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PRACTICAL ASPECTS OF HOTEL AND RESTAURANT BUSINESS DEVELOPMENT IN UKRAINE BASED ON THE USE OF THE jSOLUTIONS RESTAURANT MODULE

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Vilkhivska O. V., Vilkhivskiy V. V. Practical Aspects of Hotel and Restaurant Business Development in Ukraine Based on the Use of the jSolutions Restaurant Module

The article conducts a practical study of the aspects of the development of the hotel and restaurant business in Ukraine and reviews the jSolutions module «Restaurant». Its functionality, main characteristics and advantages in comparison with other software solutions for the restaurant business (RB) are described. The main aspects of the dynamics of development of the RB are allocated, which includes: introduction of POS-systems; online ordering and delivery; use of CRM systems; analytics and Big Data; social media and digital marketing; virtual and augmented reality (VR/AR), kitchen automation and inventory, cybersecurity. A list of functions provided by the jSolutions module «Restaurant» is provided. It is noted that the module consists of two parts: BACK OFFICE and FRONT OFFICE. BACK OFFICE allows users to create calculation cards, create menus, set up outlets for implementation in FRONT OFFICE, works with invoices and orders. It is also possible to set up a discount or bonus system for visitors to the establishment. Users of FRONT OFFICE are bartenders, cashiers or administrators who work in TouchScreen mode, taking orders from visitors, creating invoices and settling customers. The module includes 4 TouchScreen modes, each of which is designed for different aspects of work, namely: automation of the cook's workplace (the cook can mark the preparation of each dish to order, which helps to optimize the process of work in the kitchen and ensures timely processing of orders); TouchScreen self-service (the interface allows users to independently create orders from the menu without the help of a waiter, cashier or administrator); Cashier's TouchScreen (the interface allows the bartender, cashier or administrator to create a customer account and make payments on this account); Waiter's TouchScreen (the interface is used to record food orders and their delivery). Such additional unique functions of the jSolutions «Restaurant» module as «Cash Collection», «Cancellation of Bills», «Table Reservation», «WEB-Interface for Ordering Meals» (the functionality is intended for registration in the database of food orders in places where the desktop version of jCatering is not installed), «Mobile version of the waiter's workplace», etc. Attention is focused on the fact that IT significantly affects the increase in restaurant revenues due to the optimization of operations, improvement of the quality of service, effective marketing and expansion of sales channels. Investing in modern IT solutions will help restaurants stay competitive, improve operational efficiency, and ensure sustainable revenue growth.

Keywords: information technology (IS), restaurant business (RB), jSolutions module «Restaurant», module, system.

Fig.: 15. **Bibl.:** 8.

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Вільхівська О. В., Вільхівський В. В. Практичні аспекти розвитку готельно-ресторанного бізнесу в Україні на засадах використання модуля jSolutions «Ресторан»

У статті проведено практичне дослідження аспектів розвитку готельно-ресторанного бізнесу в Україні та виконано огляд модуля jSolutions «Restaurant». Описано його функціональні можливості, основні характеристики та переваги порівняно з іншими програмними рішеннями для ресторанного бізнесу (РБ). Виділено основні аспекти динаміки розвитку РБ, що включає: впровадження POS-систем; онлайн-замовлення та доставку; використання CRM-систем; аналітику та Big Data; соціальні мережі та цифровий маркетинг; віртуальні та доповнені реальності (VR/AR), автоматизацію кухні та інвентаризацію, кібербезпеку. Наведено перелік функцій, що забезпечує модуль jSolutions «Ресторан». Зазначено, що модуль складається з двох частин: BACK-OFFICE і FRONT-OFFICE. BACK-OFFICE дозволяє користувачам створювати калькуляційні картки, формувати меню, налаштовувати торгові точки для реалізації у FRONT-OFFICE, працює з рахунками та замовленнями. Також є можливість налаштувати дисконтну або бонусну систему для відвідувачів закладу. Користувачами FRONT-OFFICE є бармен, касир або адміністратор, які працюють у режимі TouchScreen, приймаючи замовлення від відвідувачів, створюючи рахунки та розраховуючи клієнтів. Модуль включає 4 режими TouchScreen, кожен з яких призначений для різних аспектів роботи, а саме: автоматизація робочого місця кухаря (кухар може відзначити приготування кожної страви за замовленням, що допомагає оптимізувати процес роботи на кухні та забезпечує своєчасну обробку замовлень); TouchScreen самообслуговування (інтерфейс дозволяє користувачам самостійно створювати замовлення з меню без допомоги офіціанта, касира або адміністратора); TouchScreen касира (інтерфейс дозволяє бармену, касиру або адміністратору створювати рахунок клієнта і здійснювати розрахунки за цим рахунком); TouchScreen офіціанта (інтерфейс використовується для фіксації замовлень страв та їхньої видачі). Наголошено на таких додаткових унікальних функціях модуля jSolutions «Ресторан», як «Інкасація каси», «Анулювання рахунків», «Бронювання століків», «WEB-

інтерфейс замовлення харчування» (функціонал призначений для реєстрації в базі даних замовлень на харчування на місцях, де не установлена десктопна версія jCatering), «Мобільна версія робочого місця офіціанта» та ін. Акцентовано увагу на те, що ІТ значно впливають на підвищення доходів ресторану завдяки оптимізації операцій, поліпшенню якості обслуговування, ефективному маркетингу та розширенню каналів продажів. Інвестування в сучасні ІТ-рішення допоможе ресторанам залишатися конкурентоспроможними, підвищувати ефективність роботи та забезпечувати стабільне зростання доходів.

Ключові слова: інформаційні технології (ІТ), ресторанний бізнес (РБ), модуль jSolutions «Ресторан», модуль, система.

Рис.: 15. **Бібл.:** 8.

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Modern information technologies (IT) play a crucial role in the development of the hospitality and restaurant business in Ukraine. The restaurant industry actively utilizes IT to optimize its processes. The application of software in restaurant management has a significant impact on business efficiency. Key areas include process automation, inventory management, personnel management, data analysis, interactive ordering systems, and loyalty programs.

A large number of Ukrainian and foreign scientists were engaged in scientific research on the application of IT in the restaurant business. Among them, the following researchers can be singled out: N. Vlashchenko (in the publications, concerning innovative methods of managing personnel, material resources, information, implementation of infrastructural and technological and other innovations in the activities of restaurant, hotel, and tourist enterprises) [1]; V. Dzhyndzhoian, V. Teslenko (disclosure of innovations in socio-cultural service and tourism using the experience of domestic and foreign research, features of innovative processes, and evolutionary changes in these fields) [2]; O. Davydova (in the works of these authors, special attention is paid to the issues of diagnosis and improvement of the efficiency of innovative management of the development of enterprises, the methodological basis and conceptual foundations of the formation and evaluation of innovative management of the development of enterprises in the hotel and restaurant industry) [3], M. Kasavana (research in the field of hotel and restaurant business, with particular regard to the use of information systems for management) [4]; D. Reynolds (research on the implementation of technologies in the restaurant business and their impact on the efficiency of operations and customer satisfaction) [5].

