Integration aspect in the use of digital technologies for the sustainable development of the timber industry complex of Uzbekistan

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Abstract. The article raises the issue of the relevance of introducing information technology into aspects of the activities of forestry enterprises in order to increase sustainable development, operational efficiency, and also reduce the negative impact on the environment. The forestry industry is considered in terms of decomposition into areas of activity that make up the structure, problems of business processes and information infrastructure. Based on the research results, a stack of tasks related to the development, reengineering and support of enterprise information infrastructure components is formed, the solution of which will allow us to develop a strategy for optimizing business processes and digital transformation, which in its concept should reflect the use of modern methods of lean and environmentally friendly production.

1 Introduction

Agriculture is one of the economically important sectors of the Republic of Uzbekistan. In the structure of the gross domestic product of the Republic, the share of agriculture reaches 28.98%, more than 27% of the population is employed in the production of agricultural products. The development of agricultural production ensures economic growth, diversification of production, export potential, food security, providing the country's population with food and raw materials for the processing industry, which ensures stability and reliability in the supply of agricultural products, job creation in rural areas, and also guarantees socio-economic development of rural areas and agglomerations. Development is essential to ensure the sustainability of agriculture as a whole and to maintain a balance between production, environment and social aspects [1-4].

One of the main areas of the agricultural sector of the Republic is forestry - a branch engaged in forest reproduction, forest management, protection and use in order to meet the needs of the economy for wood and by-products while maintaining environmental and social aspects. The main goal of forestry is the rational use of forests and forest resources for the purpose of their conservation and sustainable development. In turn, the timber industry complex includes industries related to the procurement, processing and production of wood

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products. It provides numerous sectors of the economy with construction materials and raw materials. Forestry provides the timber industry complex with wood raw materials, and the timber industry complex, in turn, finances forest reproduction. Thus, forestry and the timber industry complex are interconnected and interdependent within the framework of a single forest complex of the country [5-7].

Fig. 1. Forest lands of Surkhandarya in Uzbekistan.

As an example, Figure 1 shows the forest lands of Surkhandarya in Uzbekistan. The total area of land of the Baysun, Surkhandarya, Bobotog, Uzun and Kyzyrik state forestry enterprises and the Hissar specialized forestry enterprise in the region is 367 thousand 73 hectares.

But the country's modern forest complex is characterized by systemic problems and crisis phenomena, which include an ineffective economic model and system of state regulation of agriculture, instability of the price environment in the agricultural sector, a low level of institutional framework and insufficient coordination of aspects of legislative regulation, ineffective and unbalanced use of forest resources and infrastructure restrictions. These issues are the key challenges facing modern forestry in Uzbekistan, which requires systemic reforms and improvements to ensure sustainable development of the industry. To increase the efficiency of agricultural productivity and overcome current problems, the introduction of information, communication and digital technologies is required. The challenges are also highlighted by the significant gap in digital adoption across the agricultural sector in developed and developing countries, as well as between global companies and local, community and family farms. In this context, the introduction of information technologies to automate forestry management processes becomes an extremely relevant and important step [8-11].

2 Materials and methods

One of the key branches of agriculture as a leading sector of the economy is the forestry industry, which is part of the timber industry complex. The main task of the timber industry

complex is to meet the needs of the economy for wood and its processed products, as well as the rational use, conservation and reproduction of forest resources. The structure of the timber industry complex consists of the following areas: industrial exploitation of wood (harvesting, processing and sale of wood, wood processing, paper and pulp production, chemical processing of wood) and processing of by-products, production of non-wood raw materials, product exchange (timber export, sales of products), reproduction forest resources. The complex also includes organizations involved in the protection and restoration of forests, research centers and educational institutions specializing in the study of forests and their resources and the training of qualified specialists in this subject area.

The problems faced by forest industry enterprises that harvest and process wood include aspects of their activities related to business processes and information infrastructure.

2.1 Business process structure

Business processes reflect the order of actions, the repetition of which is aimed at creating the final production product for consumers and include stages ranging from timber harvesting to the production of finished products (both primary and secondary) and their sale, and t16-17he enterprise infrastructure is a set of structural units (resources) that ensure the efficient and uninterrupted functioning of the enterprise [12].

