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INNOVATIVE INDUSTRIAL AND CRAFT TECHNOLOGIES FOR HoReCa

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The textbook reveals the priority areas of innovation in industrial and craft production of a modern range of high-quality products, in particular using local raw materials. Particular attention is focused on improving existing or developing new technologies for processing meat, milk and fermentation products and winemaking. The characteristics and requirements for raw materials are presented, the range of food products is systematised, and the main technological equipment designed to ensure efficient production processes is considered. The information contained in this publication allows you to deepen your knowledge of technology and form your own vision of the food production development strategy.

The materials of the textbook can be used in research work by applicants, undergraduates and postgraduates, teachers of higher education institutions, specialists in the food industry and HoReCa.

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INTRODUCTION

The food and hospitality industries are the fastest growing and most competitive sectors in the world, with a high level of competition aimed at meeting the needs of consumers for quality and safe food, as well as providing high quality services and comfort.

The attractiveness of the HoReCa business lies in its success, providing high quality goods and services that increase market demand through the introduction of technological innovations, taking into account the needs of the consumer to the maximum extent possible. The combination and development of innovative science-based technologies for industrial and craft products for HoReCa, as well as for organizing and managing the tourism process at the local and regional levels, necessitates the development of industry specializations.

This, in turn, actualizes the need to train competent specialists who have an extended range of modern methods, techniques and technologies in industrial and craft production for the Hospitality Industry in the tourism sector.

The competitiveness of the food industry in today's environment, characterized by uncertainty and rapid change, is inextricably linked to the introduction of advanced technologies, the transition to the production of quality and safe products and the creation of effective mechanisms to stimulate innovation. The experience of creating progressive systems of well-known world leaders (the USA, the EU, and China) proves the significant role of small and medium-sized businesses in building a competitive national economy.

At the current stage of development of the food industry, innovations are becoming increasingly important for improving the efficiency, quality and sustainability of production. The priority areas of innovation in the food production industry are: improvement of existing and development of promising production methods using functional and innovative methods of packaging, storage and transportation of finished products with minimal environmental impact; creating mechanisms for the efficient use of raw materials, including those of local and regional origin; developing a new

range of high-quality food products, including those made according to unique and authentic recipes; use of digital technologies to optimize production processes, resource management and customer relations; improving marketing and promotion strategies for food products among consumers.

In today's world, industrial and craft production are two important sectors, each of which plays a role in economic development and shaping the development of society. Industrial production is the basis of large-scale production, using advanced technologies and the operation of large-scale enterprises. Craft production is not just a fashion trend, it is characterized by individuality, uniqueness, craftsmanship, use of local resources and a combination of time-tested traditional technologies and innovations aimed at meeting the needs of the consumer market.

Both sectors play a key role in the structure of the economy, each with its own unique strengths and opportunities. The industrial sector plays a key role in ensuring mass production and availability of products on the market, contributing to economic growth and increasing the country's competitiveness. In relation to the existing context, craft production plays a significant role in contributing to the development of local communities. This is manifested through the preservation of traditions and cultural identity, as well as ensuring high quality products and individualized production.

It should be borne in mind that both sectors can and should develop through the introduction of the latest technologies. Interaction between industrial and craft production can lead to synergies that will contribute to significant results in the production of high-quality and safe products and sustainable economic development.

Global trends in the development of the food industry using innovative processes in the production of products are steadily moving towards the creation of new types of products, the latest equipment and machinery, and the involvement of qualified personnel with a high level of competence.

The textbook presents the theoretical basis of innovations, as well as practical solutions implemented at modern enterprises, including the

HoReCa hospitality industry. The chapters widely cover the trends in expanding the range of food products of industrial and craft production for HoReCa. Particular attention is paid to current technologies for processing meat, milk and fermentation products.

The systematization of the information provided in the manual allows to ensure the necessary professional level of applicants and specialists who implement classical and innovative food technologies for HoReCa in practice. The material presented in the manual will contribute to the deepening of relevant knowledge by specialists in the food industry, especially in the technology of meat and milk processing, fermentation and winemaking products, as well as industrial and craft technology for HoReCa in tourism.

The information contained in this publication allows you to deepen your knowledge of food technology, to form your own vision of modeling technological processes for the production of food products.

The presented material of the manuscript can be used in the performance of research works by applicants of the first educational level, undergraduate and graduate students, teachers of higher educational institutions, specialists in the food industry and HoReCa.

The manual is presented in accordance with the programs and curricula for the training of higher education applicants for the educational degrees "Bachelor" and "Master" in the specialty G13 "Food Technologies" and the educational programs "Technologies of storage, preservation and processing of meat", "Technologies of storage, preservation and processing of milk", "Technologies of fermentation and winemaking products". The content of the textbook corresponds to the curricula of the following professional educational disciplines: "General Technologies of the Food Industry", "Quality Control and Safety of Meat Processing Industry Products", "Student's Research Work", "Food Quality and Safety Management", "Current Problems of the Industry", "Modern Methods of Industry Research", "Meat Preservation and Storage Technology", "Production Management", "Special Technologies", "Modern Technologies of Food Storage and Canning".

CHAPTER 1.
INNOVATIONS: CLASSIFICATION AND FEATURES

1.1 Characterization of the concepts of innovation and innovation activity

The modern development of food technologies is impossible without the achievements of scientific and technological progress, which are united by the modern term “innovation” and “innovation activity”.

Innovations and innovation activity are traditionally considered as a direction of scientific and technological progress, in particular its high-tech part, and as a process related to the implementation of research and development results in practical application.

Innovation is the end result of innovative activity in the form of a new or improved product or technological process that has qualitative advantages in use and design, production, marketing, and is used in practice and has a social advantage.

The scope of innovation is broad, covering not only the practical application of scientific and technical developments and inventions, but also including transformations and improvements in products, processes, marketing, and organizational approaches. Innovation functions as a distinct catalyst for change, manifesting itself as a result of activity realized in the form of a new or improved product, technological processes, new services and innovative methods of meeting social needs.

Innovations and innovative activities are a direction of scientific and technological progress, its high-tech component, and a process related to the implementation of research and development results into practice.

Innovations are the result of activities embodied in a new or improved product, technological processes and new approaches. The term innovation is a combination of two words - the English prefix “in” - “in”, “introduction” and the Latin “novation” (novelty, innovation). Literally translated, it means the introduction of something new, renewal, which characterizes qualitative changes or features in the production process. Innovations are possible in all spheres of human activity. Innovations are divided into types, which are shown in Fig. 1.1.

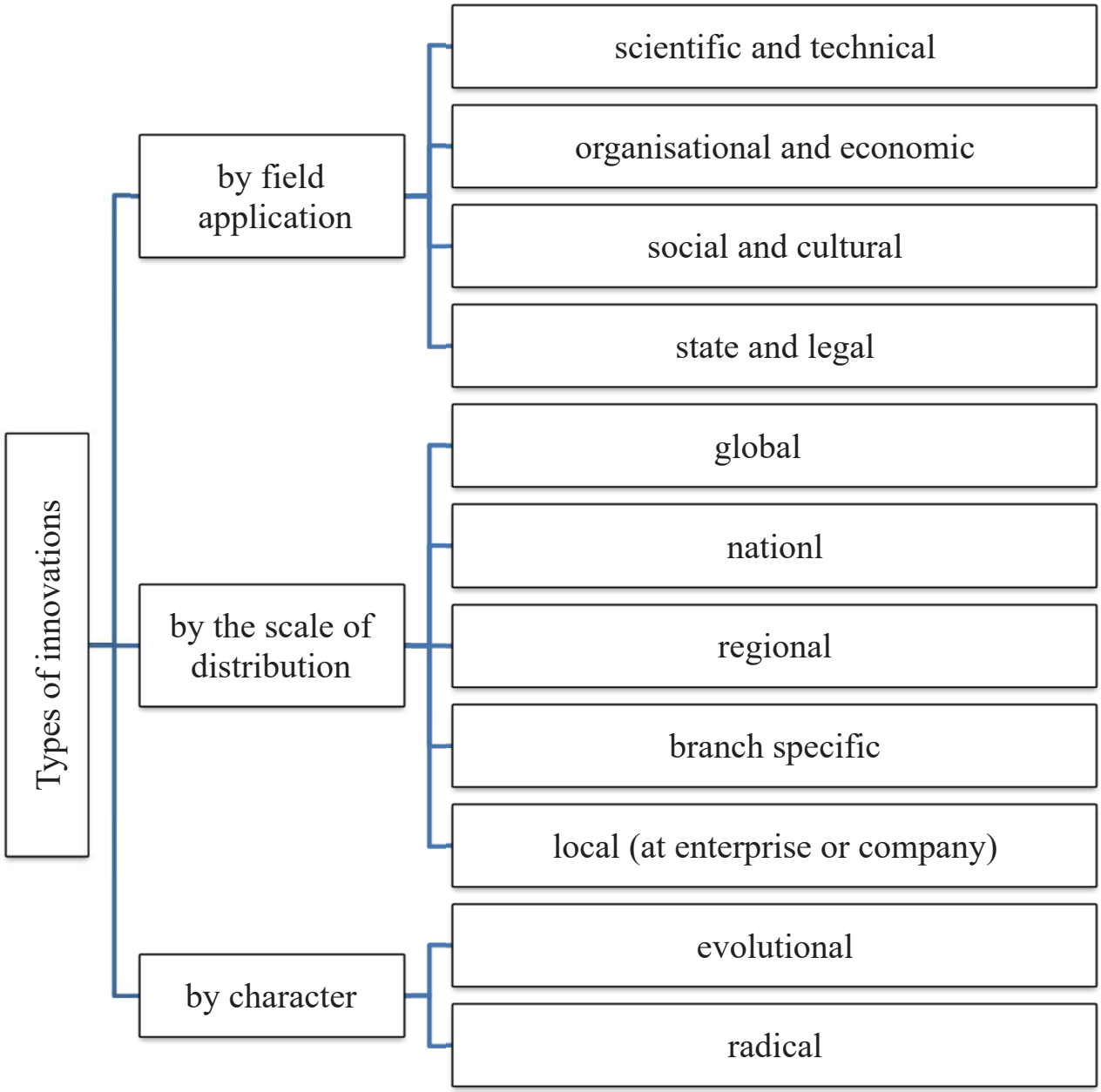

Fig. 1.1. Types of Innovations

Improving the efficiency of food industry enterprises is a strategic task for any developed country. At the same time, in Ukraine, the traditional resources for solving this problem are practically exhausted. Many producers operate in conditions of financial instability, low technical equipment, high wear and tear of technological equipment, weak management and fierce competition. Overcoming such barriers is possible only through the active implementation of innovations at all stages of the life cycle.

A characteristic feature of the current stage of economically developed advanced countries is the innovative way of development, which is based on a targeted process of searching, preparing and implementing innovations that allow to increase the efficiency of social production, in our case - the production of new food products with improved quality characteristics.

An innovation is a newly created or improved production method or technology that has significant competitive advantages over existing analogues.

The relevance of innovations is determined by various factors that affect their importance and successful implementation (Fig. 1.2).

These factors can vary depending on the industry or field of activity in which innovation is taking place and are important for determining and assessing the relevance of innovative ideas and products.

An innovation project is a project based on the use of new or improved technologies.

The influence of technological parameters on the features of innovative projects is shown in Fig. 1.3.

Therefore, based on the above characteristics, the product of innovation can be:

✔ a new product

✔ a new means of production

✔ new technology (production, management, labor organization, consumption).

