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SERIES E: OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

Network management – Checking the quality of the international telephone service

Framework for service management operational requirements – Service management

ITU-T Recommendation E.480

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Framework for service management operational requirements – Service management

Summary

Service management (SM) is a new operational discipline being introduced to manage the increasing complexity associated with services built up from multiple interconnected networks delivering content from multiple sources. This Recommendation is intended to support and define the role of service management. It explains the service management principles and functions. The major part of this Recommendation provides a definition of service management and provides a framework for further analysis of the operational activities associated with service management.

Source

ITU-T Recommendation E.480 was approved on 6 September 2006 by ITU-T Study Group 2 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

Service, service development, service development & management, service management, service management & operation.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Introduction

The purpose of this Recommendation is to provide a conceptual framework of service management in view of operations. It also provides definitions of service management as well as information on service management in terms of enhanced telecom operations map's (eTOM [ITU-T M.3050]) service development & management and service management & operations as well as IT infrastructure library (ITIL [BS 15000]). Service delivery and service support are also provided. The information provided can be used as a starting point for further study and analysis in service management arena.

ITU-T Recommendation E.480

Framework for service management operational requirements – Service management

1 Scope

This Recommendation provides a definition of service and service management, as well as a framework for further analysis of operational service management activities. With the collaboration of network operators and IT enterprise providers, a combined model is required to manage ICT services as depicted in Figure 1. The top two blocks refer to existing standards, while the middle block depicts this Recommendation and the lower layer blocks allow for extensions to the current Recommendation.

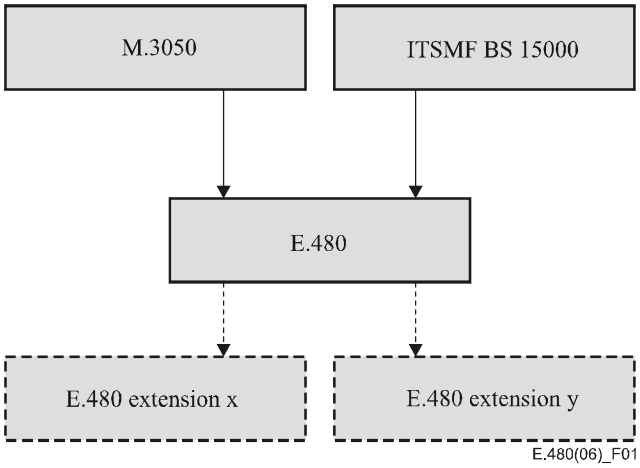

Figure 1 – A combined model on management of ICT service

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.3050] ITU-T Recommendation M.3050.x (2007), *Enhanced Telecom Operations Map (eTOM).*

[BS 15000] Information technology infrastructure library (ITIL). (Same as ISO 20000.)

3 Definitions

This Recommendation defines the following terms:

3.1 service management: The operational processes responsible for planning, development, deployment, usage and support of the service infrastructure, as well as the operational processes responsible for deploying, providing and supporting individual services as part of packaged product offerings to customers.

3.2 service: A logical capability that is packaged as part of a product offering by service providers to their customers. The totality of the capability available to customers within the product offering is derived from the services which collectively are packaged within the offering. An individual service is derived from the service infrastructure and may be visible to customers in which case it is known as a customer facing service, or it may be only invisible to, or indirectly detectable by, a customer in which case it is known as a resource facing service.

3.3 customer facing service: A logical capability that is packaged as part of a product offering by service providers to their customers, which is directly purchased, leased, visible to and/or otherwise directly usable by those customers. The logical functionality can be derived from underlying network or information technology (i.e., a dedicated contact number or tailored web-based access to operational support for a specific customer), or may be delivered or supplied by staff or contractors employed by the service provider (i.e., dedicated service team or help desk for a specific customer).

3.4 resource facing service: A logical capability that is packaged as part of a product offering by service providers to their customers, but which is not directly visible to and/or usable by those customers. The logical functionality can be derived from underlying network or information technology (i.e., MPLS capabilities provided as part of a router), or may be delivered or supplied by staff or contractors employed by the service provider.

3.5 service infrastructure: All physical and logical capabilities which are used to derive, deploy and directly manage services. The capabilities could be represented by an organizational capability (i.e., dedicated service team for a specific customer), or by physical and/or logical capability which delivers the packaged service (i.e., MPLS and associated IP VPN management systems, or web-servers dedicated to support online access to service supported by customers).