The structure of business processes of timber industry enterprises (in the aspect of economic activities aimed at the industrial exploitation of wood and processing of by-products, export and marketing of products) consists of four groups [13-15]:

The main business processes of the enterprise are focused on the production of products (wood, woodworking, paper and pulp production, chemical processing of wood, by-products, production of non-wood raw materials) and the provision of related commercial services, which are the target objects of the enterprise (representing value to the consumer) and providing income generation: logging, purchase of auxiliary materials and equipment, wood processing, production of goods from wood and products of its processing, storage, sales on the domestic and foreign markets, customer service.

Supporting business processes correlate with the enterprise infrastructure and represent a set of structural units (resources) that ensure the functioning of basic and management business processes: administrative support, IT support, communication and coordination, security, legal support, financial management, accounting and reporting, personnel management, warehouse and transport logistics, internal control and audit, product certification.

Management business processes are associated with decision-making and management of the enterprise's activities at various levels of the organizational structure and consists of developing and optimizing a strategy for the enterprise's business processes.

Business development processes are aimed at improving the goods and services produced, updating the equipment used and the stack of technologies used.

2.2 Information infrastructure

The information infrastructure of timber industry enterprises is a set of structural units (resources) that ensure the efficient and uninterrupted functioning of the enterprise, classified into categories: hardware and technical stack (IT support) and administration of information processes. The hardware and technical stack includes information (application) systems, resources and digital technologies, means of their support and interaction. The administrative stack includes organizations involved in the development of educational programs and courses for training in information technology and carrying out educational activities in this area, research institutions involved in the development of new information technologies and

solutions, and regulatory and control authorities in the field of information infrastructure [16-18].

2.3 Results of integration of business processes and information infrastructure

Optimization of business processes through the use of digital technologies consists of changing the quality of management of technological processes of information infrastructure and reflects the use of modern methods of lean and environmentally friendly production and the further use of information about the status and forecasting of possible changes in controlled elements and subsystems, as well as economic conditions in forestry. The study examines the problems of business processes and information infrastructure, solved by the integration of modern technologies.

In accordance with the decomposition of the main business processes, the problems of this group include [19-21]:

- harvesting and processing: presence of wood defects due to lack of proper storage conditions, insufficient control over deforestation, search for reliable suppliers of materials and equipment.
- production of products: low quality of manufactured products, as a result of problems with the competitiveness of products in the domestic and foreign markets and obtaining quality certificates.
- sales and marketing: competition from other manufacturers, ineffective marketing strategies, lack and irrational use of financial resources.

Problems of supporting and management business processes include [22-24]:

- administrative and economic support: problems with the maintenance of equipment, premises and work sites, low level of control over work, logistics.
- IT support: problems with hardware and software, information systems, equipment.
- communication and coordination: disruption of interaction between divisions of the enterprise.
- safety: the absence or insufficient effectiveness of safety systems at work sites.
- legal support, financial flow management: absence or low efficiency of applied information systems.
- personnel management, internal control and audit: insufficient qualifications of employees (the timber industry is the only sector of the economy for which an industrial competence center has not been formed), the absence or low efficiency of work process control management systems.
- warehouse and transport logistics: violation of coordination of vehicles, including preparation of products for transportation, loading, unloading and placement in warehouses, lack of modern information systems for managing logistics processes, inaccessibility of delivery of raw materials and finished products to work sites and warehouses.

Problems of business development processes include the lack or lack of innovation. Many timber industry enterprises use outdated equipment and technologies, which reduces labor productivity and increases production costs, which contribute to a decrease in the efficiency and competitiveness of enterprises.

Problems in the area of functioning of the hardware and technical stack (correlated with the business process of IT support (group of supporting business processes) and the business process of introducing innovations (group of business processes of development) include problems with hardware and software, information systems and equipment The study

examines problems associated with information systems, since the main functionality of enterprises is tied to their functioning [25-30].

Information systems of timber industry enterprises, like most systems of industrial enterprises of the agro-industrial complex, are fragmented and difficult to use and do not have a unified regulatory reference system. The design and development of such systems is quite difficult, because There are no technological and methodological principles and tools to ensure unity of approaches in terms of the information used, approved exchange formats, technical and software specialized solutions for analytical processing, modeling and visualization of information.

