRAMEWORK BY PROVIDING AN OVERVIEW OF ITS CORE COMPONENTS AND ILLUSTRATES RELATIONSHIPS OF THE eTOM WITH THE OTHER TELEMANAGEMENT FORUM (TMF) ACTIVITIES. IT ALSO INDICATES WHERE CONTINUING DEVELOPMENT IS UNDERWAY TO EXTEND THIS WITH DETAILED PROCESS DECOMPOSITIONS AND FLOWS IN HIGH-PRIORITY AREAS OF CONCERN FOR THE INDUSTRY.

INTRODUCTION

Information and communications Service Providers (SP) worldwide continue to urgently require well-automated operations processes whether they are incumbent providers or new entrants. SPs are faced with ever-increasing competition, a market that has experienced dramatic change at an unprecedented rate, as well as an industry undergoing significant shakeup. For the growing Mo-

bile/Wireless and IP Services markets, these SPs are focused on quickly provisioning new customers and supporting service quality issues. For all SPs, there is an intense drive to introduce both new value-added services and dramatic improvements in customer support.

For the full range of service providers and network operators, the leading focus of the TMF's mission is to enable end-to-end process automation of information and communications services for business and operations processes. In this context, the eTOM³

¹ (<http://www.tmforum.org>)

² The enhanced Telecom Operations Map™ is a registered Trade Mark of TeleManagement Forum

³ The “enhanced Telecom Operations Map™ (eTOM) business process framework was approved in its version 3.0 by the TMF in June 2002.



ICSP:

Information and
Communications
Service Provider



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Enrico Ronco received the Computer Science degree from the University of Torino in 1991 and joined CSELT (now TILAB) working on Human Machine Interfaces specification.

Since early 1993 he was involved in the "process management" theme: amongst other initiatives he participated in process reengineering projects within Telecom Italia and collaborated to the definition of a process analysis and formalization methodology.

During the 1998-2001 period he led three projects at Telecom Argentina aimed at the reengineering of operations and strategic processes, and at the definition of an overall enterprise process model for that company.

Since 2000 he is also involved in the activities of the Tele-Management Forum by covering the role of the eTOM (enhanced Telecom Operations Map) Team Leader.

Currently he is leading a TILAB research project focused on innovation in the Operations and Management topic area.

is the business framework for accomplishing this mission.

The purpose of the eTOM is to continue to set a vision for the industry to successfully compete through the implementation of business process driven approaches to managing the enterprise. This includes ensuring integration among all vital enterprise support systems concerned with service delivery and support.

The eTOM is a business process model or framework, developed within the context of the TMF, describing all the enterprise processes required by a SP. For such a company, it serves as the blueprint for process direction and provides a neutral reference point for internal process reengineering needs, partnerships, alliances, and general working agreements with other providers.

For suppliers, eTOM outlines potential boundaries of software components to align with the customers' needs and highlights the required functions, inputs, and outputs that must be supported by products.

A particular strength of eTOM as a business process framework is that it is an essential part of the TM Forum NGOSS™ (New Generation Operations Systems and Software) program and links in with the work being done elsewhere in the TM Forum, notably the NGOSS™ system work. The eTOM provides the NGOSS™ business view, which is the driver for a development leading to the specification of system requirements and implementation, followed by an operational solution to solve the business problem. More information on eTOM and NGOSS is available through the TM Forum website

(<http://www.tmforum.org>) where documentation and other material can be downloaded.



TOM BACKGROUND

The eTOM is based on the Telecom Operations Map (TOM), which is a high-level reference process model for Operations and Management in a modern telecommunications company.

The Telecom Operations Map (1) was developed to drive a consensus around the processes, inputs, outputs and activities required for service provider operations management.

The TOM also provides the definition of common terms concerning operations processes, sub-processes and the activities performed within each. Common terminology makes it easier for Service Providers to negotiate with Customers, third party Suppliers, and other Service Providers.

