

# NGOSS Real World Use Case

*How to realize NGOSS principles?*

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## Executive Summary

This document provides illustrative examples of the realization of NGOSS principles for implementing the Operation Supporting Systems.

Standards are only useful if the industry adopts them. And industry leaders agree that only impermeable, open standards can meet today's OSS/BSS challenges.

The intent of this document is to show the one of use case how to use and realize NGOSS on the real telco's environment.

Specifically this document describes the followings.

- Illustrates the procedure for specifying and implementing the business processes.
- How to decompose eTOM Business Processes into lower levels?
- How to realize business process flow based on the BPM?
- How to use and extend SID?
- How to extract & design User Interfaces based on eTOM business processes?
- How to compose the operational organization?
- For each item, we also described the lessons learned and open issues for further discussion.

Note also that recent updates in the eTOM Framework process detail (as published in GB921D Release 7.0) have not yet been reflected in this work, which has been developed in parallel with the consideration of these detailed process changes, and has thus been based on previous GB921D releases.

This document should therefore be regarded as a work in progress, and is provided for information on this basis, at this Release. The detailed contents of the examples provided should not be taken as a finished view, but as a vehicle for demonstrating how NGOSS principles can be used and realized through the NGOSS Lifecycle, for some meaningful – if artificial – situations.

This document should be read in conjunction with the range of NGOSS documentation, in particular GB927, TMF053B, GB921 and GB922.

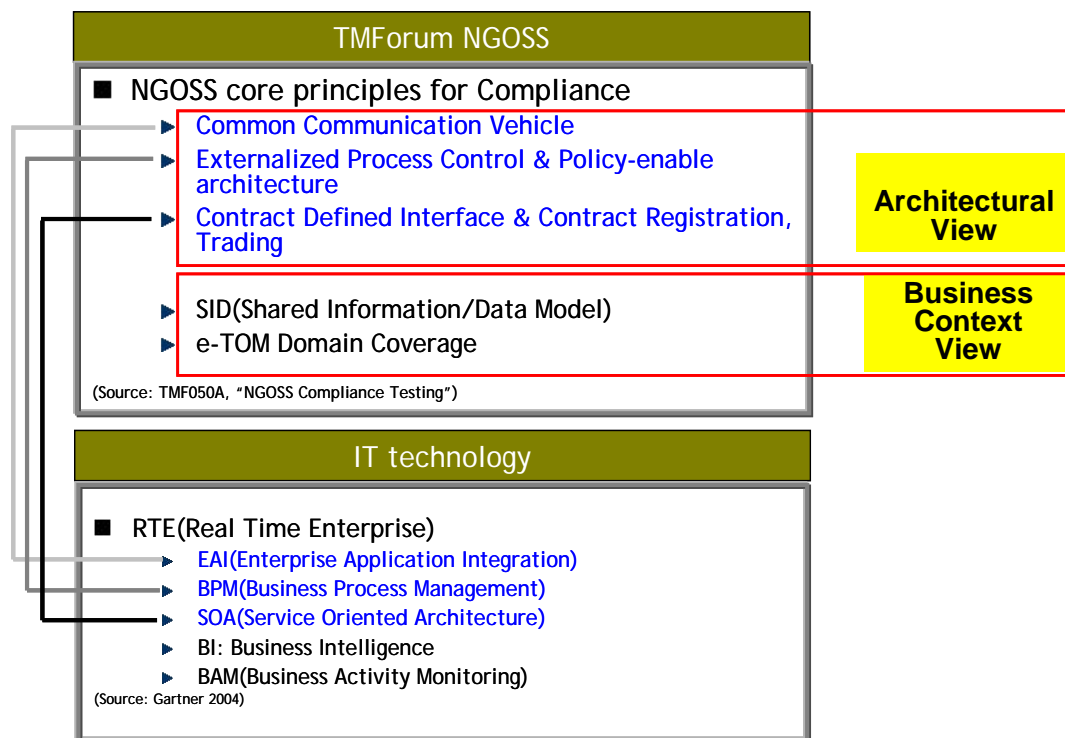
# 1. Motivation

With global competition and ever-evolving technology, corporate management environment is changing fast while customer’s voice is becoming more powerful and their fast-changing demands more diverse in the market. ‘Change’ has become the only trend that is not changing.

In addressing such a trend, agility, flexibility, and efficiency have replaced stability which we have been pursuing until now. In other words, in this changing environment, corporate competitiveness now relies on how efficiently and flexibly a company can follow the trend and address customer demands.

To reflect such demands and trend in the telecommunications sector, TM Forum suggests NGOSS as a guideline. NGOSS defines the core principles for achieving business efficiency and agility.

The core principles set by NGOSS can be implemented as the following IT technologies in Figure 1.1.



**Figure 1.1: NGOSS core principles and related IT technologies**

Among these principles, the Common Communication Vehicle (CCV) can be realized using EAI (Enterprise Application Integration) technology. The Externalized Process Control can be realized using BPM (Business Process Management) technology.



And the Contract defined interface & registration, trading principle can be realized using SOA (Service Oriented Architecture) technology.

These principles are related to the software architectural view. This architecture could be applied to the other domains such as financial and ERP, not to mention telecommunication domain.

Then, how can we realize a telco' s OSS application based on this general architecture? To answer this question, eTOM (Enhanced Telecom Operations Map) and SID (Shared Information/ Data) model provides the blueprint for this. eTOM provides a business process framework for use by service providers and others. SID provides all the information required to implement use cases based on the eTOM processes.

But, unfortunately, what eTOM describes now is rather abstract and high level business processes. And SID also has stayed in the business view, not yet in the system and implementation view.

In other words, it is still difficult to implement OSS systems by using current eTOM and SID because they are still too abstract and generic.

This is the reason why it is difficult to find a NGOSS compliant OSS system in the real world.

So this is the reason why we came to define the detailed procedures for specifying and implementing eTOM business processes into a real world OSS system.

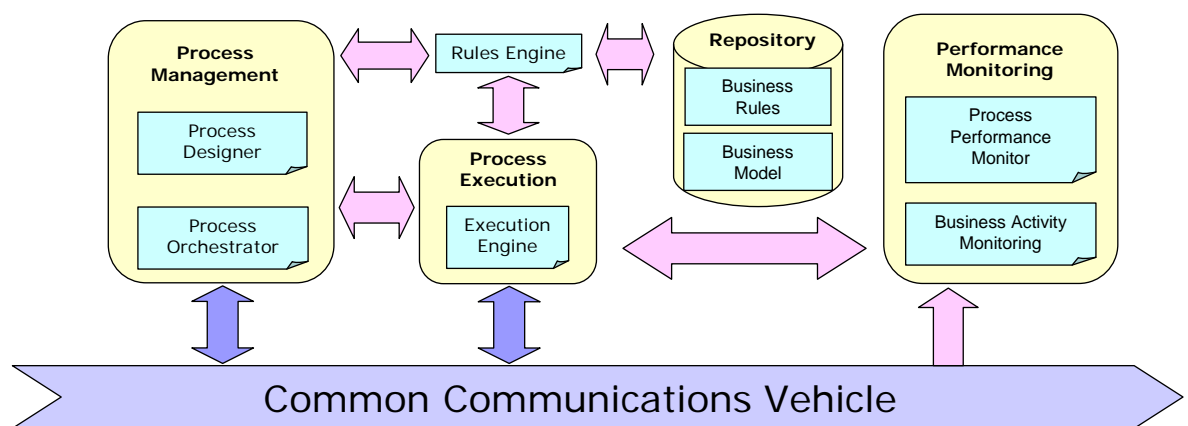
In the next chapter, we will explain the procedure of applying the business processes of fulfillment, assurance and billing for service provider's operation based on software architecture that adheres to NGOSS core principles.

We hope to suggest a guideline for developing NGOSS compliance application which is the center of attention among many service providers and software vendors.

## 2. How to realize NGOSS ?

The NGOSS core principle can be implemented as the following software architecture, BPM in Figure 2.1. BPM refers to activities performed by businesses to optimize and adapt their processes.

