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## FORESIGHT AS A STRATEGIC MANAGEMENT TOOL IN THE ICT INDUSTRY

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### Bannikov V. B. Foresight as a Strategic Management Tool in the ICT Industry

*Foresight, as one of the most effective tools of strategic management, logically fits into the system of strategizing, which determines the relevance and actuality of the presented study. The desire to exchange traditions and management practices, along with consideration of scale, also contribute to the development of strategic management, in particular, foresight management. The purpose of the publication is to identify the essence of the available foresight studies and the possibilities of introducing their results in practice, in particular at the enterprises of the ICT industry. To achieve the purpose, general and special methods were used, such as methods of system analysis, analysis and synthesis, empirical methods of comparison and generalization, case method. The task is set as follows: studying the practice of application of foresight methodology in the ICT industry. The article considers the content and features of foresight as a tool of strategic management of enterprise development used to ensure their competitiveness. The purpose of the practical application of foresight is the implementation of strategic long-term forecasting, which is formed on the basis of expert opinions, analyses of factors, identification of stakeholders, displaying alternative trends in the development of enterprise, allowing to form development scenarios and implement the chosen strategy. Its main advantage consists in the maintenance of the provision of competitive advantages for a long time. Standard methods can also be used when conducting a foresight, the best practices and achievements of other enterprises can be implemented as well. The main steps of foresight management are substantiated. The efficiency and prospects of its application are determined. The positive and negative aspects of the application of foresight methodology in the enterprises' projects were analyzed. The conclusions and results of the article can be of advantage in the educational-scientific process of the economic faculties of higher educational institutions. It is expedient to transfer them for practical use in the management of enterprises in order to increase their efficiency on an innovative basis.*

**Keywords:** foresight, foresight research, foresight management, forecasting, strategic management.

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### Банніков В. Б. Форсайт як інструмент стратегічного управління в ІКТ-індустрії

Форсайт, як один із найефективніших інструментів стратегічного управління, логічно вписався в систему стратегування, що зумовлює сучасність та актуальність даного дослідження. Прагнення до обміну традиціями та практиками менеджменту поряд з урахуванням масштабів також сприяють розвитку стратегічного управління, зокрема форсайт-менеджменту. Робота присвячена виявленню сутності форсайт-досліджень і можливостей втілення їх результатів у практику, зокрема на підприємствах ІКТ-індустрії. Для досягнення мети використовувалися загальні та спеціальні методи, такі як методи системного аналізу, аналізу і синтезу, емпіричні методи порівняння та узагальнення, кейс-метод. Завданням статті є вивчення практики застосування методології форсайту в галузі ІКТ. У статті розглянуто зміст та особливості форсайту як інструменту стратегічного управління розвитком підприємств для забезпечення їх конкурентоспроможності. Метою практичного застосування форсайту є реалізація стратегічного довгострокового передбачення, яке формується на основі думок експертів, аналізу чинників, виявлення стейкхолдерів, показує тенденції розвитку підприємства, дозволяє сформулювати сценарії розвитку та втілити стратегію. Його головна перевага полягає в забезпеченні надання конкурентних переваг протягом тривалого часу. Визначено, що при проведенні форсайту можуть використовуватися стандартні методи, впроваджуватися кращі практики та досягнення інших підприємств. Обґрунтовано основні кроки форсайт-менеджменту. Визначено ефективність і перспективи його застосування. Проаналізовано позитивні та негативні аспекти застосування методології форсайту в проєктах на підприємствах. Висновки та результати статті можуть бути корисними в навчально-науковому процесі економічних факультетів вищих навчальних закладів. Доцільним є практичне використання в управлінні підприємствами з метою підвищення їх ефективності на інноваційній основі.

**Ключові слова:** форсайт, форсайт-дослідження, форсайт-менеджмент, прогнозування, стратегічне управління.

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Considerable attention is paid to foresight at the corporate level, it is opposed to situational management and spontaneous response to the challenges of the external and internal environment. In the conditions of global uncertainty, the management of enterprises needs to have a clear vision of opportunities, prospects for development, and attraction of resources. The expediency of introducing foresight management into practice is manifested in shaping the future, creating a long-term vision and a strategy to achieve it. Therefore, innovation-oriented enterprises should pay special attention to the application of such a strategic tool.