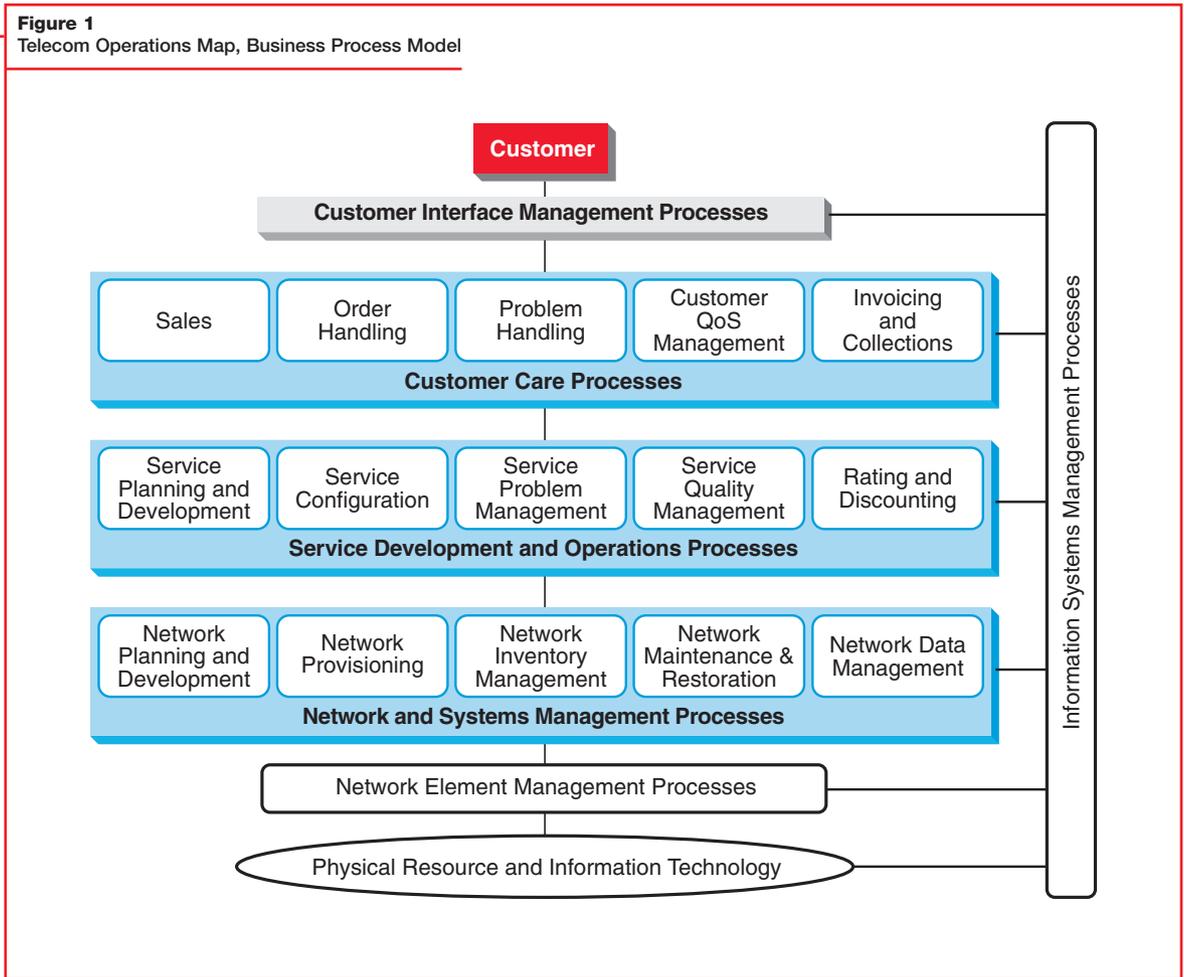
The TMF decided to expand the TOM to the current eTOM framework due to the two following reasons:

- First, there was a necessity to expand the TOM to a total enterprise business process framework.
- Second, the TOM did not sufficiently address ebusiness impacts on the business environment and business drivers, the need for ebusiness integrated processes, nor the increased complexity of service provider business relationships.

The Telecom Operations Map high-level diagram from TOM is shown in [figure 1](#).

The development of the eTOM begun in September 2001 and encapsulated the TOM operations

Figure 1
Telecom Operations Map, Business Process Model



processes within a comprehensive Business Process Framework covering the whole enterprise space. The new eTOM was launched in the early part of 2001 and since then it was enhanced developed into its present form.

During June 2002, after a TMF Board of Directors vote, the eTOM Business Process Framework (version 3.0) became formally approved and is available to the general public (2).

THE ENHANCED TELECOM OPERATIONS MAP

The eTOM Business Process Framework positions the SP's enterprise within its overall business context: i.e. the business interactions and relationships, which allow the SP to carry on its business with other organizations.

The eTOM Business Process Framework begins at the Enterprise level and defines business processes in a series of groupings. eTOM uses hierarchical decomposition to structure the business processes according to which all of the processes of the enterprise are successively decomposed. Process descriptions, inputs and outputs, as well as other key elements are defined.

The Framework also includes views of functionality as they span horizontally across an enterprise's internal organizations. For example, managing customer relationships spans an enterprise from marketing to ordering to billing to after-service support and follow-on sales.

eTOM provides the definition of common terms concerning enterprise processes, sub-processes and the activities performed within each. Common terminology makes it easier for service providers to negotiate with customers, third party suppliers, and other SPs.

The eTOM Business Process Framework is defined as generically as possible, so that it is independent of organization, technology and service.

eTOM CONCEPTUAL LEVEL VIEW

At the overall conceptual level, eTOM can be viewed as having three major areas of process (known as “Level 0” process groupings), as shown in [figure 2](#):

- **Operations** - covering the core of operational management
- **Strategy, Infrastructure & Product** - covering planning and lifecycle management
- **Enterprise Management** - covering corporate or business support management