3.6 service management & operations (SM&O): This horizontal functional 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. Some of the functions involve short-term service capacity planning for a service instance, the application of a service design to specific customers or managing service improvement initiatives. These functions are closely connected with the day-to-day customer experience, see [ITU-T M.3050].

3.7 service development & management (SD&M): This horizontal functional process grouping focuses on planning, developing and delivering of services to the operations domain. It includes processes necessary for defining the strategies for service creation and design, managing existing services and ensuring that capabilities are in place to meet future service demand, see [ITU-T M.3050].

3.8 "end to end": The scope of a service referring to all physical and logical elements that constitute the service, as well as the application, presentation and transport mechanisms to deliver the service. This allows measurement (across the network) between service end points, providing an accurate assessment from a customer's perspective.

3.9 configuration management database (CMDB): A database that contains all relevant details of each CI and details of the important relationships between CIs.

3.10 configuration management plan: Document setting out the organization and procedures for the configuration management of a specific product, project, system, support group or service. [BS 15000]

3.11 configuration management: Configuration management covers the identification of all significant components within the IT Infrastructure and recording details of these components in the configuration management database (CMDB). Importantly the configuration management system

also records relationships between these components. It provides comprehensive information about all components in the infrastructure that enable all other processes to function more effectively and efficiently. [BS 15000]

3.12 change management: Change management covers the process of IT change for all types of change, from the request for change, to assessment, to scheduling, to implementing, and finally to the review. It is the change management process that produces approval (or otherwise), for any proposed change.

3.13 release management: Release management is very closely linked with configuration management and change management, and undertakes the planning, design, building, and testing of hardware and software to create a set of release components for a live environment. Activities cover the planning, preparation and scheduling of a release to customers and locations. [BS 15000]

3.14 incident management: The primary goal of the incident management process is to restore normal service as quickly as possible following loss of service, and to minimize the adverse impact on business operations, thus ensuring that the best possible levels of service quality and availability are maintained. An incident is defined as any event which is not part of the standard operation of a service and which causes, or may cause, an interruption to, or a reduction in, the quality of that service. [BS 15000]

3.15 problem management: The goal of problem management is to minimize the adverse impact of incidents and problems on the business that are caused by errors within the IT infrastructure, and to prevent recurrence of incidents related to these errors. In order to achieve this goal, problem management seeks to get to the root cause of incidents and then initiate actions to improve or correct the situation. The problem management process has both reactive and proactive aspects. The reactive aspect is concerned with solving problems in response to one or more incidents. Proactive problem management is concerned with identifying and solving the underlying causes of incident before they recur. [BS 15000]

3.16 service desk: The service desk differs from the other main areas of service management in that it is not a process but is the central point of contact for customers to report difficulties, complaints or questions. Additionally the service desk extends the range of services allowing business processes to be integrated into the service management infrastructure by providing an interface for other activities such as customer change requests, maintenance contracts, software licences, service level agreements and configuration management.

Many call centres and help desks naturally evolve into service desks to improve and extend overall service to the customers and the business. [BS 15000]

3.17 service level management: Service level management is the processes of planning, coordinating, drafting, agreeing, monitoring and reporting on service level agreements (SLAs), and the ongoing reviewing of service achievements to ensure that the required and cost-justifiable service quality is maintained or where necessary improved. SLAs provide the basis for managing the relationship between the provider and the customer. [BS 15000]

3.18 financial management for IT services: Financial management is concerned with three main processes of budgeting, IT accounting and charging. Budgeting is the process of predicting and controlling the spending of money within the enterprise and consists of a periodic negotiation cycle (usually annual) to set limits on budgets and the day-to-day monitoring of the current budgets. IT Accounting is the set of processes that enable the IT organization fully to account for the way its money is spent – particularly the ability to identify costs by customer, by service, by activity. Charging is the set of processes required to charge customers for the services supplied to them. To achieve this, sound accounting is required, to a level of detail determined by the requirements of the analysis, billing and reporting processes. [BS 15000]

3.19 capacity management: Capacity management is the focal point for all IT performance and capacity issues. It is essential that capacity management has a close, two-way relationship with the business strategy and planning processes within an organization. The process needs to understand the long-term strategy of the business while providing information on the latest ideas, trends and technologies being developed by the suppliers of computing hardware and software. [BS 15000]

3.20 IT service continuity management: IT service continuity management is responsible for taking risk reduction measures to reduce the chances of major disasters occurring and for the production of an IT recovery plan which interfaces into the overall business continuity plans. The IT recovery plans will need to be cost-effective and justified by the business. [BS 15000]

3.21 availability management: Availability management is concerned with the design, implementation, measurement and management of IT infrastructure availability to ensure the stated business requirements for availability are consistently met. Availability management will consider all aspects of the IT infrastructure and supporting organization which may impact availability, including training, skills, policy, process, procedures and tools. [BS 15000]

3.22 service delivery: Service delivery comprises of the following components [BS 15000]:

- Financial management;
- Availability management;
- Continuity management;
- Capacity management;
- Service level management.

