

DEVELOPMENT OF INFORMATION TECHNOLOGIES IN THE RUSSIAN MARKET OF PUBLIC CATERING SERVICES

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Abstract: *The creation and development of information technologies inevitably entails a change in the organization and control of public catering services, and makes it possible to greatly simplify, optimize and speed up a number of everyday, specific operations. In this connection, three main classes of computer systems are considered, the specificity of information technologies in services and their diversity are studied. Comparison of software products for management and accounting of public catering services by main features is made. In chronological order, the transformation of the "IC: Accounting" program, which is most often used in this sphere, is presented, beginning with the transition period from socialism to the present day. Current business models in public catering organizations have been studied, one of which is Internet trading. Monitoring of Internet sales of products and orders of ready-to-eat meals showed a growing trend in the number of Internet customers residing in Russia. The need for automation of processes in the public catering enterprise is confirmed both from the point of view of managerial and financial control, and from the position of clients. As a result of the research, it was concluded that fraudulent operations change simultaneously with the development of computer technologies, which must be taken into account in the process of improvement of specific software products.*

Keywords: public catering, restaurant facilities, restaurant software product, internet sales, electronic cards.

It is impossible to underestimate the impact of information technology on a person. Information technology today is understood as everything that is associated with the storage, management and transmission of information in digital format. The beauty of the development of technology in this direction can be appreciated by everyone: earlier in order to find information about something, it was necessary to read a huge amount of literature. Moreover, some of them were available only in the reading rooms of the largest libraries^{1,2}. Now it is enough to open a search engine and just formulate a question.

With the purpose of researching information technologies in public catering, the analysis of the development of software products of public catering organizations was carried out. Public catering enterprise (object)

¹ A.M Rust, V.N. Suyazov, "Business model of innovative development of the enterprise", in *Bulletin of Saratov State Technical University*, 2010, no. 1, p. 252-257.

² Yu.A. Uvarina, E.A. Fiyascal, "Business model for service companies", *Innovations*, 2013, vol. 7, no. 177, p. 30-37.

is the primary link in the sphere of public catering, its independent entity with the right of a legal entity, created for the production, sale and organization of consumption of products and organization of leisure of the population.

Methodology

Information technologies in support of decision-making are designed to develop a management solution that results from the integration process, in which the decision support system (the computing link and the control object) and the person (the controlling link that specifies the input data and evaluates the result) participate³.

The business management is based on the strategy development, its adaptation to the specifics of the company and implementation. Each company strives to become socially sustainable, and also to increase its innovative potential⁴. All this implies a change in the functioning of enterprises⁵. However, in many companies, innovative processes and implementations are rather slow or do not penetrate the enterprise at all, which leads to stagnation, and, consequently, to a decrease in employee motivation and loss of company sustainability⁶.

Results and discussion

Today, one of the most important tools to improve the efficiency of the enterprise is the implementation of information technology. Information technology (IT) is a complex of interrelated scientific, technological, engineering disciplines that study methods of effective labor organization for people engaged in processing and storing of information; methods of organization and interaction with people and

³ E.E. Nakhratova, I.Y. Ilina, A.I. Zotova, M.S. Stepanov, S.V. Dusenko, "Modern peculiarities of SWOT analysis when taking management decisions by Russian TOP managers", in *International Journal of Applied Business and Economic Research*, 2017, vol. 15, no. 7, p. 187-194.

⁴ I.L. Litvinenko, L.K. Gurieva, O.N. Baburina, M.A. Ugrumova, V.I. Kataeva, "Tendencies and features of innovation management in the activities of business", in *International Business Management*, 2016, vol. 10, no. 22, p. 5397-5405.

⁵ E. Akhmetshin, E. Danchikov, T. Polyanskaya, N. Plaskova, N. Prodanova, S. Zhiltsov, "Analysis of innovation activity of enterprises in modern business environment", in *Journal of Advanced Research in Law and Economics*, 2018, vol. 8, no. 8, p. 2311-2323.

