Improvement of Business-Activities in Telecommunication Enterprises by the eTOM Business-Process Structural Model Implementation

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Abstract – For now, in front of telecommunication branch enterprises of Ukraine, there is a problem of activity improvement with the purpose of granting high-quality services and maintenance of competitive position, both on internal, and on a foreign market. To solve this problem, telecommunication companies appropriate to use the mechanisms of business-oriented process management and improvement of end-to-end business-processes. The purpose of this article is a choice of effective business-process model that will allow telecommunications companies to provide modern, high quality and cost competitive services. During research, conditions of the telecommunication branch enterprises of Ukraine were investigated and key problems of their activity were revealed. Existing business-process models have been considered and analyzed and the optimal model was chosen, according to the put criteria. By results of the analysis a conclusion was drawn, that to the enterprises for business-process modeling is expedient for using eTOM – high-level system business-oriented model aimed for providing of any technological services, including IT. As advantages from introduction eTOM at the Ukrainian enterprises were analyzed.

Keywords – business-process, business-processes model, eTOM, lean operator, process approach, telecommunication

I. INTRODUCTION

The telecommunication industry is strategic for the economy of any country. It plays a significant role in the balanced development of global and regional economy; operates as link between the industrial sector, service industry and consumers. Telecom influences for conditions of informatisation of the country, on rates of social sphere development. Hence, development of telecommunication industry in general, and in particular the telecommunication enterprises, - is one of priority directions of any country economic-social development, including Ukraine.

Let’s analyze the state of the Ukrainian telecommunications industry in a global context. For this purpose it is expedient to use an information and communication technologies development index (IDI). IDI was developed to measure the development and evolution of changes level in time in the telecommunication industry taking into account a situation in developed countries as well as in countries that are developing. IDI combines 11 indicators into a single indicator that can be used as a tool for comparative analysis at the national, regional and global levels.

Having analyzed IDI dynamics for the different countries (in particular European) for last 8 years, it is possible to draw a conclusion, that in comparison with the developed countries, the telecommunication branch in Ukraine considerably lags behind and borrows the 58th place among 159 countries in the world (Table 1).

| Economy            | Rank 2008 | IDI 2008 | Rank 2007 | IDI 2007 |
|--------------------|-----------|----------|-----------|----------|
| Sweden             | 1         | 7.85     | 1         | 7.27     |
| Luxembourg         | 2         | 7.71     | 6         | 6.98     |
| Korea              | 3         | 7.68     | 2         | 7.23     |
| Denmark            | 4         | 7.53     | 3         | 7.18     |
| Netherlands        | 5         | 7.37     | 5         | 7.06     |
| Iceland            | 6         | 7.23     | 4         | 7.06     |
| Switzerland        | 7         | 7.19     | 8         | 6.83     |
| Japan              | 8         | 7.12     | 7         | 6.89     |
| Norway             | 9         | 7.11     | 9         | 6.78     |
| United Kingdom     | 10        | 7.07     | 12        | 6.70     |
| Finland            | 12        | 7.02     | 11        | 6.70     |
| Germany            | 13        | 6.95     | 13        | 6.60     |
| France             | 18        | 6.55     | 22        | 6.09     |
| Estonia            | 22        | 6.41     | 25        | 5.86     |
| Italy              | 28        | 6.15     | 24        | 5.91     |
| Lithuania          | 35        | 5.55     | 32        | 5.22     |
| Croatia            | 36        | 5.53     | 37        | 4.95     |
| Poland             | 40        | 5.29     | 36        | 4.95     |
| Latvia             | 41        | 5.28     | 38        | 4.95     |
| Russia             | 48        | 4.54     | 46        | 4.13     |
| Turkey             | 57        | 3.90     | 56        | 3.63     |
| Ukraine            | 58        | 3.87     | 58        | 3.56     |
| Bosnia and Herzegovina | 64   | 3.65     | 65        | 3.38     |
| Kazakhstan         | 69        | 3.47     | 70        | 3.17     |

Such position of the Ukrainian telecommunication industry appears in lag on those parameters, such as volume and
quality of services, use effective mechanisms of management, creation a competitive environment in the market.

That is, in order to ensure a competitive position in the domestic and in the European telecommunication market, which is especially important with reference to proceeding of Ukraine's accession to the European Union, for Ukrainian enterprises, first of all, necessary to take care of assortment, service quality level and about support of provided services.