3.23 service support: Service support comprises of the following components [BS 15000]:

- Incident management;
- Problem management;
- Change management;
- Release management;
- Configuration management;
- Service desk.

4 Abbreviations

This Recommendation uses the following abbreviations:

DMZ	Demilitarized Zone
eTOM	enhanced Telecom Operations Map
IP VPN	Internet Protocol Virtual Private Network
ITIL	Information Technology Infrastructure Library
MPLS	Multi Protocol Label Switching
NOC	Network Operations Centre
SD&M	Service Development & Management
SM	Service Management
SM&O	Service Management & Operations
SNO	Service & Network Operations
SOC	Service Operations Centre

5 Conventions

None.

6 Operational resource and service management

The transition from a traditional telecommunications network provider to a service provider necessitates the culture evolution from the predominately resource orientated to a customer service centric offering which is driven by customers' business requirements. Hence, the resource management business framework needs to be complimented with service management processes.

6.1 Resource management

The network operations centre maintains knowledge of the 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. This 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. The purpose of these processes is to ensure that infrastructure runs smoothly, is accessible to services and employees, is maintained and is responsive to the needs, whether directly or indirectly, of services, customers and employees. The NOC also has the basic function to assemble information about the resources (e.g., from network elements and/or element management systems), and then integrate, correlate, and in many cases, summarize that data to pass on the relevant information to service management systems, or to take action in the appropriate resource.

The NOC processes thus manage the complete service provider network (MPLS, ATMNet, etc.) and sub-network and information technology infrastructures.

Segmentation places the management of the network devices, network facing interfaces, logical network related connections, etc., into the network operations centre. The model of resource management under the scope of this Recommendation is depicted in Figure 2.

