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Abstract. The main task of using information technologies is not only the automation of labor-intensive processing processes, a large amount of data, but also the acquisition of qualitatively new information resources. Taking into account that information technologies today play a very important role in the development of various socio-economic processes, it is important to understand that they must develop and improve. Today, there are many problems in the development of modern information technologies, which is invariably reflected in the level of economic development of Uzbekistan. The first important issue is the training of information technology personnel. In order to get good specialists, the training process must be properly organized, centralized, and must be carried out using modern technologies. Also among the topical problems of modern information technologies are the prevalence of foreign information technologies in this area and a low percentage of domestic ones. In addition, an equally important problem of the information space of Uzbekistan is the lack of coordinated work between its individual information sectors (commercial, regional, state). The lack of proper interaction between these sectors leads to their ineffective work. It should be noted here that in Uzbekistan different regions have different degrees of information content. And this is the main constraint on the development of information technology. After all, it is the high level of informatization of citizens that is a necessary component of social progress. The presented work describes an automated farm management system of the Republic of Uzbekistan, which was implemented within the framework of a scientific project of the Ministry of Innovative Development of the Republic of Uzbekistan. The experience of application, implementation of information technologies, information systems, scientific search systems and databases for processing, storage, analysis of data and results of scientific research, organization of research activities in the agricultural sector.

1. Introduction

At the present stage, one of the main conditions for the sustainable development of each state, as well as the growth of social welfare, is the modernization of the structure of the economy with the allocation of high-tech industries, science and education, as key growth factors. The task of modernizing the economy, set by the President of the Republic of Uzbekistan, brings to the fore the issues of increasing the level and effectiveness of scientific research and scientific and technical developments of scientific research organizations. In relation to agriculture, the implementation of the development strategy of Uzbekistan for 2017-2021 is based on international experience in the development of farms, based on the development of automated management systems and databases, as well as on the establishment of partnerships in the cultivation and maintenance of cotton, wheat and melons, as well as on the development of a technology model of information services in the

development of farms, adaptation of the automated farm management system to the process of modernization based on information services and innovative approaches.

In the Republic of Uzbekistan, much attention is paid to the effective use of information technologies in the agricultural sector. The creation and implementation of an automated farm management system is one of the main tasks of today.

The lack of legal and financial knowledge of most of our farmers is that they cannot make quick decisions about the management of their farms, do not know the exact amount of money in their accounts and have no idea what their expenses will be in the near future (taxes, social expenses, etc.). In the context of crop diversification and accelerated cultivation, one of the most important challenges is to provide staff and managers in the field with the information they need to grow crops, plant and care, and harvest and process. In most cases, insufficient knowledge of problem solving methods or delayed receipt of information can lead to undesirable consequences. This is due to the lack of databases in the agricultural sector and the inadequate use of information technology in farm management systems, which play an important role in agriculture.

The use of information and communication technologies in the agricultural sector is a requirement of the 21st century and requires the introduction of innovative technologies and the emergence of global information processes. This process will contribute to the further improvement of activities in agriculture, improve the performance of the agricultural sector through the use of electronic information resources and, as a result, improve the work and increase the profit of representatives of our agricultural sector.

Analysis of foreign literature has shown that there are numerous examples of automation in the agricultural sector. For example, in [1], the issues of automatic compilation of a groundwater map for cranberries are considered, in [2], to detect health disorders in pigs, automatic recognition of the posture and drinking behavior of animals is proposed. The design issues of the irrigation system in agriculture are investigated in [3], in [4] the issues of modeling the variability of the lactation curves of cows in automated milking systems are considered, in [5] a method of virtual fencing for dairy cows is proposed, in [6] based on time series of sensors first parity on the farm is predicted the duration of the productive life and the sustainability rating of the farm. In [7], a continuous-time state-space model is proposed for fast quality control of argos locations based on marks carried by animals. The proposed work describes an automated farm management system in Uzbekistan.

2. Materials and methods

Purpose of the study: Development and implementation of methodological, methodological and technological aspects of creating an automated farm management system.

Subject of research: The process of introducing modern information and communication technologies in agriculture.

Research objectives. To achieve this goal, the work pursues the solution of the following tasks:

- Study and scientific substantiation of theoretical and methodological approaches to improving the farm management system. Study, analysis and systematization of the accumulated experience and publications on the creation of information systems in the system of farm management both in Uzbekistan and abroad.
- Creation, pilot testing and implementation of an automated farm management system.
- Development of universal databases and programs for the automated calculation of farm tax reports.
- Development of standard solutions for the management of farms, approximate business plans for the use of free funds on accounts and sample forms of aggregated statistical data on farms in the region.

Research methods: analytical reviews, comparative analysis, experimental testing, data analysis methods.

3. Results

PHP programming language and MySQL database were used for modeling and automatic farm management, with particular attention to information storage and information security measures.

The client-server architecture is installed on a dedicated server managed by the operating system, and special software is installed on the database server. This architecture is also known as dedicated server architecture. The database management system is supported by Oracle, Informix, MS SQL, DB2.

The function of the database server is to use SQL. Requests are sent from the client (workstation) to the database server, followed by the process of searching and selecting data. The criteria that match the request criteria are stored on the server and transmitted to the user after the request is processed. Thus, the amount of data transmission in the network is reduced several times. Communication between SQL Server and client applications in such systems is carried out through the ODBC driver (OpenDataBaseConnectivity). The ODBC driver has become the standard for algorithms for accessing various types of databases.

Figure 1 shows a block diagram of the control panel developed by the system Agrosector.uz. It has the following components:

- Users - list of users and farmers.
- Harvest - Editing, the ability to add or remove information. Add, edit or delete varieties. An image of the variety and instructions are given.
- Type of activity - Editing, the ability to add or remove information. Add, edit or delete an activity.
- Operations - Add, edit or delete operations.
- Settings - site settings.