Proceeding from above told, at the given stage of social and economic system development in Ukraine, the issues for the improvement of the telecommunication branch enterprises activity are very actually.

For this reason before scientists and experts-practitioners there is a question of the lean operator development, just so, which is easily adaptable to changes in the modern environment and in the same time supplies to consumers a highest degree of providing service and maximal profit for investors and founders [2], [11].

II. THE CHOICE OF A TELECOMMUNICATION ENTERPRISES BUSINESS-PROCESS MODEL.

Having analyzed a condition of business at the telecommunication enterprises of Ukraine, we can allocate such features [1]:

- High degree fragmentation of processes and systems have a negative impact on business flexibility and its ability to adapt to change that contributes to the timing of introduction of new services, increasing the cycle order – payment.
- The inefficiency and a low level of end-to-end process automation conduct to increase in operational charges that influences on profitableness.
- Due to absence of a free competition in the Ukrainian telecommunication market, the enterprises develop their business-processes less in order to fill clients’ needs than their own needs. In addition many operators, reducing the charges, lead to deterioration in the quality of customer service.
- Use formal implementation of process approach to management and methodologies of business-processes modeling in order to obtain the ISO 9000 certificate (relative to products and services quality).

Consequently, high operational charges, long development of new services, clients’ dissatisfaction, chronic and inefficient mechanisms of business dealing, - all of it makes it difficult to Ukrainian enterprises to succeed in a dynamic macro-environment conditions and to compete on the European telecom market.

Manner that ensures the effective operation of telecom companies is such mechanism of economic activity what focused on process management, improvement of end-to-end business-processes, requires a high level of automation and decreasing operating costs and improve customer service quality. It provides a choice of referent model of activity and effective system of business-processes developing.

According to our opinion, the decision of a problem to choose a referent model of the telecommunication enterprises activities should be based on the best international practices.

Use of international standards and methodologies has several indisputable advantages:

- The use of standard blocks of business-processes reduces the building time business of model of each particular company.
- There is an opportunity of comparative analysis with processes of other enterprises.
- Decreases the risks of the dependence from the analysts, who develop a business-process model.
- The alignment of business-processes on the basis of the open international model gives a transparency of structure for all interested parties, including investors.
- Precisely formalized standard blocks of business-processes easier to deduce on outsourcing, bringing to a focus to primary activity of the enterprise.

During research process a number of business-process models has been considered, such as: frameworks enhanced Telecom Operation Map (eTOM), Information Technology Infrastructure Library (ITIL), Control Objectives for Information and related Technology (COBIT), American Productivity and Quality Center (APQC) Model, Porter Model, as well as inner techniques designed by consulting companies – the International Business Language of the PWC, Model Business Technology Optimization (BTO) lifecycle approach HP [12].

The criteria for comparing different models of business-processes were selected as follows:

- Openness (Opportunity for modeling new, originally not considered parties of Business - system and adding new business-processes or their groups);
- Systematic (Business-process model must be as a system, where provides integrity, hierarchy and communication between element, and all enterprise’ business-processes should be enveloped);
- Business or technology orientation;
- Elaboration depth (An opportunity of detailed elaboration of everyone business-process up to a level of elementary operations);
- Appreciation of Information Technology (IT) specificity;
- Appreciation of Telecom industry specificity.

Comparative analysis of different models and frameworks of business processes was conducted with usage of the hierarchy analysis method, based on the data corresponding to the description of standards.

By results of the analysis, shown in Table 2, was drawn a conclusion, revealing that the best for use is eTOM - systematic, high-level, business-focused the model aimed at granting by the enterprise of any technological services, including IT.
| Criteria of business-process model choice | Openness | Systematic | Business (BO) of technology | TO | Elaboration depth (amount level of detail) | Appreciation of IT specificity | Appreciation of Telecommunication industry specificity |
|-----------------------------------------|----------|------------|-----------------------------|----|------------------------------------------|-----------------------------|-----------------------------------------------|
| Business-process models and frameworks specification |
| eTOM v. 8.0 (enhanced Telecom Operation Map) | Yes | Yes | BO | 5 level of detail | Yes / “Resource Management & Operations (application, Computing & Network)”, includes IT-management processes | Yes |
| ITIL v. 3 (Information Infrastructure Library) | Yes | No | TO | 2 level of detail | Yes / ITSM business-process | No |
| CobIT v. 4.1 (Control Information and Data Technology) | Yes | No | TO | 2 level of detail | Yes / IT-area business-process | No |
| Telecommunication Process Classification Framework v. 5.00 (PFCF) of the APQC | Yes | Yes | BO | 4 level of detail | Yes / “Manage IT” | Yes |
| Porter's model | Yes | No | BO | 2 level of detail | No | No |
| “International Language of the Business of the PWC | Yes | No | BO | 3 level of detail | Yes/ “Developement and support of systems and technologies” | No |
| “BTO language application” of the HP | Yes | No | TO | 1 level of detail | Yes/ IT-area business-process | No |

