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DEVELOPMENT OF A SOFTWARE PACKAGE FOR INTELLIGENT MONITORING OF CUSTOMER FLOW IN COFFEE SHOPS

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Monitoring the customer flow in coffee shops is an important element of successful management of the establishment and increasing its competitiveness. For the effective functioning of coffee shops, it is necessary to ensure continuous collection and analysis of order data, which allows you to determine the dynamics of attendance and the popularity of individual menu items.

The software system allows you to conveniently process order data, taking into account seasonal fluctuations, peak hours, and other factors. Monitoring systems help optimize staff performance, plan inventory, and improve customer service. Thanks to the fast and accurate collection of data on customer activity, such solutions increase the level of service and help improve the business performance of the coffee shop.

The development of a software system for monitoring the flow of customers allows users to access analytical data without the need to install special software.

The object of research is the processes of creating a software system for monitoring customer flow in coffee shops.

The subject of the study is the methods and means of implementing a software system for collecting and processing data on customer orders.

The main task is to develop a software package that will allow you to track the dynamics of attendance and maintain effective management of service processes in coffee shops.

Development of a software package for intelligent monitoring of customer flow in coffee shops

When developing the requirements for the system and its functionality, we analyzed analogues. The following systems were selected for analysis: RetailNext, PosterPOS, and PayKit.

RetailNext [1] - It is a modern platform developed by RetailNext that allows not only monitoring the flow of customers but also integrating financial operations, warehouse management, reporting, and analytical data visualization. The system can

also be customized to meet specific business needs and is used in many international retail chains.

PosterPOS [2] - Another example of effective customer flow monitoring software is the Poster POS application. This application acts as a powerful tool that allows not only to track the number of customers in real time, but also to conduct a detailed analysis of their behavior and preferences. Poster POS provides users with the ability to create flexible graphs and charts that allow them to visualize the popularity of certain services or products depending on various customer demographics, such as age, gender, time of visit, and average check.

In addition, the application supports the functionality of generating reports for any period, which greatly facilitates business management. This software is actively used in catering establishments such as cafes, restaurants, coffee shops, and fast food outlets, where it is especially important to control the workload of staff, quickly process orders, and analyze the behavior of visitors to further optimize the work of the establishment. Thanks to its intuitive control panel, Poster POS allows business owners to make quick decisions based on up-to-date and accurate data

PayKit [3] - is an innovative web-based system that specializes in data analysis and analytical reports for cinemas. The platform helps cinemas gain detailed insights into their operations, attendance, and audience engagement.

This system is focused on providing centralized control over the activities of the institution, allowing managers to make prompt decisions based on up-to-date data stored in the cloud environment. One of the key advantages of Jsolutions is its ability to integrate with a variety of commercial equipment - from cash registers to terminals and scanners.

To demonstrate the differences between these systems, a comparison table was created (Table 1).

Table 1 - Comparison of the characteristics of software systems

	RetailNext	PosterPOS	PayKit	Own development
Measurement accuracy	-	+	+	+
Graphical interface support	+	-	+	+
Automation of measurement	-	-	+	+
Analysis of the popularity of orders	+	+	-	+
Speed and convenience of measurement	-	-	+	+
Total coefficient	2	3	4	5

Thus, own development has a higher total coefficient than analogs, which confirms the relevance of the development. As a result of the comparative analysis, a block diagram of the system's algorithm was constructed, which is shown in Fig. 1.