These scientists made a significant contribution to the development of the theory and practice of the application of information technology in the restau-

rant business, their works comprise the basis for many studies in this field.

The *aim* of the article is a practical study of aspects of the development of the hotel and restaurant business in Ukraine, an overview of the JSolutions "Restaurant" module and a description of its functionality, main characteristics and advantages compared to other software solutions for restaurant business.

The war against Ukraine, that has begun in February 2022, has had a significant impact on all areas of life, including the restaurant business. Despite the difficult conditions, restaurants continue to operate, adapting to new challenges and finding ways to support their operations and customers. After the military invasion, almost all establishments ceased their activities, but within three months from the beginning of the full-scale war, 70% of establishments reopened.

In 2023, the number of registrations of individual entrepreneurs and LLCs with restaurant premises increased sharply: in 2020, there were 6.290 registrations; in 2021 – 12.699 registrations; in 2022 – 8.059 registrations; and in 2023 – 13.721 registrations.

At the same time, the average sales at the beginning of 2024 among establishments in the restaurant business increased by 40% compared to 2022. Despite the positive dynamics of individual entrepreneur registrations, the restaurant market decreased from 36.500 to 32.000 establishments.

One of the key aspects for restaurant business is ensuring the safety of employees and customers. Frequent shelling and military operations make it difficult for restaurants to operate, especially in areas of active hostilities. Logistic problems, particularly difficulties with the supply of food products, have become a significant barrier to work. Many restaurants are facing supply disruptions and rising food prices. However, restaurant business was able to adapt to existing reali-

ties by focusing on delivery and takeout services to retain customers and continue operations. This includes partnering with food delivery platforms, creating own delivery services, using digital technologies.

The use of IT in the restaurant business is constantly developing, contributing to the improvement of efficiency, quality of service and competitiveness.

The dynamics of this process includes several key stages and areas, as shown in *Fig. 1*.

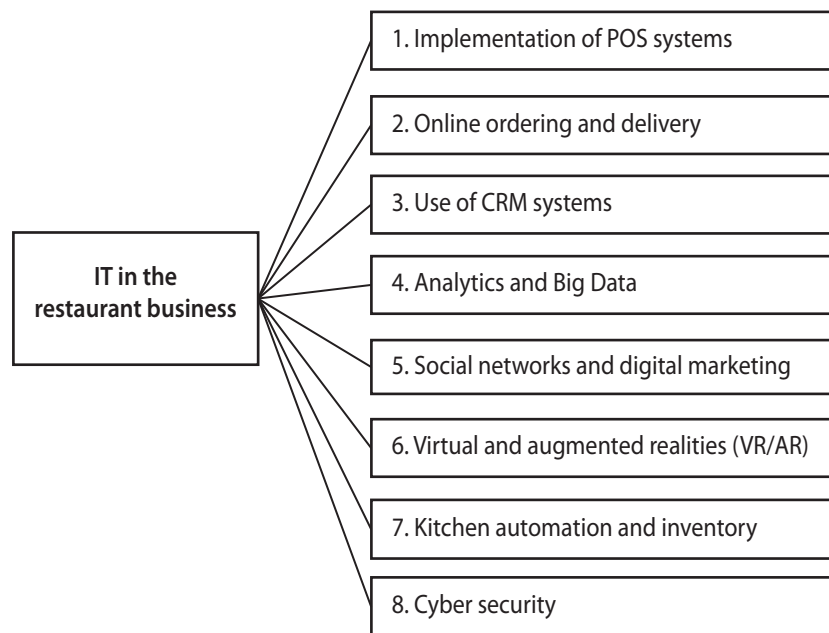


Fig. 1. Dynamics of restaurant business development

1. Implementation of POS systems. Initially, POS systems were used for basic operations such as recording sales and printing receipts. Over time, their functionality has expanded to include inventory management, sales analytics, and integration with other systems. Multi-functional POS systems now allow not only order taking but also managing all aspects of a restaurant in real time. Mobile POS systems are becoming popular, enabling waiters to take orders directly at customers' tables.

2. Online ordering and delivery. Restaurants began using websites to take orders, which allowed them to expand their customer base beyond the physical location. Mobile apps and integration with delivery platforms have become standard. This allows restaurants to process orders and deliver quickly and efficiently. Automation of the ordering and payment processes reduces human error and increases the accuracy and speed of service.

3. Use of CRM systems. Initially, restaurants used basic systems to collect customer contact information and order history. Modern CRM systems allow for maintaining a detailed customer database, analyzing their preferences and behavior, and conducting

personalized marketing campaigns. Loyalty programs are integrated with CRM systems, which enables providing individual discounts and bonuses.

4. Analytics and Big Data. Restaurants used to collect both the basic sales and customer data, although their ability to analyze them was limited. The use of analytical platforms and Big Data tools now allows restaurants to perform deep data analysis, forecast demand, and make informed decisions. Analytics

help optimize menus, inventory management, and marketing strategies.

5. Social networks and digital marketing. Initially, restaurants used social networks as an additional channel for communication with customers. Today, social networks are essential tools for brand promotion, audience interaction, and advertising campaigns. The use of targeted advertising and analysis of social media data allows restaurants to effectively attract new customers and retain regular ones.

6. Virtual and augmented realities (VR/AR). The use of VR and AR technologies was previously limited and rarely used. Now, virtual restaurant tours and interactive AR menus have become tools for attracting customers. These technologies allow customers to get an idea of the establishment's atmosphere and menu choices before visiting.

7. Kitchen automation and inventory management. Primary, simple systems were used to manage inventory and preparation of meals. Kitchen display systems (KDS) and automated inventory solutions help optimize cooking processes, reduce food waste, and increase kitchen efficiency.

8. Cybersecurity. In the past, data protection was not a priority and security measures were basic. The growing importance of protecting customer data and financial information has forced restaurants to implement robust cybersecurity systems and meet international standards.

One such modern information system for restaurant business is the jSolutions "Restaurant" module – a restaurant automation software designed to simplify, speed up, and improve service. It can be used to automate accounting in restaurants, cafes, bars, pubs, clubs, boarding houses, canteens, and other establishments [6; 7]. The list of functions provided by the jSolutions "Restaurant" module is shown in Fig. 2.

The proposed module consists of two parts: BACK-OFFICE and FRONT-OFFICE. BACK-OFFICE allows users to create calculation cards, develop menus, set up points of sale for implementation in FRONT-OFF-

FICE, and work with invoices and orders. It also enables the setup of a discount or bonus system for visitors.

FRONT-OFFICE users include bartenders, cashiers, and administrators who work in TouchScreen mode, taking orders from visitors, creating invoices, and processing payments.

