Research Paper

Improved ETOM's Fab Domain by Using SMS

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Abstract: Due to the internet use in industry, telecommunication operators have an important role in providing the services. Services are extending in all over the world and Enterprise customers have become an important part of telecommunication operators. Enterprise customers and Parties play a major role in the return of the investment as well as increasing the telecommunication operator's benefits and revenue. The infrastructure and billing of services offered to enterprise customers are different from individual customer services. Therefore, telecom operators create Business – to – Business services to offer to enterprise customers and parties. Business Process Framework eTOM is one of the best practice telecom operators in the world that creates a new domain called Engaged Party to provide B2B services for enterprise customers and parties. In this paper by the use of IBM reference model (ITSM), we try to improve business process framework eTOM in B2B domain. According to lack of B2B solution management in eTOM and telecom operators, we provide Solution Management system to improve eTOM, reduce operator's cost and increase ROI. This paper is customized for the Middle East's operators and their requirements. It is worth mentioning that in this paper customers are parties and enterprise customers.

Keywords: Business Process Framework eTOM, ITSM (Information Technology System Management), ITIL (Information Technology Infrastructure library), Business to Business, Solution Management, Parties.

I. INTRODUCTION

In the recent years, according to ICT industry progress, the traditional structures have been being replaced with modern structures and IT services are growing in all industries [1]. In this structure, business owners specially operators should take enterprise customers into consideration. Today, enterprise customers are the most important suppliers in the supply chain and therefore providing B2B Services has become significant for businesses and operators. In this regard, adequate infrastructure is necessary to provide new B2B services [2]. With the increase of customers and added enterprise customers and the increase in the scope of operators, requests, problems and customers' requirements are also increasing. To handle and solve customer's problems and their requirement, we provide a system called Solution Management System (SMS) in the Engaged Party Domain in eTOM in Fulfillment, Assurance & Billing (FAB). This system can manage most of the customer's problems, requirements and requests by reviewing possible solutions and providing the best solution considering the customer's needs and demands. These problems, requirements and requests can be extracted by Customer Relationship Management (CRM) and Sales and Marketing Management. Finally, it estimates the cost of the solution and considers the operator's ability to implement solutions and then solutions are implemented. This system can reduce customer dissatisfaction and increase honoring the customer.

II. ETOM INFORMATION

The Purpose of Business Process Framework eTOM is continue the landscape of the telecommunications industry to increase competition between service providers and increase services. eTOM can be used in business processes in enterprises. In order to ensure the integrity of a support systems that provide services, products and support, organizations can use eTOM framework. eTOM focuses on business processes of service providers. eTOM Processes involve identifying the relationships and intermediaries as well as extracting useful information that is used by customers, services, suppliers, parties and resources. This framework consists of two main vertical areas called: 1. Strategy, Infrastructure and product, 2. Operations. Each domain is divided into many sub domains. The first domain consists of 3 sub domains: 1. Strategy and Commit, 2. Infrastructure Lifecycle Management, 3. Product Lifecycle Management. The second domain consists of 4 sub domains: 1. Operations Support & readiness, 2. Fulfillment, 3. Assurance, 4. Billing &

Revenue Management [13]. Also eTOM has five main horizontal domain that crosses those two domains. These 5 domains are detailed below [2]:

1. Market / sales: including processes that manage sales and communication channels and are concerned to marketing and customer management.
2. Product: including processes such as product offer management and etc.
3. Services: including processes related to service development, providing services and service configuration as well as managing service problems, rating services and service analysis.
4. Resources: including processess that are concerned with developing and delivering infrastructure and resources (network and IT). This domain can handle problem management, supply management and performance management and etc. Infrastructure, resources, products and services can be managed by resource domain and organizations can be self-sufficient in resources and infrastructure.
5. Engaged Party: this domain has been added to the eTOM framework in version 14.5. These processes include party's interaction with enterprises such as service providers. These processes are responsible for development and supply chain management processes between parties and customers and enterprises. Also supporting any B2B2X agreements such as products, infrastructure and operational interfaces between the parties.

As described above, Engaged Party Domain only communicates with and supports B2B services and parties and enterprise customers. This domain has many processes described eTOM's sub domain that will be explained [3]:

1. Strategy, Infrastructure & product domain

Strategy and Commit:
1.1. Party Strategy and Planning is responsible for developing strategies and enterprise policies to increase interaction between suppliers and partners.
1.2. Infrastructure Lifecycle Management: Party Tender Management is responsible for managing tender's documents, running tender processes and etc.
1.3. Product Lifecycle Management:
1.3.1. Party Engagement Development & Retirement is responsible for the party lifecycle management which is associated with enterprise. Also in this process, it manages enterprise service development, outsourcing, attracting parties and etc. in order for communication with new parties.
1.3.2. Party Offering Development & Retirement is responsible for managing new products that are added by new parties and refusing old products that were offered by prior parties.
1.3.3. Party Agreement Management is responsible for evaluating agreements with the parties.

