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**OPEN INNOVATIONS AS A TOOL OF RESTAURANT  
BUSINESS EFFECTIVE ACTIVITY****V. SHCHERBAK <sup>1</sup>**<sup>1</sup> Kyiv National University of Technologies and Design

**Introduction and aim of the research:** The need to create an effective system of innovation development of restaurant business makes it especially important issues of theory and methodology, with taking into account the peculiarities of this sphere and the specifics of the services provided. Scientific support of solutions to these problems will contribute the creation of a well-functioning public catering, which primarily depends on its successful development and increasing demands from consumers to the quality.

**Research hypothesis.** It is expected that the use of open innovations in the restaurant industry will create an effective quality management systems that are adapted to work in modern conditions.

**The aim** of this research is to develop a model of the validity of open innovations use in restaurant business.

**Methodology:** systematic analysis has been used to support the strategic system of

balanced indexes based on "The ability to attract / provide innovations"; cluster analysis - to analyze and summarize the current state of the restaurant industry in accordance with the nature of their involvement in innovation activity; discriminant analysis - to build the model of the feasibility of innovative behavior of restaurant business.

**Results:** proposed ways of improving service delivery in the restaurant business, approach of innovation management in the restaurant business, substantiated model of the concept of innovative behavior.

**Conclusions:** proposed approach to the use of a system of open innovations as a mean of organization of innovative activity aimed at improving internal innovation management system, and as a result, the production of competitive catering product that meets modern needs of the market.

**Keywords:** open, closed innovations, restaurant business, violent, stakeholder and accelerator.

**Formulation of the problem.** Restaurant business - one of the few areas of the economy, in which from the very beginning of economic reforms fully emerged market relations, and today, decades later, it is the most dynamic and profitable and, therefore, promising for investments and attractive business segment on Ukrainian service market.

In many ways, the development of the restaurant business in modern Ukraine occurred stochastically, through trial and error, and scientific methods of entrepreneurs organization and management, were not used for certain reasons. However, after the crisis the situation has radically changed: real competition has come to the market of restaurant services, and the consumer has become more sophisticated, that has set a number of new challenges, such as the need to improve production efficiency and strengthening competitive position and this is inevitably associated with the implementation of modern management and marketing innovations.

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Modern business conditions require effective development strategies based on innovations, relevant to market needs and that ensure the growth of enterprises in the sphere of public restaurant. It is entrepreneurship in this case play a key role in addressing these problems, since it is the basis of the market economy and covers a wide range of economy sectors, including the restaurant. Innovation is the dominant factor in the formation of the economic development trajectory and determines the possibility of transition of the consumer market sector to a qualitatively new level of development, which, in turn, requires a conscious and purposeful management of enterprise structures innovative development.

The need to create an effective development management system in the field of restaurant business makes such issues as theory and methodology particularly important, with taking into account the peculiarities of this field and the specifics of the services. Today we need adequate conditions prevailing approaches to the development management of the restaurant business, the principles and methods of planning and management activities from a position of the modern economy and requirements of management practices. Scientific support for to these problems solutions will contribute the creation of a well-functioning public restaurant, which primarily depends on its successful development, strengthening of competition and increasing demands from consumers to the quality of services.

This raises the need to create innovative management mechanisms of restaurant business that enhance the competitiveness and efficiency of the enterprises in this field.

**Analysis of recent publications and the unsolved part of the problem.**

To this issue devoted a considerable amount of works, both foreign and Ukrainian authors. Among the most important ones, worth mentioning the study of foreign authors M. Porter, C. Egerton-Thomas, F. Kotler, S. Ansoff, K. Haksevera, B. Render, R. Russell, R. Merdik, D. Norton, R. Kaplan, P. Doyle, D. Enzhdela, Peter F. Drucker, Henry W. Chesbrough.

Fundamental and theoretical aspects of the problem are reflected in the works of Ukrainian and foreign scientists: K. Aysytulin [1], V. Antonov [9], A. Afanasyev [3], A. Belousov [3], S. Siegel [6], B. Karsenin [4], T. Litvinenko [10], B. Marvyn [7], I. Sokyrynyk [8], T. Tkachenko [4] and others.

Insufficient knowledge and the level of innovation management in the restaurant business, on the one hand, and the large scientific and practical significance - on the other, led to the choice of the study, its purpose, objectives and issues.