The jSolutions "Restaurant" system includes four TouchScreen modes, each designed for different aspects of work:

1. The chef's workplace. The chef receives on the screen orders, created by the bartender, cashier, or administrator. The chef can mark the preparation status of each dish, helping to optimize the kitchen workflow and ensure timely order processing.

2. TouchScreen self-service. This interface allows users to independently create orders from the menu without the help of a waiter, cashier, or administrator. The system is especially useful in situations where customers do not need to pay by cash or credit card.

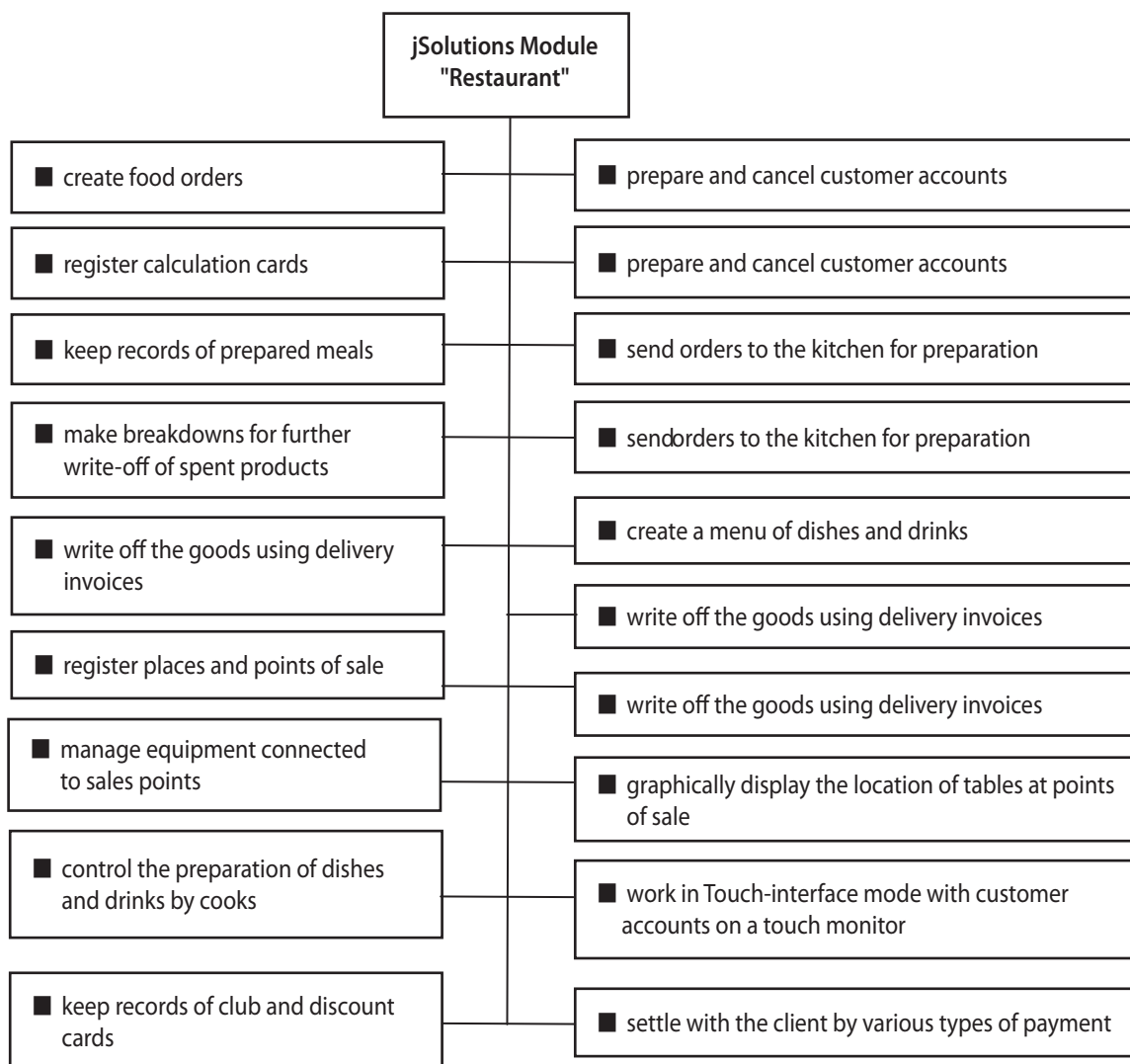


Fig. 2. List of functions of the jSolutions "Restaurant" module

Source: formed on the base [6; 7].

3. Cashier TouchScreen. This interface enables a bartender, cashier, or administrator to create customer accounts and process payments. It is a convenient tool for managing financial transactions, providing fast and accurate customer service.

4. Waiter TouchScreen. This interface is used for taking food orders and their delivery. Waiters can easily take orders directly at the customer's table, increasing service efficiency and reducing waiting time.

Each of these TouchScreens is tied to a specific point of sale (PC). It is important to note that only one of the four TouchScreen modes can be active at any given point of sale. This ensures clarity and efficiency in the operation of each individual PC.

Let us consider in more detail the features of the functionality of the proposed software product. Critically important for any restaurant is the control of procurement processes and the food products costs. The integration of the jSolutions "Restaurant" module with the Warehouse (jStock) module provides comprehensive accounting and inventory management, which includes several key aspects, namely: accounting for foods in the warehouse, container and packaging management, procurement processes, cost control, and integration with other systems.

The integration of the jSolutions "Restaurant" module with the Warehouse (jStock) module allows for detailed records of all foods in the warehouse, including their quantity, location, and condition. This helps avoid shortages or excesses of goods and ensures accuracy in inventory management. The module also provides tracking of expiration dates, enabling timely measures to use or dispose of goods approaching their expiration date.

Accounting for containers and packages allows for the tracking of not only the available goods but also the packages and containers used for their storage and transportation. This helps maintain accurate accounting and avoid costs associated with unsuitable containers.

Integration with the module enables analysis of packaging and container costs, aiding in cost optimization and identifying opportunities for cost reduction.

Procurement planning is facilitated by real-time inventory and consumption data, reducing the risk of ordering excessive or insufficient quantities of foods.

The module can automatically generate orders to suppliers based on inventory levels, reducing order processing time and minimizing the possibility of errors.

Cost monitoring allows you to track the expenses of purchasing products, containers, and packaging, which helps ensure accurate cost accounting and improve financial control. The module provides an opportunity to conduct a detailed analysis of costs, which can help identify excessive expenses and optimize the costs of purchasing foods.

The integration of the module with POS systems allows for automatic updates of data on costs and stocks based on sales, ensuring the relevance of information about availability of foods in the warehouse.

The module contains the section "Calculation cards." This section is designed to store and display information about ready-made meals, as well as the food products included in those meals. Based on the calculation cards, the menu is formed in the "Menu of Dishes and Drinks" section as shown in Fig. 3.