2. **Operations**
2.1. Operations Support & readiness:
2.1.1. Party Support & Readiness is responsible for ensuring the readiness and performance of all essential facilities to interact with parties and customers.
2.1.2. Party Privacy Management is responsible for regulation of data privacy and party information management.
2.2. Fulfillment:
2.2.1. Party Order Handling is responsible for tracking, monitoring and reporting to product and service providers and ensuring that obligations associated with providing the services and transactions are in accordance with the agreement.
2.3. Assurance:
2.3.1. Party Problem Handling is responsible for monitoring and reporting problems and ensuring alignment between interactions and agreement.
2.3.2. Party Performance Management is responsible for tracking, monitoring and reporting performance obligations offered by a service provider and ensuring alignment between interactions and agreement.
2.4. Billing & Revenue Management:
2.4.1. Party Settlements & Payments Management is responsible for managing all settlements and enterprise's payment such as bill validation and payment authorization.
2.4.2. Party Bill Inquiry Handling is responsible for ensuring the timely and effective all resolutions of bill inquiries or complaints that are sent to the parties

In the engaged party, one process has included FAB domain called Party Interaction Management. Some of sub processes are in Fulfillment, some of them are in the Assurance and some of them are in Billing

and Revenue Management. This process is responsible for continuing interaction between the enterprise and parties. Each interaction can be created by enterprise or parties [3].

In this article, we will add SMS to FAB domain, it will be described in the following.

Operations domain is the heart of eTOM framework and all operational processes in this area are related to customers. FAB is sometimes known as customer operational processes.

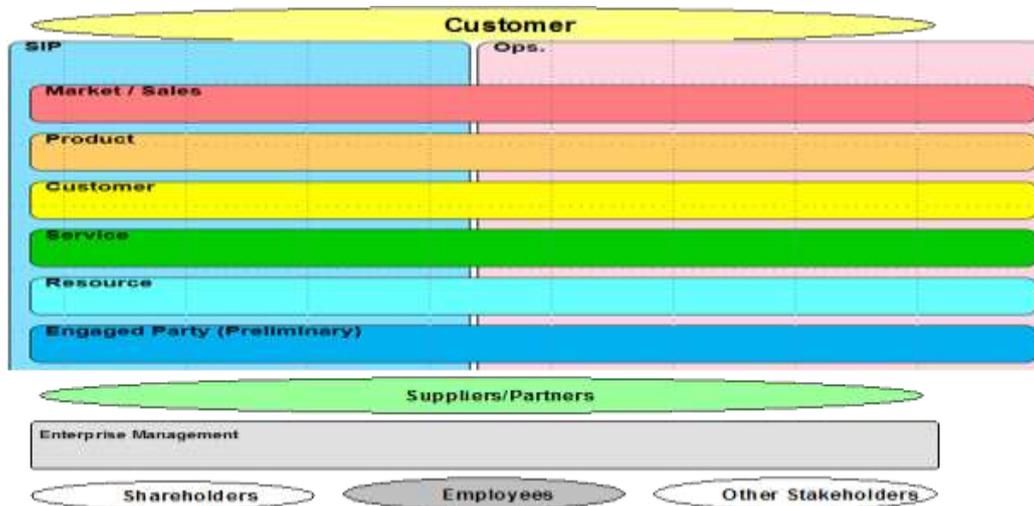Business Process Framework eTOM in higher levels is shown in Fig 1.

Fig. 1. Business process framework eTOM in high level view

III.   Itsm Information

Information Technology System Management includes 8 groups [6]-[12], [14]:

1. Transition: These processes are responsible for supporting all aspects of change status of solutions in the lifecycle. For this purpose many methods are defined and can be applied to all levels of lifecycle for better planning. This group includes 5 main processes.
2. Operation: These processes are responsible for creating processes that are related to Infrastructure operation management, applications and services to align enterprise goals and agreements. These processes can be used for identification, analysis and elimination of problems. This group includes 7 main processes.
3. Resilience: These processes are responsible for analyzing and planning to build flexible infrastructure and applications. This group includes 6 main processes.
4. Administration: These processes are responsible for resource support such as finance, agreement, knowledge. Also, these processes are responsible for creating ICT management infrastructure process for software, hardware and human resource. This group includes 5.
5. Customer Relationship: These processes are responsible for realizing, monitoring and enforcing market to service providers. This group includes 7 main processes.
6. Governance & Management System: These processes are responsible for process development of guidance and controlling ICT obligation. These processes also involve strategies, definitions, operations and terminology for a management framework to guide realizing, monitoring and enforcing the market to service providers. This group includes 7 main processes.
7. Direction: These processes are responsible for providing advice to foreign technology market, adapting ICT with business strategies, decreasing risks and providing a mechanism in order for ICT architecture and portfolio management. This group includes 7 main processes.
8. Realization: These processes are responsible for creating solutions in order to meet customers and stakeholder requirements. Also, these processes include the development of new solutions and maintenance or upgrading existing solutions. This group includes 5 main processes