**The aim** of the study is to develop a model of the validity of innovations use in restaurant business.

**Results of the study.** Innovative management - integrated set of actions aimed at achieving or maintaining the necessary level of viability and competitiveness of the enterprise with the help of innovative process control mechanisms. The objective basis for innovations make the new requirements, which are formed in different areas of individual's life.

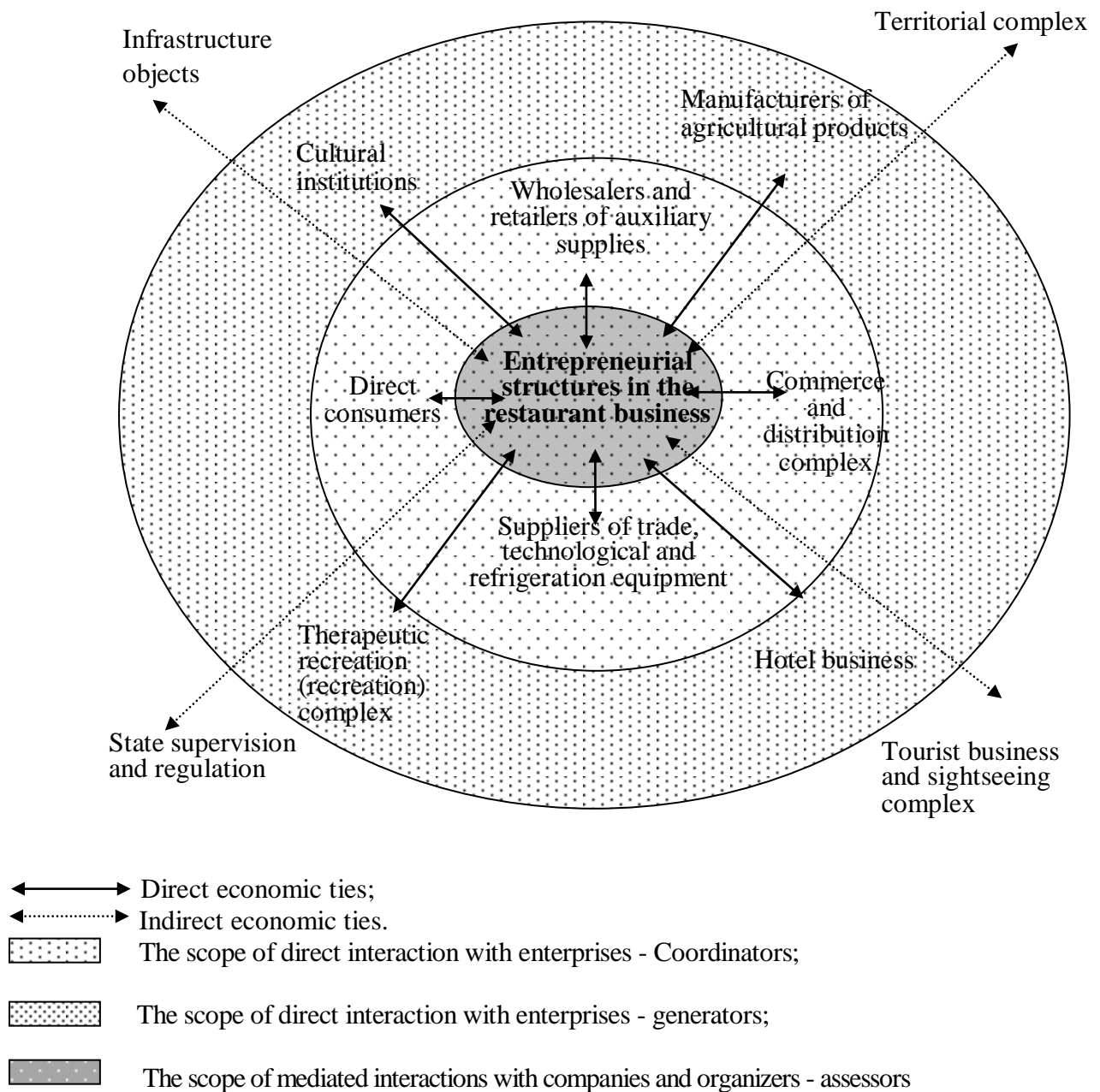
Depending on the use, there are three groups of innovations: product - new products in production or in consumption; technological - new ways (technologies) of producing old and new products; management - new methods of work. All these three types of innovations are taking considerable place in the restaurant business. However, there are some specific features of innovations in the restaurant business. An interesting feature of the restaurant business is a dual composition of the restaurant product. Therefore, the restaurant product can be divided into tangible (product) and intangible (service) components, which must comply with requirements of the market. Another feature of the restaurant services, which distinguishes them from industry services, which increasingly use machines, is the involvement of people in the restaurant process. The human factor is one of the big problems of the restaurant business - the variability of the quality and associated lack of standardization.