⁶ D.A. Kaldiyarov, A.M. Baltabayeva, A.E. Bedelbayeva, "Competent role of anti-crisis management in the development of economy in the Republic of Kazakhstan", in *Espacios*, 2017, vol. 38, no. 48, p. 20.

production equipment, their practical applications, as well as all related social, economic and cultural problems. For example, modern IT developed specifically for public catering enterprises can significantly simplify, optimize and accelerate a number of routine daily business-specific operations, namely: form a procurement scheme, product data and information on dishes served in the restaurant business^{7,8}.

The emergence of information technologies based on a system of bureaucratic control arose in public catering enterprises back in the USSR in the era of socialism. The control at the enterprise concerned everything: working places, procedures and amounts of remuneration, discipline, levels of responsibility, etc. Determining the scope of work, assessing the achievements of employees, the distribution of remuneration, – everything was determined by the established rules and procedures⁹.

However, it should be noted that in the service sector, there is no link between the investment in information technology and productivity^{10,11}. One of the first to pay attention to this was the famous American economist R. Solow, who in the process of studying the influence of large-scale investments in computer equipment revealed that they did not lead to an adequate increase in labor productivity in the service sector. According to him, in the 80-ies of XX century, in the United States, \$ 1 trillion was invested in computer equipment; 85% of this amount fell on the service sector, but labor productivity in it increased by less than 1% at an annual rate. This phenomenon was called the "paradox of information technology", or the paradox of Solow (1987).

In the socialist period, the main problem was the invoicing of customer's accounts for copying paper in two copies – one for the client, the other – for cash accounting. There were cases of fraud, which manifested itself in the execution of various sums of money reflected in these accounts. The accounting was carried out manually in the accounting

⁷ O.G. Fedorov, “*Stages of development of information technologies. Classification of information technology*”, 2009. Available at: www.elibrary.ru.

⁸ T.N. Kutaeva, E.A. Kutaeva, “Public catering in the system of consumer services”, in *Bulletin NGII*, 2013, vol. 22, no. 3, p. 114-125.

⁹ M.P. Gapochka, “*An integrated approach to the study of problems interaction between a human and a computer technology on the way to the information society. Theory and practice of social-scientific information*”. Sociology, Moscow, 2001, p. 18-25.

¹⁰ A.I. Nazarova, “Future belongs to information technology”, in *Secondary Vocational Education*, 2006, no. 9, p. 38-39.

¹¹ E.M. Akhmetshin, E.I. Artemova, L.V. Vermennikova, R.A. Shichiyakh, N.A. Prodanova, N.M. Kuchukova, “Management of investment attractiveness of enterprises: Principles, methods, organization”, in *International Journal of Applied Business and Economic Research*, 2017, vol. 15, no. 23, p. 71-82.

notebooks, where it was possible to make inconspicuous corrections to steal money or products. With the use of IT, the possibility of such fraud is almost eliminated, and in the modern world, we are seeing the process of automation, which cannot but affect the living standards of the population and the stability of enterprises and organizations. Computerization covered all types of services, and the success in the development of any business, including restaurant, depends on many factors, one of which is the use of information technology¹².

Public catering is one of the most promising branches in the hospitality industry. Modern information computer technologies developed specifically for public catering enterprises make it possible to significantly simplify, optimize and speed up a number of routine, business-specific operations. Consider the 3 main classes of these systems:

1. Full-featured original systems. Initially, they were developed to solve the relevant key tasks. Have appropriate AWS for the work of contact staff (Front office) and managers (Back office). The most common representatives of this class are "R-keeper", "Tilypad", and "Expert". Advantages: functionality; well-developed program, extensive dealer network in the regions; it is integrated with many software products of related areas (management of hotels, cinemas, etc.). Disadvantages: high prices; many channels for the abuse of personnel are not "blocked"; incomplete Front-office; poorly worked out component of providing and supporting guests' loyalty. The same group includes the software products "RST: Restotator" and "RST: Magnat" LLC "Company RST", "Parus-Enterprise" line 7 and 8, "Iiko", "Magic", etc.

