Development of an AIS to improve management of energy distribution at enterprise

Andrei Boyko¹,²,³, Anna Gorodishcheva¹, Elena Melnikova¹, Natalya Fedorova¹,², and Alexey Gladkov¹*

¹Reshetnev Siberian State University of Science and Technology, Krasnoyarsk 660037, Russia
²Siberian Federal University, Krasnoyarsk 660041, Russia
³Bauman Moscow State Technical University, Moscow 105005, Russia

Abstract. This paper considers the possibility of implementing an automated information system at the enterprise, to manage the distribution of energy. Also considered are the problems that will be aimed at solving the implementation of AIS of this type, as well as established requirements for the developed system, functional requirements and proposed some schemes of options for the use of the system, which should ensure the optimal use of electricity in production.

1 Introduction

The implementation of a website for the sale of machinery will allow you to cover the market more widely and automate many processes in the business logic of the company. [1, 2] And also improve the experience of interaction between customers and the company with the prospect of increasing the audience. [3-5]

Creating an online store, is becoming increasingly popular. According to recent data, the audience on the Internet is growing rapidly, and sales through the Internet in major cities, reach up to 25%, with experts emphasize the tendency to increase sales through the Internet. Site for the sale of machinery - is a modern trade channel. [6, 7] With the help of such a site, there is an opportunity to sell a variety of equipment at a very good price to a huge audience using access to the Internet. The site for the sale of equipment for the buyer is:

1. saving time, because it is much faster to go online and find the right product than to go to the store itself;
2. money, because this site sells goods directly from the manufacturer with minimal markup;
3. strength, because you don't have to go to the store yourself, choose the equipment, drive it home.

That is why, according to statistics, more and more people in Russia make their purchases through websites. Every year the number of stores that sell their products is increasing, because it is really profitable and very convenient for the buyer, as well as the creation of a site for the sale of equipment is very economical budget and time of the owner. Compared to the usual store, the sales territory of which is limited to the population of the city or district,

* Corresponding author: LEXA-GLADN@yandex.ru
the territory of coverage of the site for the sale of equipment increases throughout Russia and even the Russian-speaking audience in other countries, because the goods can be delivered not only by courier service, but also by mail. [8]

Creating a website, will help companies to strengthen their position in traditional markets and enter new ones, with the help of sales through the site, the company will be able to increase its sales, and accordingly turnover and profit. [9, 10] Especially the creation of the site is useful if you are a novice entrepreneur, you can with minimal cost to organize your own business, and the site will help to increase sales and open new markets for goods. [11]

The system being developed will automate many of the tasks of salespeople, administrators, marketers and the owner, thereby reducing their workload, so that everyone can better perform their direct duties. [12, 13]

Most businesses have a large staff for customer service, which consists of salespeople on the floor as well as their managers. [14] A large staff performs its tasks and often there are errors due to human error, which lead to incorrect ordering, and this leads to customer dissatisfaction and a decline in the reputation of the company. [15]

The system will automate some tasks of staff members and exclude their participation in this process, thus reducing the load on the staff, who can concentrate on their main tasks. [16-18]

The software will automate not only some tasks of regular employees, but also provide monitoring of each employee's activities and the ability to manage employees. [19]

Monitoring the team will allow the management staff to find the weaknesses of subordinates, point them out and make decisions that can increase productivity.

2 System requirements

The database server shall be used to store information on reports, user accounts and customer orders. The database server should be created on the basis of PostgreSQL DBMS.

Users should receive access to the site corresponding to their role in the system of accounts. Thus, the owner - has access to all company reporting, the administrator - to the functionality for reporting and editing the assortment list, the seller - to the functionality for processing orders and handling customer requests, the customer - to the functionality for creating orders and consultation.
The site processes confidential information (information about customer orders, bank card data, addresses, personal correspondence with a consultant) and is an automated system in a secure design.

The server part of the application should be realized on the basis of java technology.

The site should be realized with the help of structural subsystems, which are presented in the system architecture, in Figure 1.

3 Functional requirements

The site should implement the functions presented in the use case diagrams. A general use case diagram is shown in Figure 2. And some of the use case diagrams are shown in more detail in Figures 3-8. A brief description of the user function of the system is presented under each figure.

![General diagram of use cases](image1)

**Fig.2** General diagram of use cases

![Purchase of goods](image2)

**Fig.3** Purchase of goods

Brief description: a customer makes a purchase in an online store.
Precondition: the user is authorized on the site.
Main flow of events: the user clicks on the "add to cart" button, the user selects the method of delivery and the method of receiving the goods. User selects the method of payment for the product. User clicks the "Checkout" button.

**Fig.4 Sale of goods**

Brief description: online technical consultation.
Prerequisite: the user is logged in as a seller.
Main flow of events: user enters the chat room. The user accepts questions from customers about ordering or product features. The user answers these questions online.

**Fig.5 Reporting**

Brief description: administrator makes reports for a certain period.
Prerequisite: the user is authorized as an administrator.
Main event flow: the user processes incoming data for a certain period of time and enters it into a report to be sent to the management.
**Fig. 6** Conducting an advertising campaign

Brief description: the marketer conducts an advertising campaign on the site. 
Prerequisite: coordination with the management. 
Main flow of events: user coordinates the project with the management. User places advertising notices on the site.

**Fig. 7** Guideline

Brief description: the owner is engaged in management. 
Prerequisite: the user is authorized as the owner. 
Main event flow: the user is engaged in monitoring the store network using site features such as: "Number of sales", "Documentation".

**Fig. 8** System support

Brief description: the developer maintains the site during its life cycle. 
Precondition: the site is put into operation.
Main flow of events: the user checks the operability of all system functions and fixes them as quickly as possible in case of malfunctions.

4 Conclusion

In this work, requirements have been compiled which has helped in providing a reliable customer service through automation system namely a website for sale. The creation of the website has helped to increase the demand for various products at a reduced price.

The implementation of this system will allow the company to widely cover the market for the sale of machinery and also automate many processes in the business logic of the company. [20] This system will help to improve the interaction between customers and the company with the prospect of increasing the audience.

The system being developed will help automate many tasks, administrators, management, salespeople and other employees, thereby reducing the load on them. With this system, each employee will be able to understand and perform their direct duties more accurately. The developed software will reduce the likelihood of errors in the work of employees of the company, especially those that arose due to human error. [21]

Also the developed software will help the administration and management to monitor the work of their employees, to find any weaknesses in their work, and if necessary to make decisions to improve the quality of work, which can increase productivity.

References

1. A. Borodin, et.al., Energies, 14, 15 (2021)
4. V. Kukartsev, Analysis of Data in solving the problem of reducing the accident rate through the use of special means on public roads, IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS), 1-4 (2022)
5. I.S., Masich, et.al., Computation 10, 185 (2022)
6. E. Popov, et.al., Mathematics 8, 12 (2020)
7. B. V. Malozyomov, Energies 16, 9 (2023)
8. I. A. Barantsov, Sensors 23, 2 (2023)
11. A. Rassokhin, Magazine of Civil Engineering 109, 1 (2022)
13. I. I. Bosikov, et al., Fire, 6, 3 (2023)
15. V. Kukartsev, Methods and Tools for Developing an Organization Development Strategy, IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS), 1-8 (2022)
17. I. S. Masich, et.al., Electronics, 11, 24 (2022)
20. V. V. Bukhtoyarov, Electronics, 12, 1 (2023)