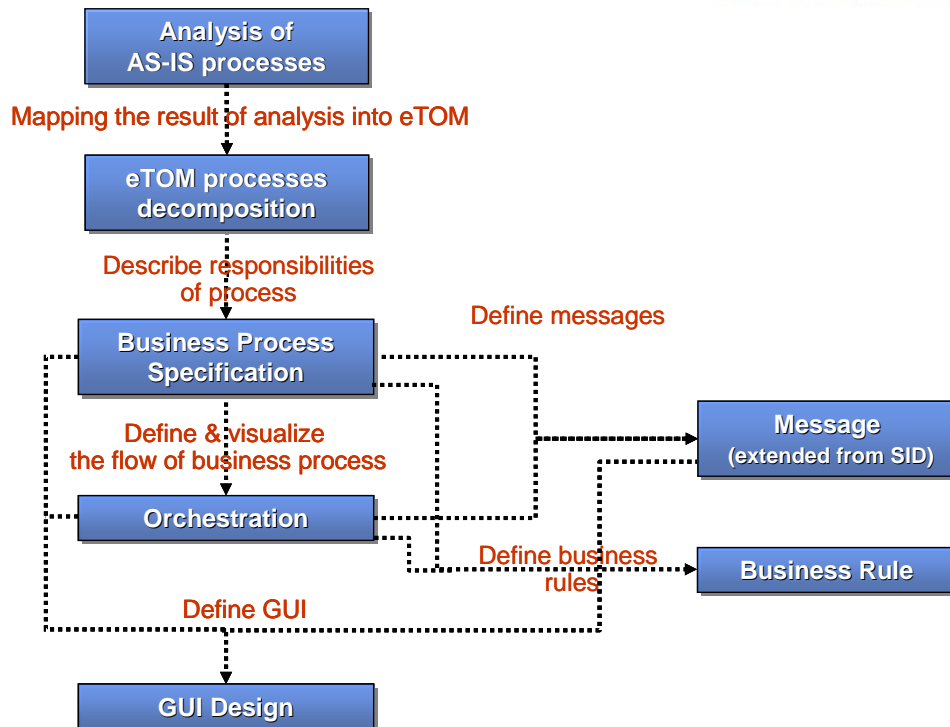
It includes Process Management which models any of process and simulates, Process Execution which actively executes the process, Process Monitoring & Analysis which monitors and analyzes the status of the process, and Repository which stores processes model and rule detailed by eTOM.



**Figure 2.1: BPM Architecture (source: TMForum BPM Team)**

In this BPM-based software architecture, we used the following procedure to design and implement the optimized business processes.

The business processes required for service provider's fulfillment, assurance and billing are specified and systemized through the following procedure illustrated in Figure 2.2.



**Figure 2.2: Procedure for specifying and implementing the business processes**

This procedure can be largely divided into the AS-IS process analysis stage and the stage of designing the TO-BE process which is based on the analysis result of current business processes and eTOM.

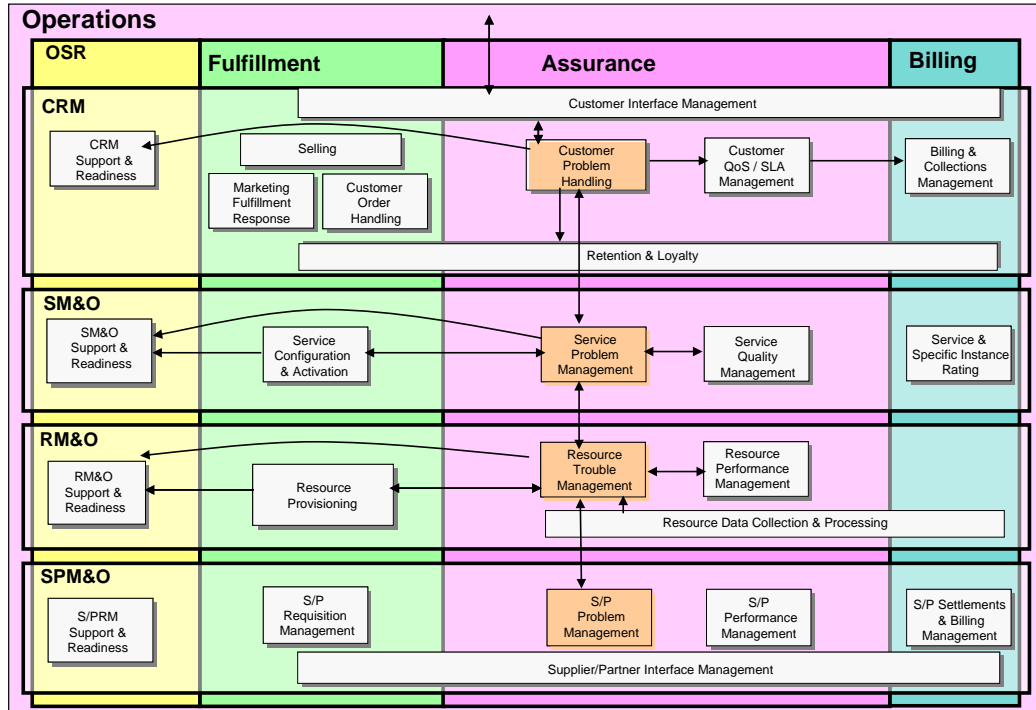
At the stage of AS-IS process analysis, the state of existing OSS and business processes for each service provider is analyzed.

The TO-BE Process designing stage includes rearrangement of specifically analyzed results of the AS-IS process according to eTOM's processes classification. It also includes mapping of separated or integrated parts of the existing process to eTOM, followed by defining of responsibility of each process for system implementation and decomposing of eTOM processes into more specific levels according to the defined responsibilities.

Next is the step of process specification which is necessary for each process in fulfilling its given responsibility, and orchestration. This is also where categories for process input and output need to be defined to set the basis for 'Extended SID', which is an extension of NGOSS SID. Also, business rule is extracted from the process flow. The step of extracting message and rule from business process specification and orchestration is repeated, through which patterns are created for suitable application to each process.

Finally, business processes are optimized through abstraction.

In the remaining of the chapter, we will give a detailed step-by-step explanation of how business process specification and implementation, illustrated in Figure 2.3, is applied in eTOM's Assurance area.



**Figure 2.3: Process interaction for service assurance based on eTOM level 2 business processes**

### 3. Decomposition and implementation of eTOM Business Processes

eTOM is an ongoing TM Forum initiative to provide a business process framework for use by service providers and others within the telecommunications industry. eTOM describes all the enterprise processes required by a service provider and analyzes them to different levels of detail according to their significance and priority for the business.

Currently, eTOM Release 6 defines business processes up to level 3, but in order to implement the actual system according to this, each needs to be defined in more detail. Also, each of business process as well as flow between the processes needs to be defined.

#### 3.1 Analysis of AS-IS business processes

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The first step of the proposed procedure is the analysis of AS-IS business processes. The analysis of AS-IS business processes and their existing OSS is necessary for this. Based on this, we can design the optimized and robust business processes. Figure 3.1 shows the example for analyzing the AS-IS business processes and mapping the business processes into the international standard, eTOM. By performing this process, the weakness and lack of AS-IS business processes could be identified. For example, as showed in Figure 5, the result of this shows that some parts of management area are missed or not defined clearly such as service management & operation (SM&) and Supplier/Partner management & operation (SPM&O) domain.

