International Journal of Education Humanities and Social Science

ISSN: 2582-0745
Vol. 5, No. 02; 2022

# USING INFORMATION TECHNOLOGY TO RAISE THE EFFICIENCY OF AGRICULTURAL INSTITUTIONS

**Prof. Safwan Al Salaimeh**
Department of Software Engineering, Faculty Information Technology, Aqaba, University of Technology, Jordan

https://doi.org/10.54922/IJEHSS.2022.0364

## ABSTRACT
Geographical information systems (GIS) and their role in solving some environmental problems. Geographical information systems play an important role in some aspects of human life. Where it was applied in the areas related to the environment and gave good results in terms of increasing the degree of reliability and raising the efficiency of work and workers, which reflected positively on those sectors and institutions.
This research came to clarify the extent of the use of information technology represented in geographic information systems in order to suggest some solutions to the problems facing the environment, especially environmental monitoring. This research also shows the mechanisms and methods of designing geographic information systems.
As we can see, the study and use of some natural resources, the successful management of some economic activities and the appropriate decision-making process all require the necessary information support.

**Key Words**: IT, efficiency, Algorithm, indicators, institutions, implementation, profitability.

## 1. INTRODUCTION
Information technology can be defined as a set of tools, methodologies, processes and equipment that are used to collect process and store information. Examples of these tools are coding, programming, storage, retrieval, analysis, systems control, and data transformation. Information technology also includes: office automation, Communications, and multimedia,[1] Information technology is also the tool through which information can be stored and processed within the system, in addition to including everything related to computers, networks, software, websites, databases, and telecommunications.[2].
Information systems are considered an integrated set of components for collecting, storing and providing information, knowledge and digital products. This system is also used by many companies and organizations in order to help implement and manage their operations, interaction between customers, competition in the market, financial account operations, and human resource management, in addition to its use. To access the Internet, information systems are used by various governments to provide services to citizens, in addition to being used to deliver digital goods, such as e-books, software, games, and social networks. Information systems are also used by individuals to communicate on networks. Social media, banking, shopping, entertainment and more [3- 5]

## 2. PROBLEM FORMULATION
The task of increasing the volume of production and processing of agricultural products with a simultaneous decrease in total costs can be solved only through the full and rational use of the

ISSN: 2582-0745
Vol. 5, No. 02; 2022

resources of an economic entity. To solve this, by the way, very difficult task, new information technologies are needed. Information technology is a set of methods, production and software and technological means, united in a technological chain that provides collection, storage, processing, output and dissemination of information [4]. Information technology is a process that uses a set of tools and methods for collecting, processing and transmitting primary data to obtain information with new characteristics and qualitative properties (information product) [3].

The introduction of new information technologies (NIT) in agriculture will increase the efficiency and controllability of information flows [4]. The purpose of the implementation of information technology is to create a high-quality information product from an information resource that meets the requirements of a manager making a managerial decision [9- 11].

To assess the effectiveness of the introduction of new information technologies in agriculture, a tool is needed that will allow to quantify the contribution of each of the IT tools to increasing the profitability of agricultural production.

Currently, information technologies are implemented using personal computers and telecommunication means of communication.

Advanced information technologies will increase the efficiency and stability of the functioning of business entities.

It is they that, possibly based on the use of advanced information technologies, will allow identifying the internal reserves of the subjects, attracting external resources and restructuring organizational structures with subsequent reengineering of management systems. Thus, information technology is not a process of constant infusion of financial resources for the sake of economy, but a means of making a profit, which is determined by the degree of stability of the functioning of an economic entity[12- 14].

## 3. THE SOLUTION

Based on the modern requirements for the quality of work of management in any business entity, it should be noted that its effective work would largely depend on the level of equipping the organization with electronic equipment [1], such as personal computers, communications, copying devices, etc.

The prospect of ICT development for business entities is impossible without government support. The existing algorithm is financial support and support for business entities, the allocation of soft loans and state investments. But it will not give the maximum effect if some of these funds are not directed to the development and implementation of information technologies.

Today, the provision of business entities with information technologies is at different levels.

Some business entities require the improvement of IT, some - their implementation. Before proceeding with the informatization of business entities, it is necessary to determine the level of provision of the business entity with information technologies. For a more accurate allocation of resources to support business entities, it is necessary to assess the level of security of these IT entities or the efficiency of using IT in them, which is one of the main tasks of the state.

To assess the efficiency of agricultural enterprises, it is necessary to develop methods based on a systematic approach to the analysis of the activities of their individual areas. This task is solved as follows:

An increasing number of indicators are involved in the analysis, and among them are identified those that largely reflect the performance of the enterprise team.

The algorithm for this analysis is as follows:

ISSN: 2582-0745
Vol. 5, No. 02; 2022

1. Consideration of the subject as some integral system functioning in a certain environment;
2. Collecting sufficient information about the main characteristics of the system, primarily about the patterns of its behavior in various conditions;
3. Development of models that reflect the most important properties of real systems in the corresponding information system;
4. Determination of the development strategy of the controlled system based on the goals of its functioning;
5. Justification of the effectiveness of achieving the set goal, ie, the choice of the criterion for assessing the quality of the most optimal options for the development of the system;
6. Making management decisions based on the study of the behavior of the model by "playing" various production situations under changing conditions, taking into account technical, technological, economic, economic, social and random factors;
7. Implementation of management decisions of a real system and analysis of the response of this system to managerial influences [15 -19].