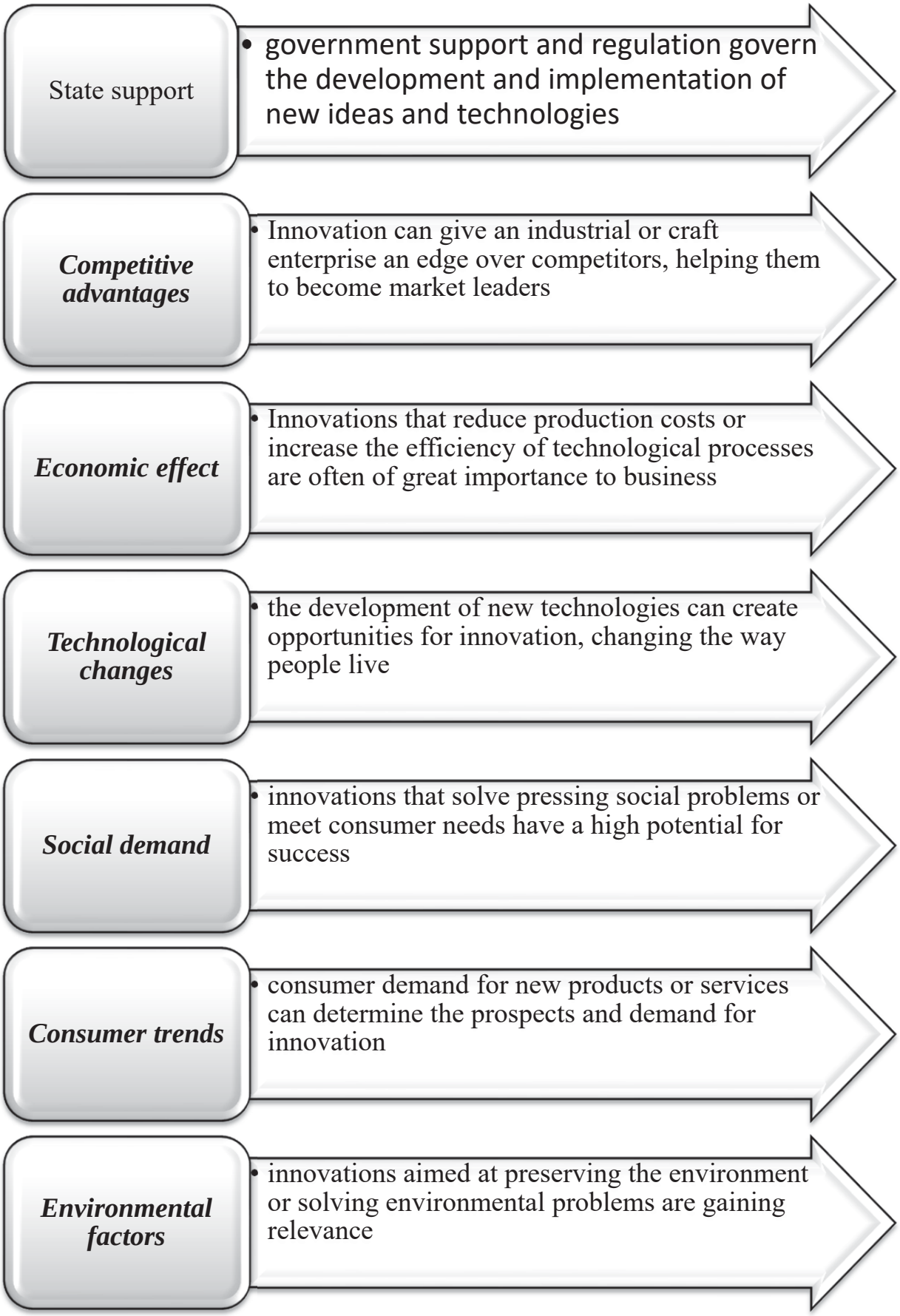

Fig. 1.2. Key factors characterizing the relevance of innovations

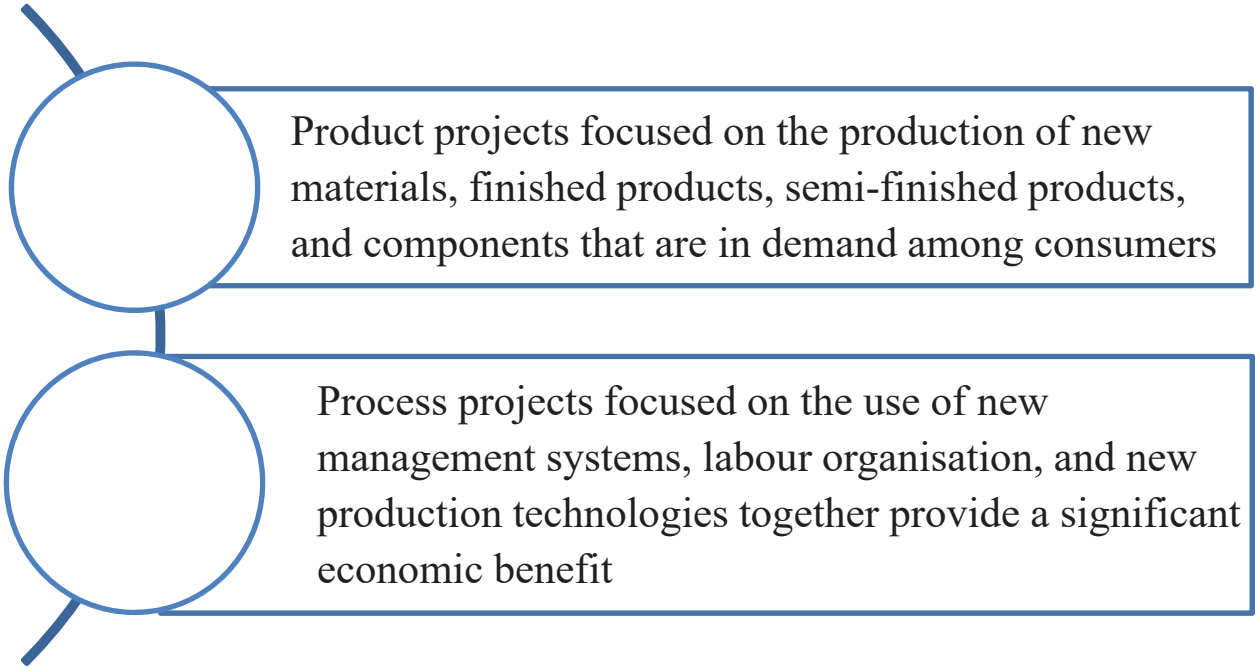

Fig. 1.3. Influence of technological parameters on the division of innovation projects

The search for innovations has various motives that can be generalized by the relevant characteristics.

These motives may vary depending on the scope, goals and context of a particular enterprise, as shown in Fig. 1.4.

Improving productivity: companies and businesses are looking for innovative solutions to improve their efficiency, optimise processes and increase productivity

Competitive advantage: the development of innovative products, technologies or services allows manufacturers to stand out in the market, gain competitive advantage and increase their market share

Responding to market needs: rapid changes in consumer preferences and needs and technological developments encourage businesses to innovate to meet new market demands

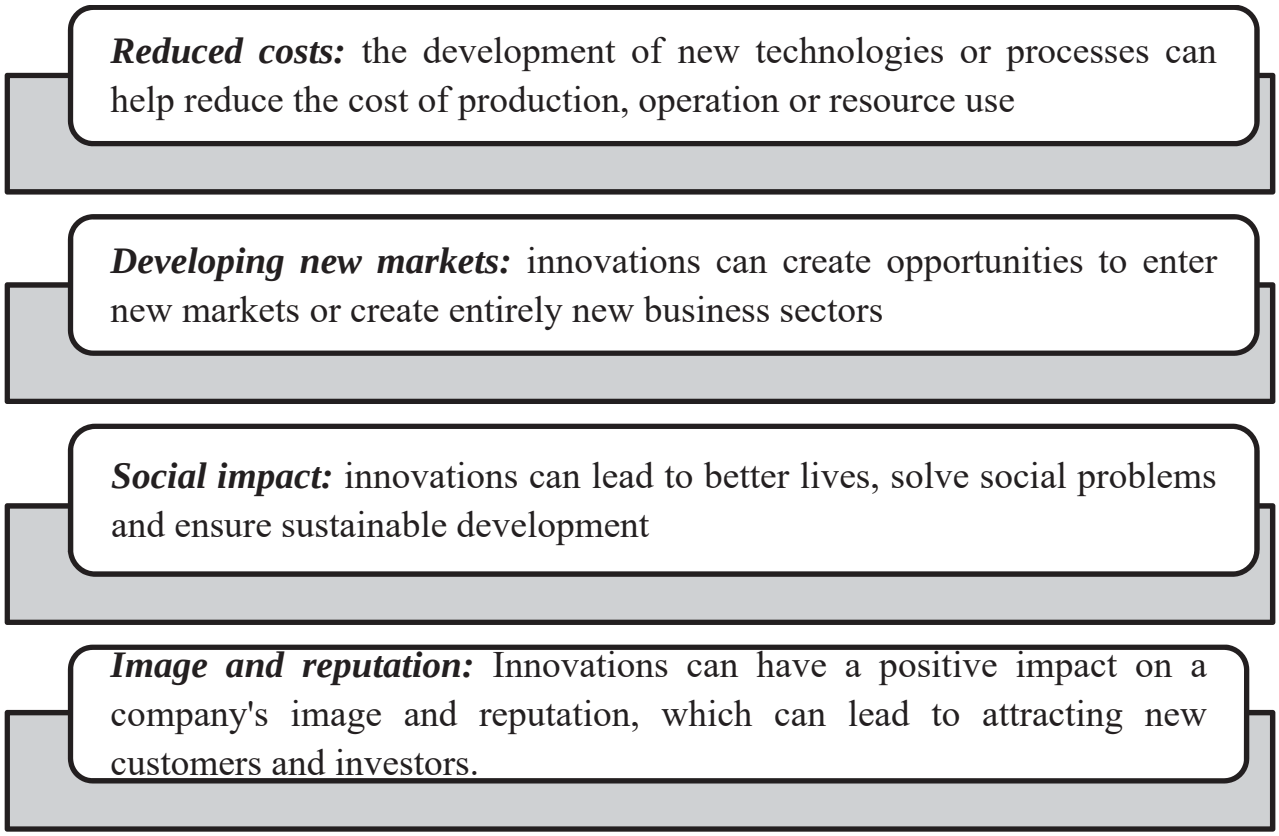

Fig. 1.4. The main motives for searching for innovations

These motives help to stimulate and support the search for innovation in business and society in general.

The dependence of types of innovations on classification features is shown in Table 1.1.

Table 1.1. **Dependence of types of innovations on classification features**

Classification feature	Types of innovations
By type of innovation activity object	✔ product innovations. This includes the introduction of new or improved products; ✔ process innovations. Development of new or significantly improved products, organization of production
By role in achieving the organization's	✔ Improving - carried out as part of the development and improvement of business areas;

goals	✔ Strategic - create new business lines or ensure successful operation of existing business lines for a long period of time
By importance for the actual line of business	✔ basic - radically change the established or form a new line of business; ✔ modifying innovations - carried out as part of the improvement and development of basic ones; ✔ pseudo-innovations - external insignificant changes in products or processes that are not fundamentally new and do not create any additional benefits for consumers
By the field of activity of the enterprise	✔ innovations at the "input" of the enterprise - targeted, qualitative or quantitative changes in the selection or use of materials, raw materials, equipment, information, employees, and other types of resources; ✔ innovations at the "output" of the enterprise - changes in the results of production activities (products, services, technologies); ✔ innovations in the enterprise structure - targeted changes in production, service and auxiliary processes
By the content of the activity	✔ Technological - aimed at creating and mastering the production of new products, technologies and materials, modernizing equipment, reconstructing facilities, and implementing environmental protection measures; ✔ production - aimed at expanding production capacities, diversifying production activities, changing the production structure, etc; ✔ economic - aimed at changing the methods and ways of planning all types of production and business activities, reducing production costs, increasing material incentives, employee engagement, and implementing an accounting system; ✔ commercial - use of new methods of pricing policy and forms of interaction with suppliers and customers; provision or receipt of financial results in the form of loans, online store, etc; ✔ social - related to improving the working conditions and

	nature of work, social security, psychological climate in the team; ✔ managerial - aimed at improving the organizational structure, style and methods of decision-making, using new means of information processing
By content and scope	✔ Technological - new technologies for the production of old or new products, introduction of information systems, new energy sources. Technological innovations are changes primarily in the means and methods of organizing production; ✔ product innovations - the creation of new goods consumed in the production sector (means of production) or in the consumption sector (consumer goods) ✔ organizational and managerial - new methods and forms of organization of all types of activities of the enterprise and their associations: new methods of personnel management, strategic planning systems, forecasting, modeling of production, supply, sales processes, new organizational structures; ✔ economic - innovations in financial and accounting spheres of activity, motivation and remuneration, performance evaluation ✔ social - new forms of activation of the human factor, including the process of changing working conditions, cultural, environmental and political aspects, and lifestyle changes in general; ✔ legal - new legal documents that define and regulate all types of activities of enterprises, organizations and individuals, creating appropriate conditions for development. Some authors refer to legal innovations as social innovations.
By scale of distribution	Global, national, regional, sectoral and local (enterprise, company) innovations
By the nature of the innovation	Evolutionary and radical.

Innovative technologies are a means of increasing labor productivity, reducing production costs, and obtaining additional market benefits, including by overcoming competition.

Different approaches to implementing innovations are shown in Fig. 1.5.