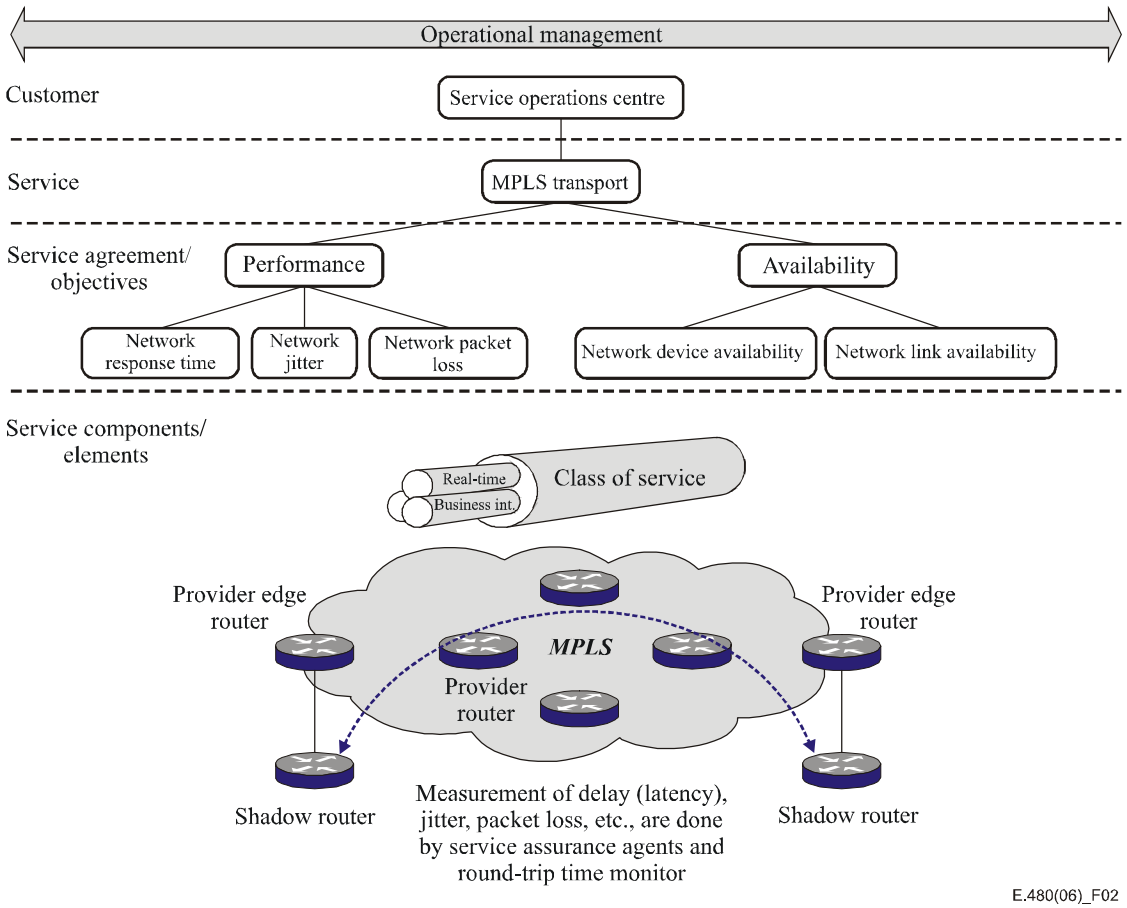

Figure 2 – Model of resource management

6.2 Service management

The service operations centre (SOC) 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. The focus is on service delivery (fulfilment) and service management (assurance/support) as opposed to the management of the underlying network and information technology.

Some of the functions involve short-term service capacity planning for a service instance, the application of a service design to specific customers or managing service improvement initiatives. These functions are closely connected with the day-to-day customer experience.

The SOC is accountable to meet, at a minimum, targets set for service quality, including process performance and customer satisfaction at a service level, as well as service cost.

Managing the service requires a full understanding of the service objectives and the resource components used to construct that service. The model of service management under the scope of this Recommendation is depicted in Figure 3.