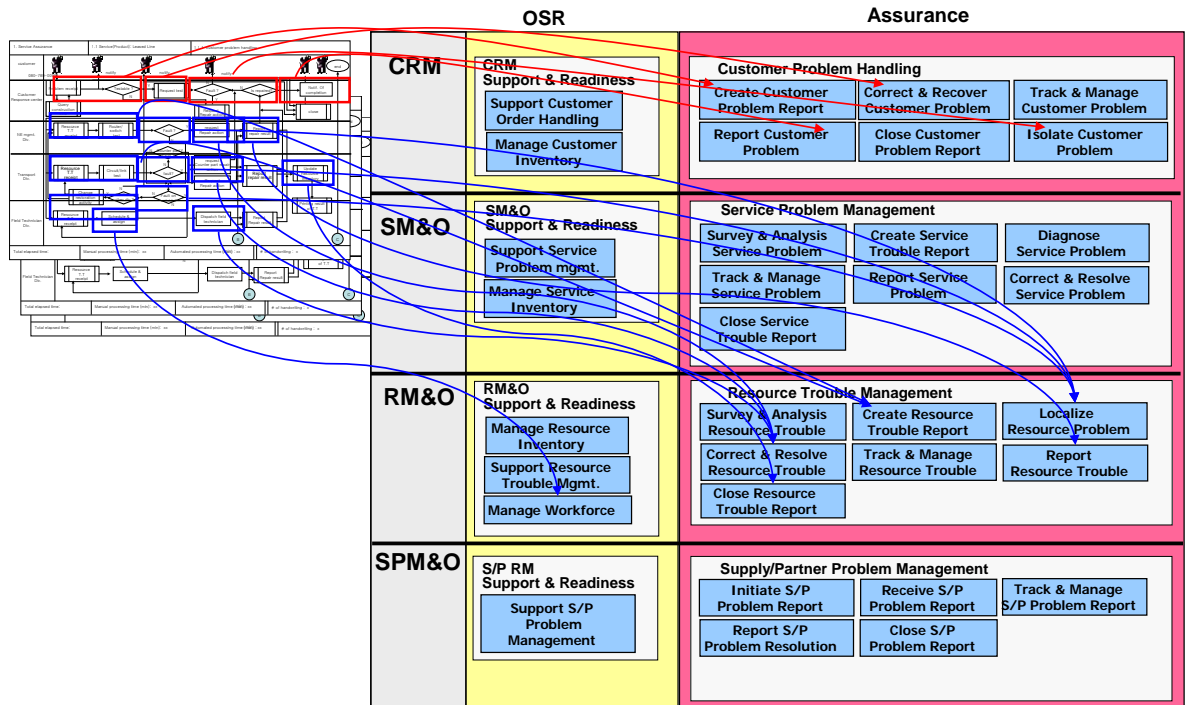


Figure 3.1: Mapping the AS-IS business processes into eTOM

Based on the result of analysis, we could define which part of management area should be designed for TO-BE business processes, as shown in Figure 3.2.

In this aspect, eTOM provides process design guideline to many service providers for optimizing their business processes, because eTOM is a generalized systematic display of complex activities conducted throughout the service provider's organization.

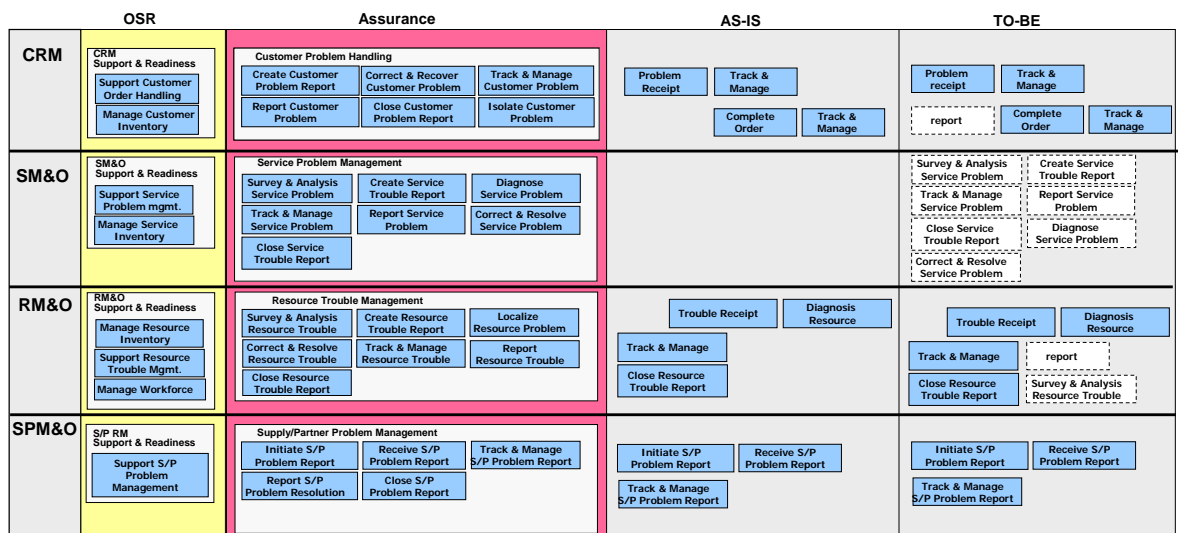
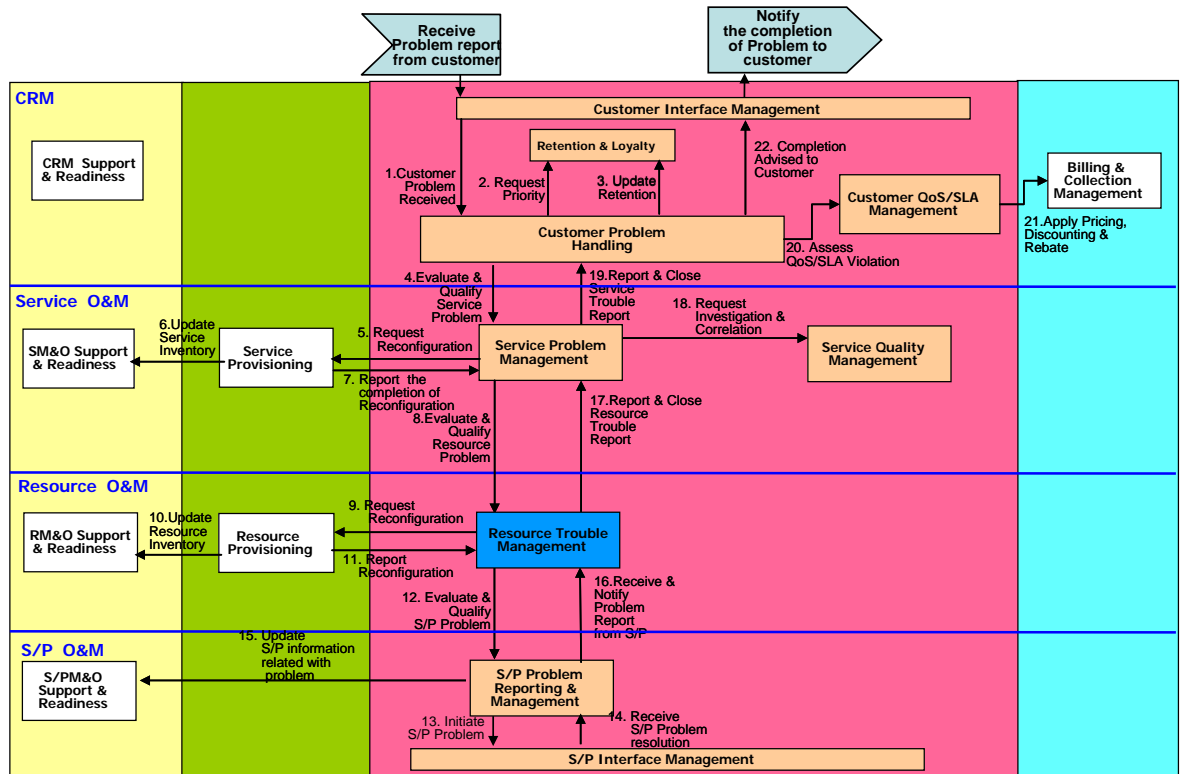


Figure 3.2: Gap analysis and definition of TO-BE business processes

However, since definitions and flows of such detailed processes are different for each service provider, it is difficult to set a standard to which such specification can be applied.