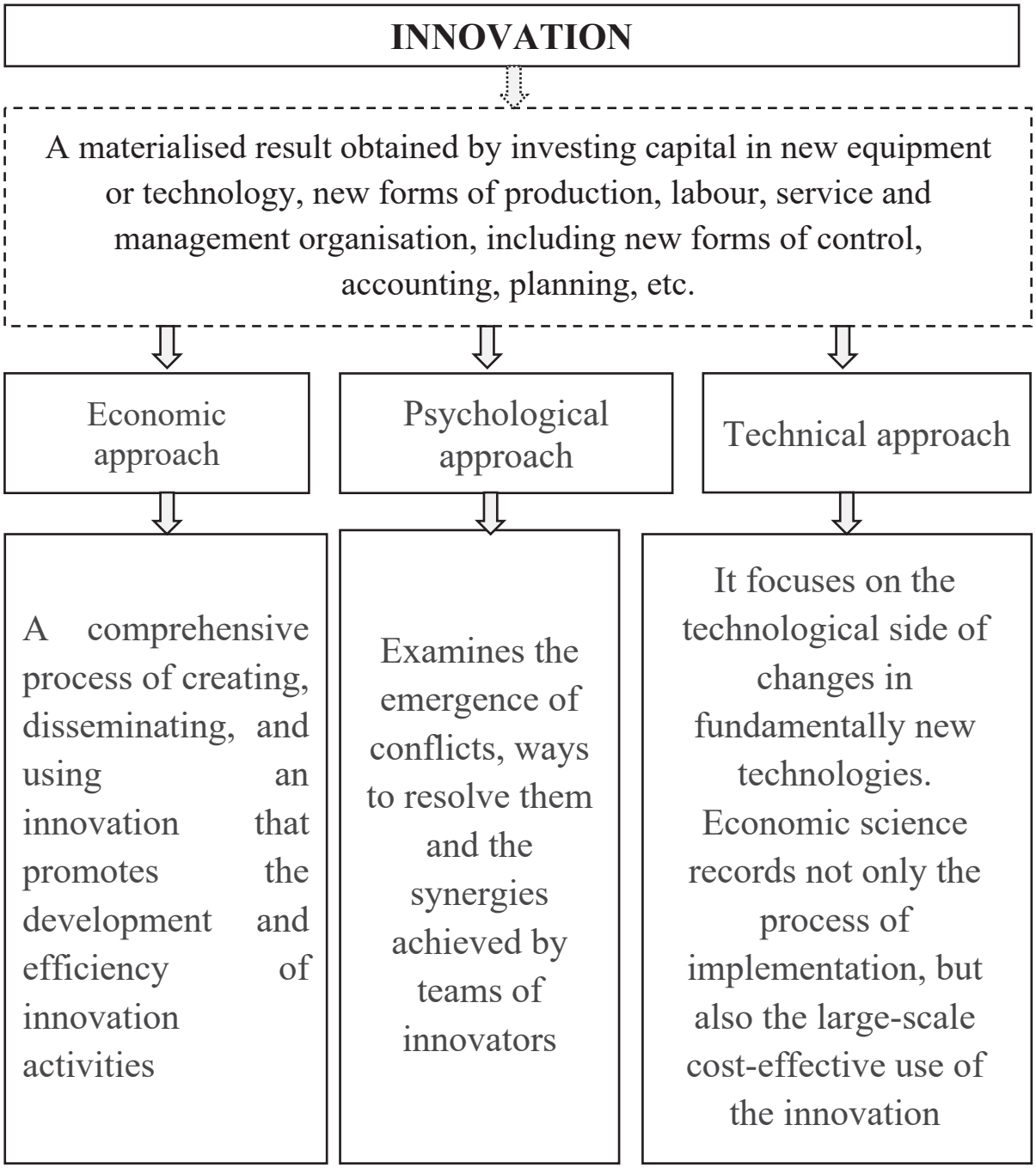

Fig. 1.5. Approaches to implementing innovations

The main scientific, technical and socio-economic prerequisites for the application of innovations are shown in Fig. 1.6.

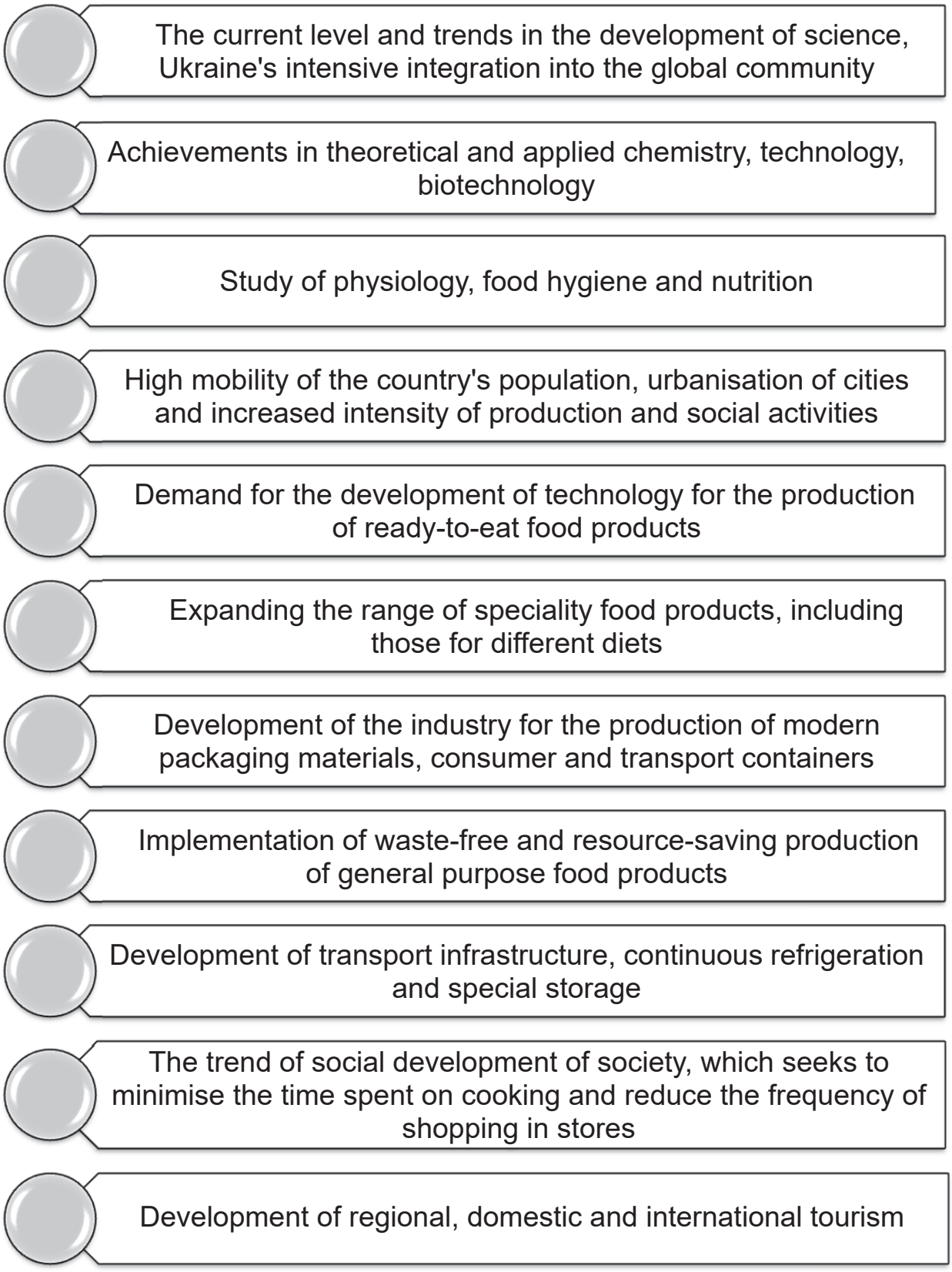

Fig. 1.6. Main scientific, technical, socio-economic prerequisites for the application of innovations

Innovations by content:

✔ technological (development of new (improvement of existing) food technology by: using new food ingredients, methods of processing raw materials and semi-finished products, packaging materials, technological equipment; creation of products with new consumer properties for mass, special and functional (health) nutrition; full or shortened technological cycle; with a certain shelf life; a certain price, etc;

✔ technical (improvement of the material and technical base, use of new equipment, automation and computerization of the production and/or technological process);

✔ economic (introduction of new methods of planning, cost accounting, etc;)

✔ marketing (introduction of new technologies for bringing products to the market, etc;)

✔ managerial (introduction of new methods of management of the institution, structural unit, introduction of quality and safety management systems, etc;)

✔ social (improvement of working conditions, introduction of corporate culture, etc.)

Technological innovations are realized through innovations in:

✔ raw materials

✔ ingredients (food additives and functional ingredients)

✔ technology

✔ equipment

✔ packaging materials.

1.2 The role of innovation in ensuring the efficiency of industrial and craft enterprises

Innovation has become a necessary element in today's world, where business competition is becoming more and more intense and changes are coming fast. The development and implementation of innovative solutions

can be a key factor for the success of any enterprise.

One of the key benefits of innovation is its ability to increase the efficiency of enterprises. New technologies can optimize production processes, reduce costs and increase the productivity of industrial lines. Implementing innovative solutions allows businesses to improve the quality of their products or services, adapt to changing market conditions, and meet consumer needs.

In addition, innovations play an important role in the development of new business lines. They allow businesses to create innovative products or services that meet modern consumer requirements or solve pressing social problems. This may include the introduction of environmentally friendly technologies, the development of new materials or production methods that contribute to sustainable development.

Industrial and craft production are two different areas, but both are important for the development of the economy and society.

Industrial production actively uses advanced technologies to manufacture large-scale products. Manufacturers implement advanced scientific developments and innovative production methods to improve product quality and optimize production processes. This includes the use of high-tech equipment, automated quality control systems and efficient management of production processes. The result of this approach is the manufacture of competitive products that meet modern quality standards and meet market needs.

Craft production is seen as an innovative and unique process that differs from industrial approaches by its pronounced individuality and craftsmanship. The main feature of this process is the use of local resources and raw materials, which not only ensures the individuality of the product, but also contributes to the development of the local economy and sustainable use of resources. The importance of this approach lies in preserving the special characteristics of raw materials and reproducing their natural qualities at each stage of production.

Industrial and craft production differ in many ways, such as the scale of production, manufacturing process, product quality, degree of

automation, and innovation. Some of the features of both types of production are summarized in Table 1.2.

Table 1.2. **Comparative features of industrial and craft production**

Evaluation criteria	*Production*	
	Industrial	*Craft*
Scale of Production	It is characterized by large-scale production, the use of large industrial equipment and flow lines for the production.	Usually has a small production scale, and production is often done by hand or in small workshops.Usually has a small production scale, and production is often done by hand or in small workshops.
Process of production	A standardized production process is used with great attention to efficiency and speed.	Usually based on manual labor and craftsmanship, often using traditional production methods.
Quality of priduction	Usually has a uniform quality due to the use of standardized processes and technologies.	It is often known for its uniqueness and high quality due to its attention to detail and handcrafted nature.
Degree of automation and innovation	It uses high automation and innovative technologies to optimize production processes.	It can be less automated and more traditional in its use of technology, emphasizing manual labor and the heritage of craftsmen.
Flexibility of production	Usually less flexible, as it is specialized in large series and mass production.	Capable of rapid adaptation and production of unique or limited batches of goods to order.

When choosing between industrial and craft production, companies usually pay attention to market needs, production costs, product uniqueness, and consumer preferences. Each approach has its advantages and disadvantages, and the choice depends on the specific circumstances and strategy of the manufacturer.

Craft products are produced in small batches in small capacities according to individual recipes by craftsmen who put creativity and uniqueness into these products based on a combination of traditional and innovative technologies to meet the needs of modern consumers. In Ukraine, the craft business in various industries is gaining popularity every year.

Today, craft production is relevant due to the growing demand for natural, high-quality products, support for regional and traditional recipes, emphasis on sustainable production and ethics, expanding culinary opportunities for consumers and creating a unique brand identity. The main priorities of such production are:

✔ Growing demand for natural products: consumers are increasingly aware of the importance of healthy eating and the harmful effects of artificial additives in food. Craft products that are made from natural ingredients without artificial preservatives, colors, and flavors meet this demand.

✔ Growing interest in regional and traditional products: craft producers often use recipes that have been passed down from generation to generation or are based on traditional recipes from a particular region. This helps to maintain local traditions and stimulates consumer interest in unique flavors.

