Application software for business process automation

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Abstract. The article explores the use of software for automating business processes. In today's market, business process automation becomes a necessity, as it determines the number of services provided, which affects the amount of profit received by the organization. The article considers the essence and functionality of the application, and also considers the impact on various aspects of the organization’s activities. Application software for business process automation is a strategic solution that helps businesses grow, increase competitiveness and help adapt to rapidly changing market conditions, as well as streamline workflows, increase efficiency and improve interaction with customers and partners.

1 Introduction

Nowadays, almost all processes lend themselves to automation or systematization. With large volumes of production, it becomes more and more difficult to manually process the ever-growing flow of information [1]. Therefore, there is an urgent need for new systems for organizing information processing that can cope with massive data, ensuring the efficient and accurate functioning of various processes [2].

Automation and systematization of information flows can significantly increase productivity, optimize resource usage and reduce the likelihood of errors. In addition, the introduction of new information processing technologies contributes to a more efficient use of time, as well as improves the quality of tasks performed [3, 4]. The use of specialized software and technologies, such as artificial intelligence, machine learning and big data analysis, is one of the important components of new systems for organizing information processing [5]. Tools allow you to automate routine operations, find patterns in data, predict trends, and make informed decisions based on analyzed data [6, 7]. Their use
improves the interaction between people and technology, helps to cope with growing
volumes of data, increases productivity and makes informed decisions based on accurate
analytical data [8].

The purpose of this article is to simulate software developed for the complete control of
orders and restaurant employees [9]. Order control means adding it to the database and
obtaining complete information about it. Supervision of employees - scheduling work and
payroll [10, 11].

The developed system is intended for: 1) automatic editing of databases of orders,
dishes, registrations and employees [12]; 2) obtaining up-to-date information about the
order (description, price, readiness status) [13]; 3) formation of work schedules for
employees and their control [14]; 4) automating the generation of reports and graphs related
to sales and profits [15].

2 Materials and method

Business process management is the most relevant topic in computer science, because it
affects the interaction of people and organizations, as well as process-oriented software.
Effective business process management allows organizations to quickly respond to changes
in the internal and external environment, while improving the performance and quality of
services provided. Business process models that reflect best practices are configuring next-
generation process automation solutions [16, 17].

Creating business process models allows you to describe the sequence of steps and
activities, roles, resources and information that interact to achieve the final result. Such
models identify bottlenecks, help optimize information flows, improve interaction between
departments and process participants [18].

To create the system, modern technologies and tools were used to ensure reliability,
efficiency and ease of use [19]. The project was implemented using the Java and Python
programming languages, which provide powerful capabilities for developing highly
functional and reliable applications, integrated development environments - VScode and
PyCharm, which provide a wide range of debugging tools, code completion and project
management, a database management system - PostgreSQL, distributed version control
system - Git, task systematization and project management – Github [20]. The system
should be developed as a computer application as well as a mobile web application. The
databases of the software must be implemented in the PostgreSQL relational database
management system [21].

The architecture of the system is shown in Figure 1.
The users of the system are: director, administrator, waiter, cook, bartender, guest, registrar. Each user must have PC skills as a user, know the principles of working with Windows 7 and above, know the principles of working in any browser, know the principles of working in the Android and / or IoS system, be trained to work with "EatDrinkApp" on their working place in the user manual. From the hardware requirements for a computer or laptop stand out: 4 gigabytes of RAM and above, an intel i5 5500 processor or above, the availability of free disk space in the amount of 5 gigabytes; for phones: 2 gigabytes of RAM and above, mobile processes “snapdragon” 680 or above.

Requirements for the software part for a computer and laptop: 64-bit system, support for browser versions from 2020, windows 7, 10, 11; for phones “Android” 7 version and above, “IoS” 7 version and above. The network controller must provide communication with the system server via an Ethernet channel, as well as be responsible for integrating the system with the existing system at the facility.