Main advantages: the developed system of maintenance and support of guest's loyalty; a convenient and easy-to-use system for constructing any reports; convenient and easy to learn by contact persons Front office; relatively low prices. Many of them are supplied in a box version, the installation of which does not require high qualification in the field of information technology;

2. Systems based on the well-known software product "1-C": "Rarus-Community", "Astor", "Traktir" and some others. Their strongest advantage is a well-developed automation of accounting. Therefore, in enterprises, where it was put in the basis of information management, such systems proved to be quite good. In other respects, at commensurate sale

¹² S.O. Kuttybaeva. "Features of information technology management", in *Mechanisms of Development of Modern Society*, 201, no. 3, p. 52-53; S.L. Lebedeva, D.V. Maksimenko, "Service-process approach to management of information technologies in business", in *Bulletin of the Academy*, 2010, no. 4, p. 76-79

prices, they are substantially inferior to the systems listed in the first paragraph;

3. Software, borrowed from the West. A typical representative of the class is the "Aloha" system. The main disadvantage: the inheritance of basic opportunities from the progenitors. In the West, HoReCa's automated business processes are organized quite differently¹³. Therefore, the consumer has either to rebuild his thinking for a software product, or not to use the many paid features of the system.

The constant creation of new software products for the restaurant business is largely due to the inclusion in the latest new opportunities for ICT and related changes in data processing technology. Almost all the integrated automation programs used are built on a modular basis, which provides an opportunity to increase the functionality of the business automation system. A significant number of innovations in the automation systems of restaurant business enterprises (RBE) is associated with the emergence of new technologies for delivery of IT services to consumers – with cloud technologies.

– Autonomous systems. They are installed locally at the RBE, where all data is stored. Access to data is possible only from this institution, which complicates the work of remote owners. Examples of locally installed systems are R-Keeper, Iiko, ASTOR, Intellect Style, Pos Sector, RST: Restorator, Magic, etc.¹⁴;

– Cloud systems. They are completely taken out of the RBE, and employees' working places are connected to them via the Internet, for

¹³ D. Yedilkhan, G.U. Bektemyssova, "Identifying similar business process models", in *Journal of Theoretical and Applied Information Technology*, 2016, vol. 91, no. 1, p. 152-157; G.U. Bektemyssova, D. Yedilkhan, "Applying of process management in the 'e-license' project", in *ICCAS 2015 - 2015 15th International Conference on Control, Automation and Systems, Proceedings*, 2015, p. 2076-2079; R.K. Uskenbayeva, B.K. Kurmangaliyeva, D. Yedilkhan, "Situational management for process implementation of working operations of the business process", in *2015 54th Annual Conference of the Society of Instrument and Control Engineers of Japan, SICE 2015*, 2015, p. 292-297; R.K. Uskenbayeva, B.K. Kurmangaliyeva, D. Yedilkhan, A.B. Kassymova, "Principles for achieving the optimal performance of the input tasks flow of a business process and optimal performance of the business process", in *2015 54th Annual Conference of the Society of Instrument and Control Engineers of Japan, SICE 2015*, 2015, p. 728-733; R.K. Uskenbayeva, G.B. Bektemyssova, B.K. Kurmangaliyeva, D. Yedilkhan, "Development of the business process for national companies of Kazakhstan with the integration of the project 'E-Government'", in *2015 54th Annual Conference of the Society of Instrument and Control Engineers of Japan, SICE 2015*, 2015, p. 724-727.

¹⁴ N.N. Voytyushenko, "Features of use of information and communication technologies in the restaurant business", in *Scientific Almanac*, 2015, vol. 11, no. 9, p. 9-10.

example, in companies such as MICROS of the American corporation MICROS, Quick Rest). In its pure form, there are not many such systems since the issues of network operation, stable supply of electricity are strong risk factors – their drastic change guarantees a malfunction of the system.