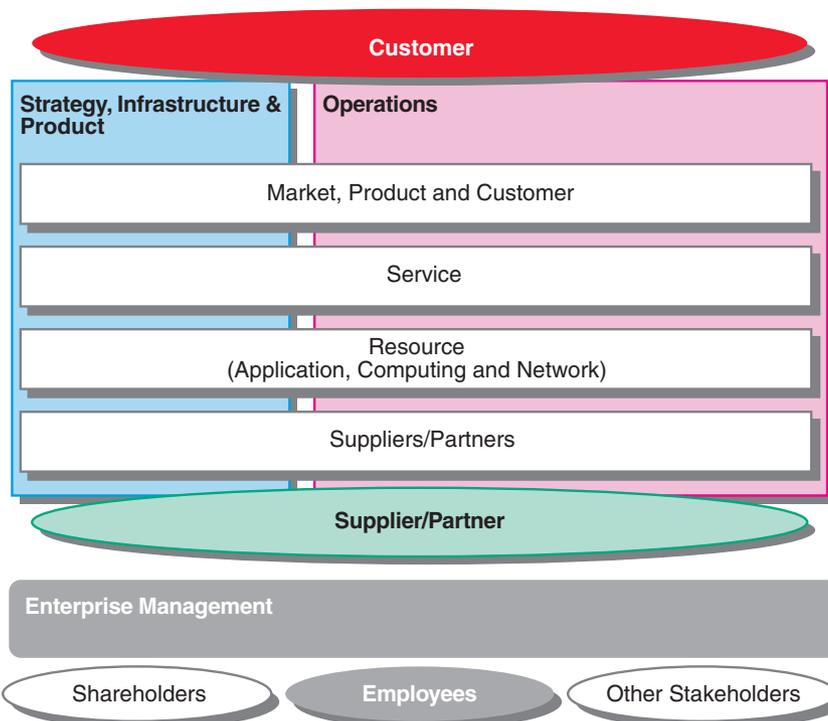
The **Operations** Process Area is the heart of eTOM. It includes all operations processes that support

the customer operations and management, as well those that enable direct customer operations with the customer. These processes include both day-to-day and operations support and readiness processes. The eTOM view of Operations also includes sales management and supplier/partner relationship management.

The **Strategy, Infrastructure & Product** Process Area includes processes that develop strategy, commit to the firm, build infrastructure, develop and manage products, and that develop and manage the Supply Chain. In the eTOM, infrastructure refers to more than just the IT and resource infrastructure that supports products and services. It includes the infrastructure required to support functional processes, e.g., Customer Relationship Management (CRM). These processes direct and enable the Operations processes.

The **Enterprise Management** Process Area includes basic business processes required to run any busi-

Figure 2
eTOM Business Process Framework — The Highest Conceptual View showing the Level 0 Process Groupings



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ness. These processes focus on Enterprise Level processes, goals and objectives. These processes have interfaces with almost every other process in the enterprise, whether operational, product or infrastructure processes. These are sometimes considered corporate functions and/or processes, e.g., Financial Management, Human Resources Management processes, etc.

eTOM CEO LEVEL VIEW

Below the conceptual level, the eTOM Business Process Framework is decomposed into a set of process groupings, which provide a first level of detail at which the entire enterprise can be viewed. These processes are considered the CEO level view, in that the performance of these processes determines the success of the enterprise.

To reflect the way businesses look at their processes, the eTOM supports two different perspectives on the grouping of the detailed process elements:

- *vertical* process groupings, which represent a view of end-to-end processes within the business, such as those involved in the overall billing flows to customers;
- *horizontal* process groupings, which represent a view of functionally-related processes within the business, such as those involved in managing the supply chain.

The Operations process area and the Strategy, Infrastructure&Product process area, include this two-dimensional structure.

The integration of all these processes provides the enterprise-level process framework for the information and communications service provider. This is the 'Level 0' view of the enterprise and shows the vertical and