* - give a systematic view only on IT business-process

**TABLE 2** Comparing Analyze of Business-process Model

**Note**: The table compares the business-process model choice based on various criteria including Openness, Systematic, Business (BO) of Technology, TO, Elaboration depth (amount level of detail), Appreciation of IT specificity, and Appreciation of Telecommunication Industry specificity. The models compared include eTOM, ITIL, CobIT, APQC, Telecommunication Process Classification Framework, Porter's model, International Language of the Business of PWC, and BTO language application of the HP. Each model is assessed based on its alignment with the criteria, highlighting strengths and areas for improvement in managing IT processes and frameworks.
III. THE eTOM BUSINESS-PROCESS MODEL

The eTOM is a structural model of business-processes, which covers all aspects of activity service-providers and other enterprises of telecommunication branch [7]

The eTOM framework is a part of New Generation Operation System and Software (NGOSS) program, which is meant for support of the concept of “the effective operator” and provides creation of complete decisions which do the enterprises by more flexible and allow them to transform effectively their activity accordingly to modern conditions of economy.

The eTOM purpose consists in forming an industrywide conception that will allow maintaining a competition due to implementation of business operation principles on the basis of business-processes.

The strategic goal of eTOM is the formation of an industrywide conception of the effective operator, which will allow maintaining a competition due to implementation of business operation principles on the basis of business-processes [4].

The structural model of eTOM gives opportunities for end-to-end business-processes automatization because it represents activities in the form of combination element processes [4]. The eTOM model provides structural decomposition of process elements, consistently specifying their details in process of specification level increase. Accordingly to the eTOM model in its first level of specification all business-processes of the enterprise are divided into three vertical functional groups (Fig. 1):

- **Strategy, Infrastructure & Product**
  - Strategy & Commit
  - Infrastructure Lifecycle Management
  - Product Lifecycle Management
  - Marketing & Offer Management
  - Service Development & Management
  - Resource Development & Management (Application, Computing and Network)
  - Supply Chain Development & Management

- **Operation**
  - Operations Support & Readiness
  - Fulfillment
  - Assurance
  - Billing & Revenue Management
  - Customer Relationship Management
  - Service Management & Operations
  - Resource Management & Operations (Application, Computing and Network)
  - Supplier / Partner Relationship Management

- **Enterprise Management**
  - Strategic & Enterprise Planning
  - Enterprise Risk Management
  - Enterprise Effectiveness Management
  - Knowledge & Research Management
  - Financial & Asset Management
  - Stakeholder & External Relations Management
  - Human Resources Management

![Fig.1. The eTOM level 1 model](image)

In the given group merged business-processes associated with strategy development, building of infrastructure, development and management of products (services), as well as the creation and management of sales channels.

- **Operations**
  This group is the central part of all methodology and includes all processes associated with the maintenance and management of customer service: supporting operations, sales management, relationship management with suppliers and partners, quality assurance, billing.

- **Enterprise Management**
  This group includes the core business-processes necessary to support the activities of the enterprise: financial management, human resource, risk, etc.

Also in Fig. 1 are shown seven vertical groups of end-to-end processes required for customer support and business management. Within these groups, the processes of vertical map eTOM focuses on the key, customer-oriented, processes that ensure the realization of services, troubleshooting and quality assurance and billing (Fulfillment, Assurance and Billing, FAB). Processes of support of operational activity and supply of its readiness (Operation Support and Readiness, OSR) are separated from proceeding in real time FAB processes, to emphasize importance of support and automation of FAB processes that is importance of direct on-line support of clients; while OSR processes provide an operational environment in which FAB processes are realized. In the process of the Strategy, Infrastructure and Product (Strategy, Infrastructure & Product, SIP) area is a vertical group of processes and strategies for its development (Strategy & Commit) and two vertical groups of processes Lifecycle Management (Lifecycle Management) [2], [3]. These groups
are separated from the others, because in contrast to the main operational processes they do not take direct part in the work with the client.

