# Development of an automated information system for a logging company

*Elina* Stepanova[1], *Vladislav* Kukartsev[2,3], *Kirill* Kravtsov[2*], *Eduard* Kukushkin[2], and *Elena* Suprun [2]

[1]Krasnoyarsk State Agrarian University, 660049, Krasnoyarsk, Russia
[2]Reshetnev Siberian State University of Science and Technology, 660037, Krasnoyarsk, Russia
[3]Bauman Moscow State Technical University, Artificial Intelligence Technology Scientific and Education Center, 105005 Moscow, Russia

**Abstract.** The development of an Automated Information System for Electronic Document Management and Communication (AIS EDiSZ) is aimed at optimizing the logging processes of enterprises. As part of this development, functionality is implemented that allows you to effectively manage documents, improve employee navigation and reduce equipment downtime. This functionality means various databases, an electronic map and various electronic charts. In addition, the creation of such a system lays the foundation for the future digitalization of the industry and opens up new opportunities for innovation. The result of the development stage will be a ready-made AIS ED&SZ project, which will be aimed at solving current problems of enterprises and increasing their efficiency.



## 1 Introduction

The logging industry plays an important role in the economy, providing raw materials to various industries. However, logging enterprises face a number of problems affecting their productivity and efficiency [1-3].

These problems include frequent downtime of equipment, which leads to a decrease in the volume of harvested wood [2]. In addition, there is a problem with the rapid transfer of important information between employees and ensuring effective communication [3-5].

Traditionally, paper document management is widely used in the logging industry, which slows down production processes and worsens the coordination of work [6]. Electronic document management offers a solution to these problems, allowing you to quickly and securely exchange documents, increasing efficiency and reducing processing time [7, 8].

## 2 Materials and methods

System development should be carried out on the basis of externally oriented connectivity. The life cycle model chosen should preferably perform iterative and incremental system tuning [9]. The main stages of work on the development of an automated information system

* Corresponding author: rhfdwjdr1@gmail.com

are analysis, technical specifications, design, development and testing. Analysis means studying current processes, identifying needs and requirements for software [10]. At the technical specification stage, functional and non-functional requirements should be determined, technologies and development tools should be selected [11]. At the design stage, architecture is developed, technologies are selected, and interface design is created [12]. At the development stage, code is written, tested and debugged [13]. The last stage of testing involves testing for compliance with requirements, identifying errors and defects [14].

## 3 Results and Discussions

System development should be carried out based on an architecture-oriented approach. The chosen life cycle model should allow for iterative and incremental development of the system. The main list of works on the development of AIS, their content and results are shown in Figures 1, 2 and 3. Here is a list of works corresponding to the spiral model of software development. It is assumed that all of the above work will be repeated at each iteration when implementing a subsystem or individual use cases [15-18].

The "Analysis" development stage is depicted in Figure 1. Analysis involves determining the customer's requirements and goals. Once the requirements are determined, the cost of developing and implementing the software is established. This process continues until the requirements satisfy the customer.

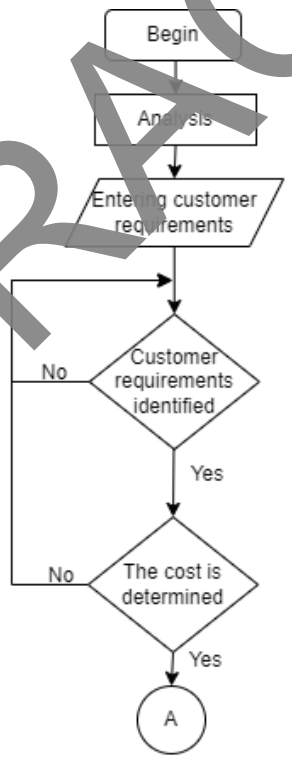


**Fig. 1**. Flowchart for the development of an automated information system ED&SZ (Analysis)

The development stage "Technical specifications" is depicted in Figure 2. The technical specifications imply the definition of the architecture of the future software and the development of its prototype. Afterwards the code is written and debugging starts; if errors occur during debugging, they must be corrected.

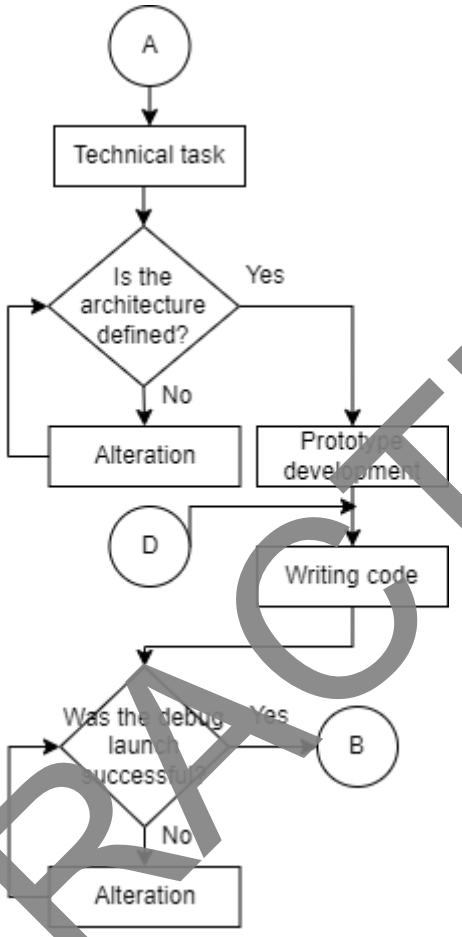


**Fig. 2** Flowchart for the development of an automated information system ED&SZ (Technical specifications)

The development stages "Design" and "Testing" are shown in Figure 3. First comes the design stage, in which the program interface is created in accordance with customer requirements [19]. After the interface has been developed, testing of the created program begins, identifying and eliminating errors [20]. If testing is not successful, then we return to writing code. If the testing was successful, then the final assessment of the customer is known; if the customer did not like the developed software, then it is necessary to return to the analysis stage [21]. If the customer likes the developed software, then the implementation of the program into the enterprise begins [22].