The first paragraph under each heading or subheading should be flush left, and subsequent paragraphs should have a five-space indentation. A colon is inserted before an equation is presented, but there is no punctuation following the equation. All equations are numbered and referred to in the text solely by a number enclosed in a round bracket (i.e., (3) reads as "equation 3"). Ensure that any miscellaneous numbering system you use in your paper cannot be confused with a reference [4] or an equation (3) designation. (10)

IV.   RELATED WORK

ETOM framework is created and upgraded by using the best practices. As we know, there is no completed framework in any fields and we can develop and improve them according to society's needs by using other reference models or frameworks. eTOM framework is no exception and TM Forum improves it with the use of ITIL (Information Technology Infrastructure Library) Model in some ports of eTOM. ITIL is focused on IT services and these services can be used in organizations to support their business and their external customers. Processes of ETOM framework are focused on communications and service contents and may involve some aspects of IT services. Actually, these are packaged products that are used to deliver or sell products or services to customers. ITIL should be used in any enterprises to organize their IT processes. When an enterprise is layered organized (either complete or partial) can use eTOM as a foundation of ITIL processes. As long as an enterprise is not layered organized eTOM can't be used as an ITIL foundation. Because of the mentioned reasons, the eTOM framework to complete processes in some domains, especially in enterprise domain, uses ITIL processes such as security management, asset management, configuration management and etc. [4]-[5], [15].

V.   IMPROVE ETOM FRAMEWORK

According to the description, in this article, we aim to review B2B gaps in eTOM framework and improve it. In the Engaged Parties Domain of this framework, there is no integrated information about provided solutions which can cover customers' needs, problems, requirements and requests. For this purpose, in order to cover this gap, SMS (Solution Management System) has been proposed. This system has covered FAB (Fulfillment, Assurance and Billing & Revenue Management) domains. In this system, efforts are made to cover all internal and external enterprise solutions to gain and increase customers and Party's satisfaction. SMS is a combination of the ITSM solution management and billing processes. This system has 10 processes. The first 4 processes are in Fulfillment domain, the next 3 processes are in Assurance domain and the last 3 processes are in Billing & Revenue domain. The 7th first process used ITSM solution management and the 3rd process is out of ITSM and is an innovation. This system and this improvement is according to Middle East telecommunication's requirement.

VI.   SOLUTION MANAGEMENT SYSTEM (SMS)

The Solution Management System is added to the Engaged Party domain in eTOM framework. This system recognizes the customer's requirements and problems and provides operator's requirements to provide appropriate solutions that eliminate problems and cover needs and requirements and proceed solution implementation. The result of this system for eTOM framework is considering customer's requirements and problems and tracking to solve these by providing appropriate solutions, reducing current services and products costs and finally increasing customers' satisfaction. Any organization usually provides a distinct solution for each problem or request, and if there is no management of these solutions, maybe for the same problems there will be created several similar solutions. In this system, all current solutions are managed and new solutions are created if required (current solutions can't cover problems) and the result of this management is reducing products and services costs by eliminating redundant solutions or improving current solutions. The aim of SMS is to provide managed and integrated solutions according to customers or parties' requirements. This system analyses all aspects and solution's ingredients and eliminates all solution's deficiencies and considers solution implementation in operator's capabilities. Also, it considers the solution in all cost aspects and discovers if implementation of the solution is not affordable for the operator, replaces it with another solution. In this system we have 2 solution types. One of them is primary and one of them is temporary. If the operator does not have the capability of implementation of primary solution, the temporary solution is replaced with it. This replacing can increase customers' satisfaction. But this solution can temporarily fix the problems and may no longer respond by changing conditions. The primary solution is permanent and sometimes may cause fundamental changes in the operator's infrastructure or structures. But this approach can have customers' satisfaction for a long time until one can answer the customer's needs and problems and it is aligned with technologies. . In each process we will confirm with stockholders. The SMS processes include:

