Workflow automation and performance improvement based on PostgreSQL

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Abstract. This article discusses the development of an automated information system for improving and improving the efficiency of the cinema. This is achieved by automating the process of submitting requests, monitoring the quality and quantity of solutions for such requests. The system is designed to provide access to the list of services provided, its timely updating and optimization; the formation of all types of reports; providing managers with a tool that automates most of the routine work on the registration of the results of the cinema.

1 Introduction

A large number of cinemas theatres have an extensive staff to serve guests. It consists of bar and control staff, as well as managers and technical specialists. Mistakes due to the human factor are not uncommon, which lead to conflicts and technical errors. As a result, this leads to dissatisfaction of guests and a decline in the reputation of the cinema. In this area, a system that will automate some of the tasks of employees can help. Due to this, their participation in the automated process should be excluded, and, as a result, there should be the workload on the staff has been reduced and the concentration on the main non-automated tasks has been increased [1-3].

Also, keeping records and monitoring the occupancy of halls is a simple routine task, during which errors may occur again due to the human factor. Automation of this part of the cinema operation could increase the efficiency of control over cinemas and help the management to focus on working with employees [4-6].

Monitoring the activities of employees without an automation system it is complicated due to the fact that collecting data on their activities manually is a routine task that takes a lot of time. Automation of this section is necessary again to unload personnel. In most cinemas, there is no healthy competition between employees, which is necessary for their motivation and the growth of active sales. It is absent due to the fact that it is difficult for managers to track statistics and financial indicators of employees. They cannot draw conclusions about their work and, accordingly, choose the most suitable motivational
program. In the age of automation, guests are less and less willing to communicate with managers when it is possible to perform the necessary actions without their help. The automation system could help attract new guests to the cinema [7-11].

The guest wants to be able to independently select a suitable session and bar products through the website or application, and then get it quickly and without waiting in line, as well as go to the hall and enjoy the movie screening without worrying that something might go wrong. If the guest wants to talk to the manager and get help, the manager must provide it quickly and efficiently. From the point of view of both the staff and the guest, a system that automates some aspects of the cinema's operation, it can help to facilitate the working day of employees and improve the quality of guests' rest. The presence of an automation system at the cinema can help to increase its reputation, since the difference in efficiency is absolutely clear [12-16].

The user can easily assess the difference between the work of an automated cinema with a competing one and conclude that the system can greatly improve the quality of the institution [17, 18].

2 Application structure

The system should be developed in the form of a website adapted for mobile and computer devices, as well as an application designed to work on the Android 6.0 and higher operating system, iOS 8.0 and higher. Software databases must be implemented in a PostgreSQL relational DBMS. The software processes confidential information (personal data of employees, reports, etc.) and is an automated system in a secure execution.

AIS should be implemented using technology Postgres in the form of four subsystems. The architecture of the system is shown in Figure 1.

![System architecture](image)

Fig. 1. – System architecture

The AIS database server and application server should be created on the basis of postrelational DBMS Cache. Client places for the developed AIS due to the complexity of the implemented functions should be developed on the basis of java-technology (applet - servlet) under the J2EE platform.

The automated system should be implemented using Cache technology in the form of four subsystems. The architecture of the system is presented in Figure 2.
The request accounting subsystem is intended for entering the registration data on employees and performed requests, as well as information on the results of work performed. When implementing this subsystem, it is necessary to differentiate access to requests in accordance with the established levels of access to data [19, 20].

The control subsystem is designed to track: the status of an employee's fulfillment of an individual work plan, service level and key performance indicators.

The report generation subsystem is intended for creating reports on quarterly performance results of both each employee individually and the division as a whole. The administration subsystem is intended for registering system users and assigning them rights.

3 Result and Discussion

AIS processes confidential information (personal data of the Group's employees, work-related information not subject to disclosure to third parties) and is an automated system in a secure design.

The system interface shall conform to the layout shown in Figure 3.
The automated information system will be developed using the algorithm shown in Figure 4.

![Algorithm of AIS development](image)

**Fig. 4.** Algorithm of AIS development

### 4 Conclusion

At The ready-made system reduces the likelihood of errors when working with a guest, and also increases the level of trust in the cinema among guests. The possibility for a guest to completely independently purchase tickets and bar products on the website or in the application using a short questionnaire allows you to attract a young audience [21-24].

Updating and improving the quality of the cash register managers' work will allow them to spend additional time not on the technical aspects of working with the guest, but on in-depth communication with the visitor, identifying his preferences and how as a consequence, the offer of the most suitable product. Thus, managers will improve their financial performance personally and the cinema as a whole [25-27].

The cinema and cinema halls monitoring system, in particular, will allow shift managers to devote more time to managers and guests and not spend it checking the cinema hall for the presence of "stowaways" in it. Also, the system administrator and the projectionist save time on manual inspections of cinema equipment, since these tasks are delegated automated system. Therefore, they can focus on other important tasks. Keeping the director's reports using a single system allows you not to waste time getting data from different systems [28].

The software being developed stores all the data in one place, and this makes it easier to get and output statistics on the cinema. The director (as well as any other employee of the cinema with sufficient authority) can request a certain report at any time and receive it quickly [29-32].
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