In this section, calculation cards are registered, which indicate the portion size of the meal, the expira-

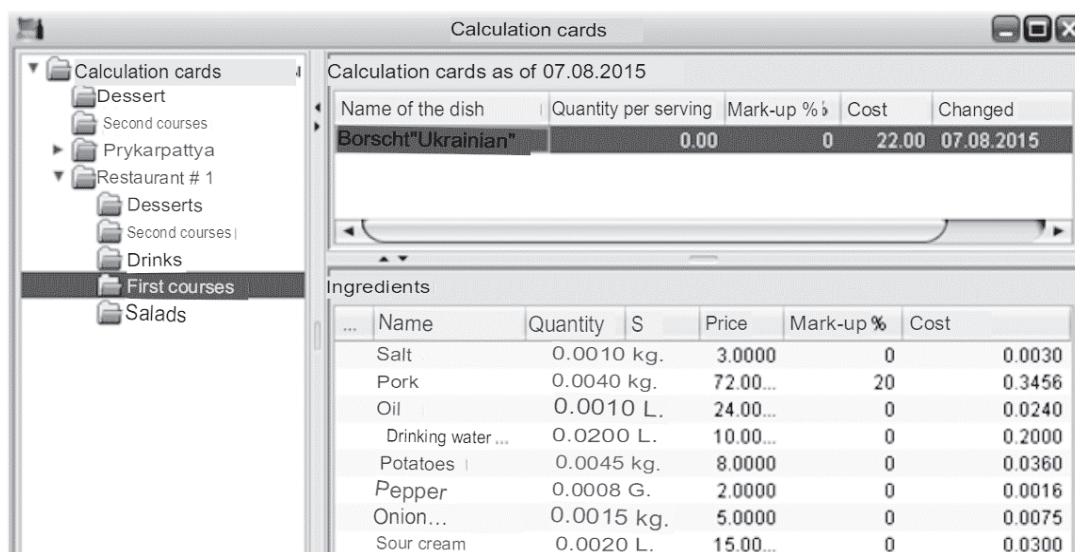


Fig. 3. Window with a list of calculation cards

Source: formed on the base [6; 7].

tion date after cooking, the amount of the minimum portion, the number of grams or the volume of the meal, as well as the selling price of the portion. At the same time, the registration of ingredients is carried out both through editing the title of the record and in the section specification table. Tab data and specification tables are synchronized.

The price change history table of the specification stores the cost of the ingredients, the date of the cost change, the markup, and the cost from the costing card. When editing ingredients in the cost card form or in the "Ingredients" specification table, an entry with the new cost for the current date will be added to the "History of Price Changes" table. This entry can also be added manually. When creating documents (such as food orders, customer invoices, and production tasks), the price applicable on the date of document creation will be used.

The "Menu of Dishes and Drinks" section is intended for compiling a list of menus for dishes and drinks, which are formed based on calculation cards registered in the corresponding section or from the list of food products. The data from this section is used to prepare customer invoices, food orders, and for other related features (Fig. 4, Fig. 5).

The "Discount Card Settings" section is intended for registering discount and club cards, maintaining the history of card expenses and cash receipts, and viewing the history of payments made in TouchScreen-interface mode (Fig. 6).

The "Working with Points of Sale" section is designed for the registration of points of sale (such as

restaurants, cafes, bars, etc.), individual areas associated with these points of sale (such as halls or bars), and for organizing the work of administrators, waiters, and cooks.

The section window consists of the main table, "Points of Sale," as well as two specification tables: the first one is "Equipment" (see Fig. 6), and the second one is "Points of Sale" (Fig. 7).

The TouchScreen-interface mode is designed for handling customer orders on a touch screen monitor. It is accessed from the main window of the "Points of Sale" section using the "Waiter's Workplace" context menu function. The administrator is responsible for setting up the workplace, which involves entering shift details and assigning employees in the TouchScreen window.

Additionally, the TouchScreen interface allows for configuring the chef's workplace. The system functionality enables waiters to attach orders to specific table numbers and send them to the cook for preparation (Fig. 8).

At this, the cook can add information about the readiness of the dish in the same application. After the cook clicks the "Done" button, the entries will disappear from the list and changes will occur at the waiter's workplace (Fig. 9).

Also, the proposed module allows the client to form an order online, which is displayed in the system automatically after its formation, and to send the order for delivery.

This process includes several steps, namely adding items that will be included in the customer's bill,

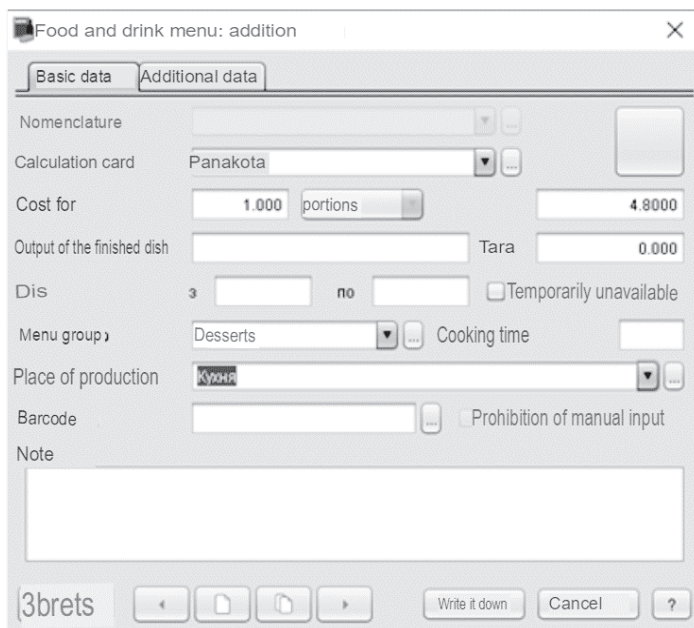


Fig. 4. Menu window of Dishes and Drinks

Source: formed on the base [6; 7].