1. Party Establish Solution Management Framework
2. Party Solution Requirement Management
3. Party solution Analysis and Design
4. Party Solution Development and Integration
5. Party Solution Test
6. Party Solution Acceptance
7. Party Evaluation Solution Performance Management
8. Analysis Cost Estimation Solution
9. Authorize Solution Bill Invoice

10. Manage Consumer Cost

1. **Party Establish Solution Management Framework:** This process is responsible for creating the framework of specific project solution requirement management in accordance with enterprise framework, define operational goals and measures. The enterprise framework is a collection of procedures, standards and related patterns with management and solution requirement engineering. This framework is always monitoring and tracking other processes and improve them by solving the problems by using the feedbacks.
2. **Party Solution Requirement Management:** This process is responsible for providing a systematic approach to discovering, documenting, organizing and system requirement tracking to achieve a common understanding of problems and customer's requirements. Actually, in this process, gather all needs, demands, problems and requests and requirement assessment is done.
3. **Party Solution Analysis and Design:** This process is responsible to design a tangible plan by analysis and consider solution requirement. This plan can describe elements behavior, acceptance criteria and agreed solution evaluation. In this process fist design many conceptual plan for the solution and after analyzing select the best of them.
4. **Party Solution Development and Integration:** This process is responsible for customizing, configuration and integration of all collected elements in previous processes, especially Party Solution Analysis and Design process.
5. **Party Solution Test:** This process is responsible for adapting solutions and their features with the specifications and design requirements before deployment. Also, this process survey the first version of products with specified requirements. It should be noted, in all over the solution lifecycle even after implementation tests are running.
6. **Party Solution Acceptance:** This process is responsible for the survey alignment of providing solutions and pre-defined criteria. In order to achieve this goal, we need an acceptable plan. In this plan determine responsibilities and how to configure the solution and etc. also RACSI (Responsibility, Accountable, Consulted (Control), Suggest, Informed) Matrix can be used to determine responsibility.
7. **Party Evaluation Solution Performance Management:** This process is responsible for evaluating the performance of Party Solution Management framework for each project with the defined primary functionality criteria measurement. The result of that is in order to provide input to the enterprise's framework (for an overall goals assessment) and identify improvement potentials related to solution management processes. Also the purpose of this evaluation is to identify areas that need improvement. For example, process relationships, roles, activities, skills and etc. can be some of these areas. The final result of this process can be the basis for improvement.
8. **Analysis Cost Estimation Solution:** This process is not part of ITSM process. Due to the eTOM framework's gaps, in order to cover these gaps this process have been added. In this process, the necessary costs to provide and create designs, planning and implementation and operational costs of the project, have been analyzed and investigated. We added this process because first in each solution, estimated cost analysis is necessary and second, after estimation, cost analyzed, operator ability to implement solutions and solution affordable be investigated. Also at this level, solution's benefits and disadvantages will be analyzed.
9. **Authorize Solution Bill Invoice:** This process is like previous process is not in ITSM processes and due to the eTOM framework's gaps, in order to cover these gaps this process have been added. In this process after final cost estimates of implementation, the total cost should be approved after evaluation all aspects and then proceed to implement.
10. **Manage Consumer Cost:** This process, like two previous process is not in ITSM processes and due to the eTOM framework's gaps, in order to cover these gaps this process have been added. In this process, all costs have been done and all carried out costs should be managed. Also in this process must investigate all changes and occurred violations and re-programming. In the result, if the organization needed to modify the allocated budget, through Analysis Cost Estimation Solution Process can estimate costs again.
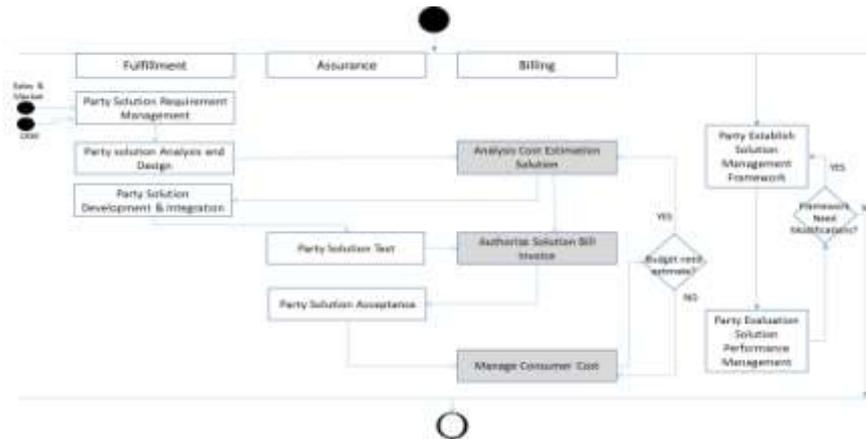The process flow of SMS is shown in Fig. 2.

