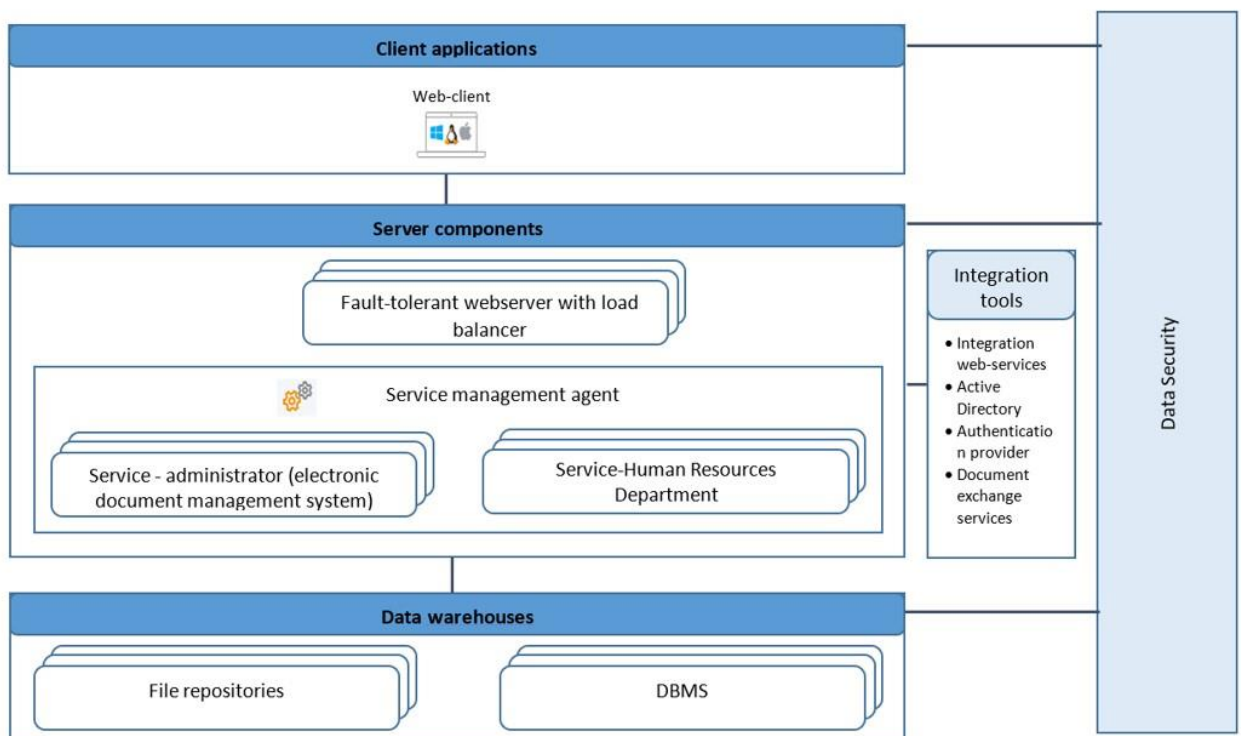**Brief information about the project**

Name of the project	AP09259208 "Creation of a scalable fault-tolerant enterprise digitalization information system using Big Data technologies" (0121RK00369)
Relevance	Currently, digitalization of all types of activities is one of the priorities for the development of society and, despite a sufficient number of information systems, there is now a need to develop scalable fault-tolerant information systems. The project has developed a scalable fault-tolerant enterprise digitalization information system with big data processing. The problems of fault tolerance, security, optimization of document routes, processing of big data, including unstructured ones, are investigated.
Purpose	The development of a scalable fault-tolerant enterprise digitalization information system with multi-level architecture of the enterprise digitalization, the development of subsystems based on Asp.Net Core and Angular Technologies, using technologies for processing large and streaming data (NoSQL, MongoDB, ApacheSpark, DataMining).
Objectives	1. To develop algorithms to ensure scalability, fault tolerance and data integrity for a multi-level enterprise digitalization architecture. 2. Create a subsystem user interface using React JS. 3. To develop new application software applications, including subsystems for digitalization of administrative and personnel activities, as well as a "Digital office" with a training module and proctoring. 4. Research and propose methods for protecting and securely transferring data during load balancing. 5. Use Apache Spark and PySpark to process unstructured big data and search for data on the contents of document files. 6. To analyze and evaluate the practical work of all subsystems, identify potential errors in data storage and propose methods to improve them. 7. Draw up detailed instructions for processing and monitoring the results that ensure the reliability, security and efficiency of the information system.
Expected and achieved results	A multi-level information system with a system security architecture has been developed, ensuring scalability and fault tolerance; new application software applications have been created, such as subsystems for digitalization of administrative and personnel activities, a Digital Office subsystem with a training module, a repository of large unstructured data; studies have been conducted to ensure fault tolerance and security of the information system, methods and new algorithms have been developed to ensure fault tolerance, implementation of protection and secure data transfer; the practical implementation of the created information system with testing and approbation has been carried out.

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List of publications with links to them	1) Paul Ezhilchelvan Isi Mitrani. On the benefits and costs of offloading among cooperating clouds. Simulation Modeling Practice and Theory 113, P. 1-10, (2021) https://doi.org/10.1016/j.simpat.2021.102393 , Q1, the percentile is 93%. SJR 0,97 SiteScore 8,5 (Scopus) 2) G.T. Balakayeva, Paul Ezhichelvan, M.K. Tursynkozha. Analysis, research and development of an innovative enterprise digitalization system for remote work. International Journal of Mathematics and Physics, vol.13, No.1, P.19-29, 2022. https://doi.org/10.26577/ijmph.2022.v13.i1.02, Q4, CiteScore 0,2, SJR 0,11 (Scopus) 3) Balakayeva, G., Ezhichelvan, P., Makashev, Y., Darkenbayev, D., Nurlybayeva, K. Digitalization of enterprise with ensuring stability and reliability. Informatyka, Automatyka, Pomiary w Gospodarce i Ochronie Srodowiska 2023, 13(1), P.54–57 http://doi.org/10.35784/iapgos.3295 Q4, SiteScore 0,2 (Scopus) 4) Balakayeva, G., Kalmenova, G., Darkenbayev, D., Phillips, C. Development of an application for the thermal processing of oil slime in the industrial oil and gas sector. Informatyka, Automatyka, Pomiary w Gospodarce i Ochronie Srodowiska, 2023, 13(2), P. 20–26 , http://doi.org/10.35784/iapgos.3463, Q4, SiteScore 0,2 (Scopus) 5) Balakayeva G., Zhanuzakov M., Kalmenova G. Development of a Digital Employee Rating Evaluation System (DERES) based on Machine Learning Algorithms and 360 Degree Method Journal of Intelligent Systems 2023. https://doi.org/10.1515/jisys-2023-0008 , Q2, SJR 0,52, SiteScore 4,8 (Scopus) 6) Balakayeva G., Darkenbayev D., Zhanuzakov M. DEVELOPMENT OF A SOFTWARE SYSTEM FOR PREDICTING EMPLOYEE RATINGS. Informatyka, Automatyka, Pomiary w Gospodarce i Ochronie Srodowiska, 2023, 13(3), http://doi.org/10.35784/iapgos.3723 , Q4, SiteScore 0,2 (Scopus) 8) Zhanuzakov, M., Balakaeva, G. Prediction of employee promotion based on ratings using machine-learning algorithms. bulletin of kaznpu named after Abaya, series "Physical and Mathematical Sciences", No.1(77), P.106-111. 2022 DOI:https://doi.org/10.51889/2022-1.1728-7901.14 . - materials of scientific conferences

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