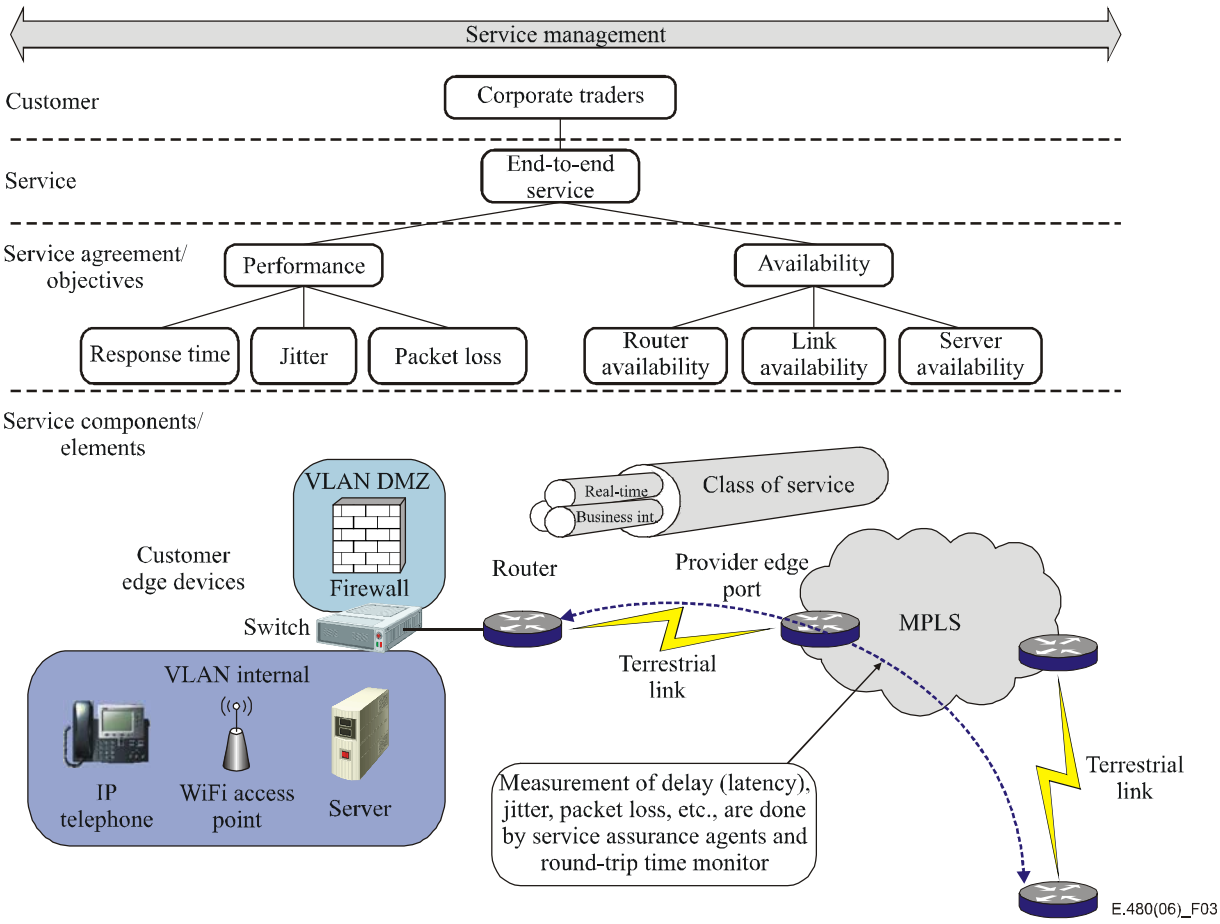

Figure 3 – Model of service management

6.3 Services and network operations model

Due to the different customer segments and their varying needs, there may be multiple operational procedures structured for the need of the market. This filters down via service operations to resource operations (including network and IT infrastructure). Strategic business models of various service providers drive the ratio between in-sourced and out-sourced technology operations as shown in Figure 4.

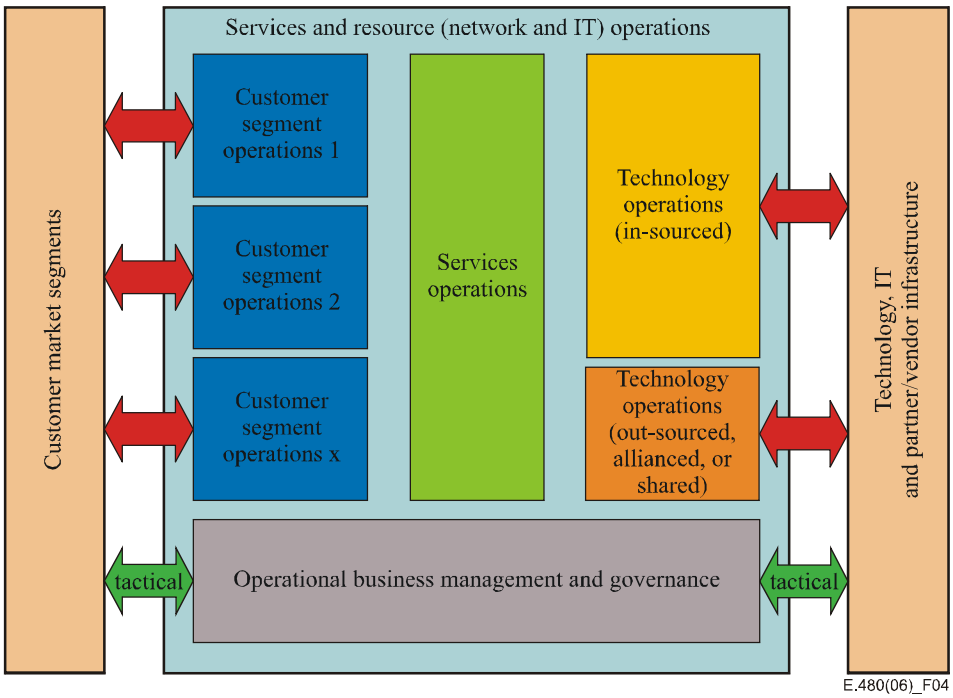

Figure 4 – Operational business model

7 Concept of service management

A conceptual *service management framework* is presented in Figure 6 as a basis for illustrating the key aspects of service management and its major components and inter-relationships.

Service management comprises all processes involved in creating, delivering, managing and operating services, and the associated service infrastructure from which services are derived. The focus of service management is end-to-end delivery & management within a telecommunications service provider organization to achieve the following:

– Understanding of the customer experience of services they have purchased;

– Addressing of the customer service capability needs and concerns;

– End-to-end coordination of operational activities associated with services and associated service infrastructure;

– Prioritization and allocation of people, physical and financial resources to deliver and operate service capabilities; and

– Developing and deploying service capabilities to meet business objectives.

Service management, as depicted in Figure 5, comprises two major groupings of operational processes – service development & management and service management & operations (the detailed decomposition of service management & operations and service development & management process groupings is defined in [ITU-T M.3050]).

