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

Network management – International network management

Framework for operations requirements of next generation networks and services

Recommendation ITU-T E.4110

ITU-T E-SERIES RECOMMENDATIONS

OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

INTERNATIONAL OPERATION	
Definitions	E.100–E.103
General provisions concerning Administrations	E.104–E.119
General provisions concerning users	E.120–E.139
Operation of international telephone services	E.140–E.159
Numbering plan of the international telephone service	E.160–E.169
International routing plan	E.170–E.179
Tones in national signalling systems	E.180–E.189
Numbering plan of the international telephone service	E.190–E.199
Maritime mobile service and public land mobile service	E.200–E.229
OPERATIONAL PROVISIONS RELATING TO CHARGING AND ACCOUNTING IN THE INTERNATIONAL TELEPHONE SERVICE	
Charging in the international telephone service	E.230–E.249
Measuring and recording call durations for accounting purposes	E.260–E.269
UTILIZATION OF THE INTERNATIONAL TELEPHONE NETWORK FOR NON-TELEPHONY APPLICATIONS	
General	E.300–E.319
Phototelegraphy	E.320–E.329
ISDN PROVISIONS CONCERNING USERS	E.330–E.349
INTERNATIONAL ROUTING PLAN	E.350–E.399
NETWORK MANAGEMENT	
International service statistics	E.400–E.404
International network management	E.405–E.419
Checking the quality of the international telephone service	E.420–E.489
TRAFFIC ENGINEERING	
Measurement and recording of traffic	E.490–E.505
Forecasting of traffic	E.506–E.509
Determination of the number of circuits in manual operation	E.510–E.519
Determination of the number of circuits in automatic and semi-automatic operation	E.520–E.539
Grade of service	E.540–E.599
Definitions	E.600–E.649
Traffic engineering for IP-networks	E.650–E.699
ISDN traffic engineering	E.700–E.749
Mobile network traffic engineering	E.750–E.799
QUALITY OF TELECOMMUNICATION SERVICES: CONCEPTS, MODELS, OBJECTIVES AND DEPENDABILITY PLANNING	
Terms and definitions related to the quality of telecommunication services	E.800–E.809
Models for telecommunication services	E.810–E.844
Objectives for quality of service and related concepts of telecommunication services	E.845–E.859
Use of quality of service objectives for planning of telecommunication networks	E.860–E.879
Field data collection and evaluation on the performance of equipment, networks and services	E.880–E.899
OTHER	E.900–E.999
INTERNATIONAL OPERATION	
Numbering plan of the international telephone service	E.1100–E.1199
NETWORK MANAGEMENT	
International network management	**E.4100–E.4199**

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T E.4110

Framework for operations requirements of next generation networks and services

Summary

Recommendation ITU-T E.4110 provides the framework for supporting and defining the role of operations for the next generation networks and services. This Recommendation provides guidance in the development of processes and systems supporting operations, including fulfilment, provisioning, configuration and activation of NGN&S. In the NGN&S domain, billing and online charging is moving from the traditional back-office to the front office.

Operations are the backbone of service providers in ensuring that services are provided to meet customer expectations, while supporting the key business objectives of the corporation. Operations organizations take into account, but are not limited to, the entire value chain across an operator from strategy to service introduction, maintenance, management, and administration. Operations require real-time access to all information about the services and networks that are supported or being introduced. Having a real-time information view of all the systems implicitly implies an integrated and automated back end but also a shared information model. A definition of real time is necessary considering that real time can be milliseconds or even hours. This should relate directly to the customers' experience.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T E.4110	2010-01-13	2

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). 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.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

CONTENTS

Recommendation ITU-T E.4110

Framework for operations requirements of next generation networks and services

1 Scope

This Recommendation provides the framework for supporting and defining the role of operations for the next generation networks and services. This Recommendation provides guidance in the development of processes and systems supporting operations.

Operations are the backbone of service providers in ensuring that services are provided to meet customer expectations, while supporting the key business objectives of the corporation. Operations organizations take into account, but are not limited to, the entire value chain across an operator from strategy to service introduction, maintenance, management, and administration (FAB). Operations require real-time access to all information about the services and networks that are supported or being introduced.