Multifactor environment of modern restaurant enterprises forces them always to be able to find new opportunities on the market of restaurant services, technologies and consumers, effective control mechanism, which is able to respond to changes and to act in terms of uncertainty. Thus, there is a need to establish an innovative control system in restaurant business, i.e. the application of new management methods that would allow functioning more effectively in the conditions of heightened market competition. Connection with other industries and possible sources of innovations are presented in Figure 1.

1) cooperators - economic entities, cooperation with which can improve production efficiency, reduce costs and improve the quality of products by harmonizing them with terms of production volumes and delivery time, its quality and variety. These entrepreneurial structures include: direct buyers and suppliers, the subjects of trade and supply industry;

2) generators - economic entities cooperation with which can improve turnover due to additional production: treatment complex, tourism industry, agricultural producers;

3) assessors - economic entities with which the restaurant business does not collaborate, but the sustainability of this type of structures and effective activity of such structures will indirectly have a beneficial effect on the activity of restaurant business.



*Proposed by author*

**Figure 1. The classification of entities that interact with enterprise structures in the restaurant business**

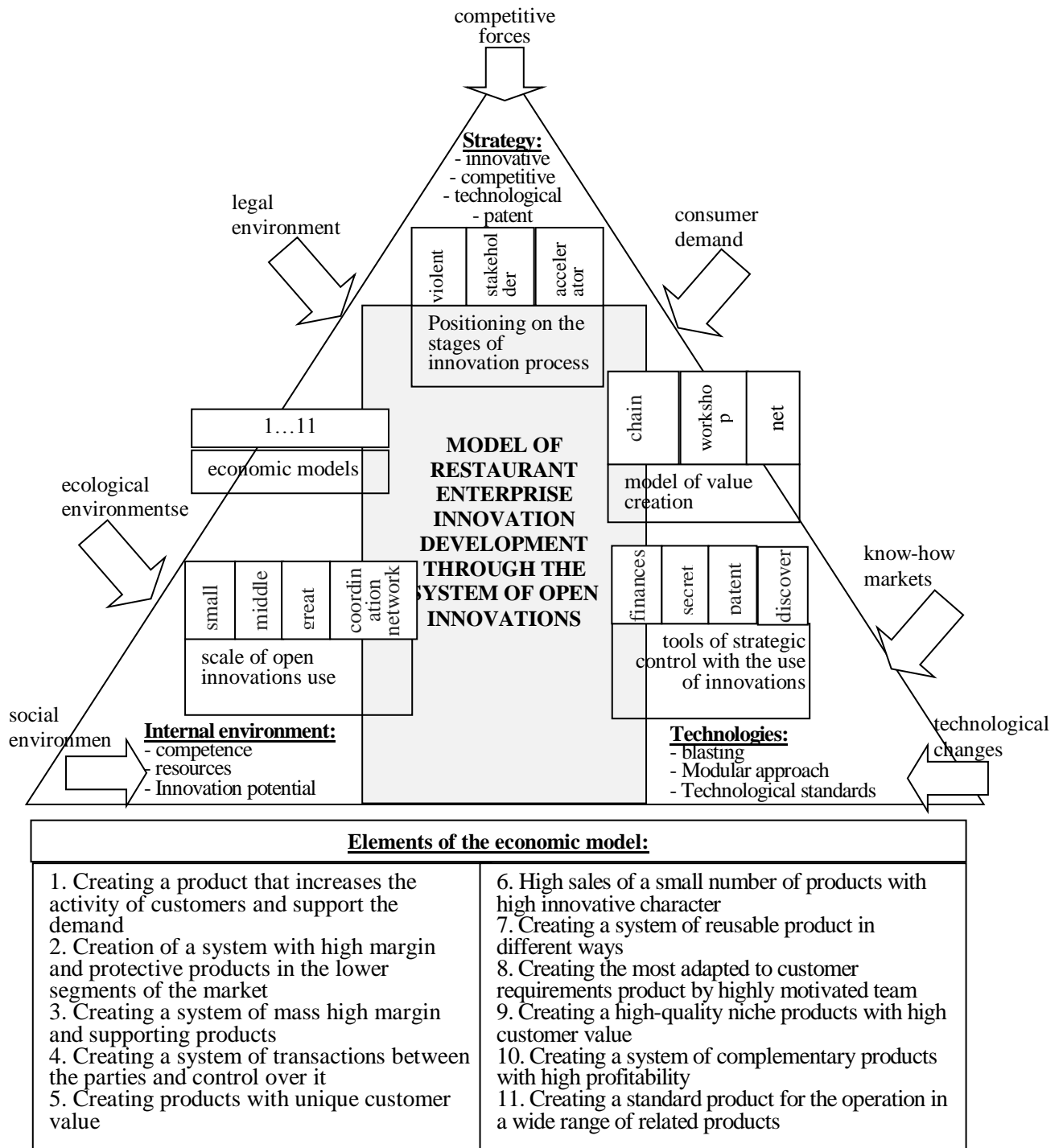
The complexity of the organization problems of the economic collaboration (for example, between suppliers and consumers) is that in the country there are hundreds of thousands of organizations in diverse business contacts with each other, bound by mutual supply of products. Under these circumstances, an urgent task is to assess the effectiveness of economic collaboration. At the same time, the more complex interaction and the number of subjects - the higher the probability of innovation initiation.