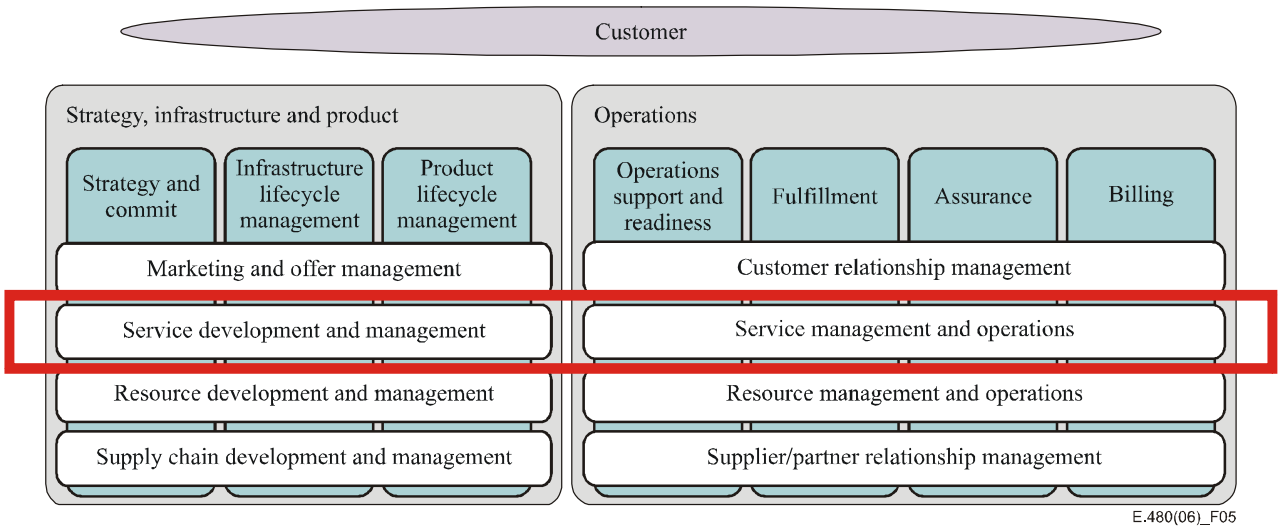

Figure 5 – eTOM service value chain

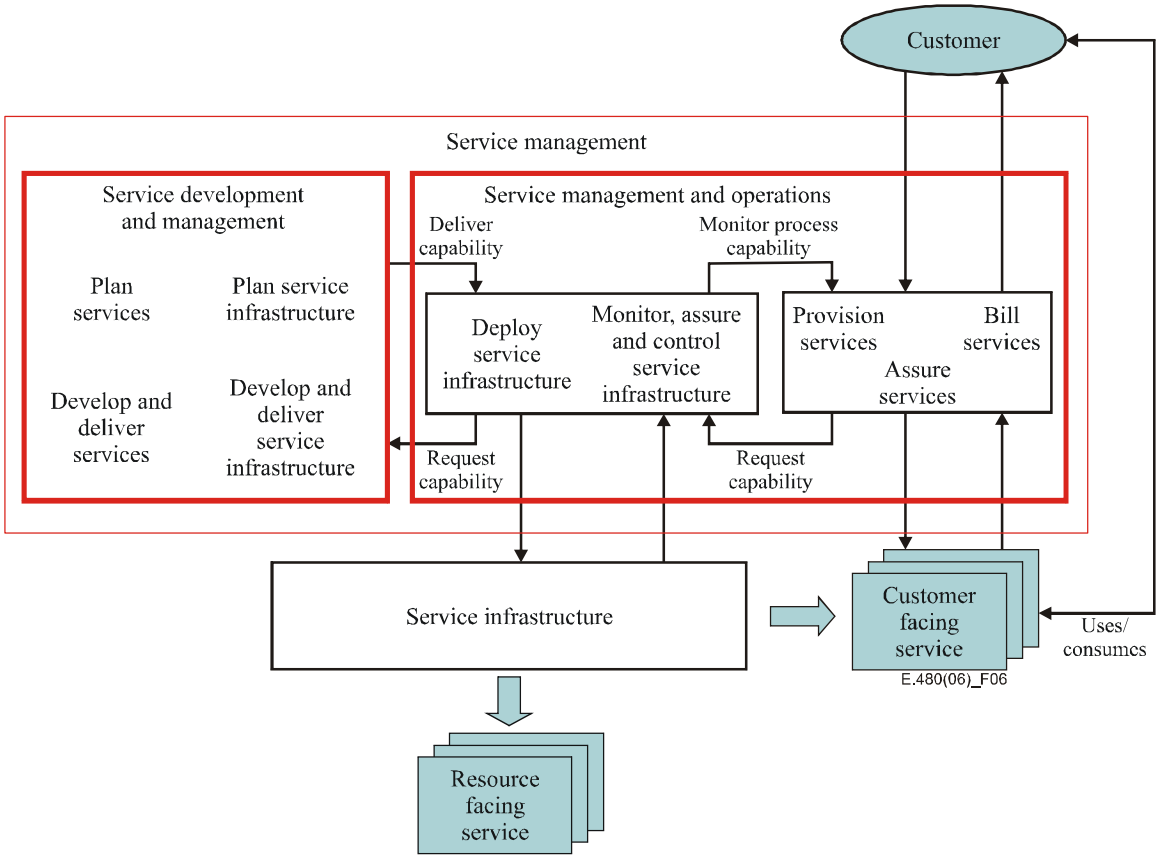

Figure 6 – Service management framework

7.1 Service development & management

These processes cover all activities associated with planning, developing and delivering new and/or modified service infrastructure, and services. In undertaking these processes, input on new service opportunities as indicated by customers and product management, together with feedback associated with existing services and service infrastructure, needs to be taken into account. The cycle time of these processes from concept to delivery can be many weeks to many months. Whilst the last process activity could be signified by the first operational release of a new service or new

service infrastructure, widespread deployment processes are contained within the service management & operations process grouping.

7.2 Service management & operations

These processes cover all activities associated with the management and operations of communications and information services required by or proposed to customers. The focus is on short-term, customer driven, delivery and management of the services and underlying service infrastructure. These processes ensure that the service infrastructure is deployed to meet anticipated customer demand for the services. They also ensure that the services, and the underlying service infrastructure, operate within the predefined operational parameters. In addition, these processes ensure that the capabilities of the processes which allow customers to interact with the organization in regard to services are operating effectively and efficiently.

Some of the functions involve short-term service capacity planning for a service instance, the application of a service design to specific customers or managing service improvement initiatives. These functions are closely connected with the day-to-day customer experience.

The processes in this horizontal functional process grouping are accountable to meet, at a minimum, targets set for service quality, including process performance and customer satisfaction at a service level, as well as service cost.

Figure 7 provides an initial view of the operational framework to be used for analysis of the service management activities in the service management & operations area.