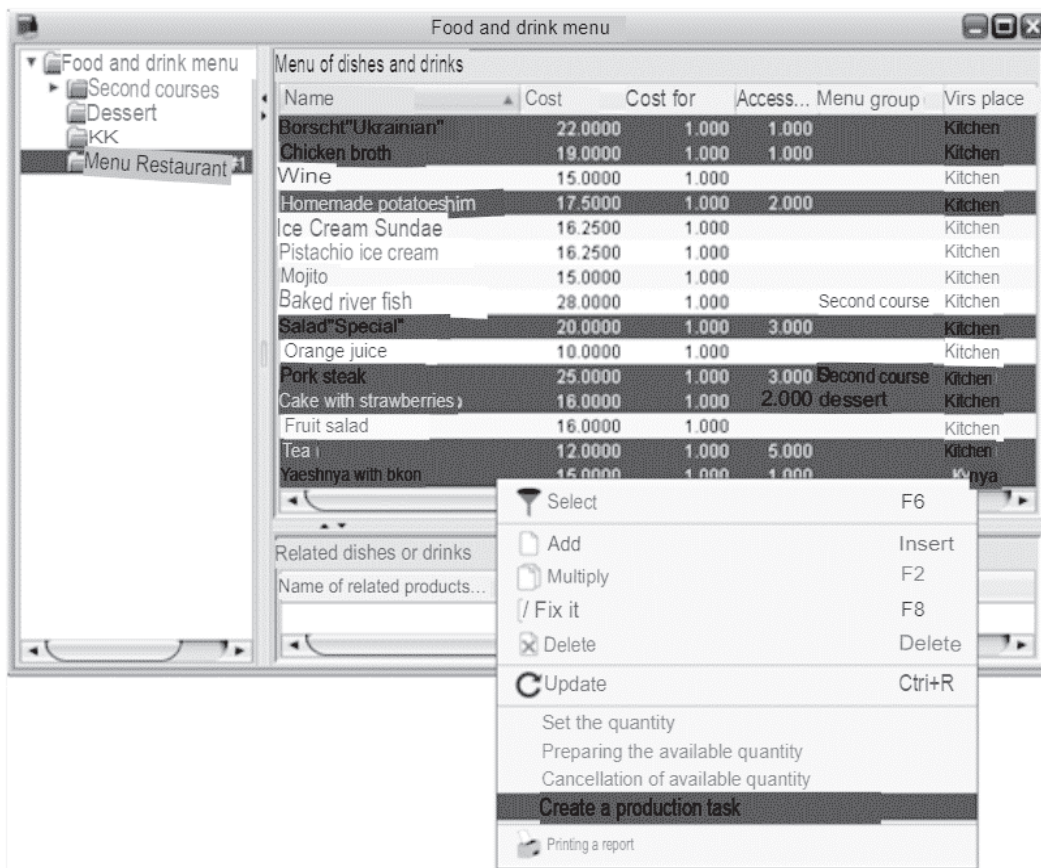


Fig. 5. Menu window of Dishes and Drinks

Source: formed on the base [6; 7].

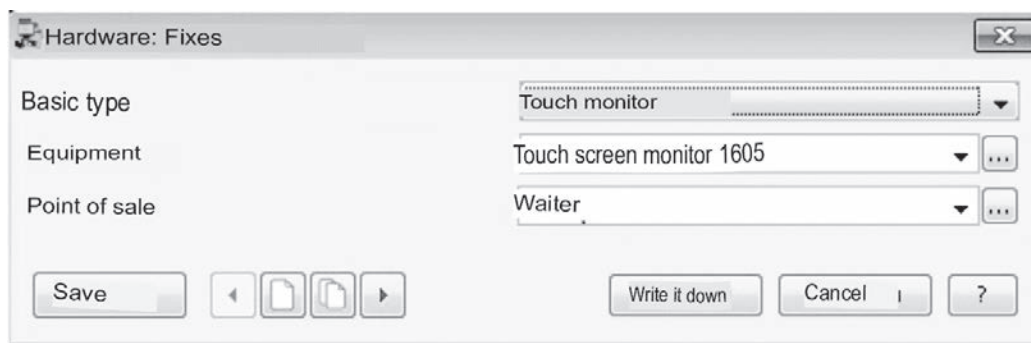


Fig. 6. Equipment

Source: formed on the base [6; 7].

such as payment for food delivery service by courier to the address specified (Fig. 10, Fig. 11).

Order information is stored in the delivery log. The module allows you to select certain orders (1), edit them (2), print invoices (3). After sending the order directly to the courier, press the Submit button (4) and print the delivery list (5) for the courier. During the calculation for the order by courier, by clicking the Calculation button (6), add payment information to the payment database (Fig. 12).

During the formation of orders from a certain table or for delivery, customer invoices are added to the database, according to which the payment must be distributed. The availability in the touch screen interface of this or that functionality for registering the fact of paying bills depends on the types of payments selected in the point of sale settings on the corresponding tab (Fig. 13).

The module allows you to make cash and non-cash forms of payment. To make a cash payment, you need to select an account for payment and click on the

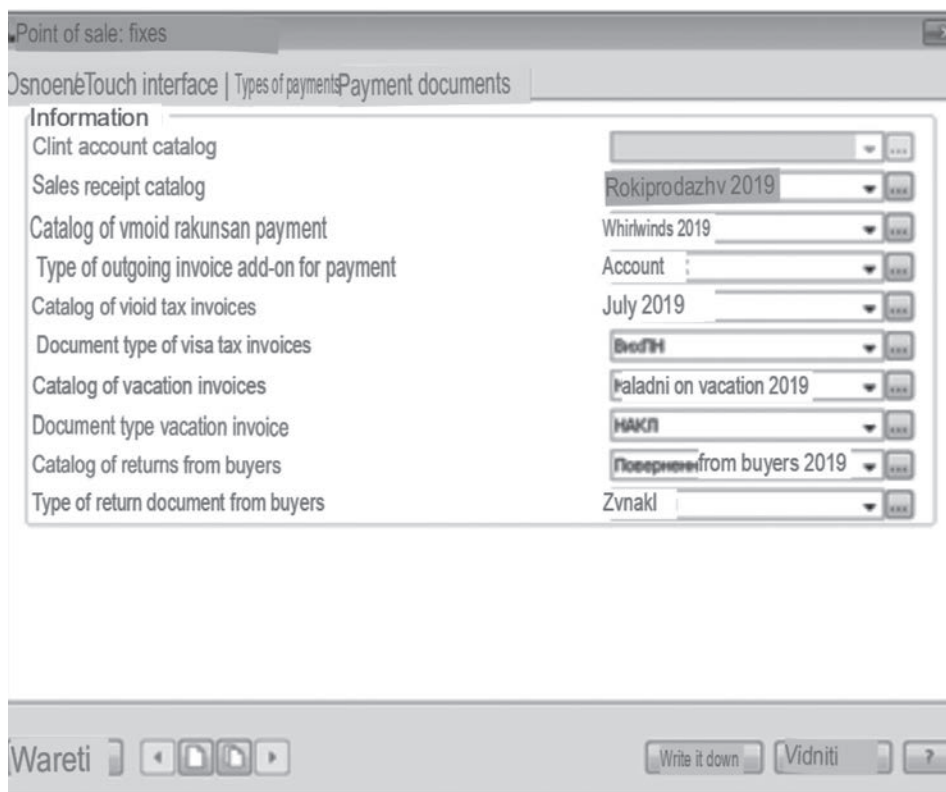


Fig. 7. Points of Sale

Source: formed on the base [6; 7].

