

Standardization of eTOM model for solving problems of the Russian telecommunications market

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Abstract. The article considers the problems of the Russian telecommunications market, substantiates the need for standardization of the eTOM model for OSS/BSS systems. There is a necessity to regulate the eTOM model (Enhanced Telecom Operations Map) by domestic regulatory documents in the domestic market. It will allow creating holistic and high-quality operations of end-to-end processes, providing a basis for understanding and managing IT application portfolios in terms of requirements for business processes. The authors conclude that the regulation of the eTOM model could solve the problems of the OSS/BSS solutions of the Russian market.

1 Introduction

Nowadays, the telecommunications market is actively and dynamically developing area. The main segments of market are telephone services, mobile communications, data transmission over the Internet, satellite television. All these services are in demand and relevant for everyone.

Due to the continuous development of the industry, telecommunications networks are rapidly expanding, thereby significantly increasing the number of new services and facilities. In this regard, for the automation of telecommunications companies, a new class of solutions began to appear - the OSS / BSS system.

OSS / BSS is an abbreviation from Operation Support System / Business Support System. This is a class of software products that are used by telecom operators, TV-companies, energy enterprises and other organizations that regularly and personally interact with customers: they keep individual accounts, monitor the consumption of services and regularly bill their subscribers. A telecommunications company cannot exist without the processes that OSS / BSS provides; this is the core of its business [1].

OSS / BSS systems operate two parts of a telecommunications company:

1. infrastructure and resources;
2. interaction with subscribers.

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OSS is responsible for the correct operation of the network infrastructure and equipment (networks, subnets, switches, PBX, base stations, etc.). Interaction with subscribers (accounting of services provided by tariffs, execution of client orders, monitoring and issuing a customer billing account, etc.) occurs in the second part of the system - BSS [1-2].

Any new class of systems needs standardization. For the first time, the issue was taken up by the international organization in the field of standardization ISO (International Organization for Standardization) in collaboration with the ITU (International Telecommunication Union) in 1982. As a result of their joint activities, several standards were developed for OSS / BSS class systems [3-5]. Later the Telecommunications Management Network reference model (TMN reference model) was presented in the ITU recommendations (see Figure 1).

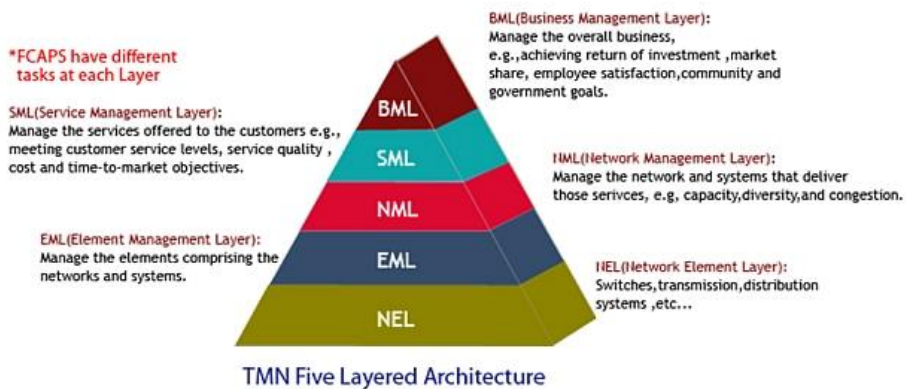


Fig. 1. Telecommunications Management Network reference model, Source: <https://www.itu.int/>.

The first level "Network Element Layer" includes elements of the network (adapter, switch, etc.).

The "Element Management Layer" controls the operation of network elements, identifying their errors.

At the "Network Management Layer" performs analyses of data information from the previous level (error handling, their solution).

The level of "Service Management Layer" covers the management of products and services provided by the operator.

The "Business Management Layer" includes the general objectives of the operating company (further design and development of the network, budgeting, organization of external contacts, etc.) [6-7].

This model for quite a long time had a significant impact on the development of OSS / BSS systems. However, during its existence, its significant shortcomings were discovered. In the article "A survey of application orchestration and OSS in next-generation network management" Saadon, G., Haddad, Y., Simoni, N. A describe several significant flaws of TMN reference model. Studies showed that this model is not effective for using it by vendor companies to develop OSS / BSS systems.