Figure 3
The eTOM Level 0 View of Level 1 Processes

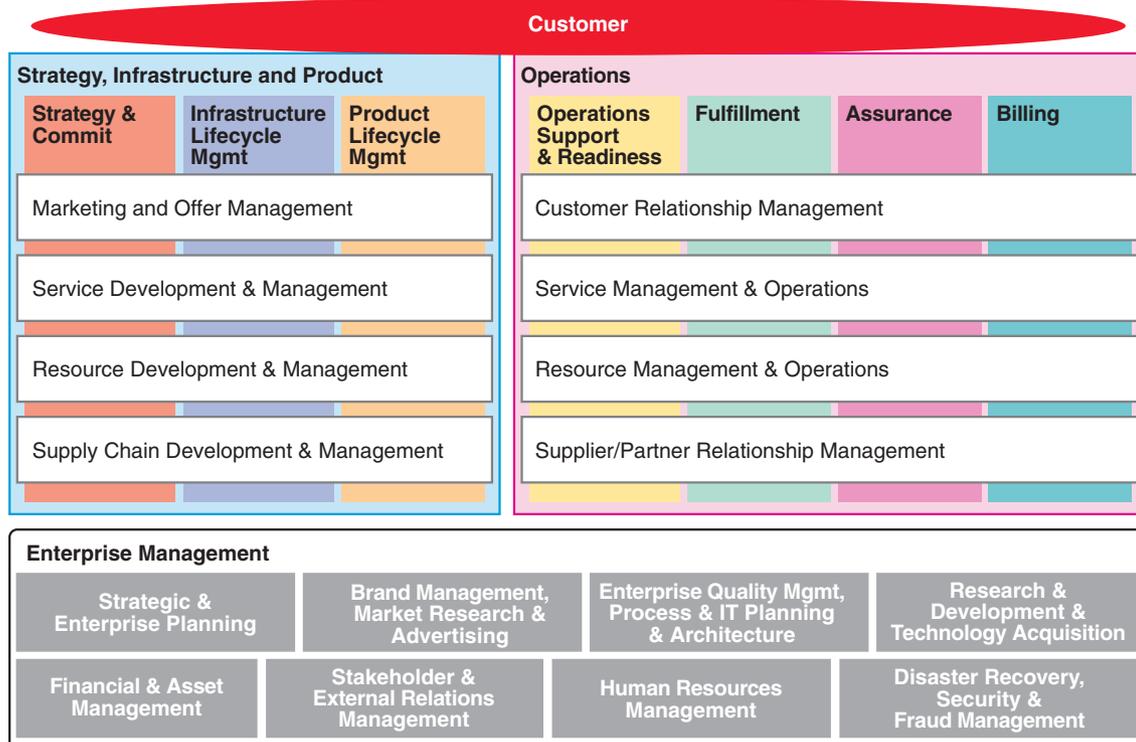
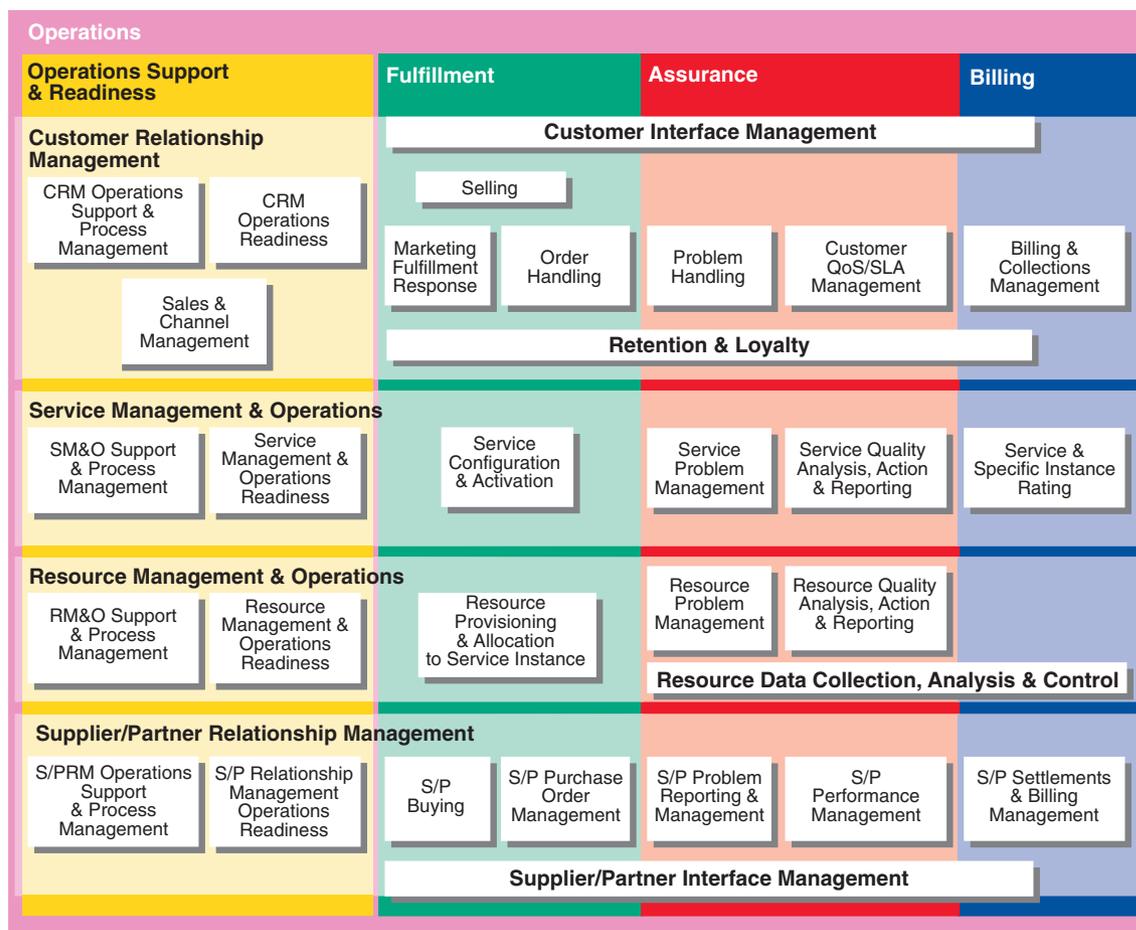


Figure 4
The eTOM Operations Processes



horizontal process groupings that are the decompositions of the process areas introduced above.

Figure 3 depicts the Business Process framework at this level. The structure shown here defines "Level 1" processes within each of the three "Level 0" processes.

In the following, a brief explanation of the eTOM processes is provided. For further detail please refer to (2).

THE OPERATIONS AREA

The Operations Area contains the processes depicted in the following picture.

OPS Vertical Process Groupings

The Operations (OPS) process area contains the direct operations vertical process groupings of Fulfillment, Assurance & Billing (FAB), together with the Operations Support & Readiness process grouping. The FAB processes are sometimes referred to as Customer Operations processes as they directly interface with and support the customer and are the priority focus of the enterprise. The *Operations Support & Readiness* process grouping includes those processes needed to ensure that Customer Operations processes can respond with what the customer requires, in a timeframe and at a cost the customer requires, including delighting the customer with delivery and support.

The process grouping is responsible for ensuring operational readiness in the fulfillment, assurance and billing areas.

OPS Vertical Process Groupings are the following.

Fulfillment: this process grouping is responsible for providing customers with their requested products in a timely and correct manner. It translates the customer's business or personal need into a solution, which can be delivered using the specific products in the enterprise's portfolio.

Assurance: this process grouping is responsible for the execution of proactive and reactive maintenance activities to ensure that services provided to customers are continuously available and to SLA or QoS performance levels. It performs continuous resource status and performance monitoring to proactively detect possible failures. It collects performance data and analyzes them to identify potential problems and resolve them without impact to the customer.