In accordance with the theory of M. Porter, the company is able to influence the competition and external factors by adapting to changes in the environment. Consequently, the ability of restaurant enterprises to highlight the most important factors and parameters, the direction of change, choosing the optimal strategy and innovative management tools for its implementation, forecasting future changes is highly valued [11, p.125].

Thus, innovative management in the restaurant business is a way to organize management activities aimed at improving the internal management system, and as a result, production of restaurant product that meets modern needs of the market. Currently, the main source of innovation development are own funds of owners and innovations. In the XXI century, the competitiveness of many companies depends on the degree of innovation. There are two large groups of innovations: closed and open. Closed innovations - an approach to innovation that uses only internal sources of the organization, namely, its own R & D. This approach implies that the company creates special department, which aims exclusively at developing innovations. Open innovations - an approach to innovation that allows you to use not only internal sources, but also external. The idea is that not all of the smartest people work for the same company. Companies need to involve people from the external environment of the organization, so they offer their ideas, make comments, and thus improve the final product. The theory of open innovations defines the process of research and development as an open system [13, p.185].

A conceptual view of the model of company innovative development through open innovations as a set of alternative strategic decisions with "traditional" and innovative components is shown in Figure 2.

Modeling of the open innovation system development should be seen as a link between technologies and enterprises environment, through which it is possible to adapt the company to external changes both in the area of the model as a whole and its individual components and connections. As a typical solutions for the use / implementation of innovations (and their unifying elements) were identified the following classes: "violent" (enterprise, which have a high level of mastering technologies firmly holds the niche, seeks to expand it and access to world markets, control all stages from concept to marketing of the finished product, bringing to outsourcing only standard operations specific for its activity), stakeholder (company interested in the activity and development of innovations, regulates the market, supports innovations and encourages certain transformational processes, involves in participation at various stages of the project as a partner) and "eksplerant" (company-innovator that obviously goes to great risk, and the profit from sales of new products and technologies depends on the talent of staff, operates mainly in the markets of know-how, patents and licenses, in most cases involved in the development, commercialization and selling the final product).



*Proposed by author*  
**Figure 2. Model of restaurant company innovative development through open innovations**

The key element in the proposed model is the existence of opportunities to achieve the strategic goals of the company and the ability to adapt to environmental changes. The relationship between the components of the model are displayed in different forms (depending on enterprise class towards open innovations). For example, the closed innovations model correspond to positioning the company as “violent”; for stakeholder the use of such models is difficult due to the fact that its purpose is to coordinate innovation processes; for “accelerator” - almost impossible because such enterprise implies innovation licensing to other enterprises. Open models impose fewer restrictions on the range of possible options for positioning.

The possibility of implementing the proposed model and its stability depend on its compliance with internal features - resources, processes and potential of the company: competence (knowledge, abilities, skills and experience of staff and the whole enterprise); resources (finances, assets and other resources of the enterprise); innovation potential (the ability of enterprises to perform innovation processes, create value, generate income and products based on them). For the typology of surveyed restaurant enterprises based on "The ability to attract / provide innovations" was conducted clustering with the use of STATISTIKA10, the list of indicators presented in Table 1.

