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USE OF FORESIGHT TECHNOLOGIES AND ROADMAPS IN STRATEGIC MANAGEMENT OF MARKETING INNOVATION ACTIVITIES OF ENTERPRISES

ВИКОРИСТАННЯ ТЕХНОЛОГІЙ ФОРСАЙТУ І ДОРОЖНІХ КАРТ У СТРАТЕГІЧНОМУ УПРАВЛЛННІ МАРКЕТИНГОВОЮ ІННОВАЦІЙНОЮ ДІЯЛЬНОСТЮ ПІДПРИЄМСТВ

The study presents a methodological approach to the development and implementation of an innovative strategy for printing enterprises, based on the use of a scenario approach – a technological roadmap and the foresight method. Technological roadmaps for the development of innovation activity are formed in a cascade: first, for a network Association of printing enterprises, scenarios were developed on its basis for each of the studied Enterprises – LLC «Vesna» and PE «Phoenix». When drawing up the technological roadmap, the foresight method was used as a tool for implementing innovation policy. The advantages of the approach are visualization of the process of forming and implementing the innovation policy of a network Association: defining long-term goals and priority areas and areas of activity, technologies, products and innovations to achieve the goals, as well as the ability to adjust the developed scenario both at the planning stage and during its implementation.

Keywords: *marketing innovation activity, strategic management, printing enterprises, foresight method, roadmap.*

Об'єктом дослідження статті є процес розробки та реалізації маркетингової інноваційної стратегії поліграфічних підприємств України. В умовах високого рівня ентропії та постійного загострення конкуренції основою конкурентоспроможності, джерелом формування стійких конкурентних переваг поліграфічних підприємств на внутрішньому й зовнішньому ринках є активна інноваційна політика й маркетингова стратегія, відповідна ресурсам і можливостям фірми та адаптована до умов зовнішньо-

го середовища. У дослідженні представлено методичний підхід щодо розробки та реалізації інноваційної стратегії поліграфічних підприємств, що ґрунтується на використанні сценарного підходу – технологічної дорожньої карти і Форсайт-методу. Дорожня карта є покроковим сценарієм розвитку певного об'єкта (технології, бізнесу, компанії, сфери діяльності, мережі тощо) з метою визначення пріоритетних напрямів, методів, інструментів і зниження можливих ризиків. Технологічні карти розвитку інноваційної діяльності сформовані каскадом: карта – для мережевого об'єднання поліграфічних підприємств, на основі якої розроблені сценарії розвитку інноваційної діяльності для кожного з досліджуваних підприємств. При складанні технологічної дорожньої карти було використано Форсайт-метод як інструмент реалізації інноваційної політики. Форсайт поєднує в собі елементи планування, прогнозування й передбачення (пророцтво), його відмінністю від планування є можливості до оперативного й швидкого реагування на зміни маркетингового середовища.

Перевагами підходу є візуалізація процесу формування та реалізації інноваційної політики мережевого об'єднання: визначення перспективних цілей і пріоритетних напрямів та сфер, технологій, продуктів й інновацій для досягнення цілей, а також можливості коригування розробленого сценарію як на етапі планування, так і в процесі реалізації, що забезпечує гнучкість, адаптивність і зниження можливих ризиків. Наразі дорожня карта мережевого об'єднання поліграфічних підприємств стала основою для розробки сценаріїв розвитку інноваційної діяльності для поліграфічних підприємств: ТОВ «ВПК «Весна» та ПП «Фенікс».

Ключові слова: *маркетингова інноваційна діяльність, стратегічне управління, поліграфічні підприємства, Форсайт-метод, дорожня карта.*

Statement of the problem. In the conditions of dynamic development of market relations, which are accompanied by an economic downturn and crisis phenomena, and increased competition, printing enterprises are faced with the need to form an innovation policy and search for effective solutions to activate innovative activities. Innovation activity requires attracting significant resources: financial, infrastructure, personnel, intellectual and ensuring the interaction of scientific and technical, marketing, production, social, organizational and economic activities in the process of creating and implementing innovations, which determines the need to develop a marketing innovation strategy of the enterprise.

So, a necessary condition for stable development and ensuring the competitiveness of publishing and printing enterprises is the development and implementation of an adequate resources and capabilities of the company and adapted to the external environment, an innovation strategy, an active innovation policy and an effective mechanism for interaction of the enterprise with other economic agents at various stages of production and product promotion.