Firstly, this standardization work was aimed at improving the OSS module. The whole emphasis was placed on the work of the network, increasing its efficiency and further development, while creating a module for organizing business decisions on interacting with the clients, providing services to them, increasing their loyalty, their retention went into the background and did not develop.

Secondly, basically OSS / BSS systems were custom-made for each operator, which means they were tuned to “their own” processes, equipment, products and services [8-9].

The further rapid development of the telecommunication industry (the emergence of new networks, products, services) contributed to the fact that the implemented OSS / BSS solutions formed gaps in the automation of operators' activities, and their further development turned out to be difficult and expensive. These shortcomings arose from the fact that the work on the use of standardization tools in this area was aimed at the efficient operation of the network and its elements, while the company's business goals, such as interacting with the client, increasing its loyalty, retaining it, etc. almost ignored. As a result, the requirements of operators in the field of standardization were not systematically met. There was a need to introduce new modules of the system, and the question of integrating “new” and “old” modules was increasingly raised.

For the first time, the international non-governmental organization TeleManagement Forum (TM Forum) took up the problem in 1995. Its main goal was to create such a universal model of business processes of a telecommunications company that would provide an understanding of the company's business goals. It was necessary to clearly define the structure of business processes for a common understanding of the processes by all possible vendors and to make possible the further integration of enterprise information systems [10].

As a result, based on the experience of implementing systems and developing the recommendations of ISO and ITU, TM Forum has developed a multi-level business process model for the telecom operator - eTOM (Enhanced Telecom Operations Map) [11-12]. Nowadays Western manufacturers effectively use this model in the development of OSS / BSS systems. But in Russian market it is not popular.

The objective of the current study was conducting a review of eTOM model and identify benefits of its regulation for the further development of OSS / BSS solutions in the Russian market.

2 Materials and methods

According to the TM Forum, for the effective implementation of the OSS / BSS system, it is necessary to use the operator's business process model that corresponds to modern requirements. To create this such business process model the typical structure of eTOM business processes should help operators. Typical structure of business processes eTOM is an assistant for the operator in creating a model (Figure 2). The business processes model makes it possible to clearly articulate the requirements for OSS / BSS system modules that are responsible for obtaining business objectives [10].

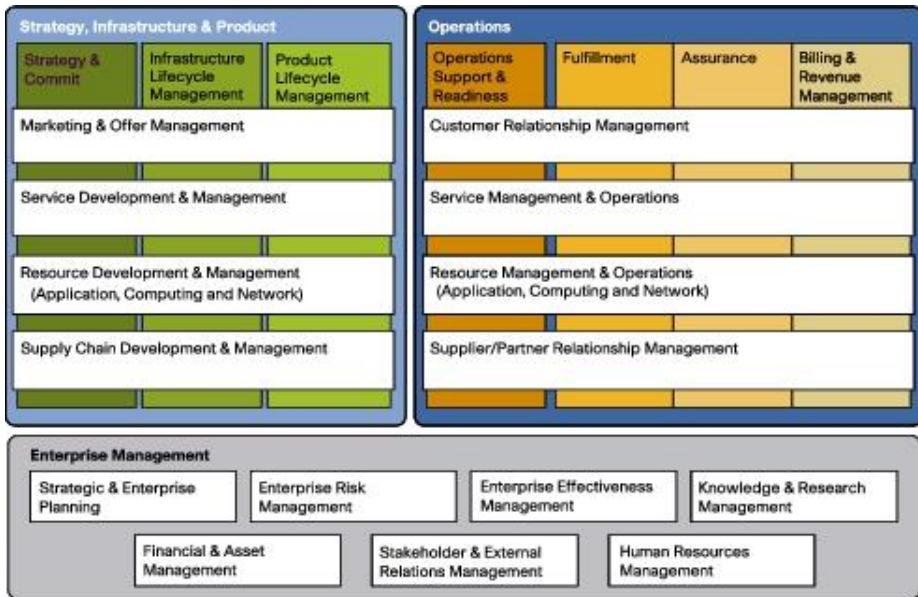


Fig. 2. Extended Business Process Map of the Communication Operator – eTOM, Source: <https://www.tmforum.org/>.

The eTOM model allows to sequentially decompose processes, which makes it possible to make a complete analysis of the decomposition process.