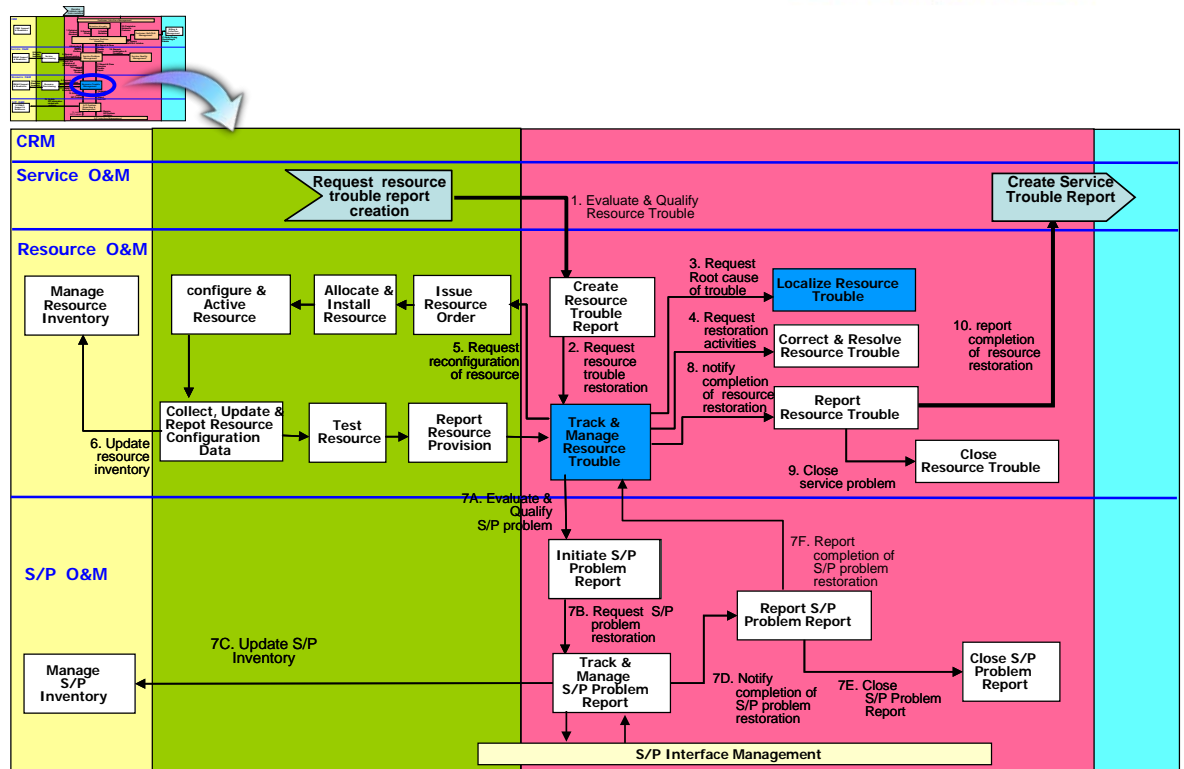
Figure 3.3 below illustrates the process interaction among eTOM level 2 business processes for customer problem handling based on SLA process flows mentioned in GB921F document.



**Figure 3.3: Problem handling from customer report among eTOM level 2 processes**

Among processes related to problem handling, 'Resource Trouble Management Process' is further specified into seven level 3 business processes including 'Survey & Analyze Resource Trouble', 'Create Resource Trouble Report', 'Localize Resource Trouble', 'Correct & Resolve Resource Trouble', 'Track & Manage Resource Trouble', 'Report Resource Trouble' and 'Close Resource Trouble Report' according to the Operation Process Pattern.

Based on the definition of process in GB921D, interaction among the processes for problem handling can be displayed as shown in Figure 3.4.



**Figure 3.4: Resource trouble management among eTOM level 3 processes**

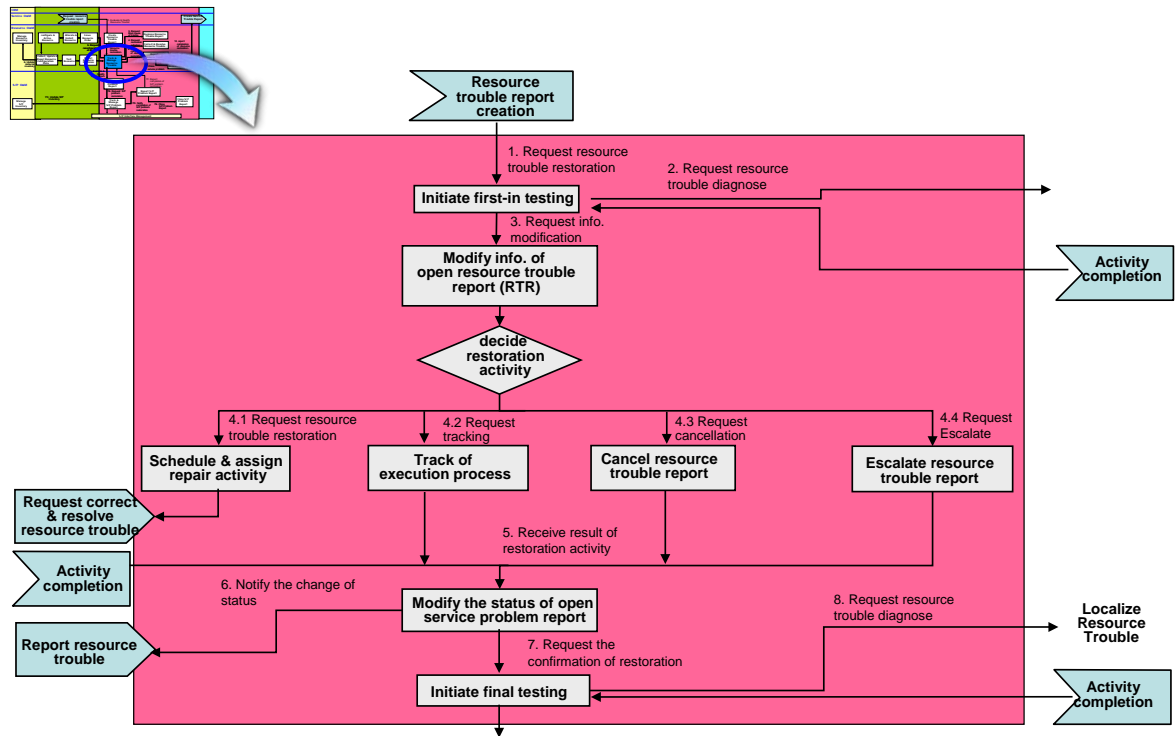
As showed on Figure 3.1, we extracted business processes from the analysis of AS-IS business processes and mapped these into eTOM. Based on these result, we can decompose level 4 business processes from level 3 business processes defined on eTOM.

### 3.2 Decomposition of eTOM business processes

We had analyzed AS-IS business processes and mapped these into eTOM model. Based on these result, we had concluded that responsibilities of eTOM level 3 business processes can become the basis for defining level 4 business processes.

And then, these defined level 4 business processes can be further decomposed more detail according to each domain such as product, service and resource. For CRM domain, dedicated processes for specific product could be decomposed into level 5 business processes. For SM&O domain, dedicated processes for specific service could be decomposed into level 5 business processes.

As mentioned before, to break down the eTOM processes to a more specified level, responsibilities of GB921D-defined level 3 business process can become the basis for defining level 4 business processes. For examples, Track & Manage Resource Trouble business process of Resource Operation & Management (RM&O) in Figure 3.4 can be decomposed as in Figure 3.5.



**Figure 3.5: Track & Manage Resource Trouble among eTOM level 4 processes**

These defined the level 4 business processes can be further specified more detail according to domain. Table 2.1 below shows business process decomposition of levels 4, 5, and 6 according to the aforementioned standards to implement the system based on the business processes defined in current eTOM.

Business Processes Level	Decomposition Criteria	remark
Level 4 Processes	Based on the responsibilities of eTOM Level 3 Processes described on the GB921D document.	
Level 5 Processes	processes unit for specific product, service or resource -CRM: dedicated process for specific product -SM&O: dedicated process for specific services -RM&O: dedicated process for specific resources	Referenced from the business processes of KT and their operation experiences
Level 6 Processes	Decomposed processes if need to be decomposed from level 5 processes	Referenced from the business processes of KT and their operation experiences

**Table 3.1: Example of eTOM business process decomposition**

Also, Figure 3.6 shows an example of specified level 4 and 5 process decomposition according to these criteria.

eTOM Level 0- 3 Process			Newly defined Level 4-N Process			
Level 2 Process Name	Level 3 Processes		Level 4 Processes		Level 5 Processes	
	Process Name	Process ID	Process Name	Process ID	Process Name	Process ID
Resource Trouble Management	Track & Manage Resource Trouble	1.A.3.3.4	Initiate first-in testing	1.A.3.3.4.1		
			Schedule and assign repair & restoration activities	1.A.3.3.4.2		
			Initiate final testing	1.A.3.3.4.3		
			Track of execution	1.A.3.3.4.4		
			Modify the information of open resource trouble report(RTR)	1.A.3.3.4.5		
			Modify the status of resource trouble report	1.A.3.3.4.6		
			Cancel resource trouble report	1.A.3.3.4.7		
			Escalate resource trouble report	1.A.3.3.4.8		
	Localize Resource Trouble	1.A.3.3.2	Verify the resource configuration	1.A.3.3.2.1		
			Perform diagnostics against the specific resources	1.A.3.3.2.2		
			Run testing against the specific resources	1.A.3.3.2.3	optical line testing	1.A.3.3.2.3.1
					Copper line testing	1.A.3.3.2.3.3
					DSLAM testing	1.A.3.3.2.3.4
					Router testing	1.A.3.3.2.3.5
AAA testing	1.A.3.3.2.3.6					
...						
Schedule routine testing	1.A.3.3.2.4					
Update the open R.T.R	1.A.3.3.2.5					
Notify to Track & Manage Resource Trouble	1.A.3.3.2.6					

Figure 3.6: Example of decomposed business processes

### 3.3 Specification of the decomposed business processes

The responsibility of each decomposed business process, basic process flow for its implementation, and message to be sent among internal- or inter-business processes need to be defined.