Analysis of recent research and publications. The study of problems related to strategic marketing planning, in general, and the use of road mapping technology for strategy development, in particular, was carried out by such domestic and foreign scientists as: F. Kotler, K. Keller [1], P. Drucker [2], A. Chandler [3], R. Best [4], I. Bamberger [5], L. Babchenko [6], Faal R., J. Claire, P. Farrukh, R. David Probert [7], N. Viola, R. Fusaro, V. Vercella, J. Saccoccia O. [8] and others.

Scientists presented the entire range of components of marketing and its management, which is focused on actions and covers various sectors [1]; revealed the features of management aimed at Results [2]; determined that the strategy includes long-term goals and objectives of the Organization [3]; revealed strategies for increasing consumer value and profitability and strategic planning as a factor of competitive advantages in small and medium-sized firms [4–5]; showed the role of strategic marketing in the management system of an industrial enterprise [6]; the authors reveal the possibilities of technological road maps in technological forecasting and planning of social changes, new methodological approaches to the development of technological maps [7–8].

Theoretical and methodological problems of innovative activity of enterprises have become the object of research by many scientists. Thus, O. Bray and M. Garcia proved the possibilities of using road mapping as an innovation in technological management, which is the key to global leadership [9].

A group of authors consisting of N. Mironova, G. Kopteva, I. Liganenko, A. Sakun and D. Chernyak developed a model for choosing an innovative strategy for the development of industrial enterprises [10].

Highlighting previously unsolved parts of the overall problem. However, a number of issues related to the development of a marketing innovation strategy and the implementation of an innovation policy of printing enterprises remain insufficiently studied.

The purpose of the article is to develop theoretical and methodological provisions on marketing strategic planning of innovative activities of enterprises using foresight technologies and roadmaps and to develop practical recommendations for application in the practice of publishing and printing enterprises

Summary of the main results of the study. A roadmap is a step-by-step scenario for the development of a specific facility (technology, business, company, industry, network, etc.) in order to identify priority areas, methods, tools and reduce potential risks. Features of road mapping are such as: long-term prediction, which is based on an expert survey of specialists in various fields; selection in the structure of the studied object (product, technology, process) of key points of development, interconnected by the time of their achievement; providing for each of the key points the most objective information on the scientific, technical, economic and financial results to be achieved and the necessary resources; review

of all the most significant development scenarios, taking into account the possibility of achieving them with different parameters of external (eg, government support) and internal factors (eg, different amounts of investment).

The roadmap is an effective tool for achieving qualitatively new results of innovation policy and reducing possible risks, it helps to choose priorities and focus efforts and resources on those areas that will lead to the planned result. Such selectivity plays an important role, as it allows the most efficient use of limited time, financial and labor resources of the enterprise. One of the main advantages of the technology of road map formation is the involvement in their development of the widest possible range of specialists of different profiles: developers of new equipment or product, marketers, manufacturers, financiers, suppliers. Of course, its clarity is of great importance for the roadmap to perform this function. Thus, the very participation in the development of the road map is a managerial influence that allows everyone to understand their role in implementing the strategy of enterprise development, and to see in the graphs different views and motivations of other services.

Due to the fact that the further development of the printing industry is associated with innovative technologies, it is advisable to consider technological roadmaps. Technological roadmaps represent different options for technological development to perform management and production tasks, they allow you to link the development of technology with trends in the printing market. In its structure, process maps have a multi-layered combination of charts and graphs based on time indicators.

The technological roadmap combines three main dynamic factors: market demand, enterprise and technology. Market demand changes over certain periods of time under the influence of increasing (or decreasing) income, technological development and changing consumer preferences. The company implements its functions in a competitive market environment, which is characterized by the emergence of new competitors, customers, changes in business owners and bankruptcy. Technologies used in printing companies are changing and evolving. The roadmap brings together target markets (or market segments), key production technologies and their possible alternatives, time frames for research and investment activities; positions the goals of the organization, its customers, competitors, production management processes; sets deadlines for the implementation of projects under investment programs in the development of technology and innovation. It is advisable to develop technological maps in a cascade: technological roadmap for the development of innovative activities in the field of printing enterprises (Fig. 1), based on which scenarios for the development of innovative activities for each of the studied enterprises [11]. The Forsyth method was used as a tool for implementing marketing innovation policy when compiling the technological roadmap. The process of creating a roadmap for the development of innovative activities of the network association of printing companies includes the following stages:

1. Determination of the research object and development directions for developing a roadmap.

2. Preliminary list of promising technologies and products.

3. Collection, research and selection of information for the chain "innovation – technology – products (goods, services) – market".

