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INNOVATIVE APPROACHES TO DEVELOPMENT OF CELLULAR COMMUNICATION COMPANIES

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The innovative approaches to the development of cellular communication operators' activities are considered. Application of modern management concepts and market strategies aimed at improving the efficiency of using resources by the cellular communication companies is advisable. The role of intellectual and innovative growth and informatization in the telecommunications sector of the Ukrainian economy is justified. The arguments to support feasibility and advantages of implementing trunk telecommunication networks are provided.

Key words: innovations, development, cellular communication companies, modern management concepts, market strategies, systems for analyzing resource allocation.

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ІННОВАЦІЙНІ ПІДХОДИ ДО РОЗВИТКУ ДІЯЛЬНОСТІ ОПЕРАТОРІВ СІЛЬНИКОВОГО ЗВ'ЯЗКУ

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Розглянуто інноваційні підходи до розвитку діяльності операторів сільникового зв'язку. Доцільним є також застосування сучасних концепцій менеджменту та ринкових стратегій, покликаних підвищити ефективність використання ресурсів компаніями-операторами сільникового зв'язку. Обґрунтовано роль інтелектуального та інноваційного розвитку, інформатизації у телекомунікаційній галузі економіки України. Наведено приклад розвитку телекомунікаційних мереж, аргументи доцільності впровадження та переваг транкінгових телекомунікаційних мереж.

Ключові слова: інновації, розвиток діяльності операторів сільникового зв'язку, сучасні концепції менеджменту, ринкові стратегії, системи аналізу розподілу ресурсів.

Problem statement

Intellectual development of modern society is transforming into an innovative process, which the following can be attributed to:

- redistribution of intellectual and professional resources, accumulation of professional intellect, which determines the rate of development of national economies [1];
- a prominent role of telecommunications and cellular networks in the creation of effective strategies for national development and improving the quality of human capital of Ukraine;
- an improved valuation of cultural and humanitarian values in the development of human capital;
- the need to provide a sufficient level of technological safety in Ukraine;
- feasibility of incorporating the practical experience of effective intellectualization, carried out in the USA, EU, Japan, China, allowing these countries to become the leaders in scientific and technological innovations [1, p. 11–12].

Due to the fact that at the moment Ukraine is set out to determine the path of its future growth, the search for self-sufficient development paths connected to intellectualization of economic processes and development of human capital continues. The potential to innovate in the field of telecommunications and connectivity plays an important role in the overall economic growth. Therefore, this paper is concerned with innovative approaches to development and improvement of market strategies of cellular communication companies (CCC).

Analysis of recent research and publications

In the recent time, we have observed a number of publications researching the aspects of development of telecommunication networks and cellular communication companies. With regard to this, the government policies, as well as best managerial practices for stimulating innovative development and intellectualisation of the economy were reviewed in the papers of Azhazh M.A., Antonenko L.A., Der K.A., Kuzmin O.Y., Sukhorukov A. [1–3]. The role of organizational innovation within the system of sustainable innovative development of Ukrainian regions was layed out in the works of Fedulov L. [4]. The nature, mechanisms and tendencies of innovative development and its influence on the functioning of individual companies has been studied by Chuhray H. [5].

Fairly professionally, in our opinion, has the analysis of innovative business model been analyzed in the works of economic theorists A. Afua, R. Mauburn, K.Obblue, C. Tucci, V. Han Kim, as well as polish economic scientist Y.Bzhusk [6].

An honorary place in the works of Ukrainian economic scholars is devoted to the studies of prominent world economic scholars, including Nobel Prize laureates, such as K. Menger, F. Hayek, G. Shumpeter, M. Keynes, G. Stiglitz and others [2, p. 21].

The peculiarities of development of the cellular communication market in Ukraine, as well as CCCs' service pricing policies, implementation of innovations in the field of cellular communication have been studied by Kolos-Mazuryk L.A., Mamchyn R.O., Isakovych I.I., Marhevka I.I., Bogatyryov A.M., Gryaznyh E.V. and others [7–9].

To our mind, the issues of innovative growth of CCCs have not been fully studied to date, mostly due to a fast pace of change inherent to this particular market. Thus, this paper is concerned with a consideration of up-to-date innovative approaches to development of cellular communication companies.

Daily operation of CCC has the following aspects:

- high technology and innovation search, necessity for renewal of main capital base for providing communication services;
- necessity to hire highly-qualified professionals who can flexibly adapt to changes in market demand;
- use of special marketing techniques (market research, sales stimulation, promoting communication services).

In order for CCC to improve resource use they must apply the following new administrative and management concepts [5, p. 96–102], which reflect modern changes in the process of resource allocation:

- Lean Management Concept;
- Total Quality Management;
- Business Process Reengineering;
- Change Management;
- Benchmarking;
- Time Business Management;
- Efficient Consumer Response;
- Computer-Integrated Manufacturing.