The problems of the hardware and technical stack include insufficient automation and optimization for a number of the following properties of information systems:

- application profile. A number of timber industry enterprises use unified information systems. However, the use of such systems can lead to problems such as incompatibility of components, conflicts between hardware and software, system instability, its vulnerability (in particular, security problems) and a number of other limitations associated with the characteristics of the system. In this regard, the use of ready-made unified solutions is not always the optimal solution. Application information systems are designed to organize and manage a specific group of business processes, which implies specialized configuration (functions, interface settings, integration with specialized systems, compliance with security standards) and customization to perform narrowly focused tasks of the subject area. For example, automated information and analytical systems are designed to manage financial resources in enterprises, business analytics, electronic document management and intelligent LegalTech systems for legal support of enterprise activities, integrated complex video management systems and intelligent recognition tools, video analysis and control to ensure security, intelligent systems to monitor the condition of work sites and warehouses.
- flexibility. Systems must be adapted to changing requirements and conditions (including the addition of software modules and components, changes in data structure, new functions and parameters in critical values, the introduction of standards and protocols) to achieve optimal results determined in accordance with the enterprise development strategy.
- functionality: the system must provide the full set of functions necessary to perform the domain tasks defined in accordance with the enterprise strategy within the group of business processes.
- reliability: the system must be stable and reliable, with a minimum number of failures and errors.
- cybersecurity: system components must ensure detection and blocking of unauthorized access and actions with data (destruction, modification, blocking, copying, provision, distribution, as well as other unlawful actions in relation to information and data of the system and its components).
- availability: the system must operate uninterruptedly during the session in normal mode.
- scalability: the system should be able to scale according to the growth of users.
- performance: the system must work quickly and efficiently, especially when working with large volumes of data.
- ease of use: the system should be easy to use and intuitive for users.
- integration: the system should be easily integrated with other systems and applications.
- support and updates: The system should receive regular updates and have 24/7 technical support.

- compliance with legislation: the system should not violate a number of regulatory documents regulating aspects of the activities of forestry enterprises.
- economic efficiency: the system must bring economic benefits and optimize the work processes of the enterprise.
- accuracy and reliability of data to ensure the accuracy of analysis results.

3 Discussion

In the case of development, the requirements for information systems must be taken into account during their design, in the case of already implemented systems in the enterprise - during reengineering and support. The implementation of these requirements is achieved by solving the following tasks: audit of problems of production and economic relation

ns, business planning of activities, information support and support, employee training and consulting.

As part of the audit of problems of production and economic relations of forestry enterprises, a number of applied and analytical studies are carried out. Applied research is aimed at finding areas of activity for the forestry industry that require the implementation of digital solutions. Analytical studies are focused on the analysis of business processes of development through changes in other groups of processes and present a set of works to assess the effectiveness of the functioning of enterprises in order to identify problems and limitations, determine the causes and develop recommendations for their elimination through the introduction of modern methods and standards of information infrastructure, including the development effective methods for implementing processes and building information systems, organizing and conducting system analysis and reengineering, setting, formalizing solutions to applied problems and processes of information systems.

Business planning of activities is aimed at eliminating the problems of supporting business processes through changes in groups of other processes: modeling applied work processes, developing requirements for the creation and development of applied information (in particular, intelligent) systems and its components, taking into account the main activities of the enterprise and the corresponding them business processes, organizing and carrying out work on the economic justification of design solutions, developing concepts for automation and informatization projects of work processes and creating applied information systems, developing an expert opinion in the design of applied information systems.

The set of works on information support and support is focused directly on the implementation of the business planning stage of activities and includes the following work blocks: development of projects for automation and informatization of applied work processes and creation of information systems, in particular, creation of a prototype, programming, documentation of information system projects on stages of the entire life cycle, implementation of design solutions using modern information and communication technologies, programming technologies and functional and technological standards, implementation of automation solutions for solving applied problems and creating information systems in the timber industry and ensuring the quality of automation, carrying out work on installing applied information software systems and loading databases, testing, providing information support for applied processes, technical support during the operation of information systems, automation of control systems, development of design and technical documentation.

Employee training and consulting covers a stack of tasks related to training employees to work with hardware and software, setting up and adapting application information systems to the specific requirements of the enterprise and the tasks of the subject area, as well as technical support and maintenance.

4 Conclusion

Based on the results of the study, a stack of tasks has been formed, the solution of which in further research conducted by the authors will make it possible to develop a strategy for optimizing business processes and digital transformation, which in its concept will reflect the use of modern methods of lean and environmentally friendly production through the use of digital technologies.

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