4. Forming the image of the future; establishing relationships between road map elements.

5. Construction of a road map for enterprises in the printing industry (Figure 1).

6. Development of scenarios for the development of innovative activities for printing companies.

Stage 1. At this stage, the key areas of research were identified, the subject area for the construction of the road map was identified, the goals and objectives of the study were set.

To determine and forecast the main priorities for the development of production and management technologies in the printing industry, Forsyth is used, which is both a system of methods and a systematic process of expert assessment of possible prospects for the development of printing and substantiation of long-term priorities. solutions in the medium and long term, taking into account several possible scenarios and allows the implementation of innovation policy.

Foresight combines elements of planning, forecasting and prediction (prophecy), its difference from planning is the ability to respond quickly and quickly. Forsyth differs from forecasting and forecasting in the first place by the composition of participants: the development of the forecast is carried out by a team of researchers in a particular field; predictions can be made by science fiction writers, screenwriters, psychics; Forsyth takes into account the opinion of a wide range of experts, the expert group includes not only scientists but also social figures, politicians and writers. Secondly, forecasting is based on the formed tendencies about possible states of some object, and in forecasting there is almost no fundamental evidence base therefore it is difficult to estimate its reliability; Foresight identifies areas for advanced research and identifies key technologies that can bring the greatest economic and social benefits, it forms guidelines for all actors in economic relations (Figure 1).

The forecast is always a completed process, confirmed by a relevant document, on which scientists and researchers can rely when assessing the situation. Anticipation contains elements of active influence on the future, in the form of reconciling the interests of different social strata of civil society and can be made in completely different forms, from oral statements to publications in the press. Foresight is a dynamic or active forecast that can be made in real time, given the changes taking place in society

The main methods of Forsyth at this stage are the survey of a significant number of experts, as a result of which it is possible to take into account all the main