3 Results

When developing a system, the intended implementation of all functions is presented in the use case diagrams in Figure 2.
Each employee must have their own account in the system. Adding to this system is made by the director. In addition, the system will track the actions of the employee in the system. From the preconditions, the formation of a database with employees with the subsequent possibility of adding new employees to it with storage of their actions, their dismissal, where you need to select the desired employee and change the status to “fired”, or viewing the actions of employees, which displays information about the actions of employees in system for the last month about coming and going and others. The user enters the system through the corresponding account of the director, selects the functionality of adding employees to the database. To do this, the user needs to fill in the following fields: full name, position, date of birth, contact information, status, then the login and password for the employee are generated.

To work with client complaints, a diagram has also been created, shown in Figure 3.

Fig. 2. Diagram of use cases "Work with personnel".

Fig. 3. Diagram of use cases "Working with customer complaints".

Each guest can leave a comment or a question in the system, which is answered by the administrator. A prerequisite for this is the provision of the ability to add reviews, that is, the presence of a formed base of answers to questions. The user logs into the system through the corresponding administrator account, analyzes the reviews received from the corresponding database, which should contain the following fields: guest id, order number, review, question, date, review id. Then he can answer the question or give a reaction to the
review. To do this, he needs to write the review id and the solution to the problem in the response database.

Reservation of a place before the guest's visit itself is also provided for by the system being developed. Such a diagram is shown in Figure 4.

![Diagram of use cases "Reservation of a seat".](image)

Each guest can reserve a seat. Entering the reserved seat into the database, as well as escorting the guest to the desired table of the client, is carried out by the registrar. The prerequisites for the implementation of such functionality include a pre-formed database of the status of places. To reserve a seat, the registrar analyzes the status of seats and reserves a seat for a guest, having received data on an attempt to book a seat, as well as guest id, phone number, date, and seat id.

To place an order, a separate diagram is also formed, shown in Figure 5.

![Diagram of use cases "Order placement".](image)
Fig. 5. Diagram of use cases "Composing an order and choosing an additional service."

The guest has a functionality that allows him to place an order, as well as leave a review or ask a question. To select the necessary dishes and drinks, you need a database containing their full names and ingredients. The user enters through the corresponding guest account, goes through the registration procedure. Next, the guest forms an order, which is formed according to the selected dishes and drinks, entered into the database and sent to the staff. After that, the guest has the opportunity to leave a review.

4 Discussion

The implementation of the system concept will allow creating a product that can facilitate and improve the activities of each stakeholder. Each employee will find the use of this system in their activities, thereby simplifying and automating some functions [22].

The daily, weekly and monthly report automatically generated by this system will save a huge amount of time for the director and administrator when analyzing productivity [23]. Also, automatic reporting analysis will allow you to easily build an assortment line of dishes for the next month, which will make it possible to make more informed decisions and greatly simplify the work of the administrator [24, 25].

Given the frequency of changes in the composition of employees, especially certain positions, will lead to the creation of an interface that does not require a long time for the internship of new employees [26, 27]. For Waiters, tasks are supposed to be reduced, for example, the choice and acceptance of an order is transferred completely to the guest. It should also be noted that this system concept may help reduce the need for some unwanted expenses [28].

Businesses must quickly and efficiently adapt their business processes to the new business environment to ensure business success [29, 30]. It is not enough to apply new methods; it is necessary to develop and implement new methods [31]. New business process automation technologies meet these requirements, delivering performance, cost, speed, and error reduction benefits [32, 33]. Automation is a growing multi-billion-dollar industry that relieves workers of repetitive routine tasks (through the introduction of autonomous agents) and frees up their time for other tasks. This results in process optimization and increased business efficiency [34, 35].

5 Conclusion

The implementation of the developed concept of the system should allow each employee to fully perform all the necessary duties. It is assumed that the speed of the work of employees will increase, as well as the number of nervous breakdowns as a result of confusion at work will decrease. And customer satisfaction directly depends on the emotional state of employees.

Thus, we can conclude that the developed concept of the system involves not only reducing the huge amount of time to perform all duties, but also increasing the productivity (quality of services provided) of employees, customer satisfaction and the profit of the company as a whole.

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