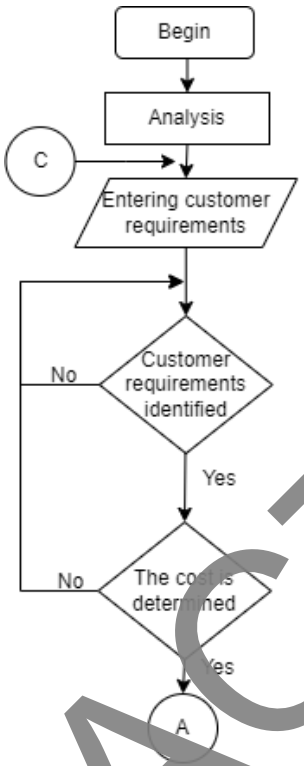


**Fig. 3** Flowchart for the development of an automated information system ED&SZ (Design and Testing)

## 4 Conclusion

Logging companies play a key role in the economy, developing raw materials for various industries. However, they have problems such as unreliable document flow and difficulties in managing personnel in forest areas. To solve these problems, further research and development of specialized systems are required [23-25].

The development of a document management solution and a request system is aimed at optimizing time, reducing the cost of document processing and improving the quality of work. The use of electronic maps and planning within this system allows you to speed up decision-making processes and reduce possible errors [25-27].

The development of electronic cards will help optimize time and improve the convenience of employees. Improved terrain navigation allows you to quickly completely new tasks on the map. Thus, the development of specialized systems for logging enterprises has the potential to increase the efficiency and competitiveness of this industry.

## References

1. Martyushev N. V. et al. Energies **16**. 2. 729 (2023)
2. Shutaleva A. et al. Sustainability **15**. 4. 3011 (2023)
3. Martyushev N. V. et al. Materials **16**. 9. 3490 (2023)
4. Bukhtoyarov V. V. et al. SOCAR Proceedings **1.** 12-20 (2022)

5. Bashmur K. A. et al. Sustainability **14**. 20. 13083 (2022)
6. Golik V. I. et al. MIAB. Mining Inf. Anal. Bull**. (11-1):**175-189 (2023)
7. Panfilova T. A. et al. MIAB. Mining Inf. Anal. Bull. **(11-1):**239-251 (2023)
8. Suprun E. et al. BIO Web of Conferences **84**. 01008 (2024)
9. Orlov V. et al. E3S Web of Conferences **460**. 07002 (2023)
10. Kravtsov K. et al. E3S Web of Conferences **458**. 09022 (2023)
11. Tynchenko V. S. et al. E3S Web of Conferences **458**. 01011 (2023)
12. Semenova E. et al. *Using UML to describe the development of software products using an object approach* 2022 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS). – IEEE, 2022. – pp. 1-4.
13. Tynchenko V. S. et al. AIP Conference Proceedings **2700**. 1 (2023)
14. Chernykh N. et al. *Comparative Analysis of Existing Measures to Reduce Road Accidents in Western Europe* 2023 22nd International Symposium INFOTEH-JAHORINA (INFOTEH). – IEEE, 2023. – pp. 1-6.
15. Volneikina E. et al. *Simulation-Dynamic Modeling Of Supply Chains Based On Big Data* 2023 22nd International Symposium INFOTEH-JAHORINA (INFOTEH). – IEEE, 2023. – pp. 1-6.
16. Filina O. A. et al. Energies **17**. 1. 17 (2023)
17. Boychuk I. P. et al. Energies **16**. 24. 8101 (2023)
18. Golik V. I. et al. Materials **16**. 21. 7004 (2023)
19. Malozyomov B. V. et al. Energies **16**. 13. 5046 (2023)
20. Malashin I. P. et al. Polymers **16**. 1. 115 (2023)
21. Malozyomov B. V. et al. Energies **16**. 13. 4907 (2023)
22. Tynchenko V. S. et al. Journal of Physics: Conference Series **2373**. 6. 062015 (2022)
23. Degtyareva K. V. et al. E3S Web of Conferences **458**. 02002 (2023)
24. Gantimurov A. et al. E3S Web of Conferences **431**. 03005 (2023)
25. Tynchenko V. S. et al. E3S Web of Conferences **458**. 07003 (2023)
26. Rogova D. et al. *Software System for Modeling Temperature Distribution During the Electron Beam Welding* 2022 IEEE International Conference on Design & Test of Integrated Micro & Nano-Systems (DTS). – IEEE, 2022. – pp. 1-6.
27. Kurashkin S. et al. Procedia Computer Science **200**. 83-90 (2022)