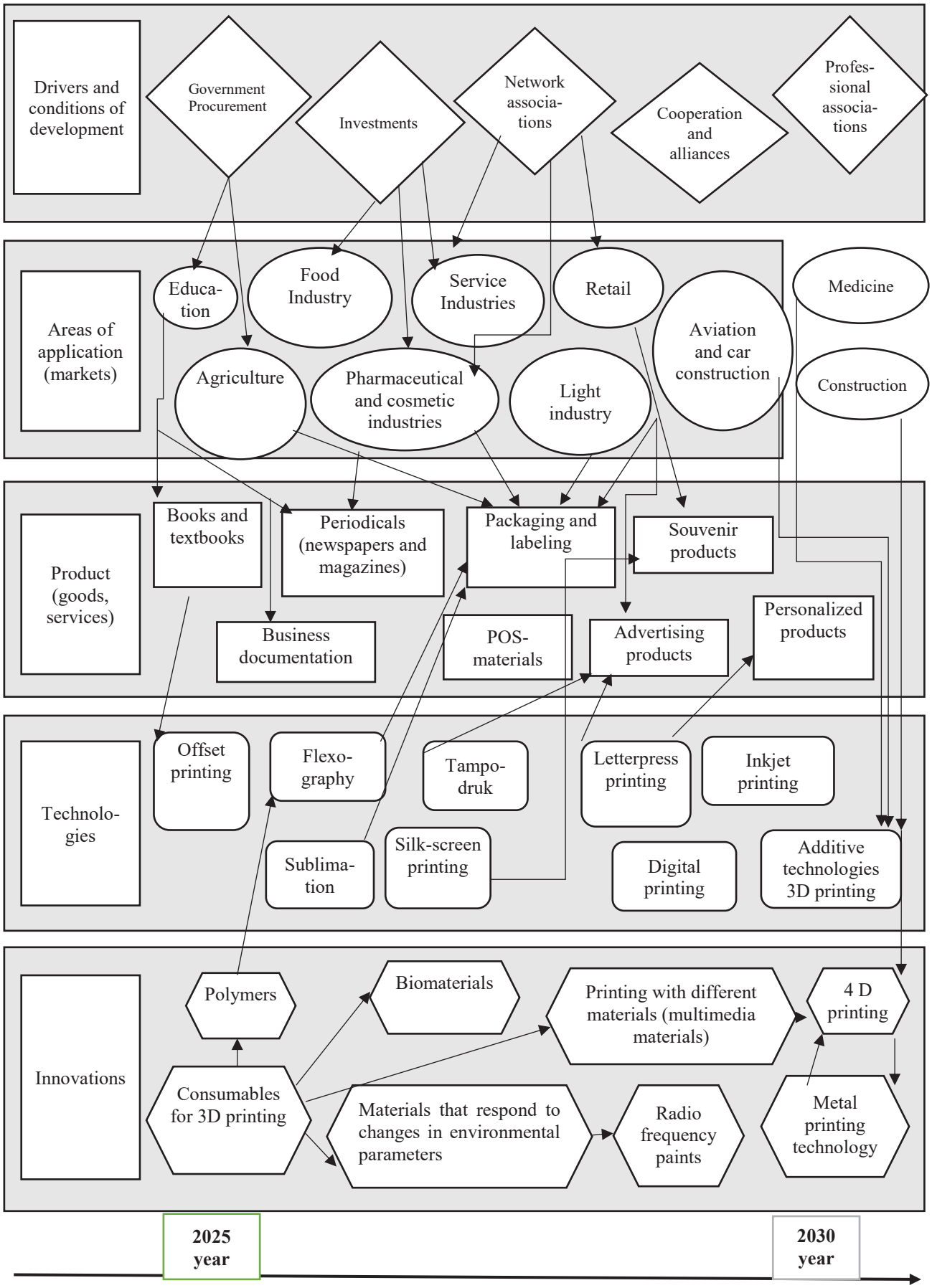

Figure 1. Roadmap for the development of innovative activities in the field of printing enterprises

opinions of experts, which ensures high reliability of the results.

Stage 2. When developing a road map, it is necessary to select information and analytical materials that reflect the scientific, technical and market trends in the development of printing. At this stage, all available information that exists in codified form is analyzed. We conducted literature reviews: collection of primary information about promising technologies and products contained in the sources [3-5] of the study of the state of the sphere of activity; market assessment of printing products, SWOT-analysis to identify strengths and weaknesses, opportunities and threats.

The analysis revealed a set of interrelated problems of the printing industry, which inhibit innovation activity in the field of activity as a whole and individual enterprises. These are: lack of financial resources due to lack of state financial support, inability to obtain loans due to the small size of printing companies and high interest rates on bank loans; low investment and innovation activity of printing companies due to lack of working capital; high cost of production, which causes the inability of printing companies to compete with foreign publishers, and, consequently, low profitability of production of printing companies; impossibility to satisfy constantly growing requirements of customers to quality and terms of production of printed matter owing to inconsistency of their resource potential to needs of the market of printed matter, technical and technological backwardness; high import dependence of domestic printing due to the lack of quality domestic printing paper, consumables and equipment; falling total output of printed products and, accordingly, the growing trend of decreasing the scale of printing production, which is associated with falling demand for printed periodicals and publishing products; printing companies have a rather low potential for inter-firm network cooperation: currently network forms of interaction are used only in the production of magazines, newspapers, and production and technical printing due to fierce competition in the fight for a potential customer does not see benefits in network resources [11].

Stage 3. This phase is aimed at identifying the so-called tacit knowledge and includes a series of in-depth expert interviews with representatives of business, science and government, etc. In the process of expert interviews, non-codified information on promising trends in the development of the subject area was obtained directly from the bearer of knowledge and different opinions of experts on the development of the printing industry were considered.

The main conclusion that follows from the analysis is that the directions of further development of business processes in the printing industry are determined by the market of printing works and its dependence on motivations in publishing and distribution structures, as well as the scale of replacement of printed products. electronic communication. Without taking into account these factors and assessing the life cycles of certain printed products, it is impossible to strategically plan the development of printing in general and create business models of a particular printing company.

Stage 4. At this stage the image of the future is formed and interrelations between elements of a road map are established. This phase uses a brainstorming technique to generate the desired image of the future and identify the key steps needed to achieve it. Stakeholders (stakeholders) are also analyzed, which allows to identify their advantages and develop a strategy for their effective involvement in the final stage. Alternative strategies are being developed to achieve the development goals of the subject area, a preliminary version of the roadmap is being formed, which is being discussed at the final seminar with a wide range of stakeholders, including representatives of science, business, government and the public.

Step 5. Based on the proposed methodological recommendations, a roadmap for the printing industry was built (for the field of printing enterprises was built). The roadmap prepared in the study consists of five interrelated layers, each of which, in turn, includes a number of analytical tools (see Figure 1).