Table 1

**Strategic table of the balanced indicators system based on "The ability to attract / provide innovations"**

Introversion of innovations	Extraversion of innovations
1. The share of venture capital Ki1	1. The share of income from open innovations Ke1
2. Number of acquired innovations (patents, licenses, copyrights, etc.) Ki2	2. The share of expenses on open innovations Ke2
3. The coefficient of innovations expansion Ki3	3. The share of innovation disposal Ke3
4. Ratio of investments in innovative projects Ki4	4. The share of transferring on outsourcing non-core functions Ke4
5. Coefficient of international openness to innovative products Ki5	5. Value of transfer knowledge and technologies Ke5
6. The share of partnership in the open innovation system Ki6	6. The percentage of transmission to modern databases "open innovations" Ke6
	7. The actual impact of R & D Ke7

*Proposed by author*

Initial data for clustering restaurant enterprises based on "The ability to attract / provide innovations" were indicators that characterize extraversion (innovation openness for external use) (Table 2).

Table 2

**Calculation formula of innovation introversion factors**

Assessment of innovation introversion	Formula	Marks
The share of venture capital in the total amount of investments	$K_{i1} = VC / I$	BK – venture capital I – total amount of investments
Number of purchased innovations (patents, licenses, copyrights, etc.)	$K_{i2} = OPII$	OPII – Number of purchased innovations (patents, licenses, copyrights, etc.) in money equivalent during certain period
Index of innovation expansion	$K_{i3} = CAIAOI / TVIA$	CAIAOI – the cost of acquired intangible assets of open innovation; TVIA – the total value of intangible assets
Indicator of investments in innovative projects	$K_{i4} = IIP / TCIP$	IIP – the investments in innovative project; TCIP – the total cost of the innovative project
Index of international openness to innovative products	$K_{i5} = VSIPA / TVIP$	VSIPA – the volume of sales of innovative products abroad; TVIP – the total volume of innovative products
The share of partnership in an open innovation system	$K_{i6} = PEIP / TCIP$	PEIP – partners expenses on innovation project; TCIP – the total cost of the innovative project

*Proposed by author*

The indicators that characterize the introversion (possibility of internal use of innovations) are presented in Table 3. Such statement of the problem allowed obtaining a generalized picture of the changes that occur in a set of features.

Table 3

**Calculation formula of innovation extraversion**

Assessment innovation extraversion	Formula	Marks
The share of income from open innovations	$K_{e1} = IOI / AI$	IOI – income from open innovations AI – total income
The share of expenses on open innovations	$K_{e2} = EOI / AE$	EOI – expenses on open innovations; AE – total expenses
Indicator of innovation disposal	$K_{e3} = VIAUOI / TVIA$	VIAUOI – value of intangible assets used for open innovation; TVIA – the total value of intangible assets
Indicator of non-core functions transferring to outsourcing	$K_{e4} = SFTO / TABPE$	SFTO – scope of functions transferred to outsourcing; TABPE – the total amount of business processes in the enterprise
Indicator of knowledge and technologies transfer	$K_{e5} = VIPSA / TVIP$	VIPSA – the volume of innovative products sales abroad;



		TVIP – the total volume of innovative products
The percentage of information transmission to modern database "open innovation"	$K_{e6} = PEIP / TCIP$	PEIP – partner expenses on innovation project; TCIP – the total cost of the innovation project
The actual impact of R & D	$K_{e7} = \frac{\sum R}{\sum_{i=1}^N Q_i - (H_n - H_k)}$	$\sum R$ – total cost of the complete works; $H_n$ – costs of transition (unfinished) work at the beginning of period; $H_k$ – costs of transition (unfinished) work at the end of period; - amount of periods; $Q_i$ – risk investment during period i.

Proposed by author

Clustering results are shown in Figure 3.