It should be noted that in the structural model of business-processes identified also horizontal processes, functional groups (Fig. 1).

The eTOM structural business-processes model has the following advantages:

1) It covers all processes of telecom companies.
2) Clearly identifies the processes of marketing, emphasizing their importance in the information business.
3) Clearly identifies the processes of enterprise management.
4) Emphasizes that the company pays the highest priority processes, the priority in terms of customers, namely the sale of services, troubleshooting and quality assurance and billing (FAB).
5) Clearly identifies the vertical and horizontal process group.
6) Allows passing to the concept of customer relationship management that will provide services to consumers and self-control, increase the efficiency of information that is tailored to the needs of customers (Customer Relationship Management, CRM).
7) Highlights the need to manage resources (applications, by means of computer processing and network resources), on top of technology and integrates functional processes of network and systems management in processes of systems and resources management (Resource Management and Operation).
8) Allows interacting with the chains of processes from external partners.
9) Provides a common vocabulary of terminology, processes, management and coordination, thereby achieving the consistency and understanding between operators.

The eTOM business-processes model implementation at the Ukrainian enterprises of telecommunication branch will enable:

- Create a common vision processes for all telecommunications companies: telecom operators, equipment vendors, application developers and integrators;
- Use the industrywide conception of processes and information in order to facilitate interaction "operator - operator" "operator - customer", "operator - supplier", which will facilitate the rapid provision of services;
- Conduct a comprehensive analysis, design and optimization of business processes by identifying and eliminating duplication of processes with the same functionality;
- Undertake assessment of cost performance, efficiency and other parameters;
- Manage and develop the IT infrastructure of company based on the business-process model in accordance with the needs and business objectives;
- Convert business-processes as a result of mergers or takeovers;
- To improve effectiveness within structure departments and project teams through a clear definition of responsibilities between the various business-processes;
- Integrate eTOM with other methodologies such as Balanced Scorecard, ITIL and others;
- Repeatedly to save resources in the development of architecture business-processes, as well as minimize the risks of depending on the errors of analysts who are building the model.

A particular advantage of the eTOM framework is that the implementation of a conceptual model effectively in enterprises with different levels of process maturity (immaturity of processes, clarity of processes and the rule of processes). This is a great importance for the Ukrainian enterprises of communication, most of whom have no real process management.

Using eTOM as a business-processes model will provide structural support for such enterprises; will help distribute responsibility within the organizational structure and form chains of end-to-end business-processes.

Today in Ukraine eTOM as the structural model of business-processes use only 3 from 1187 of economic entities, included in the State register of telecommunication operators and providers on 05.10.2009 [16].

In their activity eTOM use CJSC “Kyivstar GSM”, JSC “MTS Ukraine” and OJSC “VimpelCom” (Beeline Ukraine). It allows operators systematize their business-processes, make transparent process chains, decrease operational expenses and significantly improve quality and a range of offered services, what cause a significant increase of subscribers’ base. To 09.2010, the share of these operators subscriber base was respectively 39.88%, 32.05% and 4.35% [15].

Also necessary to note, that eTOM usage for telecommunication enterprises business-processes modeling, acts as an original basis of operators merge and absorption, and as well as at coming on the international stock market.

As example of it, is the merge of CJSC “Kyivstar GSM” and OJSC “VimpelCom” (Beeline Ukraine). As a result of networks association, subscribers will receive higher quality services. So, up to the end 2010, the new enterprise will own 44.2 % of the Ukrainian telecommunication services market.

IV. CONCLUSIONS

Today, in front of Ukrainian telecommunication enterprises is the task of their activity efficiency improving. For this purpose it is necessary to reconsider principles of business dealing and to organize uniform structure of business-processes.
To select the best model of business-processes of telecom enterprises were analyzed such models as: APQC, CobIT, ITIL, eTOM, and internal developments of consulting companies. As criteria of a model choice, were offered such as: systemic, openness, subject to IT—specificities, etc.

By results of the analysis there was made a conclusion that for business-processes modeling is expedient to enterprises to use eTOM – systemic high-level business-oriented model, aimed for providing of any technological services, including IT. The eTOM implementation at the Ukrainian telecom enterprises has a number of advantages and will enable to render high-quality services and to improve a position of Ukraine in rating IDI among the countries in the world.