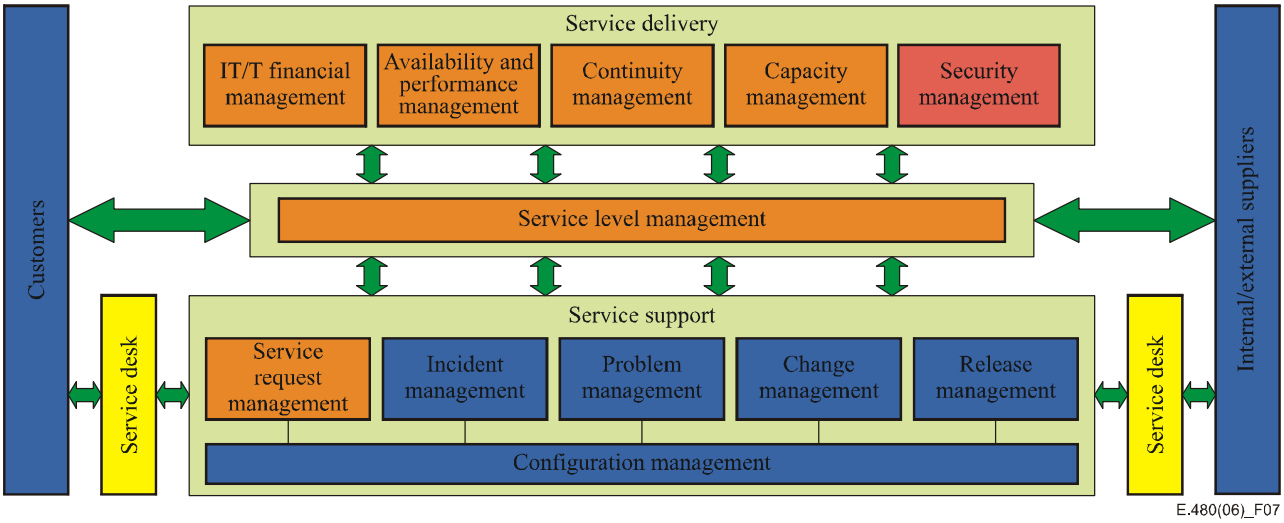

Figure 7 – Service management & operations framework

NOTE – Except for the addition of the service request management block, and a recasting of a central role for service level management, this picture is a re-statement of the ITIL [BS 15000] best practice picture whose copyright is owned and licensed by the UK Office of Government Commerce. It is also using different terminology to that already approved in the [ITU-T M.3050] series and a careful mapping would be required to ensure that this Recommendation is aligned with that of the [ITU-T M.3050] series. The alignment of terminology between ITIL [BS 15000] and [ITU-T M.3050] is for further study. ITU-T Rec. M.3050 Supplement 1 contains the eTOM ITIL application note.

7.3 Customer service management and operations

In realizing customer service management, the service management & operations framework needs to be complimented to include customer operation support processes. The customer operations support process allows for the proper customer segmentation catering for multiple operational procedures structured to the needs of the specific market segments. In addition, a clear split between resource and service operations is depicted with the associated agreements. Figure 8 provides initial view of customer service management to be used for analysis of the customer service management and operations framework activities.

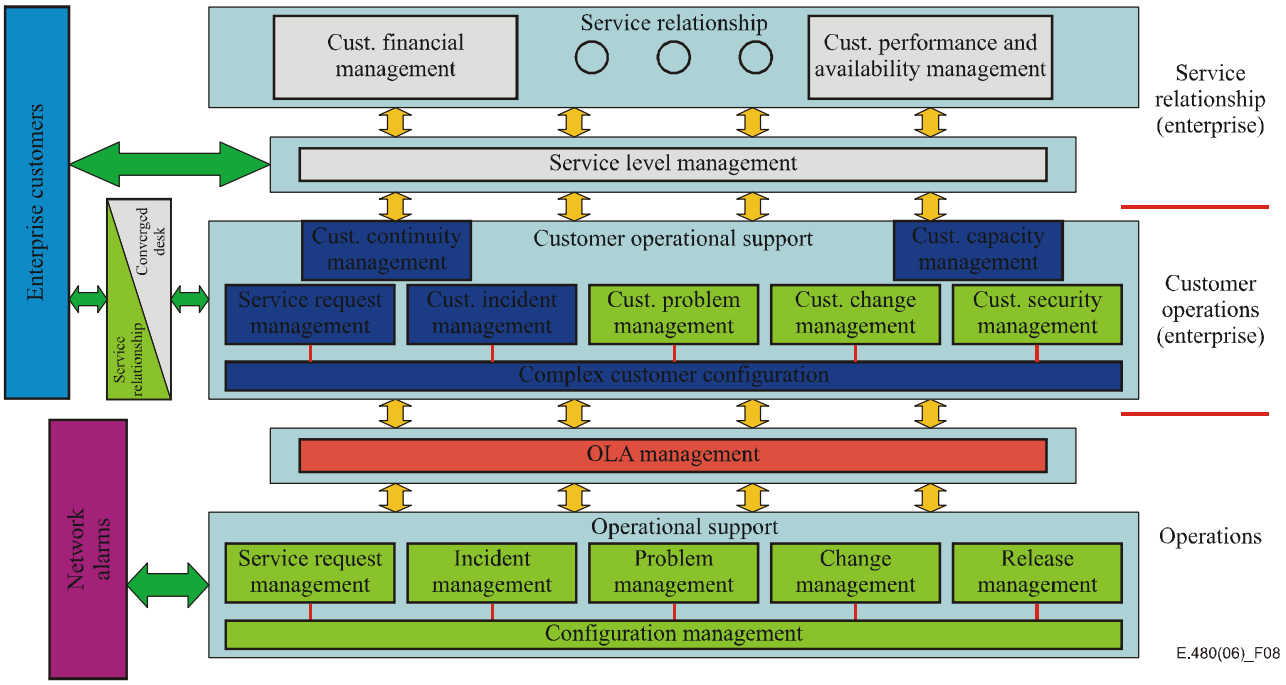

Figure 8 – Customer service management & operations framework

8 Conclusion

Service management is a new topic in telecommunication management arenas. Service management not only focuses on the service provider's operational processes, but it is directly involved in sustaining the customers business in terms of service provisioning, assurance as well as billing. To achieve the goal of service management, some Recommendations are required as guidelines to assist the concerned parties to undertake activities under service management framework as stated in this Recommendation.

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