Billing: this process grouping is responsible for the production of timely and accurate bills, for providing pre-bill use information and billing to customers, for processing their payments, and performing payment collections. In addition, it handles customer inquiries about bills, provides billing inquiry status and is responsible for resolving billing problems to the customer's satisfaction in a timely manner. This process also supports prepayment for services.

Operations Support & Readiness: this process grouping is responsible for support to the "FAB" processes, and for ensuring operational readiness in the fulfillment, assurance and billing areas. In general, the processes are concerned with activities that are less "real-time" than those in FAB, and which are typically concerned less with individual customers and services and more with groups of these. They reflect a need in some organizations to divide their processes between the immediate customer-facing and real-time operations of FAB and other Operations processes which act as a "second-line" in carrying out the operational tasks.

OPS Horizontal Process Groupings

In the OPS process area of the eTOM Framework there are four OPS functional process groupings that support the operations processes discussed

above and also the management of operations to support customer, service, resource and supplier/partner interactions.

OPS Horizontal Process Groupings are the following.

Customer Relationship Management (CRM): this process grouping considers the fundamental knowledge of customers needs and includes all functionalities necessary for the acquisition, enhancement and retention of a relationship with a customer. It is about customer service and support, whether storefront, telephone, web or field service. It is also about retention management, cross-selling, up-selling and direct marketing for the purpose of selling to customers. CRM also includes the collection of customer information and its application to personalize, customize and integrate delivery of service to a customer, as well as to identify opportunities for increasing the value of the customer to the enterprise.

Service Management & Operations (SM&O): this process grouping focuses on the knowledge of services (Access, Connectivity, Content, etc.) and includes all functionalities necessary for the management and operations of communications and information services required by or proposed to customers. The focus is on service delivery and management as opposed to the management of the underlying network and information technology.

Resource Management & Operations (RM&O): this process grouping maintains knowledge of resources (application, computing and network infrastructures) and is responsible for managing all these resources.(e.g. networks, IT systems, servers, routers, etc.) utilized to deliver and support services required by or proposed to customers. It also includes all functionalities responsible for the direct management of all such resources (network elements, computers, servers, etc.) utilized within the enterprise. These processes are responsible for ensuring that the network and information technologies infrastructure supports the end-to-end delivery of the required services.

Supplier/Partner Relationship Management (S/PRM): this process grouping supports the core operational processes, both the customer instance processes of Fulfillment, Assurance and Billing and the functional operations processes. Supplier/Partner Relationship

Management (S/PRM) processes align closely with a supplier's or partner's Customer Relationship Management processes. The inclusion of Supplier/Partner Relationship Management processes in eTOM is one of the key ways that eTOM differentiates itself from the vertically integrated enterprise framework that was in the TOM. The existence of S/PRM processes enables the direct interface with the appropriate lifecycle, end-to-end customer operations or functional processes with suppliers and/or partners.

The Strategy, Infrastructure & Product Process Area

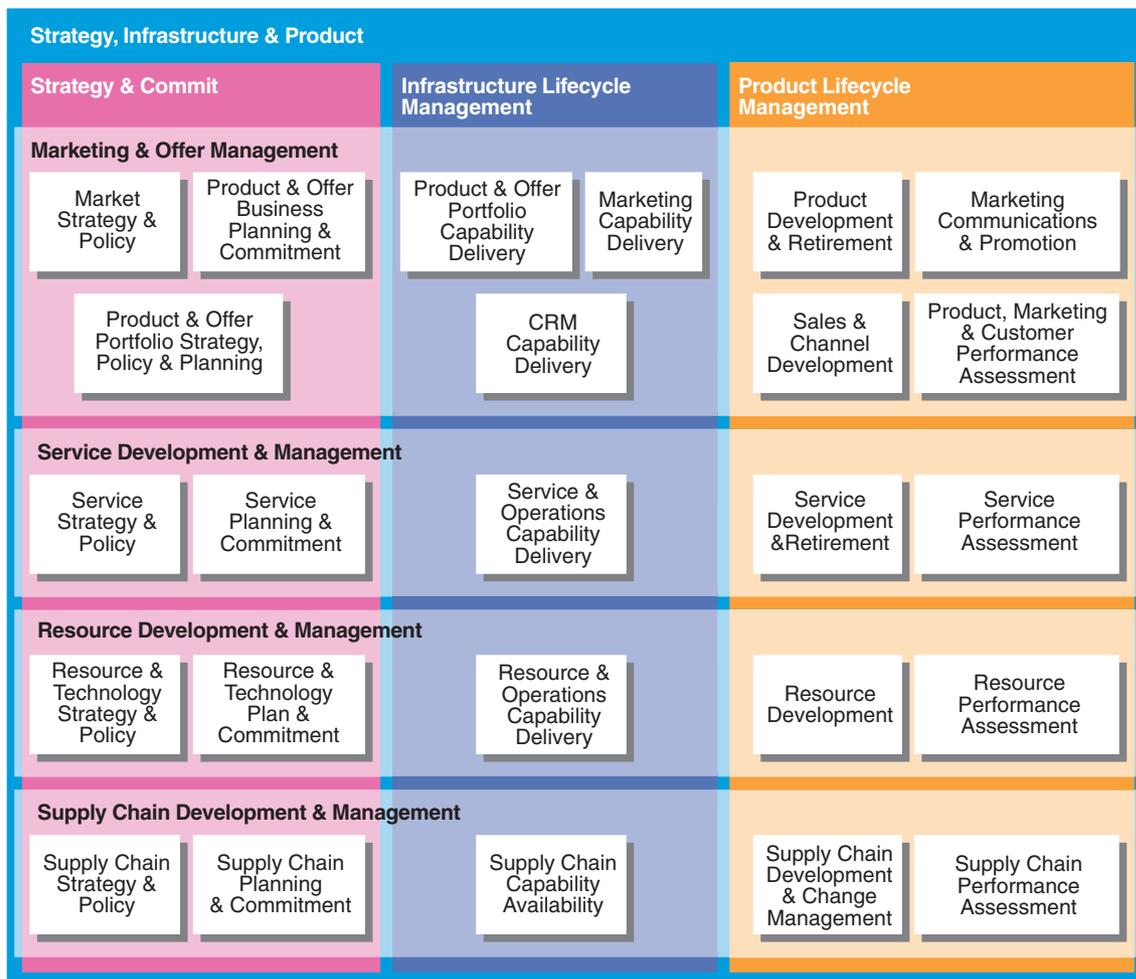
The Strategy, Infrastructure & Product (SIP) Area