Level 1	Assurance	Level 2	Resource Trouble Management	Level 3	
Title	Track & Manage Resource Trouble				
Summary of responsibility	Ensure testing, repair and restoration activities are assigned, coordinated and tracked efficiently, and that escalation is invoked as required for any open resource trouble reports in jeopardy.				
Pre condition	1	Related resource trouble report (RTR) should be exist			
Basic flow	1	Request resource testing for the open [RTR information]			
	1.1	Query [Resource Information] to the [1.O.3.1.5_manage_resource_inventory], using the 'Resource ID' attribute of the open [RTR information] as key.			
	1.2	Decide testing type and make [test request information]			
	1.3	Request resource trouble diagnose to [1.A.3.3.4.1_initiations_first-in_testing] by passing the selected [test request information]			
	2	Update or add [testing result information] to open [RTR information]			
		... [elapse]			
Exceptional flow	E1.1	If not exist the requested [resource information], cause error.			
		...			
Post-condition					
Additional Item					
Business entity	RTR Info.	RTR ID, action Type, interaction date, interaction complete date, trouble cause, interaction status, processing priority, resource ID, parent Interaction ID, RTR creation type, ...			
	Test request Info.	Resource ID, resource name, resource type, testing type, ...			
	Testing	Test ID, related RTR ID, testing result, testing type, testing date, ...			

Figure 3.7: Template for Business process specification



### 3.5 Definition of business entity (message)

eTOM business processes are driven by message (or business entity). Business entity means that the information can be exchanged among business processes. This business entity was described in the business process specification briefly. But, to define the business entities more detail, we defined the document template like Figure 3.9. We call it ‘business entity specification’.

Business entity specification template consists of the definition of business entity, its creation time, attributes and their syntax. This business entity will be used as message between business processes.

At the next chapter, we will explain how our information model can be designed based on these business entities as well as SID model.

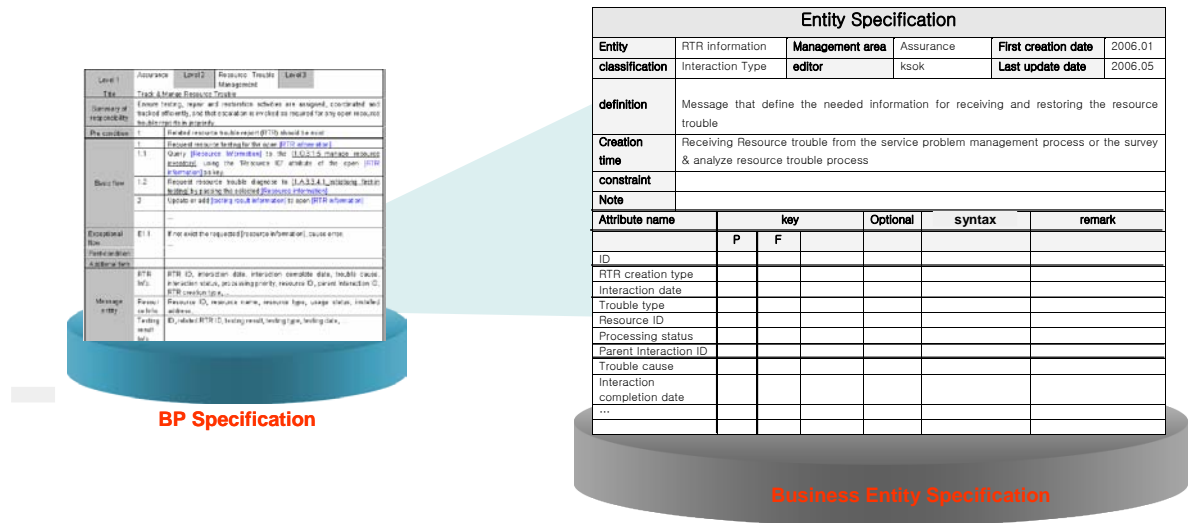


Figure 3.9: Definition of business entity

### 3.6 Definition of rule for the business processes

*This section will be described in the future as soon as possible.*

### 3.7 Learned lesson and open issue

#### Lessons learned

- eTOM can be used as a reliable process design guide

Yesterday, everything was network focused. And most services (or products) were long-lived services and relatively a simple mixture of them. But today, everything's

now service focused. Most services are short-lived services and a rather complex mixture of them.

In real telco's environment, it seems, in our case, that there is no explicit definition of product and service and their difference. In this aspect, it seems that more flexibility for adopting these changes is needed. As suggested on eTOM and SID, the concept of product and service and is required. And more, "Customer Facing Service" and "Resource Facing Service" concept is need to apply.

- Need strict constraint to change rules of business process by users

Changing the rules of operational process on-the-fly is very risky. It needs to restrict against changing the rules of business processes and require the simulation of changed rules prior to deploy and execute.

The one of solution of this problem is defining multiple levels of users.

For example, the levels of users could be defined like bellow. (refer chapter 6 for more details)

- i. (normal) Operator
- ii. Monitor
- iii. Administrator
  1. System administrator
  2. Business processes & rules administrator

### Open Issues

- Which level of business processes should be realized using BPM, in the aspect of performance?

One of issues to consider when using a BPM, workflow engine, is that which level of functionality should be made visible to the workflow engine. Especially in an environment where there are huge traffic and high transactions. If we make visible the fine grained functionality to the workflow engine, a large amount of business logics are required. As a result of this, processes become slow and inefficient by the overhead and payload of workflow engine. This creates negative impacts on the scalability.

On the other hand, what about coarse grain approach? It has some limitations of flexibility. But the simplified processes make lower traffic volumes for the workflow engine and are better for the scalability.

## 4. Extension of SID (Shared Information/Data) Model

SID Model is mentioned in the GB922P document for NGOSS-based OSS design and development. Likewise SID model can be used in the following manner:

As a starting point for internal modeling work, applications and messages between software components or database schemas

- ◆ To help in defining a common business terminology
- ◆ To help in business transformation programs

SID Model can generally be used as for two things: first, as the base information model to define messages sent among business process; second, as the base information model for conceptual data modeling in designing database for OSS.

### 4.1 Modeling the Extended SID Model

The current SID Model is an abstract information model from the business view. In order to apply it to the actual system design and development, the eight domains defined in SID need to be expanded and materialized.

To this end, packages (ex. NeOSS SID) are defined for expansion, and classes that need new expansion or materialization are defined by the extension of SID-defined domain and its sub-domain, ABE (Aggregated Business Entity).