✔ Increased attention to ethical production and sustainability: craft producers usually prefer an ethical approach to production and use products from local farmers or responsible sources. This attracts consumers who value sustainability and respect for animals and the environment.

✔ Expanding culinary options: craft products are often made in small batches with unique flavor combinations and ingredients. This allows

consumers to try new flavors and increase the variety of dishes in their diet.

✔ Creating a unique brand identity: craft producers usually offer products that are distinguished by quality, packaging design, and brand story. This allows them to attract a target audience that values individuality and uniqueness in products.

Craft production is a process of creating goods based on manual labor, traditional production methods, and the use of high-quality, often natural materials. The main idea is to create unique, handmade products that may differ from mass production.

Craft production can be characterized by the following features:

✔ Manual labor: Products are made primarily by hand or with traditional tools. Although machines may be used to some extent, the main emphasis is on manual work.

✔ Scale of production: These are usually small enterprises or workshops that are not aimed at large-scale production. They try to maintain high quality products by taking an individual approach to each item.

✔ Use of quality materials: Craft products are often made using natural, high-quality materials that give the products a unique look and quality.

✔ Uniqueness: Each product can have its own uniqueness and difference from others. Manual labor contributes to the fact that each piece can have its own characteristics.

✔ Local aspect: Craft manufacturers often focus on the local market or produce goods using local resources, supporting the local economy and culture.

This helps manufacturers create unique, high-quality products that are different from mass production and usually find their fans among those who value individuality and quality.

The role of innovations in industrial and craft enterprises and their examples are shown in Fig. 1.7.

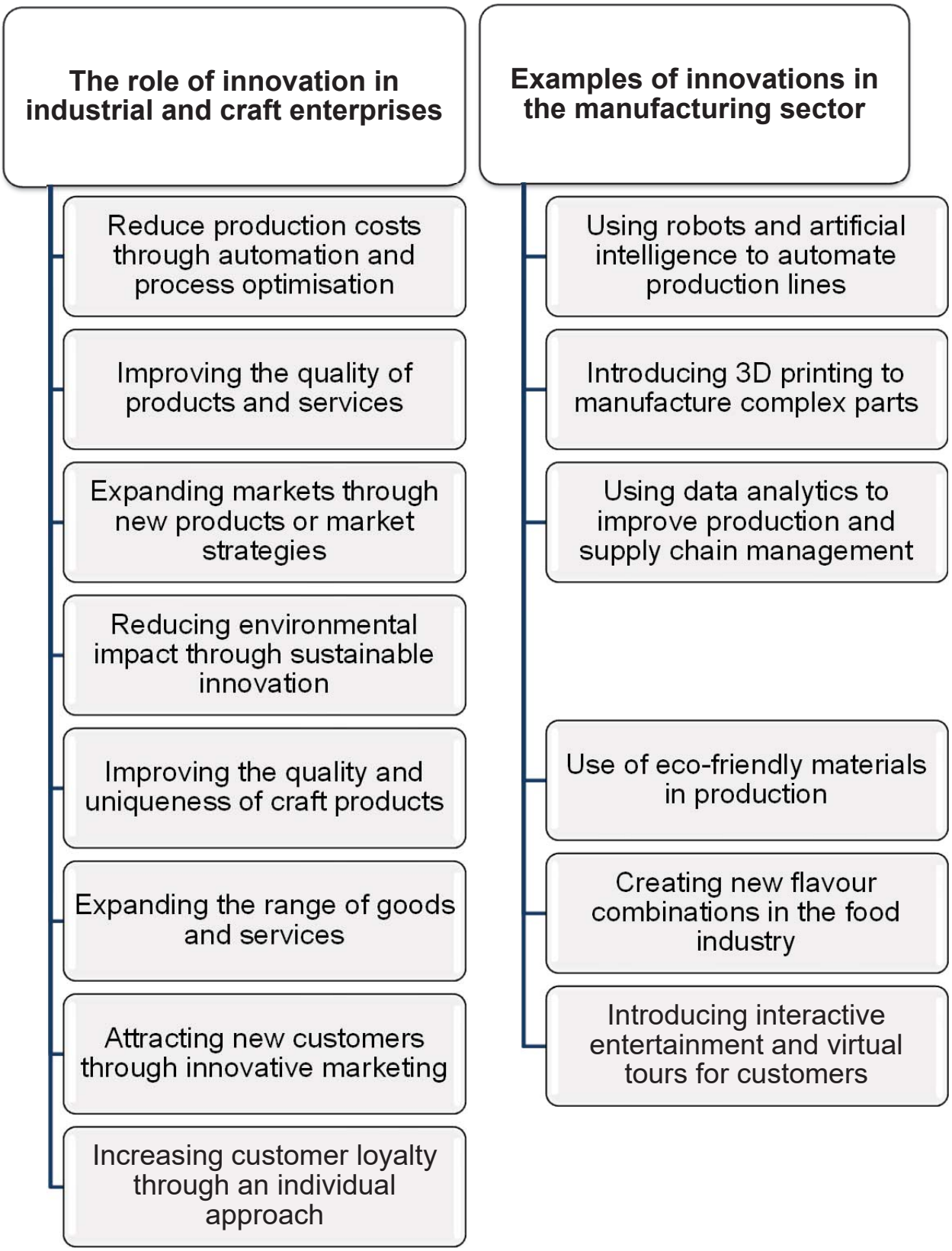

Fig. 1.7. The role of innovation in industrial and craft enterprises and examples

Both industrial and craft production have the potential to introduce advanced technologies and methods aimed at improving product quality and processes. The industrial sector, with its large scale and access to high-tech equipment, can facilitate the introduction of the latest solutions and automation, which helps to increase productivity and quality standards. At the same time, craft manufacturing, characterized by flexibility and creativity, can bring unique features to the creation of innovative products and the development of customized production methods.

Innovation can be a difficult task for many enterprises. The challenges of innovation are shown in Fig. 1.8.

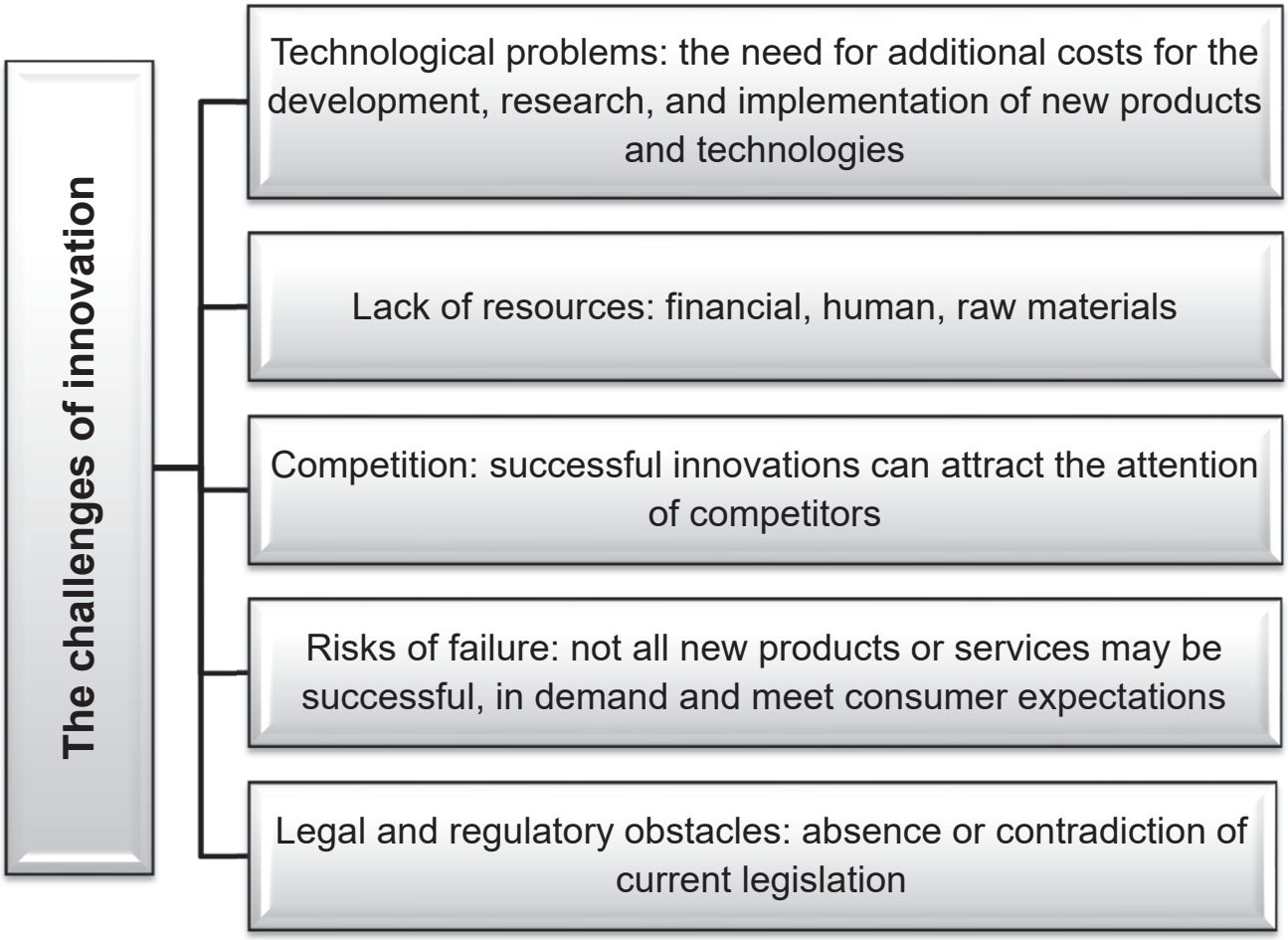

Fig. 1.8. Challenges of innovation

The joint interaction of these two sectors creates favorable conditions for the exchange of ideas, advanced technologies and best practices. The synergy between them can lead to the combination of advanced

developments with creative solutions, which opens the way to significant improvements in production and market competitiveness.

This exchange of experience and innovations allows us to create high-quality and unique products, meet the changing needs of consumers, and contribute to the sustainable development of both sectors. The interaction of industrial and craft production opens up many opportunities for innovative growth and progress towards achieving common goals.

Innovations play an important role in ensuring the efficiency of industrial and craft enterprises. They help reduce costs, improve quality, and expand markets. However, innovation also requires investment and risk. It is important to know when and how to implement them to achieve success.

1.3 Description of the innovation project

An innovation project is often implemented by many participants and organizations. According to the content structure and the nature of innovation activities, projects are divided into research and development, scientific and technical, and those related to the modernization and renewal of production.

Developing an innovative project is a long and expensive process. From idea to implementation, the process involves 3 stages:

- pre-investment
- investment stage
- operational.

Innovative projects are characterized by high uncertainty at all stages of the innovation cycle; moreover, successful testing and implementation in production do not guarantee market acceptance and successful implementation - often such production is stopped. Many projects show positive results at the first stage of development, but then are closed for a number of reasons - problems with resources, technical and technological problems.

Even the most successful projects are not immune to failure - more promising new products or analogs may appear at any time. Innovation is

difficult to predict because of its multivariate nature and alternatives. The success of an innovation project is facilitated by professional specialists, highly skilled performers, and responsible founders interested in the success of the innovation.

Each innovation project begins with a clear goal, criteria for successful implementation, and preliminary key stages of its implementation. For an investment project, the only and main criterion is financial success, while for an innovation project, fundamental novelty, patent purity, licensed protection, priority of the direction, competitiveness of the implemented innovation, production, resource and technical capabilities, and social feasibility are important. The concept of an "innovation project" can be considered as:

1. measures to achieve innovative goals.
2. The process of implementing innovative activities.
3. A set of documents that justify and describe these materials.

Innovations in food technologies are shown in Table 1.3.