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 E.410] Recommendation ITU-T E.410 (1998), *International network management – General information*.

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

[ITU-T P.800] Recommendation ITU-T P.800 (1996), *Methods for subjective determination of transmission quality*.

3 Definitions and abbreviations

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 next generation network (NGN) [b-ITU-T Y.2001]: A next generation network (NGN) is a packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

It can be observed that the NGN is characterized by the following fundamental aspects:

- packet-based transfer;
- separation of control functions among bearer capabilities, call/session, and application/service;
- decoupling of service provision from transport, and provision of open interfaces;

- support for a wide range of services, applications and mechanisms based on service building blocks (including real time/streaming/non-real time and multimedia services);
- broadband capabilities with end-to-end QoS (Quality of Service);
- interworking with legacy networks via open interfaces;
- generalized mobility;
- unrestricted access by users to different service providers;
- a variety of identification schemes;
- unified service characteristics for the same service as perceived by the user;
- converged services between fixed and mobile networks;
- independence of service-related functions from underlying transport technologies;
- support of multiple last mile technologies;
- compliant with all regulatory requirements, for example concerning emergency communications, security privacy, lawful interception, etc.

3.1.2 product [ITU-T M.3050.4]: What an entity (supplier) offers or provides to another entity (customer). A product may include service, processed material, software or hardware or any combination thereof. A product may be tangible (e.g., goods) or intangible (e.g., concepts) or a combination thereof. However, a product ALWAYS includes a service component.

3.1.3 service [b-ITU-T Z.100 Sup.1]: A set of functions and facilities offered to a user by a provider.

3.1.4 service providers [b-ITU-T E.164 Sup.2]: An entity that offers services to users involving the use of network resources.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 operations: The operations process is the traditional heart of the service provider (SP) enterprise for ensuring across the value chain within and between service providers that all key business objectives and customer experience are supported. The operational environment includes provisioning, configuration, activation and billing of products and services both on the network stratum as well as on the service stratum. It includes all operations processes that support the customer (and the network) operations and management, as well as those that enable direct customer operations with the customer. These processes include both day-to-day and operations support and readiness processes. The view of operations also includes sales management and supplier/partner relationship management.

3.3 Abbreviations

This Recommendation uses the following abbreviations:

CoS Class of Service

CPE Customer Premises Equipment

eTOM originally "Enhanced Telecom Operations Map", now a trademark of the TM Forum

FAB Fulfilment, Assurance, and Billing

ICT Information and Communication Technologies

IP Internet Protocol

IPTV Internet Protocol Television

IT Information Technology

ITIL	originally "Information Technology Infrastructure Library", now a trademark of the ITsmf
NGN	Next Generation Networks
NGN&S	Next Generation Networks and Services
NMS	Network Management System
QoE	Quality of Experience
QoS	Quality of Service
SLA	Service Level Agreement
SNO	Service and Network Operations group
SOA	Service Oriented Architecture
SP	Service Provider
VoIP	Voice over Internet Protocol

4 Introduction

This Recommendation is intended to provide operations requirements for the next generation networks and services (NGN&S). This Recommendation will identify operational challenges and some key parameters relating to performance, for supporting operations.

5 Operational goals, concerns and policies

Operations concerns itself with the operation and maintenance of adequate network and service performance under a variety of conditions, which can include exceptional traffic loads within some service platforms, network portions, system failure, element or transport outage, natural disasters, etc. The overall process of network and service management involves the observation of relevant fault, traffic and performance data, suitable analysis of that data, and the resulting implementation of appropriate network or service management controls and interventions. The effectiveness of an implemented set of network or service management controls is then evaluated based on new observations of traffic and performance data, which are then analysed and used as a basis to remove or further modify, if necessary, the current set of network or service management controls.

This clause, "Operational goals, concerns and policies" is the key portion of this Recommendation. These goals, concerns and policies are based on the current view of today's operational personnel, as compiled from the proceedings of the SNO 2009 conference and related discussions.