Fig. 2. SMS Process Flow

VII. POSITION OF SOLUTION MANAGEMENT SYSTEM

As previously described, the SMS is used in an operational eTOM framework domain. According to our description, this system will be placed into the FAB domain. Actually part of SMS processes that called Party Establish Solution Management Framework, Party Solution Requirement Management, Party solution Analysis and Design and Party Solution Development and Integration, will be placed in fulfillment, because in fulfillment provide a suitable platform for delivering requests at the right time for customers. In this domain all customer requests are translating to a suitable solution and they can inform from request statue and insure to meet their customer's requirements within the specified time.

Another part of SMS processes that called Party Solution Test, Party Solution Acceptance and Party Evaluation Solution Performance Management, will be placed in the assurance because in assurance guaranteed the responses and prevention activities in order to ensure the continuous implementation and quality levels of products or services. In this domain, continuous consider the status of running resource and how to identify errors. Also collects implement information and analyzed them to identify and fix potential problems.

Finally the last part of the SMS that called Analysis Cost Estimation Solution, Authorize Solution Bill Invoice and Manage Consumer Cost will be placed in Billing and Revenue domain because in this domain all bill invoices and payments will be analysis. The position of SMS in eTOM framework is shown in Fig. 3
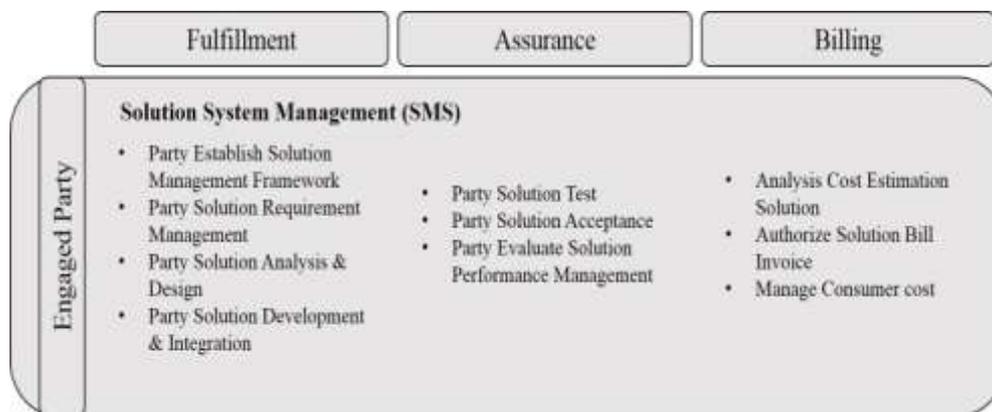

Fig. 3. SMS Position in eTOM framework

VIII. COMPARE ETOM WITH IMPROVED ETOM

As described above, in the current eTOM framework, there is not considered an integrated solution for party problems, requests and needs. Although in some parts of eTOM framework minor point to solutions in terms of customer orders, but in the Engaged Party domain and specific for B2B processes provide an integrated solution for enterprise's customers and that's implementation cost has not been exist. In the improved eTOM framework, efforts to increase considering and covering all customer needs, requirement and demands, increase management and performance, increase competitiveness between operators to cover their customer's requirements, continuous improvement processes as well as to increase customer satisfaction and loyalty by providing SMS. In this system, demands and customer problems through communication channels collected and extracted. Then examined and process the data by using SMS and finally the result provide as an appropriate solution.

IX.   CONCLUSION

Today's technologies are growth in telecommunications and high speed devices replaced with older devices. Telecom operators are obliged to offer a broadband service and should be able to cover enterprise's problems in telecommunications. Because of that, we need a system in operators that can be collect the needs and problems and after analyzing them, provide an efficient and affordable solution to cover current problems. Solution Management System (SMS) in order to respond the current B2B customers (their needs, problems, requirement and etc.) and increase partner's satisfaction is added to Business Process Framework eTOM. The SMS uses the existing processes of ITSM, review local Middle East requirements and Billing processes to provide an appropriate solution to increase customer satisfaction. This system has 10 processes and added to the FAB domain in order to domain's functionality and responsible for providing an appropriate and cost effective solution to cover customer's problems.

ACKNOWLEDGEMENTS

In this paper we worked on the first 3 levels of Business Process Framework eTOM and can be complete and develop up to 5 levels of eTOM. Also this system can be customized and improved with local society or organizations and can add more processes in another part of eTOM in this system.

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