The study of the organization of the foresight process, its place and role in the development of enterprises have become the object of attention of such foreign scientists as: M. Weissenberger-Eby, A. Almeida, F. Seus [1], A. Koniuk [2] and others. In particular, they consider the principles of a system approach to the activity and formation of strategies in a changing business environment and emphasize the permanence of this activity and the adjustment of strategies [1]. A. Koniuk substantiates that foresight is a tool for searching and adjusting options, while researching the level of foresight maturity of companies and involvement of stakeholders in the development of corporate strategies.

In Ukraine, most of the publications are devoted to the scientific explanation of the content of this tool and its application at macro- and meso-levels [3; 4]. S. A. Kvitka [3] emphasizes the importance of taking into account new factors, their impact on long-term trends, and opportunities of technology and society. The work of O. I. Reshetniak [4] summarizes the experience of conducting foresight studies using classical combinations of methods to determine strategic directions and investment priorities, stimulate and support the creation of innovations, etc. Considerable attention is drawn to the work of Ye. V. Bazhenkov [5], who presents the differences between the methodology of foresight in the educational field from futurology and strategic forecasting and planning. The monograph of the scientists at the Institute for Economics and Forecasting [6] reveals the institutional and organizational foundations, the basics of scientific and organizational support and regulation of the foresight study "Economy of Ukraine – 2050", the regulatory framework for the introduction of foresight into the practice of the State-controlled strategic planning in Ukraine. Among domestic scholars, of interest are the works of M. Zghurovskiy, T. Pysarenko. T. Kvasha [7], researching the development of a roadmap in the field of science, technology, and innovation and the place of foresight research therein, and providing recommendations for the integration of the results of national technological foresight into the regulatory field of Ukraine.

Simultaneously, the analysis of domestic foresight studies shows that they may have not essential foresight-related contents, but use the foresight brand to attract foreign funding, use resources and grant their own pro-

jects an appropriate image. They either do not reflect in any case or very poorly reflect the key features of foresight – involvement of different categories of stakeholders and qualified experts, use of a solid evidence base, organization of creative interaction between experts, multiple surveys, and discussion on the results by a wide range of stakeholders. Accordingly, the results of these studies do not claim to be objective, impartial, and there is a low probability of the effectiveness of the policy to implement their results.

The analysis of scientific works on strategic management at the present stage justifies that there are very few developments of domestic scientists and specialists related to foresight management at both the meso-level and the enterprise levels. It is worth noting that due to its relative novelty, foresight management is not a well-founded direction. Applied principles of its organization and implementation are considered by domestic experts fragmentary, thus actualizing the subject of the article.

**Formulation of the objectives of the article (statement of the problem).** Identifying the features of foresight to take into account and ensure the full development of strategic management in the ICT industry.

The *purpose* of this study is to trace the practices of applying foresight methodology in the ICT industry.

Foresight technology originated (in the USA, Japan, Great Britain) as a systematic means of assessing scientific and technological advances that could have a strong impact on economic and social development in the future [6, p. 328]. It still retains exceptional importance for anticipating the transformations associated with the rapid development of new technologies and the accelerated pace of their commercialization, which can cause significant structural shocks in the markets of resources, capital, and labor, which cannot be adapted without social and economic shocks, if preventive measures are not developed and applied.

Forecasts and plans allow to some predictability of the future, direct the efforts of economic agents to achieve selected goals, focus resources within certain priorities. In a dynamic external environment, foreign experts [8] note the lack of information, the lack of holistic knowledge, and foresight of the prospects and consequences of decisions by made by managers as part of their duties. The carried out studies affirm the thesis that teams developing innovative projects should participate in foresight. The effect of foresight is the strongest at the middle levels of project planning. The findings suggest that in order to increase the innovativeness of projects, forward planning should keep space for flexibility of implementation options, certain budgets for adjusting the project during implementation. They also emphasize the crucial importance of constant monitoring and control over the project implementation and achievement of its target indicators at certain intervals. Foresight is a methodological tool with the help of which there is a real

opportunity to project, determine the future competitive advantages of the organization, speaking of certain markets, as well as certain forecasting horizons. Accordingly, foresight management is a special, creative tool for strategic management. It embodies a step-by-step formation of the methodology and practical implementation, organization of the process aimed at creating a common vision of the future of the ICT industry and a particular enterprise, which will be supported by all stakeholders with their actions in the present period.