5.1 Operations goals

Packet-based services are most effectively managed in the context of converged voice and data networks, which typically involve substantial amounts of both IP-specific and non-IP-specific equipment types.

General network and service management goals for circuit-switched telephony have been described in [ITU-T E.410]. Although they have been defined for international network management based on circuit switching, they can be extended and may be applied to other networks. With some modifications and enhancements, such goals are still valid for packet-based services in next generation networks. Further study and experience will be needed to validate the application of these principles to packet-based next generation networks. The following is the initial set of network and service management goals for next generation networks:

5.1.1 Downsize of Legacy Networks.

5.1.2 Utilize all possible resources when dealing with a network or service problem.

5.1.3 Inhibit traffic congestion and prevent its spread.

5.1.4 Processes used in telecommunications management must be well-defined, efficient, effective, and measurable.

5.1.5 Implement measures to identify abnormalities and implement filters to kill bandwidth misuse, e.g., virus attacks, worms, etc.

5.1.6 Make economically efficient use of resources by rejecting attempts at services that have a poor chance of succeeding, this should be automated. Hence the monitoring of this is an operational goal.

5.1.7 When the offered load is approaching the capacity limit, favour completing those communication attempts at services that require the least amount of resources. Maybe it should be based on QoS methodology. DiffServ vs IntServ, e.g., RT (real time) queues have higher priority than BE (best effort) although they do not necessarily use more bandwidth.

5.1.8 Restoration of performance degradation incidents in the shortest time period.

5.1.9 Ensure that data payload integrity relevant to services is maintained, e.g., voice speech is acceptable (MOS > 3.5). MOS tests for voice are specified in [ITU-T P.800].

5.1.10 Ensure jitter measures are maintained specific to service requirements. Also look at delay and packet loss.

5.1.11 Effective implementation of performance management across networks and services.

5.1.12 Identify impending problems proactively so that corrective actions may be taken before the situation becomes service-affecting.

5.1.13 Effective root-cause analysis, on performance and availability (faults) across networks and services.

5.1.14 Retain security at all times on the network.

5.1.15 Maintain shared information database.

5.1.16 Ensure data consistency and accuracy.

5.1.17 Enforce a strong change control procedure.

5.1.18 Enforce and maintain a naming standard and common language.

5.1.19 Implement the correct performance collection methodology – move from a "collect all" to a "collect what is required" to sustain and maintain network and services. Enable also ad hoc collection of performance indicators for in-depth analysis.

5.1.20 "Operations require real-time access to all information….." this implies the requirement of a shared information model (NGN/NGOSS).

5.1.21 Utilize the Service Management framework to ensure performance and availability is maximized.

5.1.22 Minimize changes in the network when new services are deployed.

5.1.23 End-to-end view on service and network.

5.1.24 Provide end-to-end service availability so that problems can be rapidly diagnosed and isolated. Under certain conditions, this may require visibility to CPE on the customer's premises, so as to accurately know where a problem is occurring.

5.1.25 Manage all dispatch activities so as to minimize technician travel time and use of vehicles and fuel.

5.1.26 Economically operation due to service oriented architecture, customer self-care capabilities, automation in provision, standard interfaces (off the shelf).

5.1.27 Compliant with all relevant regulatory and business requirements.

5.1.28 Business process automation through a SOA is an example of architectural style. The impact on operations must be explored: What processes are feasible to automate versus what should be left till last, not automated at all… indicate how the role of Operations resources will and should change.

5.1.29 A network/service inventory with associated processes: A decent inventory system is key to any automated or online service delivery. Complexity brought about by absence, guidance on establishing inventory DB is essential.

5.1.30 Pro-active (service) operations to achieve and maintain customer experience.

5.1.31 Improve the customer experience by keeping end customers informed of outage situations and repair status.

5.1.32 eTOM – ITIL interworking.

5.1.33 NGNs must gradually migrate to the principles of "Self-Organizing" networks, i.e., capable of self-provisioning, self-healing, self-optimizing, etc.

5.2 Operations concerns

Operations concerns can be resolved by automatic (preferable) or manual detection of the problem and then the operations may take appropriate actions to resolve the problem in order to provide required network and service performance to customers. Such action in a next generations network must be done in the shortest time possible by the operations or preferably by a support system consistent with the service management framework.