Table 1.3. **Innovations in food technology**

Innovation	Innovation demands	Ways to implement innovations
1	2	3
Marketing	Meeting the needs of the general population, taking into account their psychogeographic, behavioral and other characteristics. New food products Wide range of products Integration of products and services	Production of products characterized by high nutritional and biological value
Technological	Creation of a single cycle within the framework of Business to Consumer (B2C)	Manufacturing of products in new food shapes Ensuring the

End of the table 1.3

1	2	3
	(end consumer through retailers) and Business to Business (B2B) (restaurant establishments of various formats) business processes, HoReCa segment. High consumer properties of the products. Use of raw materials with low functional and technological properties. Long shelf life	stability of quality and safety indicators during the regulatory shelf life
Environmental and hygienic	Naturalness of products. Product safety. Providing products with therapeutic and prophylactic properties	Use of natural, safe ingredients Enrichment of products with PUFAs, dietary fiber, bifidus-correcting substances, etc.
Technical	Traditional and new technological equipment that will ensure the stability of the technological process	Use of traditional and modern equipment
Organizational	Production - industrial and craft enterprises, HoReCa establishments. Sales - HoReCa establishments, retail network	Implementation of organizational and technological principles of production in accordance with the tasks set

The introduction of innovations in the food industry will allow:

❖ from a scientific point of view, to develop sound principles for ensuring the stability of food systems, develop their technology, research, determine and generalize technological parameters for the production of new products;

❖ from a practical point of view, to obtain a wide range of products for different segments of the population of Ukraine, to ensure high quality and nutritional value of products, to increase the efficiency and depth of processing of raw materials, to deepen cooperation between individual links of the food processing complex (industrial and craft production - HoReCa establishments);

❖ from the social point of view - to meet the needs of the population with affordable products through the introduction of a new range of food products, to create new jobs at existing production facilities, etc.

Innovative activity is a type of activity related to the transformation of research and development, other scientific and technological achievements into a new or improved product introduced to the market, into an updated or improved technological process used in practical activities, or a new approach to the implementation of social services, their adaptation to the current requirements of society.

Innovation activities are all scientific, technological, organizational, financial and commercial actions that actually lead to the implementation of innovations or are conceived for this purpose. Some types of innovative activities are innovative in themselves, while others do not have this property, but are also necessary for the implementation of innovations. Innovation activities also include research and development activities that are not directly related to the preparation of any specific innovation.

The objects of innovation activity are shown in Fig. 1.9.

The subjects of innovation activity may be individuals or legal entities that carry out innovation activities or attract property and intellectual property, invest their own or borrowed funds in the implementation of innovation projects.

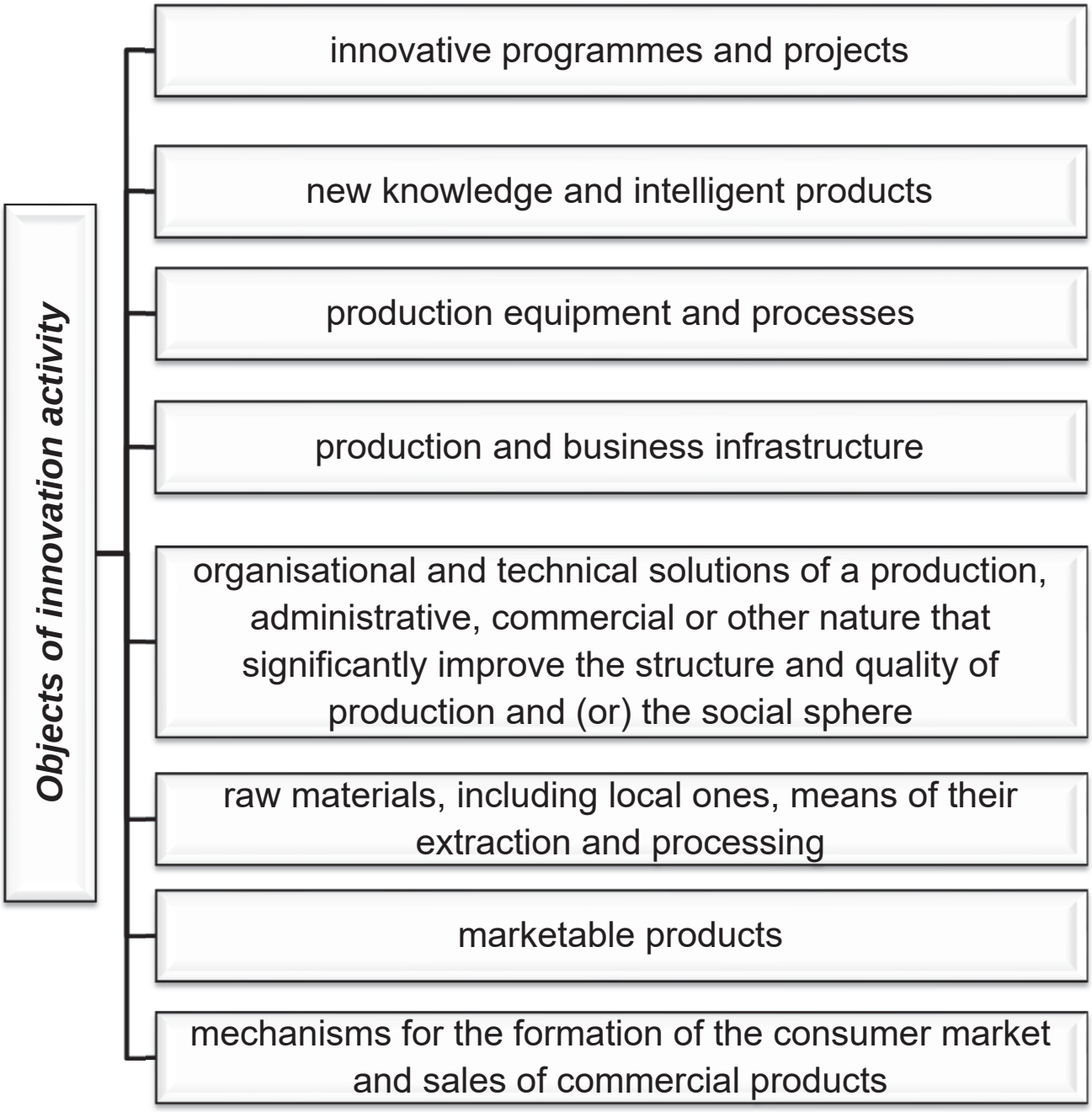

Fig. 1.9. Objects of innovation activity

An innovative product is the result of an innovative project and the research or development of a new technology (including information technology) or product with the manufacture of an experimental sample or pilot batch and meets the following requirements:

✔ it is the realization (implementation) of an intellectual property object (invention, utility model, industrial design, integrated circuit

topography, breeding achievement, etc.) for which the product manufacturer has state protection documents (patents, certificates) or licenses obtained from the owners of these intellectual property objects, or the realization (implementation) of discoveries. In this case, the intellectual property used must be crucial for the product in question;

✔ the product development improves the national scientific, technical and technological level;

✔ this product is produced (will be produced) for the first time, or if not for the first time, then compared to another similar product on the market, it is competitive and has significantly higher technical and economic indicators.

The purpose of assessing the results of the company's innovation activities is to determine the expected areas of application and use of innovations and to form a comprehensive characterization of the results achieved by new approaches to meeting existing or created consumer needs.

The criteria for evaluating the results of the organization's innovation activities are shown in Fig. 1.10.

The economic effect is determined by the excess of the cost estimate of the results of innovation activities over the cost estimate of the related costs.

The economic effect of innovative activities is estimated by the profit from:

✔ sales of innovative products or services

✔ introduction of a new technological process

✔ improvement of production capacity utilization

✔ implementation of inventions, utility models, industrial designs, rationalization proposals, etc;

✔ licensing activities.

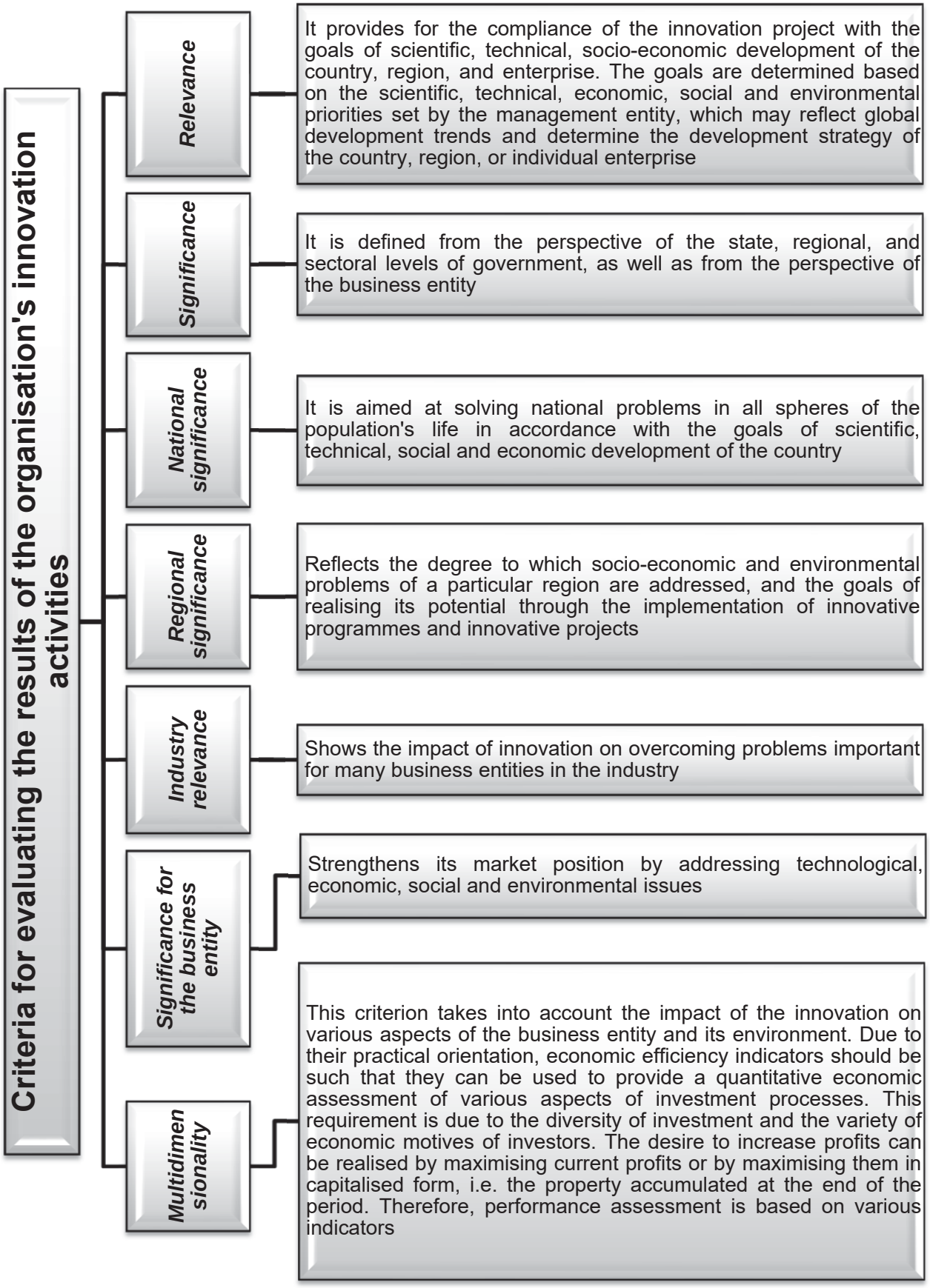

Fig. 1.10. Criteria for evaluating the results of the organization's innovation activity

The scientific and technological effect is accompanied by an increase in scientific, scientific and technical information. However, it is almost impossible to quantify it.

The scientific and technical effect of innovation activity is assessed by the following indicators:

✔ increase in the scientific and technical level of production;

✔ improvement of the organizational level of production and labor

✔ possible scale of application (national, sectoral, at the level of individual enterprises)

✔ degree of probability of success (significant, moderate, low);

✔ the number of registered titles of protection (copyright certificates, patents, know-how, licenses, etc.);

✔ increase in the share of new information technologies;

✔ increase in the share of new technological processes;

✔ increasing the level of automation and robotization of production;

✔ increase in the number of scientific and technical publications;

✔ Increased competitiveness of the company and its products in the domestic and foreign markets.

The tax effect of innovative activities is to save cash of the business entity due to a set of tax and other benefits provided to the implementers of innovative programs and projects in accordance with the legislation of Ukraine.

Assessment of the social effect of scientific and technological innovations is one of the most difficult problems of innovation efficiency in terms of methodology. Some manifestations of the social effect are difficult or even impossible to assess, and in this case they are taken into account as additional indicators of the efficiency of the national economy sectors and are taken into account when making decisions on the priority of the project and its state support.

The criteria for the effectiveness of innovation are shown in Fig. 1.11.