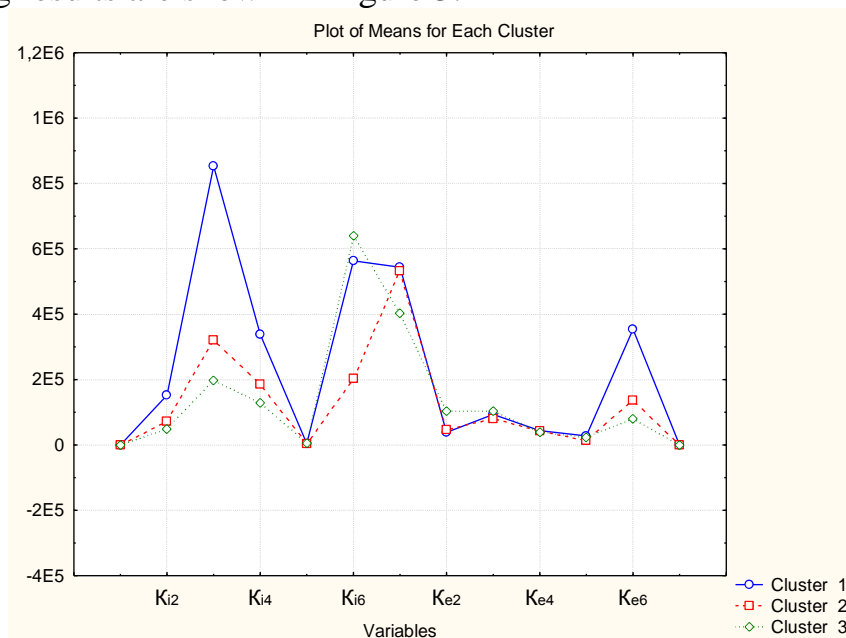


Figure 3. Listing (program fragment) - graphics of medium restaurant enterprises

Listing shows that the level of prices and other calculated performance gives 3 clusters. Clustering allows affiliating enterprises to one of the three classes (“violent”, stakeholders, “eksplerant”) based on "The ability to attract / provide innovations". Was performed discriminant analysis, according to which each enterprise was given a number of the cluster to which it belongs. Discriminant analysis allows recognizing new objects (restaurants), assigning them to existing clusters to develop proposals for their respective innovation. The results are shown in Figure 4

Variable	Classification Functions; grouping: кластер		
	G_1:1 p=,20000	G_2:2 p=,32000	G_3:3 p=,48000
Ki1	0,9519	3,7890	2,9654
Ki2	-0,1056	0,8399	0,7726
Ki3	0,3358	-0,4553	-0,2959
Ki4	0,1005	-0,4397	0,5758
Ki5	-0,1179	-0,1960	-0,1960
Ki6	0,3222	-0,3435	-0,2844
Ke1	0,4160	0,8493	0,5780
Ke2	0,4129	-0,3860	0,2952
Ke3	-0,2245	0,1057	0,1608
Ke4	0,2397	0,2404	0,2393
Ke5	-0,1667	-0,1030	-0,1621
Ke6	-0,2743	0,2474	0,2374
Ke7	0,2126	-0,2035	-0,1616
Constant	-68,3126	-48,7301	-40,3320

Source: Calculated by the author

Figure 4. Listing of the program - the results of discriminant analysis of restaurant enterprises identification by belonging to one of three clusters

Information about dividing enterprises between clusters obtained discriminant models based on "The ability to attract / provide innovations" is shown in the Table 4.

Table 4  
Discriminant model identification belonging to one of the 3 classes of enterprises restaurant business

Marks	Name of the enterprise	Number of objects	Cluster	Model of discriminant analysis
П8	BEEF meat and vine	5	1 – "violents"	$Y_1 = - 68,3126 + 0,9519 K_{i1} - 0,1056 K_{i2} + 0,3358 K_{i3} + 0,1005 K_{i4} - 0,1179 K_{i5} + 0,3222 K_{i6} + 0,4160 K_{e1} + 0,4129 K_{e2} - 0,2245 K_{e3} + 0,2397 K_{e4} - 0,1667 K_{e5} - 0,2743 K_{e6} + 0,2126 K_{e7}$
П11	Canapa restaurant			
П19	BAO Modern Chinese Cuisine			
П24	VINO e CUCINA			
П25	Fujiwara YOSHI			
П2	Goodman steakhouse	8	2 – stakeholders	$Y_2 = - 48,7301 + 3,789 K_{i1} + 0,8399 K_{i2} - 0,4553 K_{i3} - 0,4397 K_{i4} - 0,1960 K_{i5} - 0,3435 K_{i6} + 0,8493 K_{e1} - 0,3860 K_{e2} + 0,1057 K_{e3} + 0,2404 K_{e4} - 0,1030 K_{e5} +$
П3	Hunting for sheep			
П5	REEF			
П6	Prague			
П7	Sanpaolo			
П13	Citronelle			