In order for CCC to improve resource use they must apply the following new administrative and management concepts [5, p. 96-102], which reflect modern changes in the process of resource allocation:

I – securing the current market position of CCC by using the “wait and see” strategy that most traditional major CCC with a determined market share use;

II – effective use of available resources (networks, equipment, personnel, capital and financial resources);

III – maximum use of market opportunities [7].

Necessity of strategy application is caused by the following:

I – the absence of radical and unpopular decisions, sufficiency of network capacity to carry out most profit-oriented functions

II – sufficiency of network potential and stage-by-stage network improvement and transformation into new generation networks, aside from providing traditional cellular services and slowed reaction to market changes;

III – improvement of service quality and competitiveness based on introduction of new networks and availability of new services, use of dynamic market strategies and price determination.

Tactics of improved resource allocation at CCC include: detail planning; new equipment introduction, according to growing market demand; equipment testing; personnel training; consecutive installation of new equipment with temporary doubling of potential resulting from functioning of old networks; transition to providing new services using the new networks.

Modeling of the processes of resource use on separate companies is realized with the help of linear models and correlation tests, which are used to:

- Forecasting economic situation, based on researching internal and external environment of a firm (SWOT – analysis of strong and weak points, opportunities and threats);
- Studying demand and supply functions, determining sufficient service sales level and market competition specifics and relationship between their relative advantage and usefulness;
- Solving neoclassical consumption problem;
- Solving problems of expense minimization and price optimization.

Though modeling of complicated, dynamic, multifactor systems of resource allocation must be based on the following: using modified approaches to creating models of mathematical regressions, while considering availability and aspects of non-linear economic processes, regression models with time series, meeting requirements for mathematical modeling of resource allocation at CCC (adequacy of modeling of real resource use, ability of practical application under changing internal and external conditions).

Objectives

The goal of this paper is to review and analyze innovative approaches to development of CCC, as well as applying modern managerial theories and know-how to the operational and strategic activities of this type of high-tech communication companies

Materials

The operational environment of modern CCC is characterized by the following factors:

- increasing integration and globalization;
- increasing competitiveness on the global markets, including the influence of Russian CCCs and capital on the pricing policies, service composition and profit margins of domestic CCCs;
- unique characteristics of the cellular communication market;
- rising expectations of improvement of margin of profits;
- increasing tendency to form deep cooperative relations within the cellular communications market. These relations can take a form of a union, partnership, joint venture or an alliance. This is natural, as no firm acting on its own, under current economic circumstances, is capable of maintaining a competitive advantage globally.

Scientific scholars around the world point to the following macroeconomic factors that should be accounted for in the process of creating strategic alliances:

- globalization;
- technology;
- national legislation effective in the countries operation;
- merging capital and the risks related to such ventures [10, p. 153–154].

Depending upon the market position of the firm within the telecommunication sector, as well as its unique combination of competitive advantages, CCCs may be inclined to cooperate due to the following motivation:

- attempting to get into the lead on the market;
- maintaining position within the market segment;
- improving market positioning;
- restructuring [10, p. 154];
- creating strategic alliances, including joint ventures [11].
- CCCs may be more or less inclined to cooperate with each other within their sector due to the

following factors:

- formal or informal incentives that are dictated by the legislative status and mode of operation of CCCs;
- certain operational peculiarities that can induce cooperation in certain aspects of the companies' activities.

We believe that with respect to this, thoughtful analysis and study of similar processes, taking place in other countries makes perfect sense, as is the case with the neighboring Poland. Poland has long been reaping the advantages of coordinated functioning of companies, taking the form of a union, an alliance or a joint venture.

A union is a coordinated long-term cooperation of companies on a broad international scale in order to achieve common goals by merging capital. While doing so, the operational activities of the companies involved can be carried in the following ways:

- traditional, entailing acquisition/sale of assets or technologies, as well as licensing;
- modern, pertaining to creating long-term and mutually beneficial relations with end-consumers, as well as suppliers. This may concern mutual efforts in planning and production, as well as distribution and servicing.

An alliance is a form of cooperation between the companies, competing in a market segment that does not necessarily perform the same type of activities according to their core competencies. This mode of cooperation is aimed at achieving quick economic results and increasing the profit margins.

In their own right, strategic alliances are intended to shorten the time, needed for the companies to achieve or realize certain competitive advantages or research projects. One of the most effective modes of cooperation is cooperation on a micro-corporate level, which is aimed at development of informal relations locally. This takes the form of consultations between the management, their employees, as well as representatives of local authorities, non-governmental organizations (NGOs) and non-profit organizations. This is an effective venue for realization of local initiatives, based on the needs of local communities. A cooperation effort like the one mentioned above requires a joint effort of a couple of companies and organizations. Adoption of this public-private partnership (PPP) method is especially important for Ukraine, since it allows for greater and more effective decentralization of power, as well as the use of principles of sustainable and inclusive regional development and greater competitiveness on the global scale.