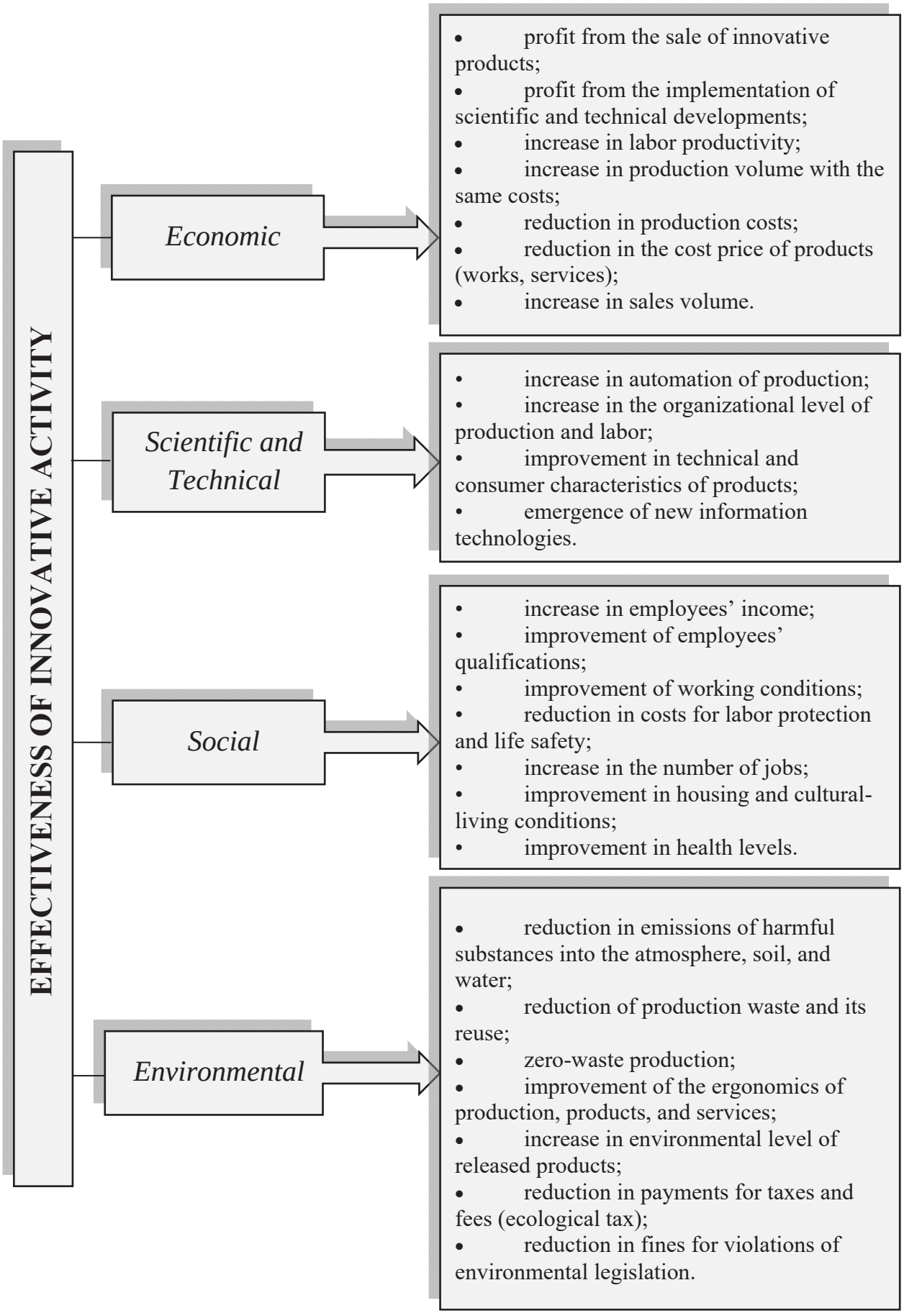

Fig. 1.11. Criteria for the effectiveness of innovation activities

The resource effect of innovation activity reflects the impact of innovations on the volume of production and consumption of a particular type of resource. It is manifested in the release of resources at the enterprise, including material, labor, and financial resources.

The environmental effect characterizes the impact of innovative activities of business entities on the environment.

The creation of complex technological systems leads to a significant increase in the technogenic load and environmental risk. Environmental safety is of particular relevance in the environmental assessment of innovations.

Therefore, it is necessary to increase the requirements for the quality of design, manufacture, operation of complex technical systems, their reliability; to create technical means that automatically block the consequences of deficiencies in the level of organization of labor, equipment and technology, which prevents accidents and eliminates their consequences.

1.4 Experience, place and prospects of HoReCa development in the modern society

The experience of the HoReCa industry reflects the accumulated knowledge and practical skills in the areas of service, hospitality and food technology. This integrated approach forms the basis for ensuring the quality of services provided, responsibility to customers and strategic planning in a sustainable competitive environment.

In today's society, HoReCa plays a key role as a key element in building social ties, facilitating the exchange of cultural values and contributing to the formation of personal identity. Hotels, restaurants and cafes not only provide food and accommodation services, but also serve as places for meetings, business negotiations and cultural exchange.

The hospitality industry (HoReCa) is one of the most important components of modern society, playing an important role in meeting consumer needs, creating new jobs and influencing economic

development.

The experience, place and prospects of HoReCa (hotel and restaurant business) development in modern society are determined by a complex context of socio-cultural and economic factors. Driven by increasing globalisation, technological innovations and changes in consumer preferences, the HoReCa industry is undergoing constant transformation.

Hospitality is a service industry characterised by a high level of competition and market saturation. The HoReCa sector in Ukraine is one of the most dynamic. In most cases, HoReCa establishments are either created or opened by well-known restaurateurs with an established reputation within the country or abroad, or are launched on the basis of well-established franchise models with a successful track record in the market.

HoReCa is an acronym for Ho (Hotel), Re (Restaurant), Ca (Catering/Cafe/Casino). This trend is gaining in importance and relevance, and most importantly, it has a huge potential for growth. This concept is actively used by restaurateurs, hoteliers, and other hospitality professionals. In our country, this term appeared relatively recently, in the late 90s, with the emergence of such establishments as restaurants, cafes, nightclubs, etc. The term HoReCa is more widely used in Europe and the US. It is also important to note that this concept does not apply exclusively to food establishments. Entrepreneurs engaged in the production and supply of various products to establishments and retail chains (e.g. food, paper tableware, bar equipment, etc.) are also considered HoReCa workers. It creates jobs not only in the service sector, but also in manufacturing, technology, marketing and other related industries.

HoReCa is an acronym that explains the structure of the hospitality industry and covers equipment, catering for hotels, restaurants, cafes and other public establishments.

The HoReCa concept includes many structural elements that have a lot in common, the most important of which are shown in Figure 1.12.

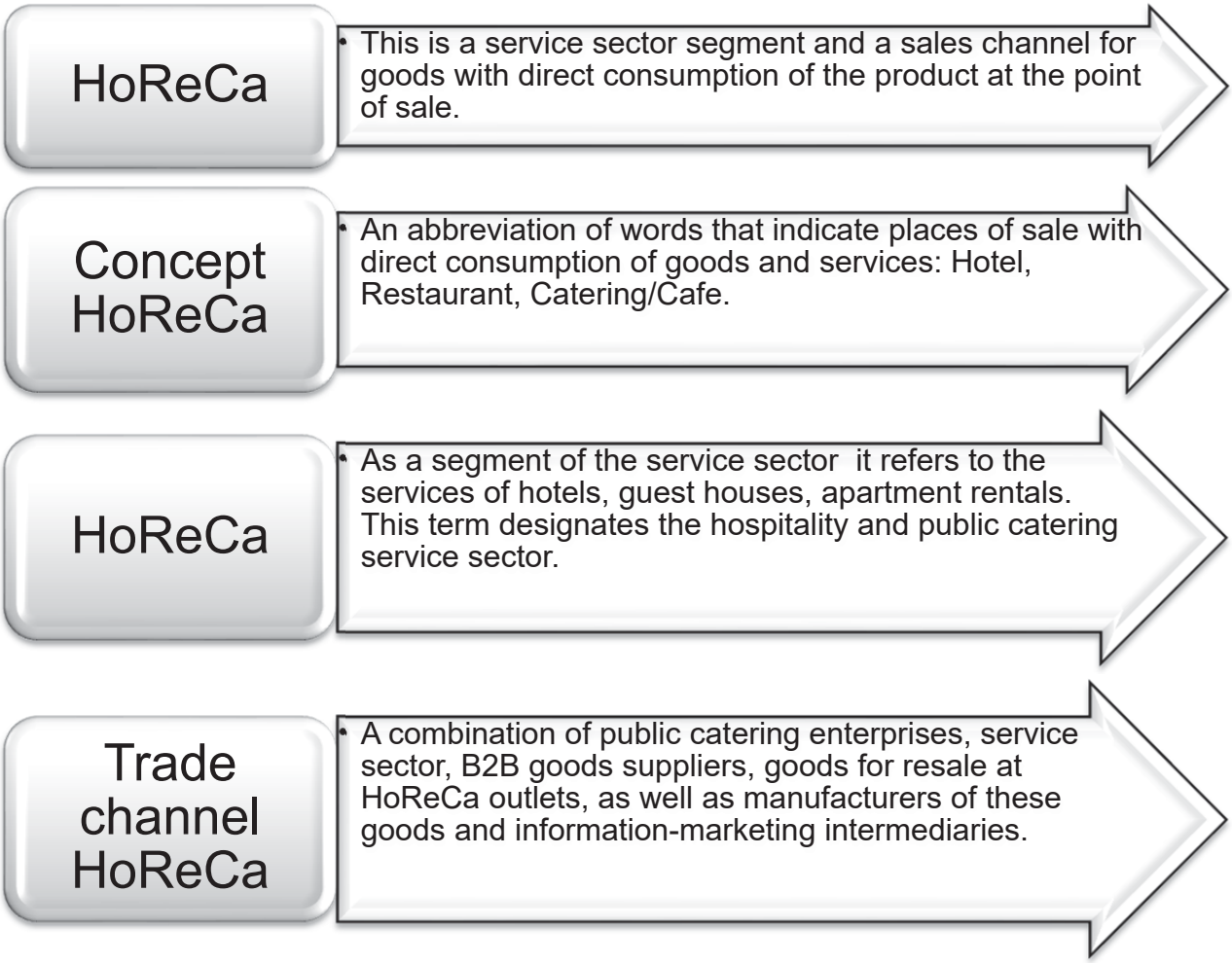

Fig. 1.12. Main features of the HoReCa concept

HoReCa is a segment of the service sector and a sales channel for goods with direct consumption of goods at the point of sale.

HoReCa as a segment of the service sector includes hotel, catering and apartment rental services. This term is used to describe the hospitality and catering industry.

HoReCa includes 3 main components:

- optimisation of the business network: increasing the customer base, recognition of the establishment, branding;
- high-quality customer service and continuous professional development;
- work in compliance with the law - knowledge of the legal framework under which the establishments operate.

Hospitality is one of the fundamental concepts of human civilisation,

which is currently provided by such economic activities as hotel and restaurant business. Over the centuries, it has evolved from places for travellers to spend the night and cater for them to the creation of powerful hotel and restaurant chains.

The HoReCa industry emerged in response to changing consumer needs in society. It covers a wide range of activities from hotels, restaurants and cafes to catering and entertainment services. Originating as a response to people's need to eat and stay elsewhere, the industry has quickly transformed into a complex mechanism where service, product quality and creativity have become key success factors.

1.5 Development of Ukrainian restaurants - from tavern to restaurant

The beginnings of the hospitality business can be traced back to antiquity, but its modern form emerged in the context of the Industrial Revolution and the growth of international tourism. Since then, the industry has gone through a number of stages of development, changing its formats, services and ways of interacting with customers. For example, global hotel chains have emerged, the approach to gastronomic spending has changed, and new formats of restaurants and cafes have developed.

The Ukrainian national culinary tradition was born within the first stage of restaurant business development during the IV millennium BC - VII century AD. The main occupations of people - cattle breeding and agriculture - played a significant role here, which led them to a special way of cooking in closed ovens.

With the adoption of Christianity in Kyivan Rus in 988, cultural and religious ties with the countries of the Christian world were strengthened, and pilgrimage became a major development. In Ukraine, pilgrims were treated with great respect. Pilgrims could stay in private houses and estates, at churches and monasteries, where the night's accommodation was mostly free, and rarely required a donation.

Meals were also free for poor pilgrims in the Lavra's dining room. For other categories of pilgrims, meals were also inexpensive. The food for the

pilgrims staying at the Lavra was partly provided by its own production, while sugar, salt, salted fish, cereals, flour, oil, and wine were purchased from suppliers. The food was mostly lean, but quite varied: dishes were prepared from vegetables, potatoes, mushrooms, bread and pies were baked. Tea and kvass were served as drinks.