Packet-based services such as VoIP, streaming video, wireless applications and data require special attention due to their low tolerance for delay and delay variation.

The following are some of the major concerns of NGN&S management:

5.2.1 Latency, packet loss, ability to detect issues proactively, packet sequencing.

5.2.2 To ensure the network overview anytime particularly during problem phases (end-to-end view).

5.2.2.1 Network view (topological view of all network elements and interfaces).

5.2.2.2 Service view (logical view).

5.2.3 An overall network monitoring on the voice signalling (TDM, VoIP) is necessary.

5.2.4 Mapping of networks to services needs to be implemented and maintained.

5.2.5 Assurance tools like trouble tickets and performance management are not ready to implement service models. Service models are required in order to determine the customer or service impact that is caused by conditions occurring at the network or server level.

5.2.6 Qualitatively understand the relationship between network and services, i.e., the impact of network element performance degradation on services.

5.2.7 The exponential growth in data traffic is straining network resources and will require new tools and techniques for proper management.

5.2.8 Impact on SLAs is hidden from operations. SLAs may be offered to customers that do not have input from operations staff and may call for unachievable levels of service.

5.2.9 The use of operations outsourcing brings new requirements for service management and SLA management in order to assure that required service levels and financial targets are met.

5.2.10 The increasing use of the network for streaming video, IPTV, and real-time teleconferencing imposes strict new requirements on allowable loss, delay, and jitter.

5.2.11 Impact of performance of partner (3rd party vendor)'s network on the customer's service is unknown, e.g., if partner is managing the LAN, the overall performance of a customer service might not be visible to the operator.

5.2.12 General lack of IP knowledge in an operation's environment, and the need for upskilling technical staff to the new skill sets required for operations and management in an NGN environment.

5.2.13 Migration from a network driven environment to a service environment is lagging.

5.2.14 Impact on implementing a comprehensive universal management system, preferably web based. For example, the many different protocols in the NMS environment, many of them being proprietary or subsets of current standards, as used by the vendors developing the NMS system, makes the implementation of a universal management system very complex.

5.2.15 Many broadband customers call the service provider even if the problem is in the CPE. Providers must have tools to accurately take care of such calls without wasting time or dispatches, and if possible must try to resolve the problem. The large number and variety of mobile devices used by technical staff brings new management challenges.

5.3 Operations policies

Based on network and service management goals and concerns, a set of operations policies needs to be enforced. Besides operations goals listed in clause 5.1, individual service providers may have additional operations policies that support their business objectives.

Such policies may, for example, include:

5.3.1 Meeting service and performance standards set by regulatory bodies, where applicable.

5.3.2 Meeting a service provider's own service and performance objectives. KPIs and KQIs must be defined and managed for the benefit of the business.

5.3.3 Meeting service level agreements established with individual customers and other groups.

5.3.4 Protecting the performance, stability and operating margins of network and service resources.

5.3.5 Minimizing the interference by one customer, product or service upon another.

5.3.6 Providing top-quality customer-interfacing communications of operations status consistent with the provider's customer-facing policies.

5.3.7 Traffic control policies are required.

5.3.8 Security policies.

5.3.9 Device configuration policy.

5.3.10 Policies on providing a customer "Quality of Experience" must be known corporate wide, and must include service and network operation input.

5.3.11 Device naming policy.

5.3.12 Performance management guidelines, e.g., bandwidth utilization to be maintained.

5.3.13 Operations policies can be stated in an internal company policy document.

5.4 Operational processes

The following is an initial set of network and service management processes for the NGN&S framework in support of the operational goals, concerns, and policies described in the previous clauses.

5.4.1 Service level management

5.4.1.1 Maintain and improve service quality through a constant cycle of agreeing, monitoring and reporting on Service achievement and instigation of actions to eradicate poor service.

5.4.2 Configuration management

5.4.2.1 Provision the network, record and control infrastructure configuration items (CIs) and relationships in an accurate inventory database. In order to manage a network, we need to know what is in it and how it is connected.