Drivers and conditions of development: what factors influence and will stimulate the development of the printing industry. Areas of application (markets): what types of economic activities, industries and sectors form the demand or will form in the future for products (services) of printing companies.

Product (goods, services) – the most promising goods or services. Printing products are divided into several main groups: representative products (business printing): business cards, folders, notebooks, envelopes, invitations, letterheads, envelopes; book and magazine products are printed in large numbers in large printing houses: books, textbooks, magazines, etc .; advertising products are the most numerous by types of offered advertising printed products: leaflets and flyers, booklets, brochures and catalogs, labels, leaflets in envelopes and without, posters, posters and posters, POS-materials; calendar products – multifunctional printing products: sheet calendars, wall and desktop flip calendars, calendars for the office, pocket calendars, non-standard "image" calendars with the use of cutting forms and exclusive finishing, etc. The most promising types of products are packaging, labeling and advertising products.

Technologies – effective organizational and production innovative technologies. In printing, there are many different printing technologies: high (flat and rotary, sheet and roll using photopolymer forms); deep (sheet and roll, deep autotype, pad printing); offset printing (sheet and roll, with and without humidification), direct rotational lithography (di-summer), electrography, DI (direct image), phototype, offset phototype, digital (CtPrint); screen printing (flat and rotary, sheet and roll), silk-screen printing, risography (DI rotary sheet-fed printing), inkjet printing.

New printing technologies: lenticular printing allows you to give individual parts of the image a

three-dimensional effect (stereo image); bronzing technology – application of bronzed powder and pigments on the adhesive surface, due to which the image acquires volume and shine; aromatic printing – a special varnish on the image is applied fragrant substances that are released during its use; for hybrid printing special inks are used, combining the properties of UV inks and oil, which gives the image a nice texture.

Modern directions in the field of technology include hybrid printing methods, dry offset, research in the field of nanotechnology, expanding the range of environmentally friendly materials. Digital control and printing technologies have changed the basics of printing. High-speed printing machines with digital control and with variable images on the printed form at each revolution of the form cylinder (digital printing technology) made it possible to issue publications with changes in the content (without changing the form) of printed products in the printing process.

The promising development of the printing industry is associated with digital printing and the creation of a more efficient and competitive than the traditional type of production method of printing in the newspaper, book and magazine industries. These can be: holography, printing on water, further differentiation of 3D printing; differentiated digital printing.

Innovation. Modern additive technologies (3D printing) radically change the existing production processes of metalworking, greatly facilitating and reducing the cost of them. The innovative system allows to make details of any complexity, from various materials, to reduce their weight, keeping durability, and all process is completely automated. Today, additive manufacturing is used in medicine, automotive, construction, aerospace, energy, etc. due to the use of 3D printers for the manufacture of parts and objects from polymers, metal, concrete and other building materials.

Augmented or augmented reality technology is specially placed markers (printed prints) on packaging or other printed products, which are used for further visualization in the form of sound, animation, three-dimensional objects, graphics and other data. The means of augmented reality are various gadgets (monitors, phones, tablets, virtual reality glasses, screens, etc.).

Stage 6. Development of scenarios for the development of innovative activities for printing companies: LLC VPK «Spring»and PE «Phoeni» (Table 1-2).

The Print 4.0 concept is a cross-cutting digital workflow made possible by an intelligent network of machines and systems. The main principles of "Industry 4.0" are the integration of all stages of the life cycle into a single information space and the interaction of machines without human intervention. The main role of man in «Industry 4.0» is to develop algorithms and train machines by programming.

Digital printing technology involves the manufacture of printed products using digital equipment. The machine prints files electronically using the technology of ink coating without the use of permanent printing plates.

Augmented Reality (augmented or augmented reality) technology is markers (printed prints) that are specially placed on packaging or other printed products and are used for further visualization in the form of sound, animation, three-dimensional objects, graphics, etc. The means of augmented reality are various gadgets (monitors, phones, tablets, virtual reality glasses, screens, etc.). Using special markers, the application overlays the data digitally and displays them instead of the existing image of reality or on top of it.

Smart printing with innovative Smart UV technology allows you to make the transition to web-based UV printing on eco-solvent printers, which are based on the use of hybrid inkjet ink. Smart printing combines all the benefits of ultraviolet and eco-solvent printing. The advantages of the new technology are low elasticity and resistance to mechanical damage, regardless of the printing material - paper, fabric, canvas or film.