Travellers were also fed free of charge at the Trinity Monastery, the Kitaevsky and Feofanovsky deserts (monasteries).

In the XII - XIII centuries, inns or guest houses began to appear in Kyivan Rus. They were intended for all categories of the population. The territory of the inn had a rectangular shape, surrounded by a stone or wooden fence, where there were various rooms connected by covered galleries. They could accommodate visitors' horses and vehicles, i.e. they offered “stabling” services, as well as meals and overnight stays. In Kyiv, there was an ‘Armenian yard’, a ‘Genoese yard’, a ‘Venetian yard’, etc. By the fifteenth century, inns had become part of postal stations.

In fact, they can be called prototypes of motels. In large cities, inns appeared, which differed from hotels in that here travellers had the opportunity not only to stay and eat, but also to carry out commercial transactions, i.e. inns combined furnished rooms, shopping arcades, shops, and warehouses. As a rule, all this was surrounded by walls and towers with entrance collars. The inns along the roads lasted until the mid-nineteenth century and ceased to exist with the development of the railway.

The Ukrainian national culinary tradition continued to be formed on the principle of ‘in spite of enemies’, which prompted Ukrainians to optimise the raw materials used, as well as through the use of new food products that appeared as a result of the expansion of Ukraine's international relations. Later, the basis for the development of the restaurant business in Ukraine at that time was created by the tavern trade.

A *korchma* is an original Old Slavic drinking establishment. Among Christian saints, there is even a patron saint of restaurateurs - Theodotus the Innkeeper.

Depending on the time and place of its location, this institution

performed not only public but also national duties. At the beginning of its existence and until the beginning of the twelfth century, the tavern was a free establishment. It served as a 'tribune' for the people, where news was announced and where public figures of the time discussed various affairs and events. Zemstvo courts met in the tavern. Almost every town had at least one tavern, and in some places there were two or four. But with the loss of 'freedom', the tavern became, if not entirely, then almost a state institution. The tavern trade was highly profitable, so it was subject to taxation. The introduction of a local heavy tax contributed to the rapid development of secret tavern-keeping in all the principalities of Rus.

In the 16th century, on the initiative of the state, a new type of restaurant appeared in Rus - a shynok, which, with strong government support, won the competition over the tavern.

At the same time, in Galicia, particularly in Lviv, *zabihailivka*, which served the first alcoholic beverages, became particularly widespread. It was analogous to a cafe or a small restaurant.

The first coffee shop on the territory of modern Ukraine, namely the Polish-Lithuanian Commonwealth, appeared in 1672 in Kamianets-Podilskyi. The fashion for coffee came to Lviv a little later in the 18th century. People used to drink coffee with milk and sugar from a cup and serve it in a coffee pot (imbric).

During the period of the Golden Horde's rule (XIII-XIV centuries), inns for officials and messengers of the Great Khan, called 'yams', appeared in Rus'. The Tatar word 'yam' means 'station'. They ate, rested, and changed horses in the yams. Accommodation and catering services were supplemented by transport services provided by the Yam Service.

In the sixteenth and first half of the seventeenth century, Kyiv was one of the trade centres of Eastern Europe. Merchant caravans from Poland, the Crimean Khanate, Turkey, Moldova, Greece, Hungary, and other Western European countries passed through it, heading not only to Ukraine but also to other countries. Ukrainian merchants had the right to trade duty-free in border towns. Special inns were set up for them. Korchmas were rented out on the Chumak and trade routes of Ukraine,

which not only sold alcoholic beverages but also served as an overnight accommodation for travellers.

A *traktir* (from the Polish word ‘trakt’ - road) is a table without an overnight stay serving vodka, wine, English beer, coffee, tea, chocolate and tobacco. A catering establishment with waiter service, located near the road, with a wide range of snacks, hot first and second courses, and buffet products. There were fashionable taverns for the rich and cheap ones for the poor. They became the ancestors of today's restaurants. The best streets of Kyiv were decorated with traktir signs: City of Paris, Royal House, Swedish, Tavriysky. The owners of these establishments were foreigners: French, English, Germans, etc.

The first real restaurants appeared in Ukraine in 1805. In 1821, there was a need for legislative regulation of the restaurant business, so the Regulation ‘On establishments of the tavern trade’ was issued (as amended in 1835; 1861; 1893), which distinguished the following categories: hotels, restaurants, coffee houses, taverns and inns. The notion of a restaurant as a separate high-class establishment was legally formalised only in 1894.

A *kharchevnia* was a catering establishment where one could taste first and second courses, snacks, and drink vodka.

A *Chaina* was a catering establishment that sold only second courses and buffet products (without alcoholic beverages). Tea was usually served in two kettles: one for boiling water, the other for brewing. The state offered special conditions for the operation of ‘tea establishments’: minimal rent and a very low tax rate, which allowed this type of establishment to spread rapidly.

A *kabak* was a drinking establishment for the common people, where only alcohol (vodka, beer, mead) was served. A Kabak was a large room with simple furnishings.

In modern Ukraine, in the late XIX - early XX centuries, under the influence of Western culture, confectioneries and shanty cafes became quite widespread, serving wine, fruit, snacks, an orchestra, concerts and dances. In this way, catering enterprises (establishments) with leisure activities (entertainment performances) gradually appeared on the market.

Historical references show that the restaurant business in the mid-nineteenth and early twentieth centuries, along with the hotel business, was one of the most prestigious and profitable. The social and cultural significance of this sector of the economy was recognised by both the government and society.

Coffee houses flourished in the first decade of the twentieth century. Lviv had 25 coffee houses, and in 1911 - 46. The Viennese type of coffee houses was replaced by the Warsaw type, which was characterised by great attention to the interior.

The events of October had a negative impact on the development of the restaurant business in the territory of modern Ukraine. In accordance with the first decrees of the Soviet government, the restaurant business was classified as trade; restaurant businesses were nationalised, and the unique culinary tradition was recognised as ‘anti-revolutionary’, ‘bourgeois’ and ‘anti-Soviet’. The reorganisation of the restaurant business into public catering laid the foundations for the giant gap between this sector of the economy and other countries. One of the most difficult problems, which was of a long-term nature, was the loss of highly qualified personnel - restaurateurs with professional knowledge, best practices, brands, gastronomic traditions, etc.

Certain elements of the restaurant business were observed in restaurants and cafes that belonged to a public chain. According to domestic scholars, this period saw the unification of Ukrainian cuisine through the development and implementation of standards; the diversity of Ukrainian cuisine was reduced to a minimum set of dishes.

As a result of the implementation of the country's industrialisation policy, in the second half of the 1920s, the first large catering enterprises of the ‘factory-kitchen’ type were established in large industrial centres, and centralised catering systems were formed, which further contributed to the division and development of networks of procurement and preparation enterprises (establishments) of the catering industry (restaurant business).

The development of enterprises (establishments), especially those engaged in catering at factories and in transport, was positively influenced

by an innovation of the 50s and 60s of the XX century, which consisted in the production and further use of frozen food. The growth in the speed of service and the increase in the level of satisfaction of the need for catering services was facilitated by the active development of the self-service system, which by the end of 1959 covered about 90% of canteens, tea rooms, cafes and snack bars. The development of a network of vendorless cafeterias and self-service halls in canteens at mines, universities and schools, as well as the introduction of food subscriptions and credit catering, provided significant benefits in terms of labour and service time savings when organising meals at the place of study and work.

In the 1970s, new technical capabilities expanded the range of fast food outlets, which contributed to the growth of their popularity and, consequently, led to their active development in various countries.

Thus, for the Ukrainian restaurant business, the time period from the early 20s to the late 80s of the XX century was a period of dramatic changes, characterised by the reorganisation of the restaurant business into catering.

After Ukraine gained independence, a period of qualitative and quantitative restaurant development began.

Some scholars consider this period to be the ‘new birth’ of the Ukrainian restaurant business. Denationalisation and privatisation, commercialisation started the processes of market transformations, contributed to the establishment of the restaurant business in Ukraine, during which fundamental changes took place and continue to take place, characterised by changes in ownership from state and collective to private, the possibility of choosing different organisational and legal forms of management, the formation of a new network of establishments of individual entrepreneurs and a change in the ratio with the network of legal entities, significant changes in the shares of public and closed

From the second half of the twentieth century to the present day, the development of the HoReCa sector has been characterised by an active managerial desire for innovation, which is primarily due to increased competition. During this period, innovative approaches appeared on the

restaurant market (Fig. 1.13).

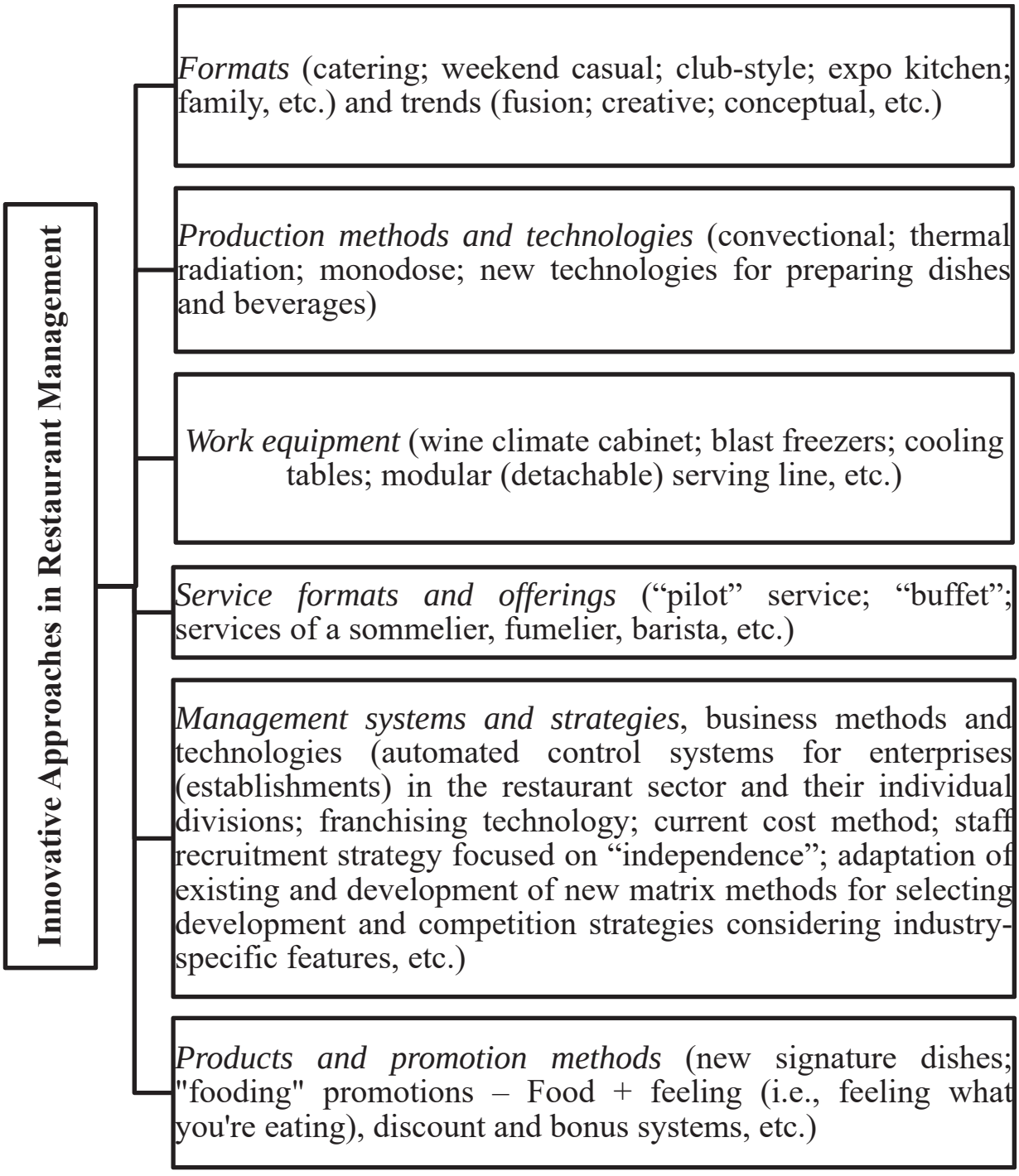

Fig. 1.13. Innovative approaches of restaurant companies

1.5.1 Prospects and opportunities for HoReCa development

The Ukrainian HoReCa market is quite dynamic and competitive. Compared to Europe, in 2016-2021, there were about 30 people per 1 seat in a restaurant, while in Europe there were only 8. This suggests that the

hospitality industry in Ukraine is well-developed and popular.