The decomposition of business processes in the eTOM model begins with the level of the company (level 0). Further decomposition of processes determines their description, inputs and outputs, main elements. Levels of decomposition are presented in Figure 3.

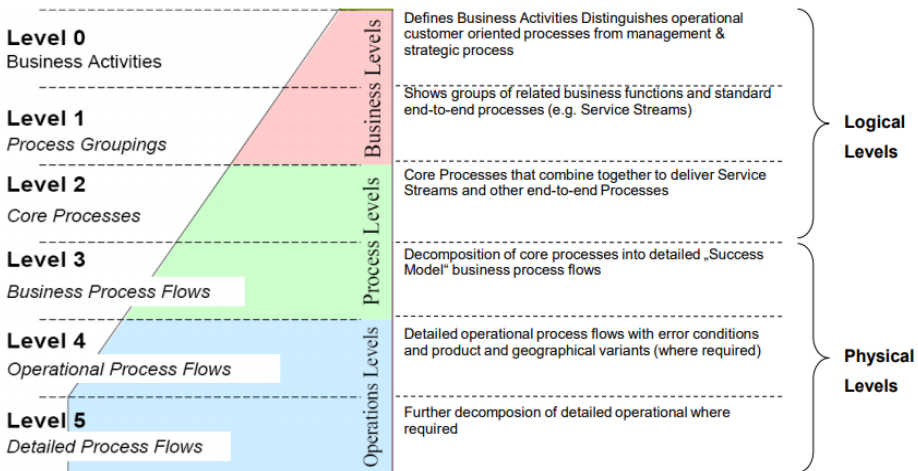


Fig. 3. eTOM Decomposition, Source: <https://www.tmforum.org/>.

Business processes of 0-2 levels are standardized in eTOM architecture specifications. They are top-level and do not depend on the characteristics of the enterprise and the services provided by them. Level 3-5 processes are unique to each company.

Figure 4 shows an example of the decomposition of the eTOM process. Enterprise Management is decomposed on 0-2 levels.

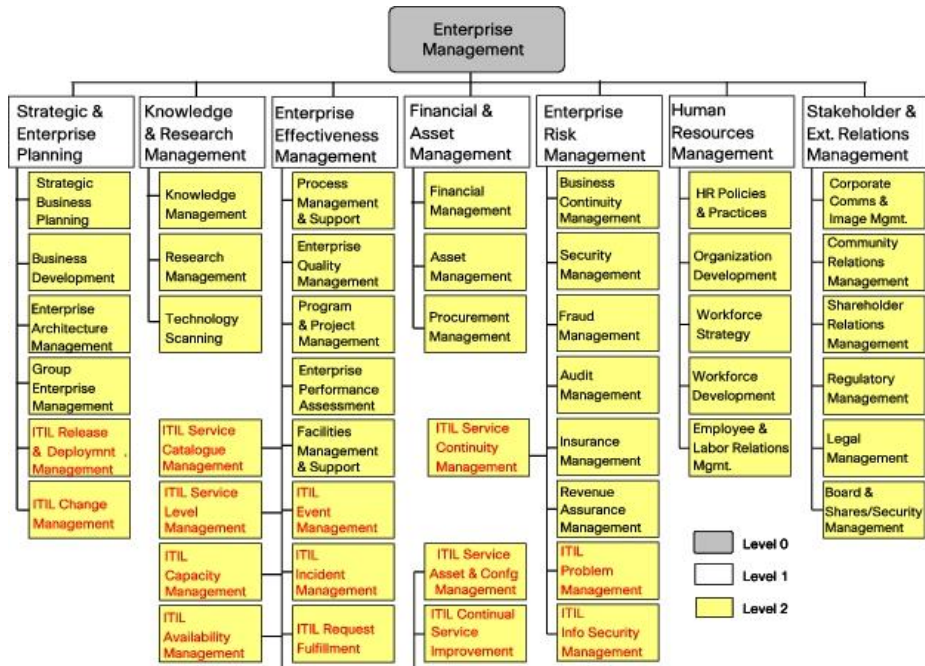


Fig. 4. Enterprise Management Level 2 Processes, Source: <https://www.tmforum.org/>.