contains the processes depicted in the following picture.

SIP Vertical Process Groupings

The Strategy and Commit process groupings, together with the two Lifecycle Management process groupings, are shown as three vertical end-to-end process groupings. The Strategy and Commit processes provide the focus within the enterprise for generating specific business strategy and gaining buy-in within the business for this. The Infrastructure Lifecycle Management and Product Lifecycle Management processes drive and support the provision of products to customers.

Figure 5
The eTOM Strategy, Infrastructure & Product Processes



Their focus is on meeting customer expectations whether as product offerings, the infrastructure that supports the operations functions and the products or the suppliers and partners involved in the enterprise's offering to customers.

SIP Vertical Process Groupings are the following.

Strategy & Commit: this process grouping is responsible for the generation of strategies in support of the Infrastructure and Product Lifecycle processes. It is also responsible for establishing business commitment within the enterprise to support these strategies. This embraces all levels of operation from market, customer and products, through the services and the resources on which these depend, to the involvement of suppliers and partners in meeting these needs.

Infrastructure Lifecycle Management: this process grouping is responsible for the definition, planning and implementation of all necessary infrastructures (application, computing and network), as well as all other support infrastructures and business capabilities (operations centers, architectures, etc.). These processes identify new requirements, new capabilities and design and develop new or enhanced infrastructure to support products.

Product Lifecycle Management: this process grouping is responsible for the definition, planning, design and implementation of all products in the enterprise's portfolio. The Product Lifecycle Management processes manage products to required profit and loss margins, customer satisfaction and quality commitments, as well as delivering new products to the market.

SIP Horizontal Process Groupings

Corresponding to the Operations functional (horizontal) process groupings, there are four functional process groupings in the Strategy, Infrastructure & Product domain. These support the SIP processes presented above and the management of operations to support marketing and offer, service, resource and supply chain interactions. They include functionalities necessary for defining strategies, developing, managing and assessing the performance of products, services and resources, as well as suppliers and partners.

SIP Horizontal Process Groupings are the following.

Marketing & Offer Management: this process grouping focuses on the knowledge of running and developing the Core Business for an ICSP Enterprise. It includes functionalities necessary for defining strategies, developing new products, managing existing products and implementing marketing and offering strategies especially suitable for information and communications products and services.

Service Development & Management: this process grouping focuses on planning, developing and delivering services to the Operations domain. It includes functionalities necessary for defining the strategies for service creation and design, managing and assessing the performance of existing services, and ensuring that capabilities are in place to meet future service demand.

Resource Development & Management: this process grouping focuses on planning, developing and delivering the resources needed to support services and products to the Operations domain. It includes functionalities necessary for defining the strategies for development of the network and other physical and non-physical resources, introduction of new technologies and interworking with existing ones, managing and assessing the performance of existing resources and ensuring that capabilities are in place to meet future service needs.