With the onset of the pandemic, this figure has significantly decreased, and the activity of catering and coffee shops has begun to decline significantly. The introduction of the lockdown regime has restricted visitors' access to establishments and imposed strict restrictions. Demand for out-of-home dining services has fallen significantly in popularity. After these events, only 70% of establishments were able to resume operations.

The events of 2022, the beginning of the full-scale invasion, led to a new crisis in the HoReCa sector. Most establishments ceased operations, and owners of coffee shops and restaurants emigrated abroad, starting their businesses in other countries. This has led to an unstable market situation at the moment. Currently, establishments that focus on food delivery and gastronomic restaurants that have completely renewed their business concept and do not hold back in creating extraordinary and creative menus are gaining ground.

The positive effects of the development of the restaurant industry in Ukraine are shown in Fig. 1.14.

Ukraine's restaurant industry was one of the first to switch to market relations. After the privatisation of enterprises, the organisational and legal framework of the restaurant industry changed, and a large number of private enterprises started operating.

Competition is an integral part of a market economy. As visitors have more choices, the main task of each enterprise is to improve the quality of products and services provided.

To achieve its goals, a company must also take into account all the technical, administrative and human factors that affect product quality and safety, which together form a quality system.

This system covers many segments. It includes management responsibility, procurement of raw materials and products, development of new products, production management, control, identification of services and products, prevention of wrongdoing, management of service processes, statistical methods, product safety, marketing, and training.

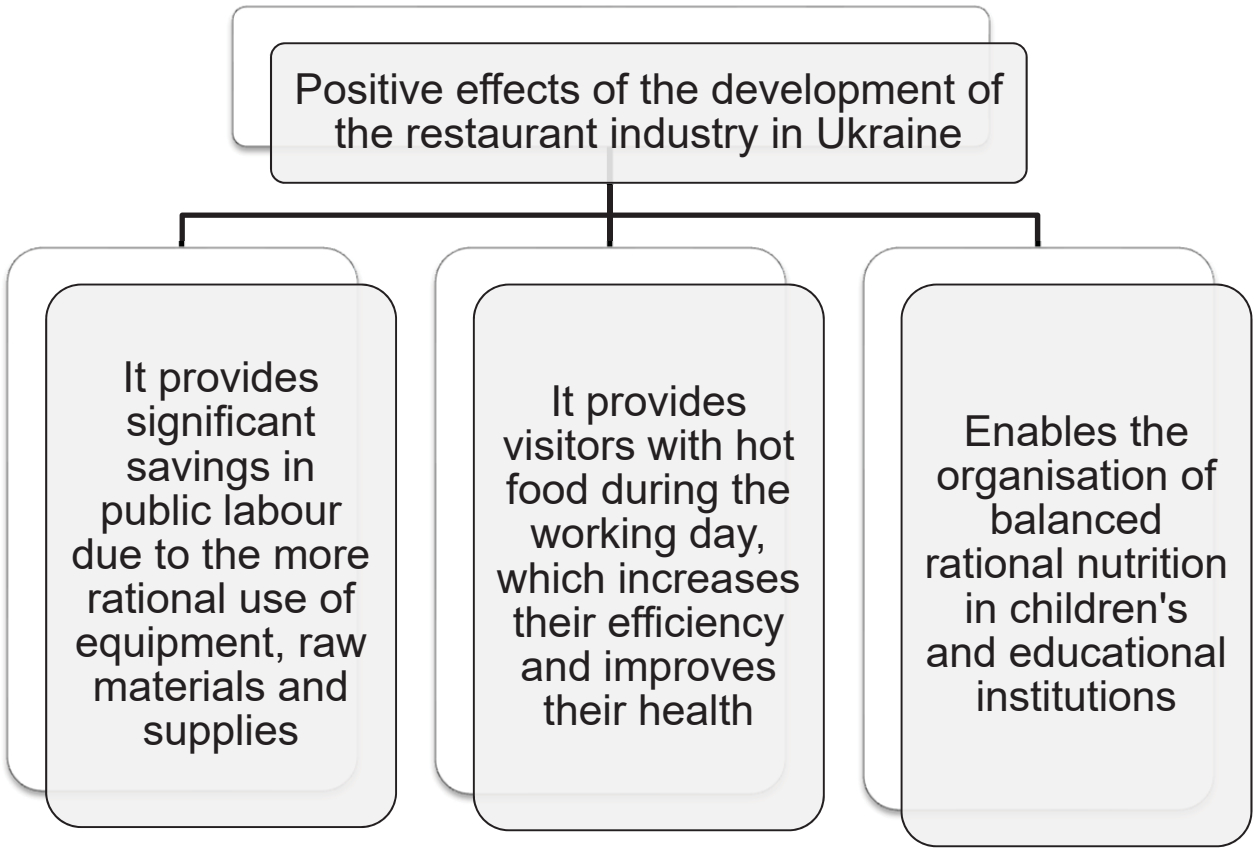

Fig. 1.14. Positive effects of the development of the restaurant industry in Ukraine

The key to the company's success is the quality of services provided, as shown in Fig. 1.15.

The HoReCa sector remains an important element of modern society, combining economic, social and cultural influence. Its development depends on the ability to adapt to changes, introduce new technologies and respond to consumer needs.

In addition, the growing interest in healthy lifestyles and environmentally friendly products poses a challenge to hospitality companies - the need to adapt menus and concepts to meet these new consumer needs.

By focusing on sustainability, increasing the use of local products and reducing waste, the HoReCa industry can play a key role in shaping a more environmentally conscious approach.

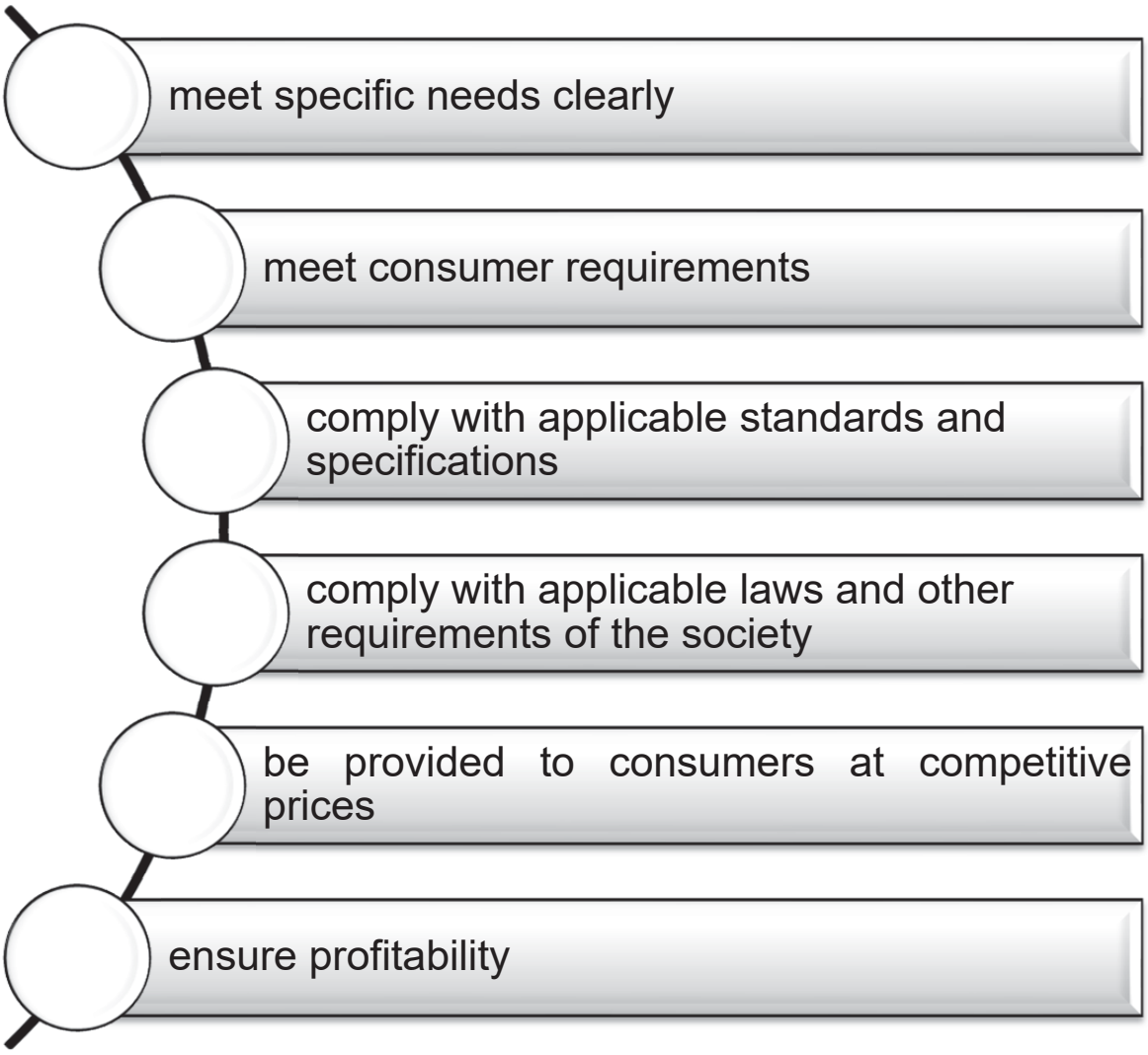

Fig. 1.15. Requirements to the quality of services provided

The hospitality industry plays a significant role in economic development, contributing to tourism growth, job creation and infrastructure development. In addition, the industry has an important socio-cultural significance, influencing the formation of cultural and gastronomic traditions, creating places for social gatherings and contributing to the development of culinary and cultural skills.

In the modern world, the HoReCa industry is constantly transforming under the influence of new technologies, changes in consumer preferences and environmental requirements. The use of digital technologies is expected to continue to grow in order to provide customer convenience, develop online services and personalised service. In addition, the industry

is actively responding to environmental challenges by developing the concepts of sustainable food and reducing environmental impact.

The development prospects of the HoReCa industry lie in the improvement of technological processes, optimisation of services, as well as in the improvement of safety and sustainability standards. Changes in consumer trends, the growing popularity of healthy lifestyles and the sustained maintenance of cultural diversity are expected to shape the evolution of the HoReCa industry in the future.

As a result, the experience, place and prospects of HoReCa in modern society depend on a deep understanding of consumer needs, improved technologies and the ability to adapt to constant changes in the socio-cultural and economic environment.

- In the context of the development of a market economy and Ukraine's integration into the global economic space, the place and role of the hospitality industry are being reconsidered. Changes in economic development in the country require new approaches to management and organisation of activities, which should be focused on maximising customer satisfaction and ensuring a high level of efficiency in their production and economic activities.
- To succeed in this area, it is important to take care of all the components, including:
- The specificity of the HoReCa sector is constant customer care and maximum focus on the needs of the visitor. Customers in a cafe pay not only for a specific item on the menu and drinks on the cocktail menu. They pay for the mood, service and atmosphere.
- Interior design features of the establishment.
- Staff recruitment. Special attention is paid to the selection of staff. A hostess, a waiter, an administrator - each of them can either spoil the impression of the establishment or make a casual visitor fall in love with it and make a loyal regular customer.
- Assortment. Successful establishments do not become successful overnight. It is a complex work that requires taking into account all the components.

The HoReCa business, which includes hotels, restaurants, cafes, bars and other hospitality establishments, has a rich historical experience and an important place in modern society. Taking into account this experience, the most promising areas of HoReCa development are:

- Tourism: Hospitality is a key segment of the tourism industry. Hospitality plays an important role in attracting tourists and supporting travel.
- Economic importance: the HoReCa business creates a large number of jobs and generates significant revenue for regional and national economies.
- Consumer culture: hospitality is not only a place to eat, but also a social place to meet and have fun.
- Technological innovations: The use of technology, such as online reservations, food ordering apps and automated service systems, helps to improve the quality of service and reduce costs.
- Sustainability and sustainable business: There is a growing focus on sustainability, and many HoReCa businesses are looking for ways to reduce their environmental footprint to ensure environmental responsibility.
- Changing consumer preferences: modern consumers value quality, authenticity and organic products more, which opens up new opportunities for restaurants and cafes.

Despite its rich experience and important place in society, the HoReCa industry is constantly changing and adapting to new trends and consumer demands. Innovations are important for its successful development, as they help businesses survive in a competitive environment and meet the needs of modern consumers.

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Study guide

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INNOVATIVE INDUSTRIAL AND CRAFT TECHNOLOGIES FOR HoReCa