The main functions of eTOM are:

1. Demonstrate the standard structure, classification scheme and terms for describing business processes and their main elements (makes it possible to apply a common terminology for the Customer and the Developer);
2. To provide the basis for the use of the basic principles of developing business processes (i.e. it makes it possible to solve the problem of compatibility of “new” and “old” modules of the system);
3. Provide a basis for understanding and managing a wide range of information systems in terms of requirements for business processes.

3 Results

Today, the eTOM model is a reference map of the main, managerial and auxiliary processes of a telecommunications company.

At the moment in the world market, many leading Western manufacturers of OSS / BSS systems, such as Oracle, Amdocs, Agilent Technologies, participate in the development of TMF. The goal of these manufacturers is to standardize their software. As a result, when choosing a software operator, you need to pay attention to whether the software manufacturer follows the recommendations of the eTOM model. Otherwise, the company faces complete dependence on the manufacturer and the complication of interactions with the information systems of other manufacturers. This problem is manifested in the Russian market of OSS / BSS solutions [13].

According to statistics from J’son& Partners Consulting, shown in Figure 5, the volume of the Russian telecommunications OSS / BSS solutions in 2016 did not change and amounted, like in 2015, to about 34 billion rubles. At the same time, two thirds of this amount falls on the costs of supporting existing systems, and the annual volume of purchases of new OSS / BSS solutions by Russian operators does not exceed 8 billion rubles. This suggests

that the Russian suppliers of OSS / BSS solutions are significantly oriented towards the cost of refinement and maintenance of systems, while the sales volume of Western OSS / BSS solutions is rapidly growing.



Fig. 5. Volume of the Russian market of OSS / BSS solutions according to statistics of J'son & Partners Consulting.

Table 1 presents a comparison of Russian and Western vendors of OSS / BSS solutions.

Table 1. Comparison of Russian and Western vendors.

	Russian vendors	Western vendors
General structure of the telecommunications software market	The BSS segment covers about 70%, and the OSS segment accounts for 30% of the market.	A broad portfolio of solutions for the entire OSS / BSS stack
Primary automation method	The desire to single-handedly "close" all the needs of a large operator in information systems	Modular automation of business processes by eTOM model
Understanding of the abbreviation OSS / BSS	OSS - network and network management systems, network resource accounting, anti-fraud; BSS - operations are automatized by CRM, ACP and ERP systems	OSS - systems supporting eTOM operating processes; BSS - systems supporting the processes of the strategy, infrastructure and product of the eTOM model

4 Discussion

Firstly, if we talk about the overall structure of the Russian telecommunications software market, the BSS segment covers about 70%, and the OSS segment - 30% of the market. At the same time, western vendors are actively developing solutions for the entire OSS / BSS stack.

Secondly, Russian vendors seek to fully automate all the processes of a large operator on their own, which is impossible with a rather weak segment of OSS systems. Therefore, as a result, the operator has to seek help from other software providers in order to close the missing "gaps" of automation in the OSS. In this regard, domestic suppliers need to solve the problem of integrating "their" and "alien" systems.

Finally, it must be borne in mind that there is a difference between the understanding of the abbreviations OSS / BSS in Russian and Western vendors. Western software vendors use the definitions of these concepts from the ETOM standard. At the same time, today the majority of Russian operators and integrators under the OSS systems actually understand the network and network management systems, network resource accounting, anti-fraud management, etc. Automation of all other operational processes (interaction with customers, billing, interaction with partners), in their opinion, is closed by the corresponding CRM, ACP and ERP systems, which are not completely justified in the end, belong to the BSS class.

Today to solve these problems of Russian Telecommunication market it is required to regulate the standard developed by TM Forum by domestic documents. First of all, it is necessary to create a common understanding of the terms and definitions of the eTOM model.

5 Conclusion

Standardization of eTOM model for the requirements of domestic companies and requirements for information systems will provide:

- The emergence of "optimal operators" in Russia, created on the basis of the analysis of the best solutions of previous years;
- Operator independence from software capabilities of a single information system provider (multi-vendor);
- Ability to combine solutions from different software vendors;
- The interaction of operators with each other at the level of standard business processes, which in turn will allow providing end-to-end services to customers, developing the most progressive business models;
- Cost minimization through the use of standard approaches in process automation

Thus, today there is a need for standardization of requirements for OSS / BSS information systems in the Russian telecommunications market.

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