5.4.3 Incident management

5.4.3.1 Upon occurrence of an incident, restore service as soon as possible and within a SLA; Record incidents for problem management.

5.4.4 Problem management

5.4.4.1 Identify, prioritize and remove errors from the network infrastructure, processes and performance.

5.4.5 Change management

5.4.5.1 Implement appropriate changes with minimum negative impact on service delivery; provide accurate updates to the inventory database.

5.4.6 Release management

5.4.6.1 To take a holistic view of a change to a service and ensure that all aspects of a new release or other change or upgrade, both technical and non-technical, are considered together in implementation. Ensure all areas affected are ready for the changes that are to be released.

5.4.7 Service request management

5.4.7.1 To deliver new services and equipment as ordered and within a SLA; ensure timely and accurate updates to affected databases (which enables accurate billing as well as accurate technical records).

5.4.8 Availability management

5.4.8.1 To optimize the capability of the infrastructure, services and supporting organization to deliver a cost effective and sustained level of availability that enables the business to satisfy its business objectives.

5.4.9 Capacity management

5.4.9.1 To understand the future business requirements, the organization's operational requirements, and changes to the infrastructure.

5.4.9.2 To ensure that all current and future capacity and performance aspects of the business requirements are provided cost effectively. This shall include managing capacity additions that will provide the bandwidth for service growth at an acceptable quality of service.

5.4.10 Service continuity management

5.4.10.1 Support the business continuity plan by ensuring that the required technical and services facilities can be recovered within the agreed business timeframes.

6 NGN operations functions

Past and new ITU-T Recommendations include many of the operational functions applicable for NGN&S operations. This Recommendation expands on these functions as needed by NGN&S operations to fulfil the defined goals of the service providers. While the focus of this Recommendation is on the network, this work will also include services and converged network view.

NGN&S operations functions include the following:

6.1 Status and performance monitoring on a near real-time basis

6.1.1 This task is based on the use of periodically collected measurements, alarms (i.e., major, minor, and critical) and notifications generated upon occurrence of significant events. These are sent from the network platforms and service platforms to the NM/SM systems in a NM/SM centre. The measurements may be used directly or may be processed by a NM/SM tool in order to provide useful parameters.

6.2 Detecting abnormal conditions

6.2.1 This is performed through analysis of the collected and derived parameters, e.g., measurements, alarms, notifications and correlation with other data. Abnormal conditions can also be detected with the help of statistical algorithms and threshold procedures.

6.2.2 Not only detecting abnormal conditions but also predicting abnormal conditions.

6.3 Investigating and identifying abnormal network and service conditions

6.3.1 This task should provide a diagnosis of the situation that may lead to a corrective control. The abnormal condition is usually expressed in terms of service or traffic identifiers with their traffic characteristics.

6.4 Initiating corrective actions and/or controls

6.4.1 Once an abnormal situation has been detected and its causes identified, traffic control actions should be executed. Actions may include controls to bypass a congested or overloaded portion of the network/services platform.

6.5 Operational relationship

6.5.1 In an increasingly complex and competitive telecommunications and value-added services (content) market, it is unlikely that one network operator will be solely responsible for end-to-end delivery of traffic/content. Network operators will need to develop and maintain strong operational relationships with interconnecting networks, carriers or content providers to receive traffic/content from them and their customers.

6.5.2 There may be opportunities to understand the sorts of interactions required to fulfil these relationships by considering the interactions which form a regular part of international operations, or inter-carrier operations in competitive markets. The following three items signify this importance:

6.5.2.1 Cooperating and coordinating actions with other NM/SM centres

Different applications (e.g., telephony service) may have distinct NM/SM centres. Cooperation between the centres may be necessary to meet a global, regional and/or customer network performance or service target.

6.5.2.2 Cooperating and coordinating with other work areas

As in the PSTN, information coming from equipment surveillance and maintenance is important. Since IP packets in a converged network may traverse through other networks such as ATM, strong cooperation must be established between all work areas.

6.5.2.3 Cooperating and coordinating with other network operators

IP packets may traverse from one operator's network to another. Cooperation and coordination between network operators will strengthen the network management support of IP-based network services.