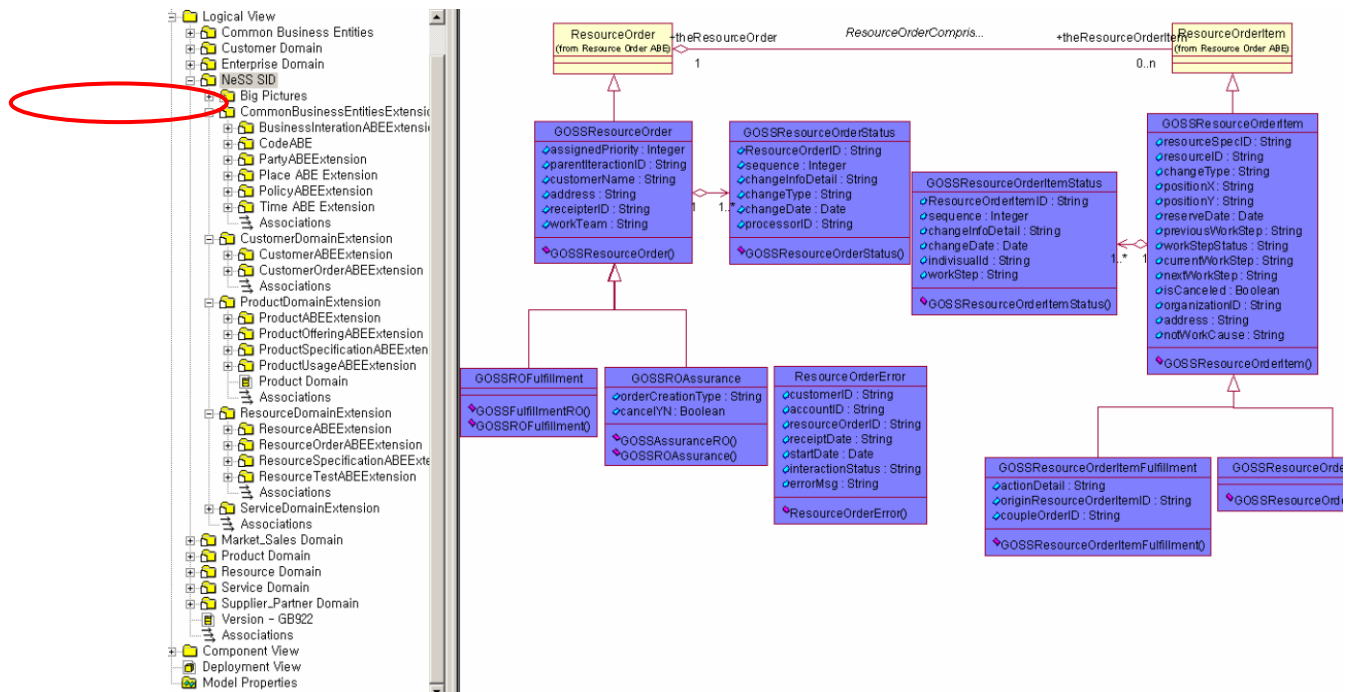


Figure 4.1: Extension of SID Model



## 4.2 Designing Database Model based on SID

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The scope of database model establishment covers areas managed by existing OSS's inventory, ordering and workforce management, for supporting telco's service fulfillment, assurance and billing.

How to design database model? The Database Model is designed based on the current data model of existing OSSs and NGOSS SID model.

Reversed data modeling was conducted to confirm the current data model of existing OSS and to collect around 1700 tables and columns of the tables. Except for tables needed to link code table with statistics table, all the tables were grouped according to the nature of their major tasks. The grouped tables are then analyzed for their use and characteristic, which became the basis for selecting the core entity and finding the correlations to create the primary practical concept model as shown in Figure 4.3.

While running reverse modeling, the key concept of SID was reflected in the integrated model by analyzing the NGOSS SID model of TM Forum. SID model is an information model that focuses on the things related to operation processes of telcos. Although SID model is not a data model for database designing, it reflects general concepts on important objects that service providers aim to treat.



**Figure 4.3: Database table information of each system collected in existing OSS**

SID model shows generalized concepts of things treated at service providers by using the UML. This model is neither a data model used for designing a database nor a basic class model used for developing software. However, since it is a model independent from a specific service provider, it provides a conceptual basis with its class to which a core entity derived from a model dependent on a specific company (e.g., KT) can make a comparison. For example, when a product is purchased by and provided to a customer, its record is stored in an entity called “contract registration” of existing OSS. This entity can be generalized as a part that belongs to SID’s ‘Product (product offering purchased by customer or member)’.

As mentioned earlier, SID model is an abstract model, thus data model design and software development based on it is impossible. In the data model design, SID model was used as the conceptual basis to generalize the concept of the core entities of existing OSS. Core entities of existing OSS include customer, contract register, product code, equipment, lines, work order, fault registration, lot number information, organization, and telephony office. These entities make up the backbone of KT’s operation work as of integrated data model of the model system.

Other than the core entities derived from existing OSS, SID has parts that are exclusive to SID but reflective in the data model of the NeOSS. Business Interaction

Item and Usage are a couple of main examples. Business Interaction Item contains the objectives of Business Interaction, which is composed of collection of product, service, and resource entities. In the existing OSS, objectives of orders related to product, service, and resource were displayed in either work order or problem report entity, but the Business Interaction Item has separated such objectives into the concepts of interaction and interaction item in applying to the integrated data model to reflect the concept of SID.

SID definition of Usage is ‘an occurrence of employing product, service or resource for its intended purpose’. In the data model, it is defined as the collection of occurrence of employing services that make up the corresponding product and resources that make up the corresponding service.

Figure 4.4 is an illustration of the model that has been derived from such process.

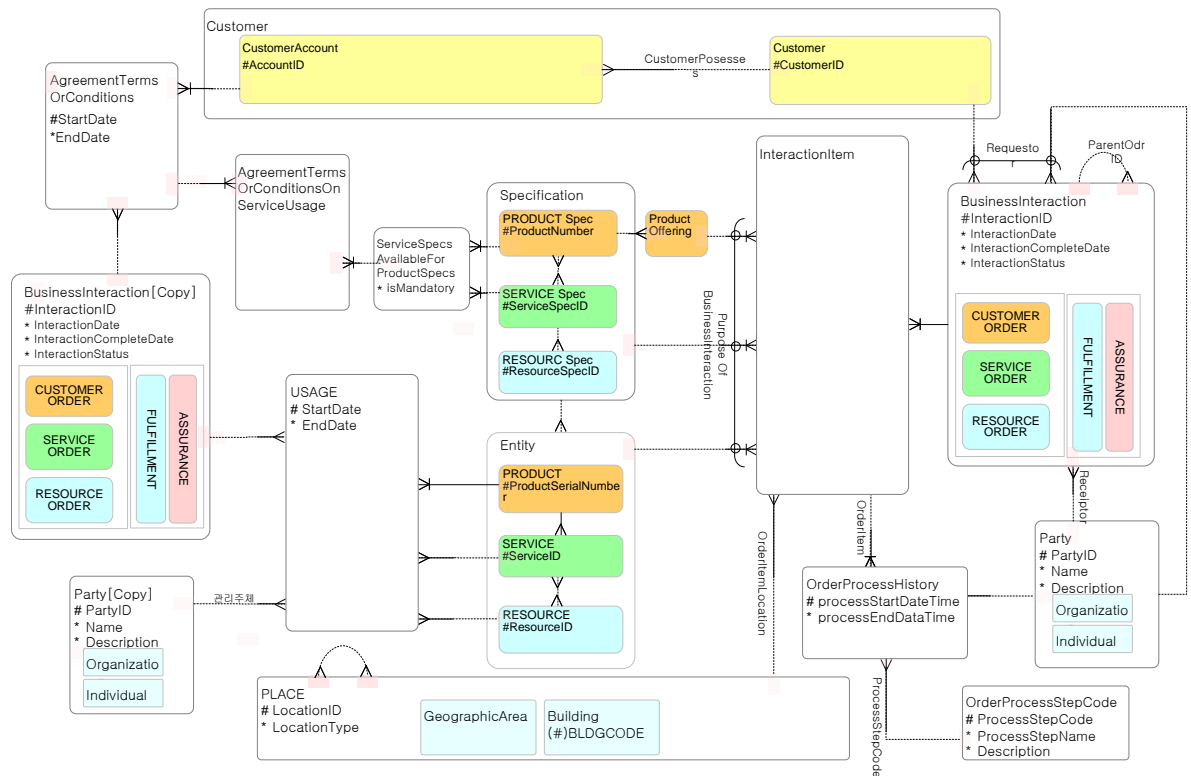


Figure 4.4: Conceptual data model based on SID model

### 4.3 Learned lesson and open issue

#### Lessons learned

- SID can be used as reliable and extensible base information model for designing messages and database.



- Some of dynamic modeling needs to be considered for applying in real world.

Some of dynamic modeling patterns (such as characteristic pattern) is good for ideal design. But, there are some limitation for realizing it, such as performance, usability and complexity of maintenance.

If we use or apply this characteristic pattern on database modeling, it can gain its flexibility, but this cause the difficulty of understanding and developing APIs to supporting features of this pattern.