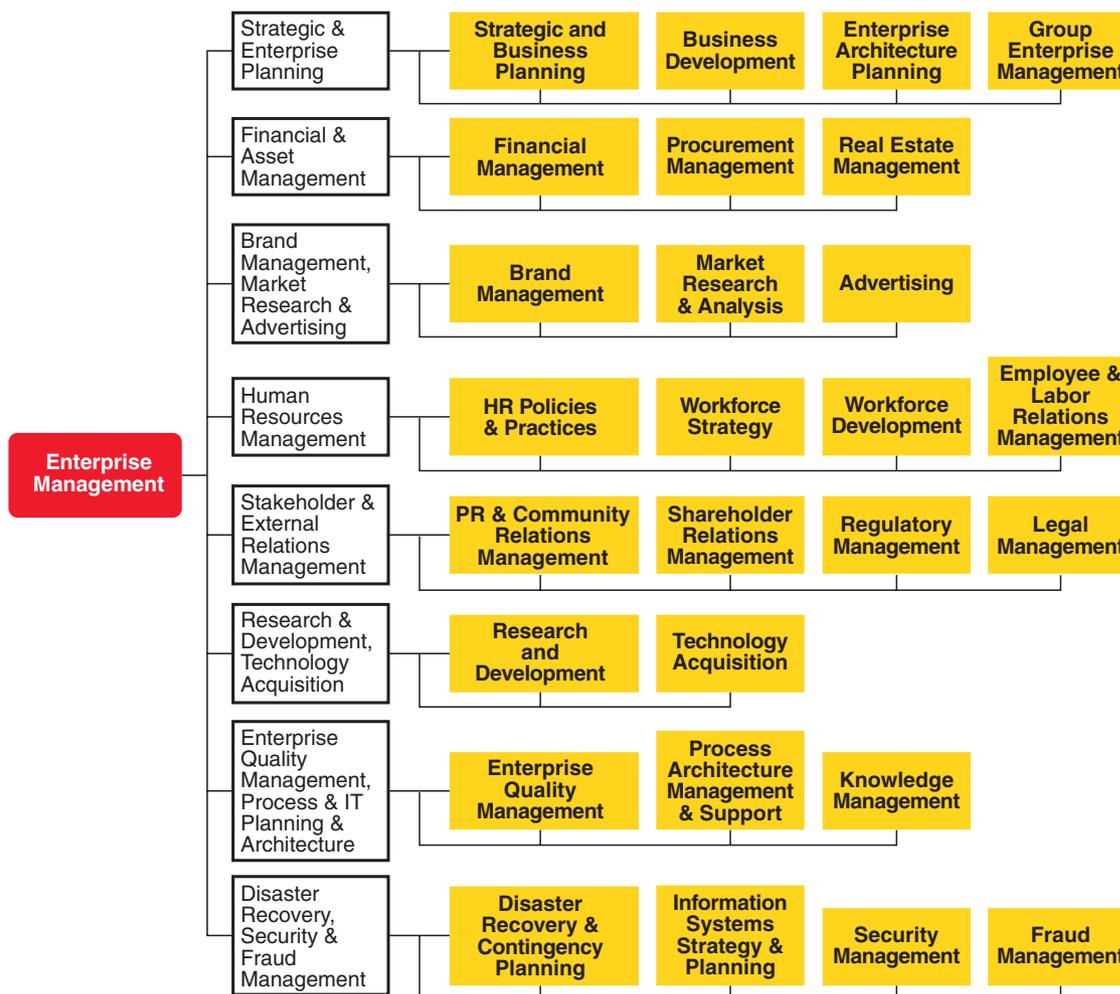
Supply Chain Development & Management: this process grouping focuses on the interactions required by the organization with suppliers and partners, who are involved in maintaining the supply chain⁴. These processes ensure that the best suppliers and partners are chosen as part of the enterprise supply chain.

THE ENTERPRISE MANAGEMENT PROCESS AREA

This grouping involves the knowledge of Enterprise-level actions and needs, and encompasses all business management processes necessary

⁴ The supply chain is a complex network of relationships that a service provider manages to source and deliver products.

Figure 6
The eTOM Enterprise Management Processes



to support the rest of the enterprise. These processes are necessary in any business because they are needed to run the business at the enterprise level, to direct the business, and are critical to support the direct and indirect Customer Processes. Enterprise Management processes include processes for financial management, legal management, regulatory management, etc. These processes are not typically specific to the telecoms domain.

FUTURE DEVELOPMENTS OF eTOM

Within TMF, the work on the Business Process Framework did not stop with the approval eTOM version 3.0, but is ongoing with two main objectives:

- the further decomposition of selected Level 2 processes of the framework in more detail; the choice of the various processes to be decomposed depends on the specific interest of TMF member companies;

- the definition a “Library” of Examples of End-To-End Process Flows, obtained by utilizing process components (at level 2 or lower) contained in the eTOM Business Process Framework.