6.6 Issuing reports about network traffic and service management activities need to be service driven. Service performance reporting.

6.6.1 As in the PSTN, these reports are important for managers, training and planning network performance improvements.

6.7 Provide advanced planning for known or predictable network and service situations

6.7.1 This planning should take into consideration the impact of abnormal or special events on network traffic flows, and should also consider the requirements of particular service and traffic categories.

6.8 Testing

6.8.1 Automatic and manual test facilities should be integrated (e.g., testing the devices).

6.9 Interface to fault management system

6.9.1 A bidirectional interface should be implemented to send events and alarms to the fault management system and acknowledgement from the fault management system to the element management system or network element.

In [b-ITU-T M.3000], a framework is provided to consider the functions described in this clause and in [ITU-T M.3050.x] which describes the eTOM.

7 Process definitions

This analysis focuses on the relationship between TM Forum eTOM and ITIL. A methodology which ICT enterprises can use is proposed to address the Operational challenges associated with transforming into lean and agile operators.

7.1 eTOM enterprise view

The eTOM model is an enterprise process framework. Focus is on the relationship between SIP and FAB process groupings.

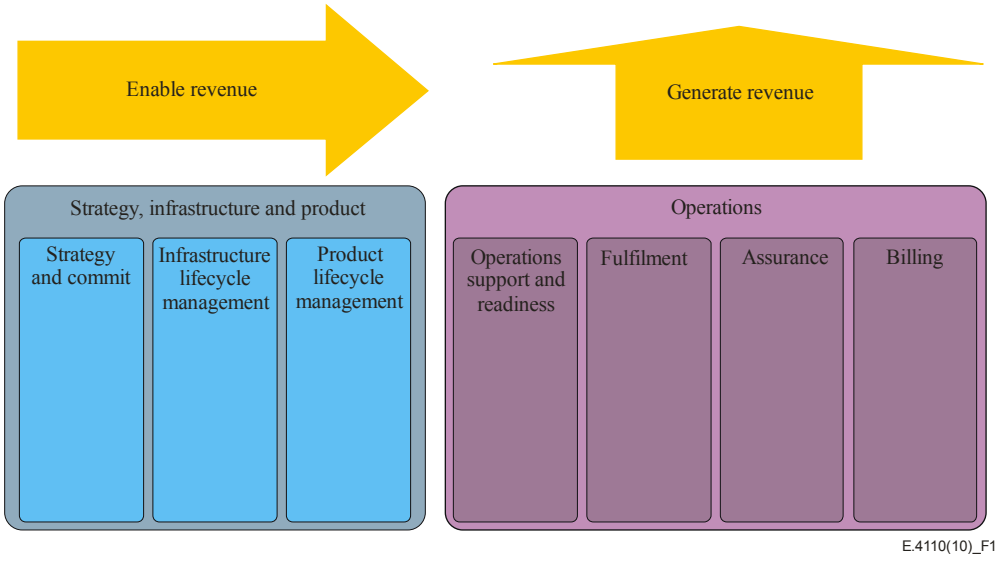

Figure 1 – Relationship between SIP and O-FAB

The function of the FAB process grouping is to generate revenue for the enterprise.

The function of the SIP process grouping is to provide strategic direction and to create new revenue streams.