According to our experience, if the business process or logic is subject to be changed, it is more desirable to apply these dynamic modeling patterns to improve business agility and adopt the change of business logic easily.

But, if the performance is more important factor, it is not desirable.

### Open Issue

- SID model does not define the whole scope of required information.

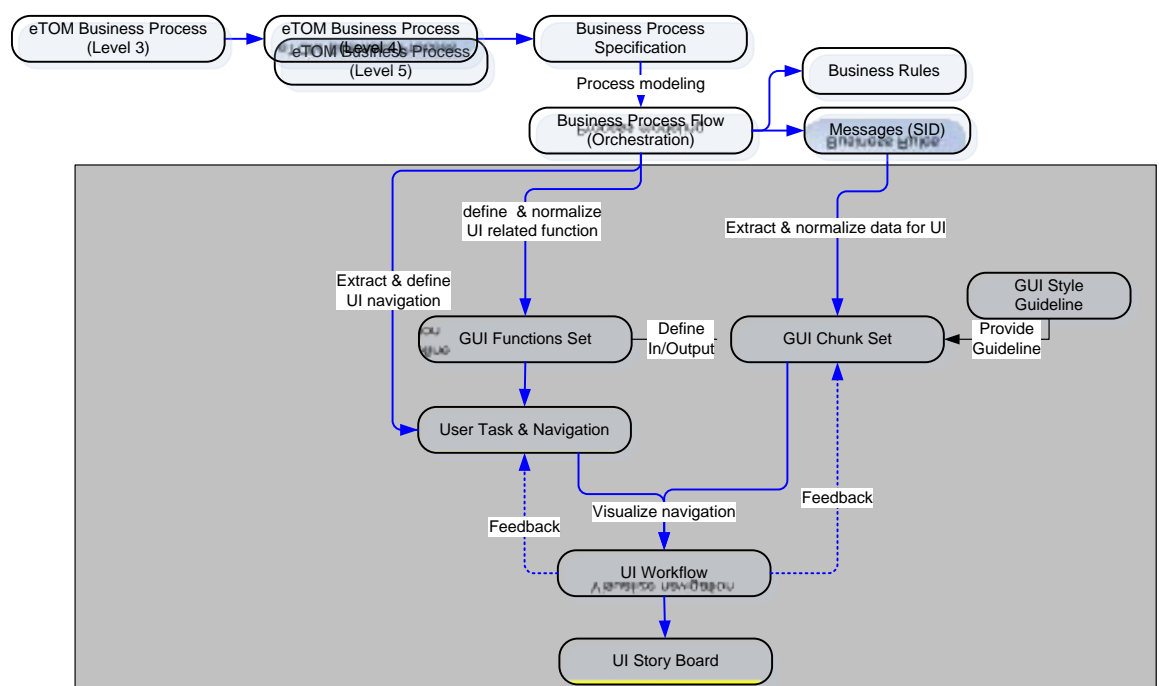
Current SID model (Phase 6) does not define the entities required for service assurance, such as Customer Problem, Service Trouble and Resource Trouble entity. It needs that these entities should be defined first.

## 5. Designing User Interfaces based on eTOM business processes

‘Externalized Process Control’ among NGOSS core principles refers to the ability to separate the business logic and component implementation, and to externally control the defined business logic. This can be implemented through the BPM technology.

In this process, the change of the business process logic may cause the change of a user’ screen. To support these changes efficiently, the mechanism is needed that adopts the changes easily into a user interface (UI) and its flow. In other words, the user interface and its navigation need to actively reflect this change of the business logic via external controls. For this, we took the following processes as shown in Figure 5.1 below.

GUI functions are deduced from business process specification and orchestration which defines the responsibility and flow of business processes in each specific stage. These GUI functions are then normalized into small units that can be reused. Through this process, a collection of reusable GUI functions could be defined.



**Figure 5.1: Methodology for extracting and defining user interface from business process specification**

By extracting the attributes - entered by the user or to be shown on the screen – from the messages of the business process specification, and considering the relationship of these attributes, some GUI units could be grouped in the reusable atomic units. We called this unit as ‘GUI chunk’.

Each GUI function defines the display category and screen layout of input and output as a GUI chunk or a collection of GUI chunks.

Based on such GUI function set and GUI chunk set, and through the analysis of each business process specification, the flow of user interface related parts, which are entered by users or displayed, are defined in 'user task & navigation'.

The UI workflow groups 'user task & navigation' in page units by considering user entry convenience and correlation of information for output, and decides on the arrangement of GUI functions to be displayed in each page. The layout information of these GUI functions is in XML format. Therefore, UI-related section regarding business process logic change is also registered in the UI workflow in XML format to enable external control.

Such UI workflow needs upgrading of related information whenever there is a change in the business process specification.

Figure 5.2 shows how to extract and normalize GUI function and chunk set. To extract GUI related functions, it is required to analyze the user's screens of existing OSS as well as business process specifications. As a result, GUI chunks could be composed of input and output for each GUI function. And also, GUI function set could be classified into 4 areas such as common, fulfillment, assurance and billing showed in figure below. As a result, we hope that every user screens could be composed by using these GUI chunks.

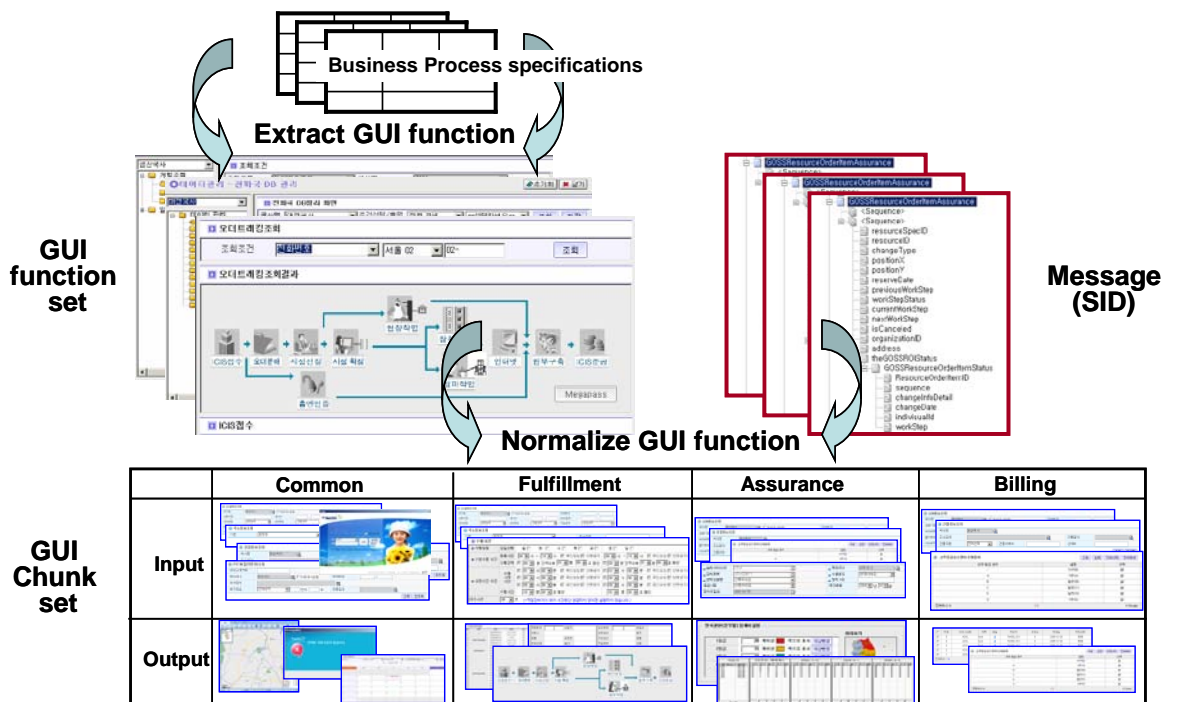


Figure 5.2: Extract and normalize GUI chunk from the business process and existing OSS

## 6. Operational organization based on eTOM

Operational organization for service provider’s business processes can be configured in various ways according to different situations and consequently, the user groups may become diverse. However, with eTOM as the standard, user groups can generally be divided into three management areas of fulfillment, assurance and billing.

Also, each management area can be further divided into Customer relationship management (CRM), Service management & operation (SMO), Resource management & operation (RMO), and Supply and partner management & operation (SPMO).