The basic principles of the foresight-oriented methodology of strategic management of enterprise development programs are described in detail in the scientific work of L. Chernova [9], among them: the principle of forming a strategic vision, the principle of forecasting, the principle of long-term orientation, the principle of decision-making, the principle of decision-making based on the analysis of expert assessments, the principle of value and benefit management. They should form the basis of foresight application in the following areas: assessment of technology potential, assessment of prospective demand in certain segments of ICT goods and services markets, assessment of competitive advantages and possible competition strategies, elaboration of foresight development scenarios for the ICT industry and its segments.

Thus, in the development of enterprise the following steps should be considered:

- ✦ creation of a target image of the future development of the enterprise for management needs;
- ✦ research of the desired image of the future development of the enterprise for management needs;
- ✦ study of the readiness and ability of the enterprise to develop in a certain direction;
- ✦ study of the limits of the enterprise's activity under certain initially set conditions;
- ✦ study of the dependence of enterprise development on the influence of factors of different hierarchy and origin, especially concerning the technological and resource dependence;
- ✦ study of possible options for enterprise development in space and time, depending on the combination of conditions and resources and possible probabilities;
- ✦ use of scenario analysis for enterprise development in the context of management.

Such development will be characterized by: weak formalization; multivariability of instruments; multivariability of results in the initial ranges; a certain forecasting horizon; focus on providing a managerial value; necessity to adapt to the conditions of a particular enterprise.

Thus, the general goals need to be transformed into specific areas of work, taking into account the definition of the specialization of the firm, the needs of consumers and the possibilities of satisfying them both technologically and functionally, the practical implementation

of the chosen plan to achieve the desired indicators, the effective implementation of the chosen strategy, the assessment of the above activities, taking into account the analysis of the situation in the external and internal markets, making adjustments to the long-term main activities, goals, strategy or its implementation plan, taking into account the experience gained.

Foresight management helps to improve policy development, elaborate forward-looking strategies and ensure consistency of short-term actions with long-term goals through a number of different methods, in particular:

- ✦ horizon scanning: a systematic scanning and review of events and trends that results in a plan for the future or a visual display of new signals of change;
- ✦ megatrend analysis: analysis and discussion of changing patterns and interacting trends, resulting in a future story (singular) and an action plan;
- ✦ scenario planning: an interactive and iterative process involving interviews, analysis, and modeling that results in a set of stories about the likely future and how it might happen;
- ✦ visioning: defining the desired direction, resulting in a shared understanding and clear description of the desired future and a medium-term roadmap detailing specific actions to make progress towards the vision.

All these methods operate by means of an updated database, knowledge, flexible networking, and high corporate culture, which leads to new competitive advantages. In this context, coordinated actions are relevant to improve the professional level of foresight managers; attracting experts and building teams for group work; procurement or development of new technological solutions or software for processing results, information, and analytical data.

Foresight implementation manager must have the following competencies: identify and evaluate new market opportunities, develop business plans for the creation and development of new areas of activity of organizations; be able to understand the principles of modern information technology and use them to solve problems of professional activity of the organization.

To study the experience of practical foresight management at the meso- and micro-level, let us consider the specifics of the ICT industry. In defining the field of study of the ICT industry, we will rely on the review of literature and materials of international think tanks, comprised by the team of authors of the monograph "Digitalization of the Ukrainian economy: transformation potential" [10], where the structure of the ICT sector and its elemental content is scientifically substantiated. Thus, it includes ICT services and the ICT industry (production of electronic devices, production of data center components, production of electronic network elements). As prerequi-



sites for the successful development of the ICT industry at the macro level are considered the following factors:

- ✦ stable economy, the development of which is predictable;
- ✦ high level of education of the population, in particular, computer literacy;
- ✦ reliable institution of intellectual property rights;
- ✦ developed ICT market;
- ✦ state supported enterprises of ICT industry;
- ✦ antimonopoly regulation and creation of a competitive environment between ICT enterprises.

**A**mong the global trends that cover all areas of economic activity, including the ICT sector, is the “green” transition. Promoting policies aimed at climate neutrality and energy efficiency for data centers and cloud infrastructure by 2030, in particular by addressing their electricity demand, will support the greening of data-driven technologies such as big data analytics, blockchain, and the Internet of Things. The striving for reduction of e-waste will be realized through improved design, more targeted business models, and production schemes. On the demand side, consumption and practices of businesses and citizens will be important to reduce energy consumption when using digital technologies. Particular attention will be paid to the implementation of environmental trends in the activities of global companies [11]. It is necessary to foresee not only the environmental consequences of the sale of products and their subsequent disposal but also the possible audit or provision of environmental consulting services for environmental assessment of existing/project technologies; introduction of automated systems for environmental management; environmental and energy audits, mandatory and voluntary environmental insurance. New cross-cutting strategic priorities in management also include the introduction of “green” human resources management [12]. It involves continuous training of staff in “green” practices, raising environmental awareness of employees in the implementation of “green” methods of human resources management in order to improve environmental performance.