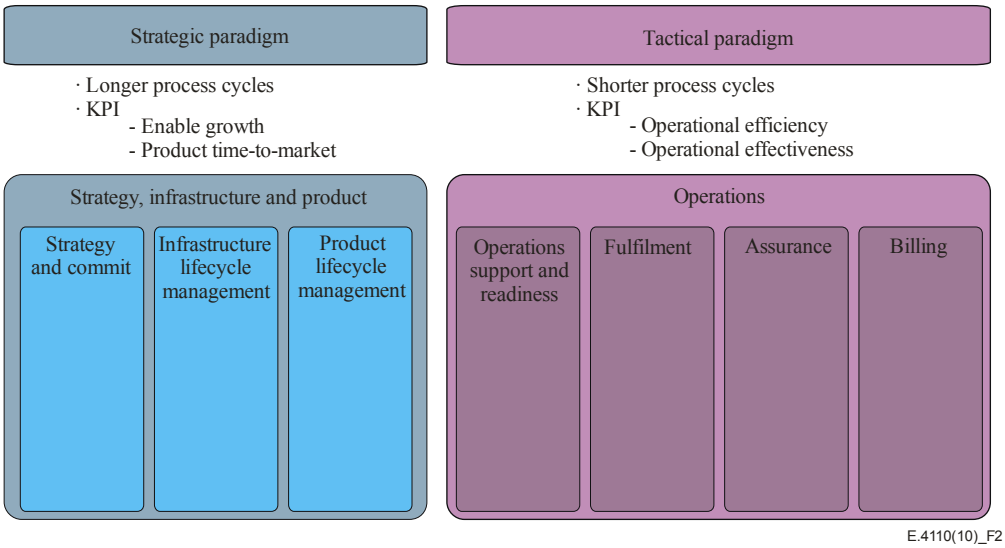

Figure 2 – SIP and FAB management paradigms

The Operations (FAB) process group is characterized by short process cycles. The goal is for FAB processes cycles to be real-time. The efficiency and effectiveness of FAB processes impact the financial bottom line of the enterprise. Efficient and effective FAB processes are vital in delighting customers.

SIP processes have longer processes cycles. The Strategy lifecycle is the longest followed by the Infrastructure lifecycle and the Product lifecycle. One of the key performance indicators of the SIP process group is Product time to market.

The transformation into a lean and agile operator requires that the SIP and Operations processes be optimized and harmonized. For example, the product time-to-market has to be shortened dramatically while operational efficiency is increased dramatically.

7.2 The role of operations support and readiness

The operations support and readiness (OSR) vertical process grouping is positioned on the interface between SIP and FAB. Analysis has shown that OSR plays a vital role in harmonizing SIP and FAB key performance indicators.

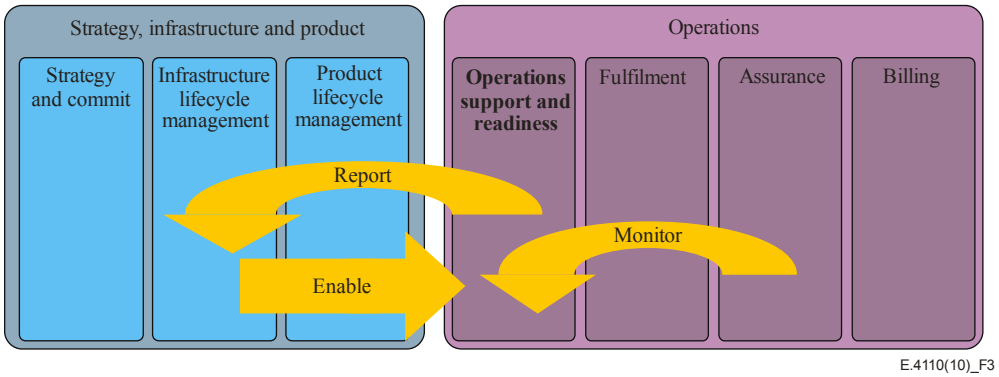

Figure 3 – OSR as an interface between FAB and SIP

The OSR process group has three major functions:

7.2.1 A gatekeeper between SIP and FAB seeking to ensure that new products and infrastructure are operationally ready and do not cause undue disruption to FAB processes.

7.2.2 Monitor FAB processes and support FAB processes to ensure smooth and efficient operation.

7.2.3 Report FAB process metrics to SIP to enable effective and informed decision making.

The OSR process group can enable a learning enterprise by providing feedback to the SIP process group. This enables an enterprise to respond to operational realities and the consequences of SIP decisions.

7.3 Importance of alignment

The analysis of this Recommendation focuses on operational challenges. To address the operational challenges of a lean and agile operator, the IT, the product development and operational domains have to be aligned.

Without this alignment, the enterprise will end up in a logjam where either operational efficiency or product time-to-market or both are compromised.