In generally, user role can be divided into administrator, operator, and monitor according to their roles. Each user role is as follows. Operator takes charge of actual operation of each management area, administrator manages exception and escalation in operation, and monitor(supervisor), with c-level of the management being its major target, is in charge of deciding on long-term situations by reviewing statistics information on KPI/KQI-related states and general operation.

OSR (Operation Support & Readiness) is divided in a manner unlike those of other management areas. First part is the business activity monitoring (BAM) part that monitors current status and performance of business processes and defines KPI/KQI related attributes that be measured.

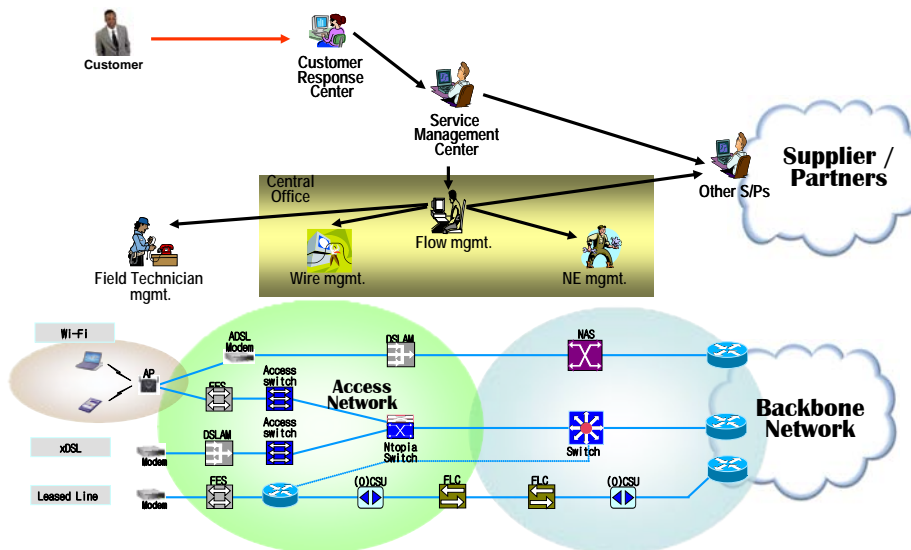
Second one is a part managing inventory information for each domain, and third one is a part that manages the workforce for each activity. OSR sector’s user roles are given according to each user role of Fulfillment, Assurance, and Billing.

The basic user group of eTOM business processes’ operational organization is as shown in Figure 6.1. It also displays the organization for customer problem handling.

Role	Management Area	Fulfillment				Assurance				Billing				BAM	Inventory	Workforce
		CRM	SMO	RMO	SPMO	CRM	SMO	RMO	SPMO	CRM	SMO	RMO	SPMO			
Administrator																
Operator																
Monitor (supervisor)																

Figure 6.1: Example of user group for operational organization based on eTOM

Customers register problem report at the operational organization for customer problem handling. The organization involves the call center which is in charge of educational negotiation for products, the service management center which handles problems on service registered by the call center, and the central office (Branch office) which operates and manages service-related resources.



**Figure 6.2: Operation Organization for customer problem handling**

According to their roles, each operation organization may be granted access to eTOM processes as shown in the table below.



Operational Organization	Role	Responsibilities	Related eTOM L3 Business Processes
Customer Response Center	Administrator	Customer problem receipt, customer education	Support Customer Interface Management, Create Customer Problem Report, Isolate Customer Problem, Track & Manage Customer Problem, Correct & Recover Customer Problem, Report Customer Problem, Close Customer Problem Report, Create Service Trouble Report
		Support & administrate problem handling	Support Problem Handling Support Retention & Loyalty Manage Customer Inventory Support customer QoS/SLA
	Operator	Customer problem receipt, customer education	Support Customer Interface Management, Create Customer Problem Report, Isolate Customer Problem, Track & Manage Customer Problem, Correct & Recover Customer Problem, Report Customer Problem, Close Customer Problem Report, Create Service Trouble Report
	Monitor	Performance & trend analysis	Support Problem Handling Support customer QoS/SLA
Service Management Center	Administrator	Service problem management	Create Service Trouble Report, Track & Manage Service Problem, Diagnose Service Trouble Report, Correct & Track Service problem, Report Service Problem, Close Service Problem report, Create Resource Trouble Report
			Initiate S/P Problem Report, Track & Manage S/P Problem Report, Report S/P Problem Report, Close S/P Problem Report
		Support & administrate service problem handling	Support Service Problem Management, Manage Service Inventory, Enable Service Quality Management
	Operator	Service problem management	Create Service Trouble Report, Track & Manage Service Problem, Diagnose Service Trouble Report, Correct & Track Service problem, Report Service Problem, Close Service Problem Report, Create Resource Trouble Report
Initiate S/P Problem Report, Track & Manage S/P Problem			

				Report, Report S/P Problem Report, Close S/P Problem Report
		Monitor	Performance & trend analysis	Support Service Problem Management, Support Service Quality Management
Central Office	Flow Management Div.	Administrator	Resource provision & trouble management and coordinate flows	Create Resource Trouble Report, Track & Manage Resource Trouble, Diagnose Resource Trouble Report, Correct & Resolve Resource Trouble, Close Resource Trouble Report
				Initiate S/P Problem Report, Track & Manage S/P Problem Report, Report S/P Problem Report, Close S/P Problem Report
			Support & administrate resource trouble handling	Support Resource Trouble Management, Enable Resource Performance Management Manage Resource Inventory, Manage workforce, Manage logistics
		Operator	Resource provision & trouble management and coordinate flows	Create Resource Trouble Report, Track & Manage Resource Trouble, Diagnose Resource Trouble Report, Correct & Resolve Resource Trouble, Close Resource Trouble
	Initiate S/P Problem Report, Track & Manage S/P Problem Report, Report S/P Problem Report, Close S/P Problem Report			
		monitor	Performance & trend analysis	Support Resource Trouble Management
	Switch Management Div. (PSTN, IP)	Operator	Resource management such as PSTN switch and IP-based router/switch,	Diagnose Resource Trouble Report, Correct & Resolve Resource Trouble
	Wire Center	Operator	Wire management	Diagnose Resource Trouble Report, Correct & Resolve Resource Trouble
Workforce Management Div.	Operator	Field technician management	Diagnose Resource Trouble Report, Correct & Resolve Resource Trouble	

**Table 6.1: Related eTOM processes of operational organization for customer problem handling**

## 7. Administrative Appendix

### 7.1. About this document

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This is a TM Forum Guidebook. The guidebook format is used when:

- The document lays out a ‘core’ part of TM Forum’s approach to automating business processes. Such guidebooks would include the Telecom Operations Map and the Technology Integration Map, but not the detailed specifications that are developed in support of the approach.
- Information about TM Forum policy, or goals or programs is provided, such as the Strategic Plan or Operating Plan.
- Information about the marketplace is provided, as in the report on the size of the OSS market.

### 7.2. Document History

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#### 7.2.1. Version History

This document will be updated to incorporate interactions and processes as and when the Use Cases are expanded or further detailed.

GB921R: NGOSS real world use case is being issued as Member Evaluation Version. This version of the document can be considered valid until it is updated or replaced. The purpose of an Evaluation Version is to encourage input based on experience of members and the public as they begin to use the document. Following the Evaluation Period, documents that are seen to deliver value are candidates for formal approval by the TM Forum. All documents approved by the TM Forum undergo a formal review and approval process.

This document will continue under formal change control. Any supporting work will be issued as companions to this document. A document of this type is a “living document,” capturing and communicating current knowledge and practices. Further inputs will be made because of detailed work ongoing in the TM Forum and the industry.

Version Number	Date Modified	Modified by:	Description of changes
0.1	19/07/06	Kisang Ok	First internal draft
0.5	22/01/07	Kisang Ok	Updates
1.0	July 2008	Mike Kelly	Final modifications

			prior to approval submission
1.1	July 2008	Tina O'Sullivan	Minor corrections prior to posting.
1.2	June 2009	Alicja Kawecki	Minor updates to reflect TM Forum Approved status

### 7.2.2. Release History

<This section records the changes between this and the previous Official document release>

Release Number	Date Modified	Modified by:	Description of changes
7.5	July 2008	Mike Kelly	Initial release of this addendum as part of Release 7.5

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### 7.4. Acknowledgments

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