П14	Lypskiy			0,2474 K <sub>e6</sub> - 0,2035 K <sub>e7</sub>
П22	Tarantino Grill & Wine Bar			
П11	The restaurant "Terracotta"	12	3 – “ekspl erants ”	$Y_3 = - 40,332 + 2,9654 K_{i1} + 0,7726 K_{i2} - 0,2959 K_{i3} + 0,5758 K_{i4} - 0,1960 K_{i5} - 0,2844 K_{i6} + 0,5780 K_{e1} + 0,2952 K_{e2} + 0,1608 K_{e3} + 0,2393 K_{e4} - 0,1621 K_{e5} + 0,2374 K_{e6} - 0,1616 K_{e7}$
П14	<b>Fish Market</b>			
П19	Thick and thin			
П10	Restaurant "Matisse"			
П12	Fiori Il Ristorante			
П15	Da Vinci Fish Club			
П16	Boutiquebar Bianco			
П17	KOYA			
П18	Bassano			
П20	Grill Asia			
П21	San Tori			
П23	Indian Restaurant "Sutra"			

Source: Calculated by the author

According to the analysis "violent" enterprises are (BEEF meat & wine, canapés Restaurant Salon; BAO Modern Chinese Cuisine; VINO e CUCINA; Fujiwara YOSHI) inherent in the use of closed innovations, due to the fact that these restaurants have enough of its own resources and capacity for innovations. These Restaurants prefer reinvest part of their profit in Innovation technologies, for competitive advantages.

For groups of stakeholders the use of such a model is complicated by the fact that the coordination of innovation processes mostly lack of own funds: Goodman steakhouse; Hunting for sheep; REEF; Prague; Restaurant Sanpaolo; Restaurant Citronelle; Lypskiy; Tarantino Grill & Wine Bar. Enterprises- "accelerator" (Restaurant "terracotta", fish market, Thick and thin, Restaurant "Matisse"; Restaurant Fiori Il Ristorante; Da Vinci Fish Club; Boutiquebar Bianco; KOYA; Bassano; Grill Asia; San Tori; Indian restaurant "Sutra") use in their activity mostly open model.

Examples of the use of open innovations by the main types are:

*Technological:* the use of touch-menu; restaurant management on the tablet; conversion of fryer waste into biodiesel; the LEDs alarm technology; web monitoring of compliance with health and safety regulations;

*IT-technologies:* free wi-fi; the use of interactive electronic menu for quick editing of the administration menu, for the customers the opportunity to choose from a wine list by price, year, region, flowers, a dish from the local menu; calorie count of various dishes; when selecting meals, immediately see a final check of the order; during waiting to play games, read news, to wander through the Internet;

*Marketing:* competitions to win discounts on services; Teplán-innovation - in the presence of the public Teplán-product chef creates dish, next to the cooks workplace in the kitchen with the camera monitoring; use of QR-code placed on handed to the client's account as a promotional move. With the help of the QR-code can be encoded the history of the restaurant, the restaurant's menu with detailed information about each dish: the composition and origin of the ingredients, stages and methods of treatment, nutritional and caloric content. Thanks to the placed in the QR-code information about the work time and contacts, will be increased the number of orders in offices and at home. With the help of the QR-code restaurant can notify their customers about promotions, lotteries, sweepstakes, strengthen all kinds of loyalty programs, to organize the voting, interactive polls and quickly get feedback from customers about the restaurant.

**Conclusions and offers.** Under the conditions of market competition, restaurant businesses is looking for new ways to meet the growing needs of consumers. One of the ways of development in terms of limited resources is the use of open innovations. To justify the use of open / closed innovations was developed a model of identification based on "The ability to attract / provide innovations" belonging to one of three groups: "violents", stakeholders and "accelerators". Developed the system of indicators for restaurant business, describing extraversion and intro introversion.

The integration of sound management of public / private innovation in innovation management methodology in the restaurant business is an integrated approach to the definition of strategic objectives, communication of personnel, introduction to life and making timely adjustments to the activities of the company.

The integration of open / close innovations in innovation management of the restaurant business is a valuable approach to the definition of strategic objectives, communications, implementation to life and adjustments to the company's activity.

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