7.4 Where does ITIL fit in?

The IT infrastructure library (ITIL) is a set of guidelines for IT/ICT service management. The primary focus of ITIL is on service internal customers. ITIL was originally developed by the UK Office of Government Commerce (OGC) but is now managed by the IT Service Management Forum (known as ITSMF). ITIL was developed solely with a view to managing IT services and operations. However, its concepts and principles are increasingly being adopted by telecom Service Providers. The current version, known as ITIL v3, was published in May 2007.

However, ITIL processes can also interface to external customers and partners. This is often a requirement in IT/ICT outsourcing scenarios.

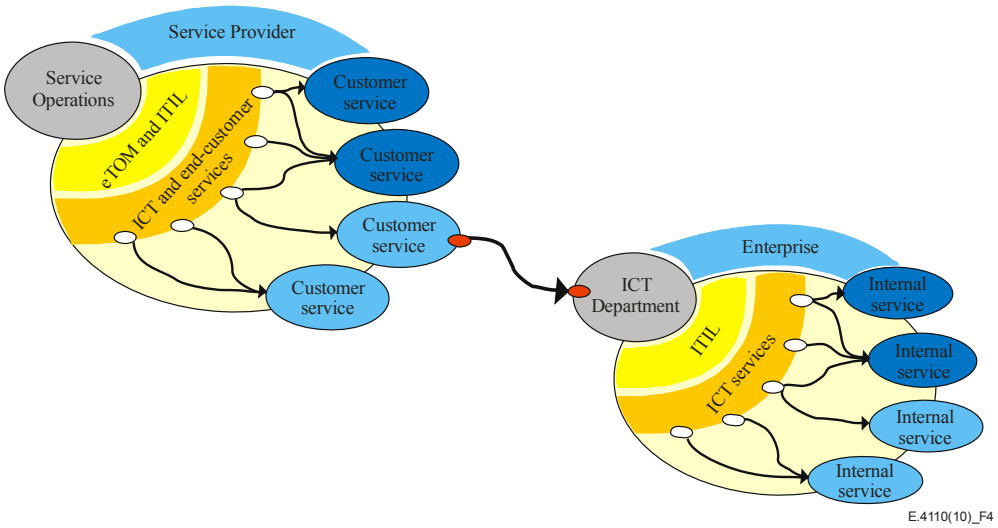

Figure 4 – ITIL as an interface to external customers and partners

A telecommunications service provider will also have to be ITIL-compliant on its customer facing interfaces to the extent that ITIL compliance is a customer requirement. This would typically be the case when the service provider offers outsourced IT products or partnerships.

In the context of a telecommunications service provider, ITIL is not a substitute for eTOM FAB processes. The eTOM is primarily focused on process definition and process decomposition, while ITIL is primarily focused on "best practices." Thus, ITIL processes can complement eTOM FAB processes, and the principles of both are increasingly being adopted and recognized as essential to successful operations and management. This complementarity is an important trend going forward.

Where it is a product or partnership requirement eTOM FAB processes should be implemented to be ITIL compliant.

Bibliography

[b-ITU-T E.411] Recommendation ITU-T E.411 (2000), *International network management – Operational guidance*.

[b-ITU-T E.412] Recommendation ITU-T E.412 (2003), *Network management controls*.

[b-ITU-T E.416] Recommendation ITU-T E.416 (2000), *Network management principles and functions for B-ISDN traffic*.

[b-ITU-T E.417] Recommendation ITU-T E.417 (2005), *Framework for the network management of IP-based networks*.

[b-ITU-T M.3000] Recommendation ITU-T M.3000 (2000), *Overview of TMN Recommendations*.

[b-ITU-T M.3400] Recommendation ITU-T M.3400 (2000), *TMN management functions*.

[b-ITU-T M.3060] Recommendation ITU-T M.3060/Y.2401 (2006), *Principles for the management of Next Generation Networks*.

[b-ITU-T E.164 Sup.2] Recommendation ITU-T E.164 – Supplement 2 (2009), *Number portability*.

[b-ITU-T Z.100 Sup.1] Recommendation ITU-T Z.100 – Supplement 1 (1997), *SDL+ methodology: use of MSC and SDL (with ASN.1)*.

[b-ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.

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