## 4. THE RESULTS AND DISCUSSION

Because of the work done, we will receive an index that will quantitatively reflect the qualitative contribution of IT technologies to improving the efficiency of agricultural production.

The general integral index of IT implementation (IT index) for various sectors of agriculture determines the degree of equipment of farms with IT, taking into account their efficiency. The index can be determined both for individual farms and for groups of farms, industries in general, or territories.

For n aspects, the total IT index is determined by the formula:

$$I = \sum_{i=1}^{n} W_i I_i$$

Where $W_i$ - - weight coefficient, $I_i$ - index on i – aspect.

The index should assess the effectiveness of the implementation of IT tools in the complex, since the increase in profit from their use consists of several components, often significantly spaced in time: saving production costs, increasing productivity and labor discipline, increasing production efficiency because of using accumulated knowledge.

The first step in determining such an index is to highlight aspects of agricultural production that are positively affected by the introduction of IT technologies.

Due to the variety of aspects of the application of IT technologies in agriculture, it is required to correctly take into account the positive impact of each of them. Hence, it is necessary to derive a complex coefficient, which is an interconnected system of assessments that allows a comprehensive and correct assessment of the impact of IT technologies.

It should be borne in mind that individual factors can produce different effects, both fast and long-term.

Mixing all into one index eliminates long-term factors. The index includes indicators of the effective use of IT from the position of various economic categories:

1. Effective use of IT as an indicator of costs;
2. Effective use of IT as an indicator of production growth;
3. Effective use as an indicator of the use of assets;
4. Effective use of IT as an indicator of business agility.

ISSN: 2582-0745
Vol. 5, No. 02; 2022

The assessment is based on the analysis of actual data on farms in which intensive farming methods were introduced, before and after implementation. In addition, the index takes into account the total economic effect on all aspects of the introduction of new technologies. The criterion nature of the indices will make it possible to carry out a comparative analysis of both individual farms and territories in terms of the degree of implementation of IT tools and their economic efficiency.

## 5. CONCLUSION

The paper provides a rationale and outlines a methodology for calculating the general integral index of information technology implementation (IT index) proposed by the authors, which makes it possible to carry out a comparative analysis of both individual farms and territories in terms of the total degree of implementation of IT tools and their economic efficiency. An integral part of the integral index is the assessment of the profitability of the introduction of IT technologies, both in crop and livestock farms.

The integral IT index includes differential indices in the following categories: economic efficiency indicators, production growth rate, asset utilization rate, business agility indicator.

A feature of the proposed calculation method is the flexibility and customizability of the index calculation algorithm, depending on the actual data and the goals set.

## REFERENCES

1. Kamila Tišlerová, Lenka Ližbetinová, Rudolf Kampf, Management of Customer Service in Terms of Logistics Information Systems, formerly Central European Journal of Engineering, vol. 7, issue 1
2. Nikolay Voutchkov, Desalination Engineering: Planning and Design, 2013.
3. Michael H. Gerardi, Troubleshooting the Sequencing Batch Reactor, 2010.
4. P.E. M.S. Jerry, Basic Environmental Technology, 2014.
5. Gnaneswar Gude, Sustainable Desalination Handbook, 2018.
6. Khaled Batiha, Safwan Al Salaimeh, (2016)// Development sustainable algorithm optimal resource allocation in information logistics systems. International journal of computer applications (IJCA), March 2016 edition. USA.
7. Mohammad Bani Younes, Safwan Al Salaimeh, // The Optimal Allocation of Simulation Resource in Logistics Information Systems. International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 2, February 2015.
8. Safwan Al Salaimeh, The Optimal Management of Information Servicing Logistics System, Institute Mathematics and Computer Science Journal, 2003, India.
9. Borel E. Probability and reliability / E. Borel; per. with fr. I. B. Pogrebissky. - M.: Nauka, 1969 .-- 110 p.
10. Doctors B.Z.On the reliability of measurement in sociological research / B.Z.Doktorov. - L.: Nauka, 1979 .-- 127 p.
11. Zaidel A. N. Errors in measurements of physical quantities / A. N. Zaidel. - L.: Nauka, 1974 .-- 108 p.
12. Kopnin P.V. Introduction to Marxist epistemology / P.V. Kopnin // Gnoseological and logical foundations of science. - M.: Mysl, 1974 .-- S. 9-280.
13. .Kopnin P.V. The transition from probable knowledge to reliable / P.V. Kopnin // Logic of scientific research. - M.: Nauka, 1965 .-- S. 177-197.

ISSN: 2582-0745
Vol. 5, No. 02; 2022

14. Kun T. Structure of scientific revolutions / T. Kuhn; per. from English. OF. Naletova. - M.: Progress, 1977 .-- 300 p.
15. Safwan Al Salaimeh, Information Technologies of Distributed Applications Design, Institute Mathematics and Computer Science Journal, p.99-103, 2003, India,.
16. Rajindar Singh, Membrane Technology and Engineering for Water Purification, 2014.
17. Nikolay Voutchkov, Desalination Engineering: Operation and Maintenance, 2014.
18. Richard P. Beverly, Filter Troubleshooting & Design Handbook, 2013.
19. Khaldoun Al besoul , Safwan Al Salaimeh, The Structure of logistics organizational technological system, Journal information society, Vol.4, Num. 7, June, 2007, Romania.