Web-to-print platforms are a technology that enables self-service customers of printing products and eliminates oral contact with sales managers. This process allows the printing house and the client to create, edit and approve layouts in electronic form during the prepress phase. The customer independently forms his order on the printing house's website in accordance with the requirements described in the web-resource, on the basis of the proposed standard templates and approves it for production, pays online. Due to the elimination of intermediary intermediaries – sales managers, order operators, a large financial department – the cost of such an order for the printing house will be significantly reduced, and therefore, the final price will decrease. The main advantage of the online platform is the ability to work automatically 24 hours a day (see Table 1).

Adding value to the product will provide the most stable competitive advantages of PE «Phoenix» and provide a wow-effect. Such exclusive offers are: branded circulation of books with a supercover, made according to the customer's design in its corporate colors; publishing of books on the terms of partnership – placement of the client's logo on the cover, root and title page; a note that the book was published with his support; placement of the text about the purpose and tasks of the joint project at the end of the book in the form of an afterword; corporate library – depending on the profile, purpose and values of the company, a corporate library is formed for the development of the client's employees.

But added value is a competitive advantage only to the extent that the company is able to maintain the exclusivity of its offer. In addition, in a competitive environment, value-added products quickly become standard and serve as a source of additional income for a short time, so new approaches, methods and tools should be introduced (see Table 2).

The limitations of the study are that statistical data from the state statistics service of Ukraine are

Table 1

Scenario of development of innovative activity of LLC VPK «Spring»

Key areas of development	Business process optimization according to the concept of "Print 4.0." - formation of high efficiency production and resource capabilities for the production of printed products in a fully automatic mode					
Incentives	Investments					Public procurement
Areas of application	Food Industry	Retail	Pharmaceutical and cosmetic industries		Service Industrie	Education
Goods (service)	Commercial products					Personalized products
	Cardboard packaging	Label and labels	Souvenir products	POS-materials	Promotional products	
Technologie	Digital printing	Offset printing	Silk-screen printing	Flexography	Inkjet printing	Inkjet printing
Innovations	UV inks	Applying hybrid varnish Drip off	Micro-embossing	Smart technologies	Web-to-print platform	Web-to-print platform

Source: developed by the authors [12]

Table 2

Scenario of development of innovative activity of PE «Phoenix»

Key areas of development	Activation of innovative activity, formation of business model of increase of consumer value of a printed product, addition of value to a product on the basis of use of a new marketing approach of a wow-factor and integration of electronic and printed editions				
Incentives	Public Procurement	Professional Associations	Cooperation and alliances		
Areas of application	Education	Science and art			
Goods (service)	Hardcover and Dutch books	Directories, catalogs, textbooks	Personalized products (author 's book editions and gift editions)	Branded circulation; corporate library	Publication of books on partnership terms
Technologie	Offset printing		Digital printing	Flexography	Letterpress printing
Innovations	Textbooks using technology Augmented Reality (augmented or augmented reality	Integration of electronic elements into the printed product		Innovative paints	Additive 3D printing technology

Source: developed by the authors [13]

received with a delay of 2-3 years, therefore they become irrelevant.

Impact of martial law conditions. All the problems of the printing industry that were mentioned above were aggravated by the full-scale invasion of the Russian Federation. New ones have also been added to this, such as: closure of enterprises due to the destruction of the material and technical base or the inability to function due to occupation; lack of qualified employees due to mobilization; shortage of paper and growth of valuable paper products due to logistics problems, delays at the border; financial insolvency of a number of enterprises; lack of state support for the printing sector in Ukraine. However, despite the difficult conditions, Ukrainian enterprises continue to actively develop and introduce innovations to support and develop the sphere.

The prospects for further research are to analyze the possibilities of cooperation between the two countries and can become the basis for the economic recovery of Ukraine and the printing industry.

Conclusions. Based on the conducted research, it can be concluded that enterprises of the printing industry need to constantly achieve competitive advantages through innovations, using both new technologies and new methods of work: the application of a strategy of specialization in product niches with reduced competition; creation of unique products (services) that allow you to set your prices; establishing close ties with customers, providing them with high quality consulting services; diversification of production on the basis of additional services with high added value; creation of image (brand) of the enterprise through awareness of customers about high quality, reliability, efficiency, level of service; investing in the latest technological solutions to increase the efficiency and profitability of production; use of Internet technologies to stimulate sales and expand the scope of services. The introduction of innovations leads to lower costs, hence prices, to increased profits, the creation of new needs, improving the image (rating) of producers of new products, to the opening and capture of new markets, including foreign ones.

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