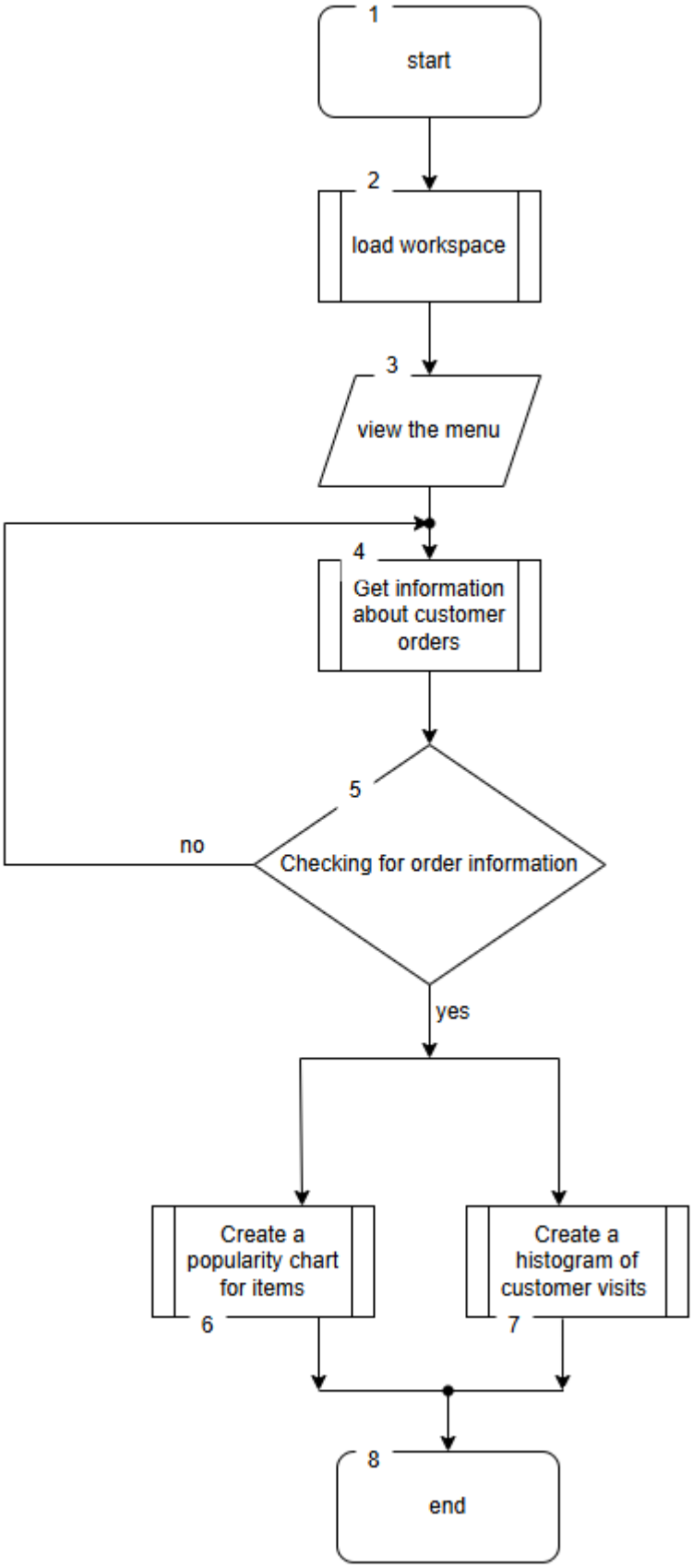

Figure 1 – Block diagram of the software application algorithm

As a result of the analysis of the subject area of web-based systems for managing cinema business processes and the comparative analysis of analogues of the developed

system, the functionality of the own system was determined and a flowchart of the system's algorithm was built.

The functionality of the software package includes:

1. simple and intuitive graphical interface;
2. adding information about the services available in the coffee shop and the price for them;
3. recording the most frequently selected services in a coffee shop for a certain period of time;
4. creating reports.

The following tools were chosen to develop the system: Python programming language [4], Visual Studio development environment [5].

References

1. RetailNext [Electronic resource] – Access mode: https://www.vista.co/
2. PosterPOS [Electronic resource] – Access mode: https://www.cinemanext.com/uk
3. PayKit [Electronic resource] – Access mode: https://cinemaintelligence.com/
4. Python [Electronic resource] – Access mode: https://www.javascript.com/
5. Visual Studio [Electronic resource] – Access mode: https://uk.legacy.reactjs.org/

ШТУЧНИЙ ІНТЕЛЕКТ В ІНФОРМАЦІЙНІЙ БЕЗПЕЦІ БІЗНЕСУ

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У сучасному цифровому середовищі, де інформаційні загрози стають складнішими, традиційні методи захисту є недостатніми зловмисних атак. Тому штучний інтелект (ШІ) здатний революціонізувати підходи до виявлення, запобігання та реагування на інформаційні загрози. Завдяки своїй здатності аналізувати величезні обсяги даних, виявляти закономірності та приймати швидкі рішення, ШІ відкриває нові горизонти в боротьбі з інфориаційною злочинністю, пропонуючи більш проактивний та адаптивний рівень захисту.

Штучний інтелект, як імітація людського інтелекту в машинах для логічного мислення та розв'язання проблем, знаходить своє застосування і в інформаційній безпеці. Його швидкість та обчислювальна потужність здатна прогнозувати, виявляти та мінімізувати загрози.

ШІ може стати ключовим рішенням, автоматизуючи рутинні завдання та виявляючи приховані закономірності [1]. Штучний інтелект відкриває широкі можливості для підсилення інформаційного захисту, про що свідчить і різноманіття методів його застосування (табл. 1.)