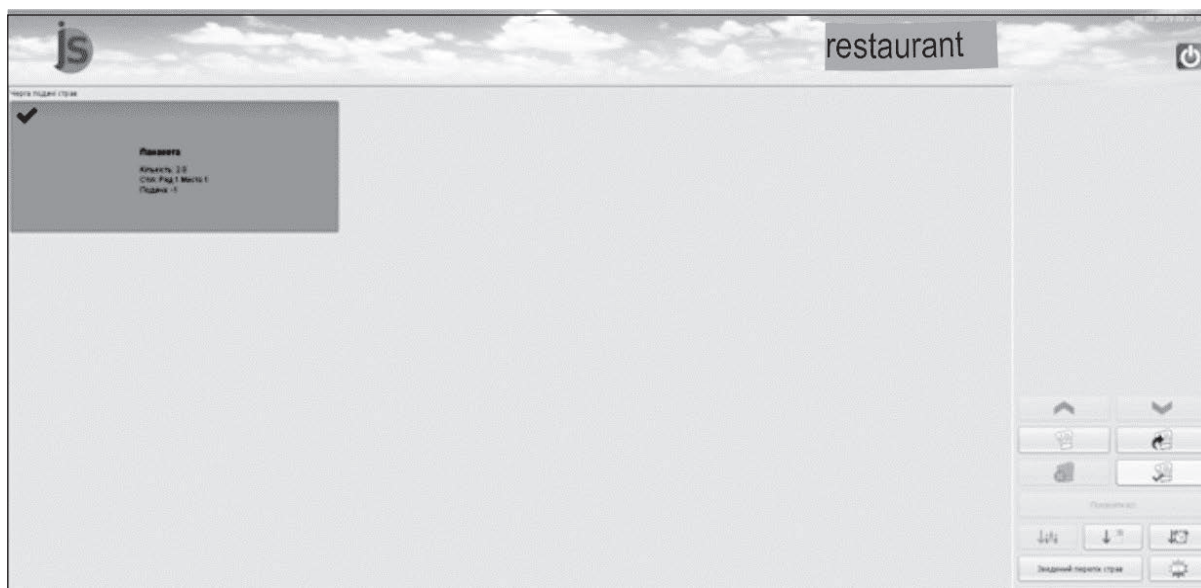


Fig. 8. The chef's workplace

Source: formed on the base [6; 7].

"Print invoice (1)" button, after which button (2) will become available .

Non-cash payment is made using the terminal. To do this, the point of sale is connected to the equipment of the Bank terminal type, then after pressing the

"Use" button, you need to press the appropriate button to transfer the amount to the bank terminal, and after successful verification of the card and successful payment at the terminal, press the "Pay" button (Fig. 14).

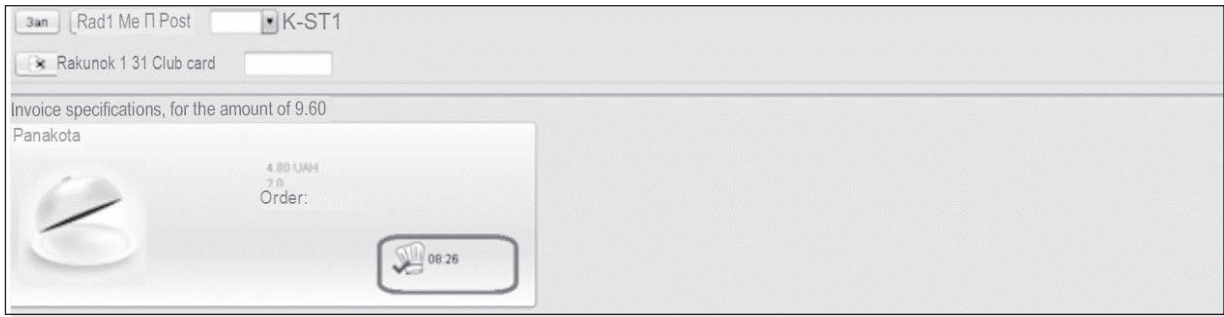


Fig. 9. Delivery services window

Source: formed on the base [6; 7].

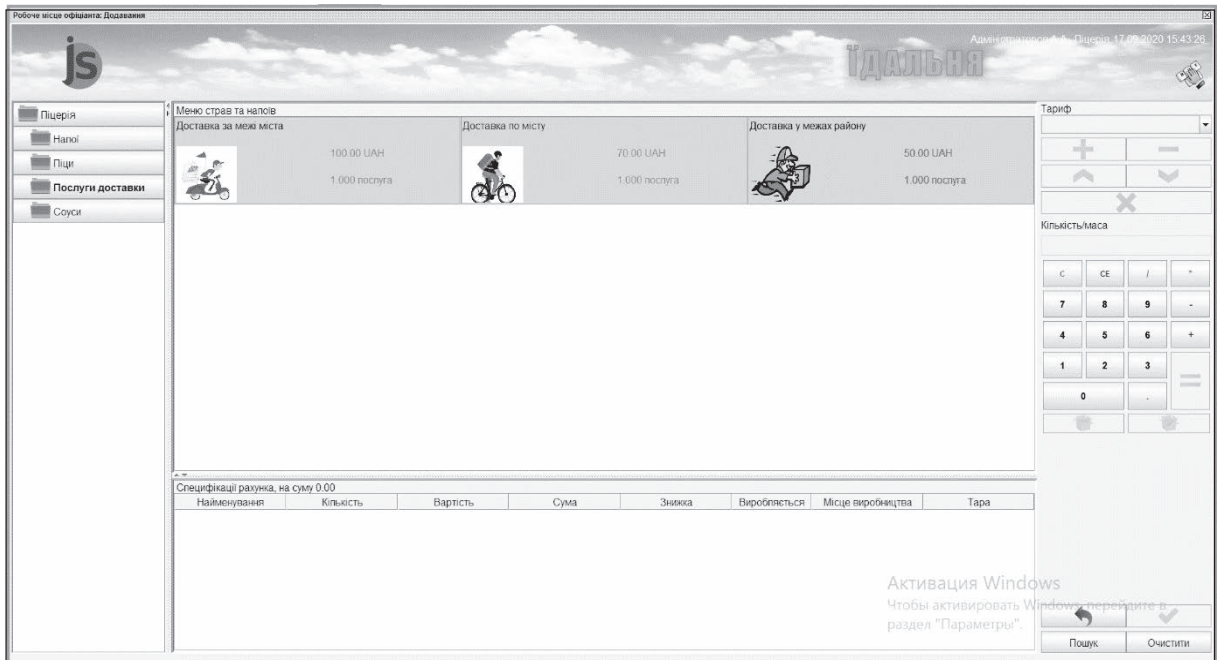


Fig. 10. Delivery services window

Source: formed on the base [6; 7].