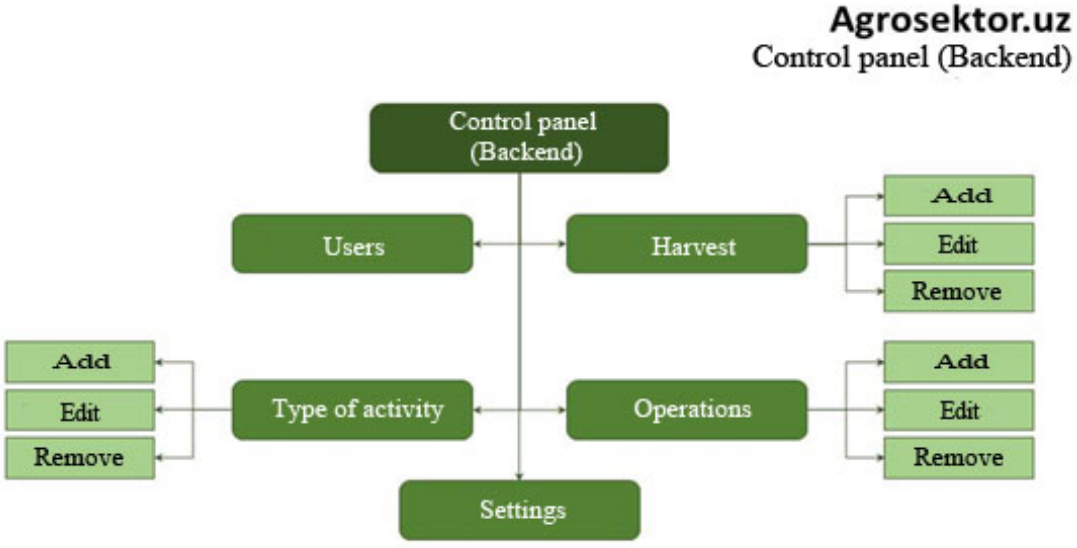

Figure 1. Control panel by the system Agrosector.uz.

Figure 2 shows the Agrosector.uz system client interface, which consists of the following blocks:

- News - foreign and local farm news, agricultural articles, information for farmers.
- List of farmers - shows a list of registered farmers. This paragraph indicates the contacts of farmers, the type of activity, geolocation in the map and various photo and video materials. There is also an advanced search by several criteria in order to find the necessary contacts of farmers. Farmer's Land and Crop Information.

- Farmer registration - registration of new farmers. Registration consists of several steps. The farmer indicates his contact information, geodata, type of activity, photo and video materials, information about the activities of the enterprise, etc.
- Search - search for information on farmers.
- Personal information about farmers - farmers can change information about themselves and the enterprise, about the location and other details.
- Weekly Weather Forecast - shows the geolocated weather forecast for seven days.
- Harvest - information about the farmer's harvest.
- Bookkeeping - Farmer's bookkeeping.
- Farmer's plot of land - in this menu, farmers can visually divide their land on the map. On the selected plot of land, farmers can plant a crop of a certain variety from the list and begin the process. Further, each operation will be recorded by their expenses, profits and comments.

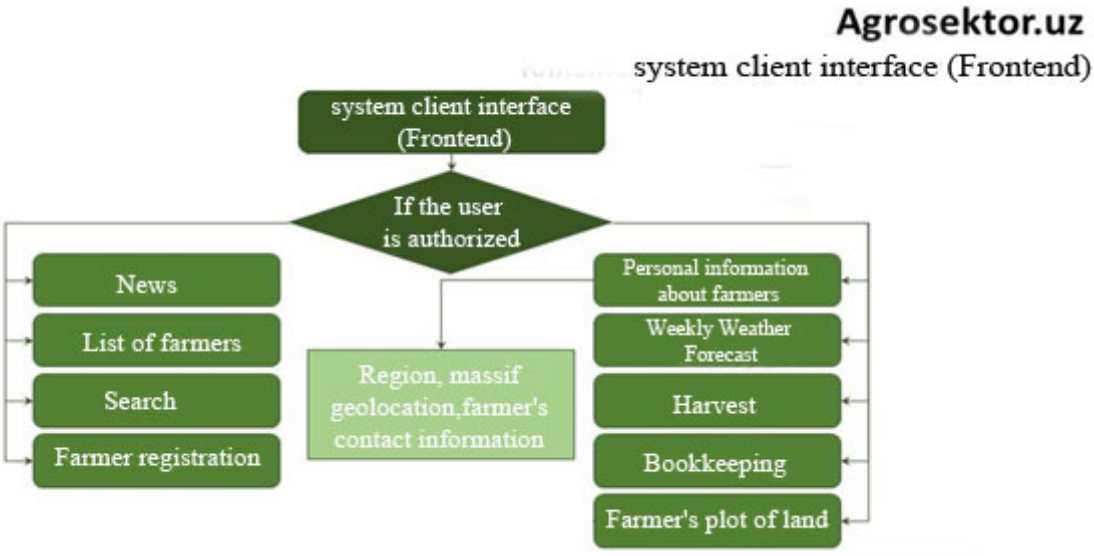

Figure 2. Client interface of system Agrosector.uz.

4. Discussion

The developed automated control system has been implemented in more than 100 farms of the Republic of Uzbekistan. To analyze the data obtained as a result of collecting information about farms, methods of reducing the dimension of the original attribute space [8-9], as well as methods for transforming the types of attributes, proposed in [10], were used.

5. Conclusion

An automated farm management system of the Republic of Uzbekistan has been created. Detailed instructions for the user on the use of the developed system have been presented. The developed system has been introduced in a number of farms in the Republic of Uzbekistan.

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