REFERENCES

1. В. К. Чажаев. Бизнес-процессы в компаниях связи. – М.: Эко-Тренд. 2004. – 176 с.: ил.
2. NG OSS: построение эффективных систем поддержки и эксплуатации сетей для оператора связи / Джон Райли, Мартин Кринер. – Пер. с англ. – М.: Альпина Бизнес Букс, 2007. – 192 с.
3. Елиферов В. Г., Ренин В. В. Процессный подход к управлению. Моделирование бизнес-процессов. 5-е изд. – М.: Стандарты и качество. 2007. – 408 с.
4. А. К. Коптелов. Управление бизнес-процессами в телекоммуникационной компании (ТМН-модель и общеотраслевая модель eTOM) // Управление бизнес-процессами в телекоммуникациях. – 2007. – №1. – с. 35-39.
5. APQC. Telecommunications process classification framework. 2008. [Online]. Available: http://www.apqc.org/knowledgebase/download/32921/a%3A1%3A7B%3A1%3B%3A1%3A222%22%3B7%2DOnline.pdf?destination=node/32921. [Accessed: Aug. 3, 2010].
6. HP Software. Optimize the business outcome of IT. 2007[Online]. Available: http://www.carahsoft.com/resources/HP/HPSoftware.pdf. [Accessed: Aug. 3, 2010].
7. Cisco. Introduction to eTOM. [Online]. Available: http://www.cisco.com/en/US/technologies/collateral/tk869/tk769/white_paper_c11-541448.pdf. [Accessed: Aug. 5, 2010].
8. International Telecommunication Union. Measuring the Information Society. 2010. [Online]. Available: http://www.itu.int/ITU-D/ict/publications/id/2010/Material/MIS_2010_Summary_E.pdf. Accessed: May 8, 2010.
9. CobIT 4.1. IT Governance Institute, 2007, 196 pp.
10. ITIL Lifecycle Publication Suite. OGC, 2007, 1343 pp.
11. Savvion, Inc. Business process Lifecycle Management for Telecommunication. [Online]. Available: http://www.savvion.com/document_center. [Accessed: Dec. 18, 2009].
12. A. Заварин. Универсальный eTOM. [Online]. Available: http://www.osp.ru/cio/2008/02/4829914. [Accessed: May 4, 2010].
13. Модель IBL (The International Business Language). [Online]. Available: http://www.betec.ru/secure/index.php?id=2&sid=10&tid=17. [Accessed: Oct. 5, 2009].
14. Модель цепочки добавления ценности (Value Chain Model - Модель Портфейла). [Online]. Available: http://www.betec.ru/secure/index.php?id=2&sid=10&tid=17. [Accessed: Nov. 4, 2010].
15. iKS-Рейтинг: Сотовая связь в Украине (сентябрь 2010). [Online]. Available: http://www.iks-consulting.ru/adocs/3494933.html. [Accessed: Nov. 4, 2010].
16. Державна адміністрація зв’язку Міністерства транспорту та зв’язку України. Статистичні дані. [Online]. Available: http://www.stc.gov.ua/uk/di/catalog/list?currDt=52715. [Accessed: Nov. 4, 2010].

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Ольга Корзаченко. Усовершенствование деятельности телекоммуникационных предприятий посредством внедрения структурной модели бизнес-процессов eTOM

На сегодняшний день перед предприятиями телекоммуникационной отрасли Украины стоит задача усовершенствования деятельности с целью предоставления высококачественных услуг и обеспечения конкурентоспособного положения, как на внутреннем, так и на внешнем рынке. Для решения этой проблемы телекоммуникационным предприятиям целесообразно использовать механизмы ведения бизнеса, ориентированные на процессное управление и усовершенствование сквозных бизнеспроцессов. Целью данной статьи является выбор эффективной модели бизнес-процессов, которая позволяет телекоммуникационным предприятиям предоставлять современные, качественные и конкурентоспособные по стоимости услуги.

Во время исследования были изучено состояние предприятий телекоммуникационной отрасли Украины, определены ключевые проблемы их деятельности. Были рассмотрены и проанализированы существующие модели бизнес-процессов и выбрана оптимальная с точки зрения поставленных критериев. По результатам анализа сделан вывод, что предприятием для моделюирования бизнес-процессов целесообразно использовать eTOM – системную высокоуровневую бизнес-ориентированную модель, нацеленную на предоставление любых технологических услуг, в т.ч. и ИТ. Так же проанализирована преимущества от внедрения eTOM на украинских предприятиях.