The ICT sector has long attracted researchers, but foresight has been conducted mainly at the national level. In South Africa, a foresight project for ICT allowed to analyze the country’s technological achievements and develop a national strategy in the field of biotechnology, which ensured the development of production and developed a cooperative dialogue between industry, government agencies, experts, and civil society. In Malta the foresight project “eFORESEE” within the framework of the section “Improvement of human potential” allowed to dissemination of knowledge and experience in foresight. In the EU, the FISTERA project – Foresight on Information Society Technologies in the European Research Area 2020 – identified the main technological, economic, social, and political factors, prospects for fu-

ture ICT technologies in Europe, and their impact on improving the quality of life. In China, the developers of the Sixth National Technology Foresight aim to assess the current state of key technologies, including ICT, in the most priority areas.

**U**nfortunately, very little is known about the practice of foresight at the level of the ICT industry and its enterprises in Ukraine. Despite the significant share of proactive stakeholders, including 18.6 thousand legal entities (2021), the associations: IT Ukraine, Unions of Ukrainian Entrepreneurs, Ukrainian Venture Capital & Private Equity Association, the presence of international players (American Chamber of Commerce, European Business Association) and IT clusters, the author found information about only one case. The company GlobalLogic [13] demonstrates a high level of maturity of the company’s culture, technologies 4.0, and their use by providing consulting services for the analysis of promising technological trends and developing the latest technologies. GlobalLogic has long been using 4.0 technologies in its developments for customers from the automotive industry, industrial logistics and other sectors. The company conducts large-scale activities to strengthen the educational ecosystem of Kharkiv and is socially responsible. Its specialists develop new concepts, look for new sources of income for customers or transform an existing product or service, i. e., conduct foresight research by brainstorming and interviewing experts to determine the future digital profile of the customer and the desired results, including the development and implementation of ideas for startups, research of enterprise systems to support specific technologies and business goals throughout the product life cycle.

There is also a successful practice of the Japanese ICT firm Foresight Techno Co [14], which was founded in March 1999 as a joint venture of MARUBUN Corporation, an electronics trading company, and MITSUIWA Corporation, an ICT and devices trading company. The company periodically conducts foresight studies of its technology base using SWOT analysis, key technology, Delphi, and scenario development techniques. The company has developed technologies and provides engineering services taking into account the requirements of sustainable development of society, responding to the diverse needs of customers using advanced equipment, and supporting the solution of environmental problems. Thanks to its technological potential and developed communication network, the company promotes the initiative of the East Asia Engineering Services Consortium. The company offers solutions for the installation, maintenance, equipment repair, and calibration. Its mission statement is: “to provide new opportunities through engineering services always and everywhere”.

Despite the positive examples of corporate foresight studies and the prospects of strategic management, including foresight management, there are cases when

even a detailed vision of the future development of their organization is not implemented in practice. Experts [15] noted that the leaders of such organizations returned to the original technological framework, since everyday business life, shortcomings of the organizational structure, and established routines did not allow the use of adapted mechanisms for the formation of a new vision.

## CONCLUSIONS

Modern trends in the development of such a direction of socioeconomic activity as foresight management are reflected in the practical activities of global, transnational companies. It is worth noting the importance of foresight technology in the formation of a specific foresight culture, accompanied by the formation of a database and knowledge, networking, and corporate culture. In practice, there is an integration and interaction of strategic foresight, management, and planning.

Foresight management focuses the activities of the enterprise on innovation, consumer demands, allowing to flexibly respond to market requirements, adapt to the dynamics of transformations of the external environment, and timely implement changes in the enterprise.

The author of the article is convinced that strategic foresight and strategic management – a structured study of the possible future and the implementation of its decisions, assessment, monitoring, and correction of their consequences – is the main condition for the effective operation of advanced enterprises and proper strategic management. In further work, it is planned to study successful practices of the collective approach in the strategic management of high-tech enterprises. ■

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