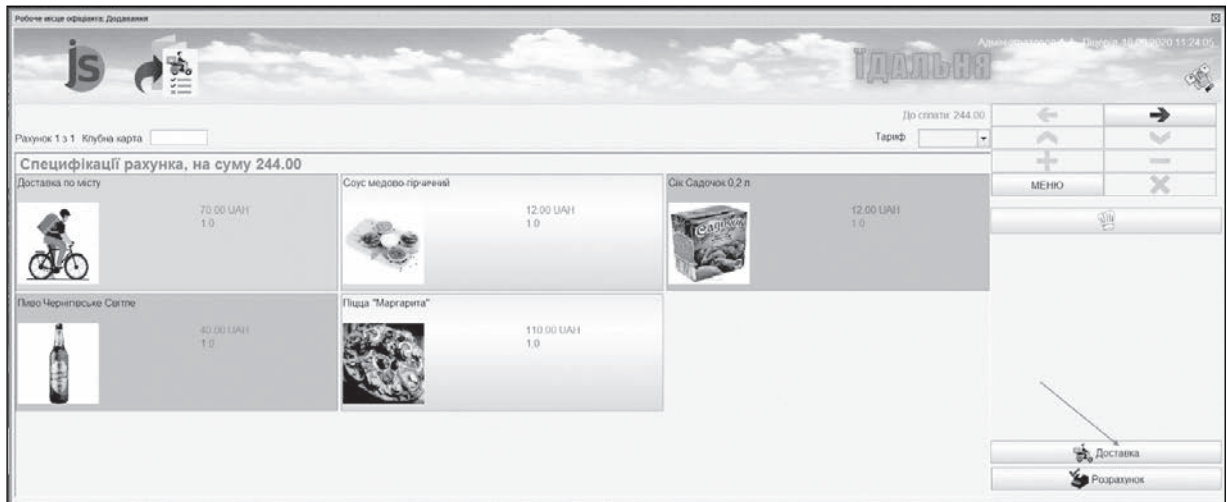


Fig. 11. Order window

Source: formed on the base [6; 7].

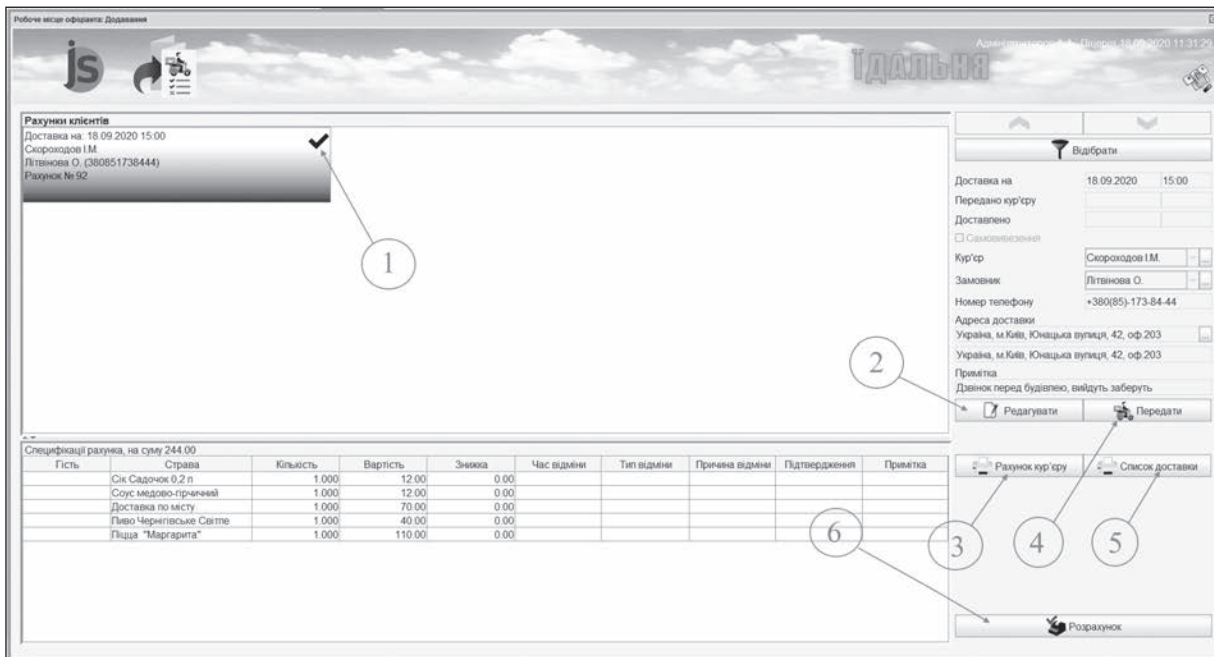


Fig. 12. Delivery settings window

Source: formed on the base [6; 7].

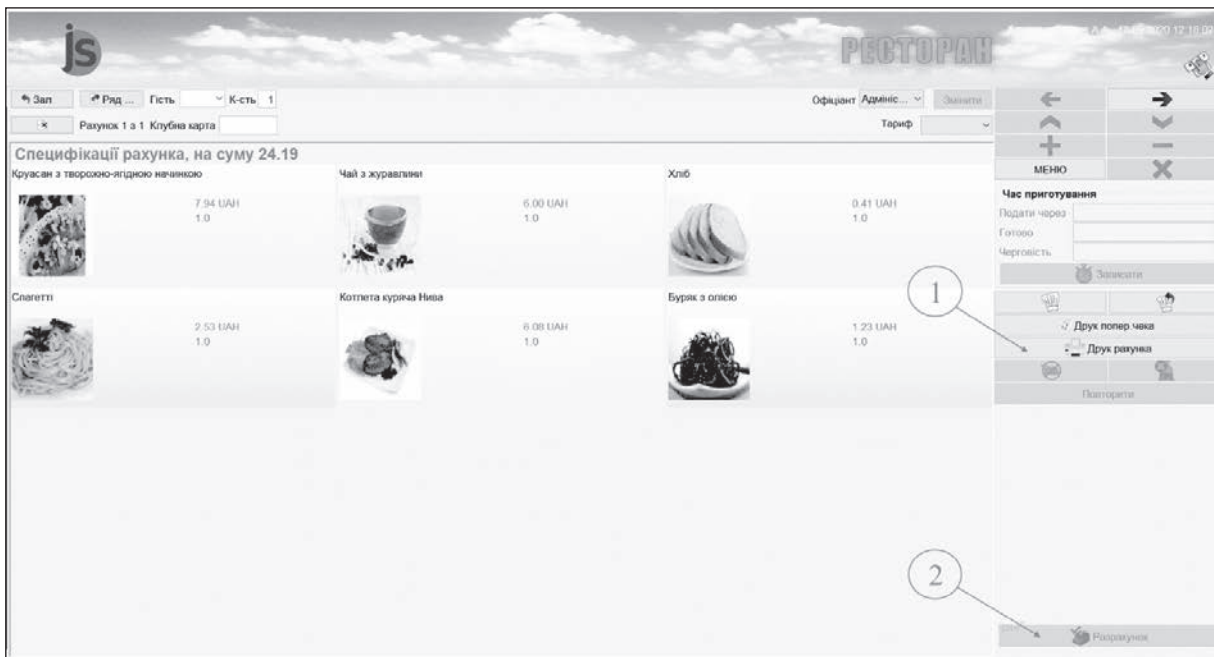


Fig. 13. Order payment window

Source: formed on the base [6; 7].

Another feature of the module is the ability to make partial payments on a single bill using both cash and a credit card.