PPPs emerge and span the field of activity of a number of stakeholder groups and organizations, including, of course:

- public (local and regional authorities, NGOs);
- private (companies, entrepreneurs).

A partnership akin to PPP revolves around formal and informal communication, based on stakeholder agreements. Noteworthy are the following advantages of PPPs:

- improved coordination between companies and organizations;
- a good selection of formal and informal methods, allowing for a deeper and more effective cooperation between stakeholders;

- a broader scope and competency of the partners involved, resulting in a possible improvement of profit margins;
- reduced information asymmetry and improved efficiency and quality of managerial decision-making;
- faster adoption and better implementation of innovations;
- easier conflict resolution, less institutional resistance to change;
- positive synergy effects from integration;
- increasing production volumes and achieving greater economies of scale;
- improving the quality of human capital, facilitating the transfer of know-how;
- positive social effects from a deeper connection with local community and citizens;
- achieving better results from practical implementation of innovative solutions into the operational activity of an enterprise.

The above mentioned partnerships abide in their functioning by the following principles:

- openness and accountability;
- consensus and consideration for mutual goals, as well as methods for their achievement;
- a healthy dialogue between the partnership stakeholders;
- reduced number of conflicts;
- aiding innovation in stakeholders' overlapping fields of activity [10, p. 156].

Joint activity undertaken by partners within such partnerships can be categorized into the following stages:

- problem definition, analysis of environment and setting goals (SWOT-analysis, PEST-analysis and other methodologies);
- development of a strategy, based on long-term goals;
- development of programs for joint activities;
- realization of approved programs of activity.

Sometimes it is feasible to consider a merger between the companies, as a means to facilitate more effective forms of reorganization. This poses a question of careful consideration and due legislative support.

In the process of development and implementation of innovative approaches to functioning of CCCs, it is important to consider the peculiarities of the service, provided by a company on the market, as well as market structure and factors, influencing the demand for such service [12–13].

Also, in order to optimize the functioning of CCCs on the market, utilization of modern managerial concepts is crucial [14–15].

Analysis of the publications and expert opinion, including those of the faculty staff of the Lviv Polytechnic National University, allows suggesting the following approaches to future improvement of the network:

- Deploying trunking corporate networks, which decrease the cost and improve the quality of scientific and corporate communication aimed at solving research, operational and managerial tasks. The improvements in frequencies utilized for wireless data transmission has, in this case, a positive impact on the quality of the connection, its security (through encryption) and stability, as well as positive associated ecological and health benefits (trunking telecommunication networks can be corporate, as well as serve as components, connecting to data transfer networks, GSM networks or landline telecommunication networks);

- Optimization of the hardware, used to provide for the functioning of telecommunication networks in light of the use of modern communication and network protocols;

- Improvements in servicing of the telecommunication networks.

The strategy of sustainable development of Ukraine, entails the analysis of the experience of the recent economic development of Poland, Sweden, Germany and other developed countries for the purpose of conducting:

- ecological monitoring and audit;
- computer-aided modeling of ecological and economic aspects of optimization of telecommunication networks;

- improvements in the ecological parameters of highly technological manufacturing, telecommunication systems and networks;
- licensing and accreditation of new professional field of activity, which have recently been born within the overlapping fields of scientific and research activities.

A good case of improvement of telecommunication and computer networks is the renovation that has taken place on the campus of Lviv Polytechnic National University in 2013. The peculiarity of this project is in a large number of serviceable network outlets, exceeding 4500 in the dormitory alone. Another factor has been the complex structure of the network, as well as constantly rising upload and download capacity requirements and the importance of minimizing Internet service outages. In 2014 the renovation of the university telecommunications and computer network was completed. Within the scope of this renovation, the telecommunication network of the student's dormitories was united with that of the campus buildings, evening out the 24 hour load cycle. To implement this solution a BGP router was used with an IBMx 3650 M4 server, which provided the actual ability to unify two previously autonomous systems. In total the task is carried out by four load-balancing servers working in parallel. The tests carried out with students and faculty stuff, after the renovation project, confirmed the improvement in service quality and reliability. The improvement was especially significant in the dormitories, where the network is experiencing the biggest load from 6 pm to 12 am.

Conclusions

This paper is concerned with innovative approaches to development of cellular communication companies and takes into consideration increasing requirements for adaptiveness of CCCs. To achieve this goal, modern managerial concepts should be considered and applied. This approach will allow leading CCCs to improve the efficiency of resource allocation and use, including financial, human and technological resources.

Prospects for further research

Perspectives for future studies include developing more specific bundles of innovative strategies that can indeed be applicable to Ukraine's own largest CCCs, including Kyivstar GSM, Ukrainian Mobile Communications, Ukrtelecom.

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