Table 1: Properties of the main programs for management and accounting

Function/Process	1C	Iiko	R-Keeper
Financial and management functionality			
Management Accounting	-	+	-
Income statement	-	+	-
Balance sheet	-	+	-
Cash Flow Report	+	+	+
Budget management and analysis plan/fact analysis	+	+	-
Sales Accounting			
Self-service buffet	+	+	-
Reserve of tables	-	+	+
Accounting of staff nutrition	+	+	-
Delivery management module	-	+	-
Beverage dispenser	-	-	+
Chef's operating terminal	-	+	-
Stock count			
Inventory in the bar	-	+	-
Working with a negative balance in stock	-	+	-
Post factum recalculation of balances after changing the technological maps	-	+	-
Control of allowable residues	-	+	+
Promotion of semi-finished products and dishes on the leftovers	-	+	-
Formation of a stop list	-	+	-
Formation of orders for banquets	-	+	-
Personnel Management			
Automatic calculation of job wages (including taxes)	-	+	-
Automatic penalty charging for violation of labor discipline	-	+	-
Maintaining a schedule of staff's shifts	-	+	-
Personal Wage Report	-	+	-
Production of dishes and semi-finished products			
Calculation of dishes	+	+	+

Dealing with postponed dishes	-	+	+
Attraction of new clients	-	-	-
Loyalty management			
Discount systems	+	+	+
Bonus Systems	-	+	+
Attraction of new clients	-	-	-
Accounting and taxation management			
Data exchange with accounting	+	+	+
Automatic declaration of excisable goods	-	+	+
Accounting	+	-	-

– Hybrid systems. They take into account the positive aspects of both previous systems and try to eliminate their disadvantages. When the system is running, the actual data is uploaded to the local module, which continuously communicates with the remote server. In case of a communication failure in the network, work continues on the basis of the local module. When the connection is restored, the central database is updated. This is the reason for the appearance of a sufficiently large number of such systems – Jowi, Poster, GBS, Market, Traktir, etc.

Convenience of automation and informatization of processes at the public catering enterprise is evident not only from the viewpoint of "doing business", but also from the position of customers, as information systems allow more rapid accounting of guests, tracking the order of service, ensuring the offered menu with all the necessary ingredients, completing information on dishes, discounts, promotions, conducted by this institution, through social networks, etc.

Table 2: Stages of improving the program "1c: enterprise accounting"

Period	Software version	The content of improvement process
Early 90's	2.0, 3.0, 4.0, 5.0	The origin of the principle of reflecting economic operations in "documents", the introduction of the concept of "printed form". The appearance of the first version of the built-in language, which was used to edit accounting entries in the system.
1995	6.0	The innovation that has brought tens of thousands of accountants to Windows (and also to the mouse and laser printers), the repetition of the DOS-version on a new basis.
1999	7.7	Compatibility with MS SQL, as well as a full-fledged configurator and debugger.
2002	8.0	Productivity increased, a unique query language, data composition system, etc. appeared.

2010	8.2	The program has found stable work on narrow communication channels, brought a new metadata object – "External Data Sources", with which one can directly connect to third-party sources: databases sql, dbf, excel
2016	8.3	With the help of the platform, it became possible to create a separate mobile application that can be launched on a device running Android or iOS
Release date of 1C 8.4 is being verified	8.4	"1C" has released a trial version of the new platform "1C: Enterprise Accounting" 8.4. It is characterized by higher performance and scalability.

For example, the implementation of payment systems using plastic cards, deposit-discount systems, the calculation of electronic money can dramatically expand the capacity of the restaurant enterprises by organizing joint actions with leading banks. The systems not only support non-cash form of payment, but also keep records of permanent and corporate clients, allow managing the system of discounts and bonuses, supporting remote access for customers to form requests and orders. Great potential is given to all sorts of programs to increase customer loyalty (discounts, bonuses, special offers, etc.), the formation of a permanent client base, which contributes to the existence of regular customers^{15,16}. In order to determine the advantages of software products for management and accounting in catering organizations, Table 1 was made.