The module also supports applying discounts during payment. If the discount is not fixed but varies based on factors such as order amount, day of the week, selected assortment, etc., it is specified by the

tariff in the corresponding dictionary. Discounts can be applied in two ways:

To apply a permanent discount as a fixed amount or a percentage, enter the discount amount in the "Discount" field (1) in the payment block. Alternatively, check the box (2) and specify the discount as a percentage (Fig. 15).

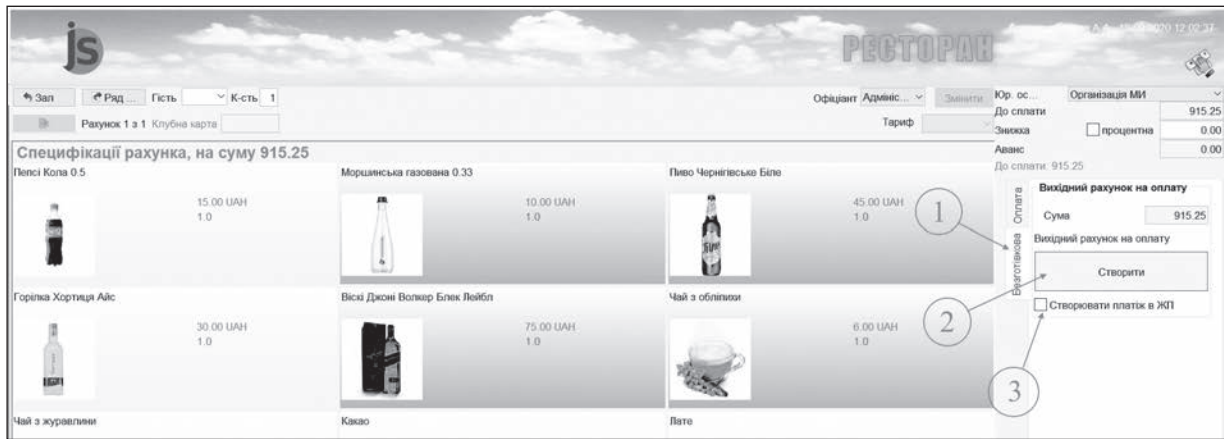


Fig. 14. Payment window using a bank terminal

Source: formed on the base [6; 7].

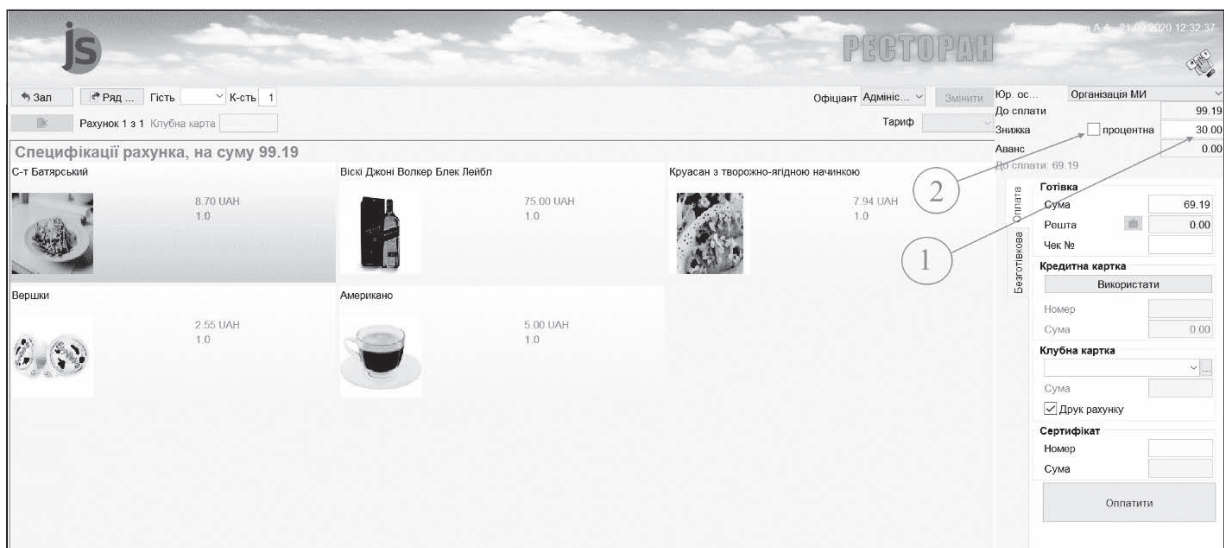


Fig. 15. Calculation specification window

Source: formed on the base [6; 7].

The module includes the "Sales Receipts" section, designed for accounting and adding sales receipts. Data in the section is registered manually or automatically.

Each check contains specifications, i. e. items that specify the characteristics of the services or goods provided. Specifications are registered on the corresponding tab of the record header edit form. Registration of specifications is carried out manually or with the help of a barcode scanner. At this, rows with records of the selected check are displayed in the section specification table.

The jSolutions "Restaurant" module contains a lot of additional functionality, including such additional functions as "Cashier collection", "Bill cancellation", "Reservation of tables", "WEB-interface of food ordering" (the functionality is intend-

ed for registration in the database of food orders on places where the desktop version of jCatering is not installed), "Mobile version of the waiter's workplace".

Thus, use of the jSolutions module "Restaurant" will allow:

- ✦ *Increase the efficiency of operations due to the automation of kitchen management processes together with inventory systems.* This will reduce the time it takes to process orders, avoid errors, and use resources more efficiently.
- ✦ *Reduce costs.* Inventory control and demand forecasting will help reduce product losses and optimize purchases, which will affect the reduction of operating costs.
- ✦ *Improve customer service.* The module allows waiters to quickly take orders directly at the table, reducing wait times and improving the

overall customer experience. And also store data about customers, their preferences and order history, which will allow providing personalized recommendations and special offers, increasing customer loyalty.

- ✦ *Expand sales channels.* The module allows you to create online orders with subsequent delivery. Own mobile applications and websites, as well as integration with delivery platforms, allow you to expand your customer base and increase the number of orders. The module can also be used to book tables online, which will reduce waiting time and increase convenience for customers.
- ✦ *Loyalty programs.* The system allows you to manage loyalty programs, offer individual discounts and bonuses, which stimulates repeat purchases and increases the average check.
- ✦ *Optimize the menu.* The module collects information about sales data to analyze the popularity of dishes and optimize the menu, which helps to increase income from the most profitable positions. Also, the popular seasonal offers feature allows you to create seasonal and special offers that attract customers and increase revenue.
- ✦ *Improve the quality of service.* The module collects and analyzes customer feedback through online platforms to help identify problem areas and improve service.

CONCLUSIONS

Information technology can significantly increase the income of a restaurant due to the optimization of operations, improvement of service quality, effective marketing and expansion of sales channels. Investing in modern IT solutions will help restaurants stay competitive, increase operational efficiency and ensure stable revenue growth. ■

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