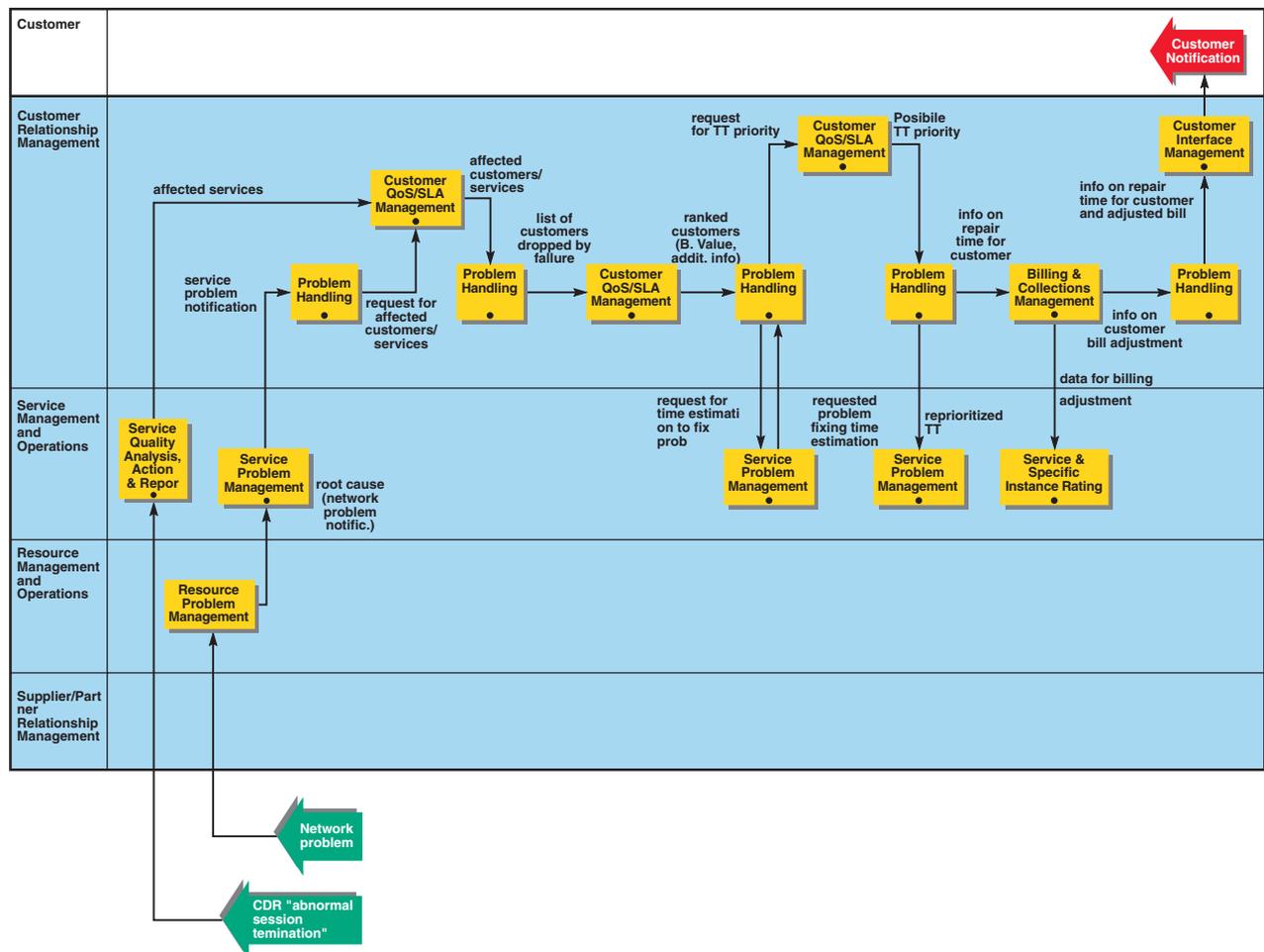
As an example, Assurance (within the Operations process grouping) has been analyzed to develop more detailed process decompositions (at Level 3 and then Level 4, below the Level 2 processes indicated earlier in this paper) and to show their linkage and the process flows interconnecting these. **Figure 7** illustrates a portion of the Level 2 End-To-End Assurance Process flow, still under construction within the TMF.

Further process decompositions flows are being

published (3) in a number of areas, including Customer Relationship Management, Service Management, Resource Management, Supplier and Partner Relationship Management, and Fulfillment, Assurance and Billing, and yet other areas are under development for future publication.

With the core work, and these additions and extensions, the eTOM Business Process Framework can be used as a tool for analyzing an organization’s existing processes and for developing new processes. Different processes delivering the same business functionality can be identified, duplication eliminated, gaps revealed, new process design speeded up, and variance reduced.

Figure 7
A portion of the Assurance End-to-End process flow (draft)



CONCLUSION

The eTOM is a sound reference enterprise process framework for the Information and Communications Services industry in the eBusiness era. Built on the former TOM process framework, the eTOM provides a common view of SP enterprise processes that can easily translate to an individual provider's internal approaches. The framework is not intended to be prescriptive about how the tasks are carried out, how a provider or operator is organized, or how the tasks are identified in any one organization.

The eTOM is expected to be the starting point of detailed work that leads to an integrated set of specifications that will provide real benefit to both suppliers and procurers in enhancing industry service provider enterprise management capability.

One of the strengths of the eTOM is that it can be adopted at a high level, at lower levels or even modularly depending upon a service provider's needs. The eTOM can also act as a translator by allowing a service provider to map their distinct processes to the industry framework.

ACKNOWLEDGEMENTS

The author wishes to thank all the participants to the TMF "eTOM Team" (and to the former "TOM" team), whose effort, dedication and enthusiasm made the eTOM Framework a success story. In particular a special mention goes to Mike Kelly, the TMF Senior Technology

Manager in charge of all eTOM related activities, for his precious inputs in the development of this paper.

GLOSSARY

CRM	<i>Customer Relationship Management</i>
eTOM	<i>enhanced Telecom Operations Map</i>
FAB	<i>Fulfillment, Assurance & Billing</i>
IP	<i>Internet Protocol</i>
NGOSS	<i>New Generation Operations Systems and Software</i>
OPS	<i>Operations</i>
RM&O	<i>Resource Management & Operations</i>
SIP	<i>Strategy, Infrastructure & Product</i>
SM&O	<i>Service Management & Operations</i>
SP	<i>Service Provider</i>
S/PRM	<i>Supplier/Partner Relationship Management</i>
TMF	<i>TeleManagement Forum</i>
TOM	<i>Telecom Operations Map</i>

REFERENCES

- [1] *TMF GB910 - Telecom Operations Map; Approved Version - March 2000*
- [2] *TMF GB921 - enhanced Telecom Operations MapTM (eTOM) - The Business Process Framework For The Information and Communications Services Industry; Approved Version - June 2002*
- [3] *TMF GB921a - enhanced Telecom Operations MapTM (eTOM) - Addendum A - Detailed Process Decompositions and Flows for Selected Areas of the Business Process Framework; Member Draft Version 0.8 - June 2002*

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