The most famous and most adapted to modern methods of accounting for today is the program "1C: Accounting"¹⁷. This program is an assistant for keeping records of any complexity: from primary documentation to drawing up reports and balancing information, which greatly facilitates the work of the accountant. The program "1C: "Enterprise Accounting" has two main positive qualities: functionality and price in the market. It has the ability to work with databases remotely, supports the client-server architecture, has the ability to integrate with other applications and with websites on all standards known to the current day, etc.

¹⁵ N.V. Baydukova, "The connection of electronic money and electronic payment systems", *Vestnik of the Orenburg State University*, 2005, no. 8, p. 135-137.

¹⁶ S.A. Musalaeu, "Electronic money and electronic payment systems", in *Problems of Modern Economics*, 2010, no. 4, p. 206-209.

¹⁷ "The Official Website of "1C"". Available at: <http://1c.ru>.

For the best presentation of the development of the program "1C: Enterprise Accounting", consider its transformation from the 90's to the present day in Table 2¹⁸.

But with the improvement of programs, there is also a transformation of fraud in the service sector, which is also changing with time. If in the USSR¹⁹ in catering enterprises, workers were engaged in fraud "manually", then a higher level of development of information technology implies a more developed fraud in public catering. Now the enterprise faces computerization in the system, which helps to pull a scheme "cleanly".

In most cases, fraud is associated with staff dishonesty, sometimes it is related to incorrect work of the program, and staff can take advantage of this. Therefore, it is so important to have means of protection and control of fraud in the program and to have an idea of the various schemes of typical loopholes in the current conditions of the market of public catering services.

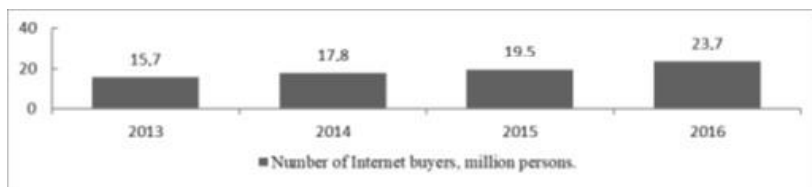


Figure 1: The number of internet – customers (18-54 years, living in Russia) million people

One of the implementations at public catering enterprises was the Internet trade, thanks to which the customers had an interest in the company's activities and the ability to place an order without leaving home. Internet sales – one of the most important and promising business models in the global economics. The following scheme became very popular: the customer buys the product and pays it through the Internet, and after a while, a deliveryman brings his order. In recent years, there has been a significant increase in consumers in the consumption market (Figure 1). The opportunity to buy food and make an order with home delivery does

¹⁸ M.A. Yakovlev, P.K. Lupinos, "Internet sales – a new stage of development of postindustrial society", in *Economics and Management: Analysis of Tendency and Prospects for Development*, 2015, no. 23, p. 18-21.

¹⁹ A.S. Morozova, "Historical review of the development of software product "1C: Accounting", in *Economics and Innovations Management*, 2017, no. 6. Available at: <http://ekonomika.snauka.ru/2017/06/15058>.

not leave people indifferent and thus shows how relevant this system is for catering organizations.

The conducted researches clearly showed that for today the society has enough information for receiving unique services, which cannot but facilitate the activity of company personnel and assist in the management and accounting. Firms are automated and, unlike public catering organizations in the USSR, are well informed and aware of the capabilities of customers and the implementation of innovations. However, the development of programs affects not only the productivity, but also fraud. The more information technologies develop, the more clever the machinations become, which also needs to be taken into account when developing software products.

A system that worked successfully in a socialist society is not applicable at the moment, since no enterprise work without using the information computer technology. Thus, only with the formation of a competently developed concept and the consistent integrated implementation of all components of the restaurant business, one of which is information technology, success in the development of public catering enterprises is guaranteed. It is important to carefully study the personal data when hiring staff to avoid the possibility of fraud in work.