Рисунок 1. Вопросы, требующие решения в ходе внедрения инструментов автоматизированного аудита

Примечание – Систематизировано автором на основе [5]

Возможности инструментов цифрового аудита, таким образом, заключаются в переходе от выборочного аудита к проверке генеральной совокупности бухгалтерских данных,освобождении времени аудиторских групп и его направлении на более глубокий анализ информации для лучшего понимания бизнеса клиента, а также снижении риска ручных ошибок. Принимая во внимание факт, что внедрение автоматизированных решений в аудиторскую деятельность требует финансовых и временных инвестиций, а также сопряжено с рядом рисков, основные из которых связаны с необходимость обеспечения информационной безопасности, ценность цифровизации аудита неоспорима.

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Modern digital technologies in accounting and internal audit in agricultural enterprises

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Abstract: The paper discusses about the issues of the current state of the using of modern IT technologies in agriculture, about the prospects of the using of information technologies in accounting and internal audit. Digitalization of all sectors of Kazakhstan, including agriculture, is

the main vector of the country's development over the past few years. To implement the strategy of long-term development of the agricultural sector of the strategy, the Ministry of Agriculture of the Republic of Kazakhstan has developed a specialized program of strategic tasks called E-APK. The main advantages for accounting and internal audit by the implementation of IT technologies are briefly presented, a possible obstacle to the large-scale implementation of modern technologies in agricultural organizations are analyzed

Keywords: digital technologies, audit procedure, indicator, agricultural enterprises, internal audit

The relevance of the research is reasoned by the fact that today digital technologies cover most areas of economy in modern developed countries. Agriculture, as a strategic industry for Kazakhstan, isn't exception. From gathering to the cultivation of fields and raising of plants, an invention of fertilizers, using of technical for mechanization and automatization of production - each revolutionary innovation raised agriculture to a new stage of development. The modern agrarian revolution implies the introduction of advanced information technology (IT), that will reduce manual labor and costs, at the same time increasing productivity and prolificness.

The purpose of this paper is to show how IT technologies are used today in agriculture, what are the most promising areas for the introduction of IT technologies, how it can be used in accounting and internal audit, what positive economic effect can this bring for agrarian companies.

The Republic of Kazakhstan farmers are far from such indicators, but the request for digital technologies is growing. According to experts, digitalization will help the Kazakhstan agro-industrial complex make a powerful leap forward.

The Ministry of Agriculture of the Kazakhstan is actively working in this direction. The departmental project «E-APK» was developed last year with a deadline for implementation until 2021. Its main goal is a digital transformation of agriculture through the introduction of digital technologies and platform solutions to ensure a technological leap in the agro-industrial complex and for achieving of productivity growth in «digital» agricultural enterprises [1]. The first stage of this project was a creation of the national platform «E-APK» - an order to start its formation was issued in the January of 2017. The implementation of the project was not stopped by the Covid-19, at this stage a personal account for the agricultural producer is being created.

There is a clear focus on the efficiency of each operation in the digital agriculture. Digitalized agricultural technique, sensors, drones and other digital elements help to achieve this. At the same time, the management of production processes is automated. Manufacturing demonstrates a relatively high productivity of land at a relatively low cost [2].

A large number of tech companies that had grown out from startups are responding to the main request of agricultural producers - data collecting, aggregating and analyzing. The decisions of American agro-startups declare using of new and very effective technologies - an artificial intelligence, computer vision and machine learning. Some Kazakh companies are also trying to use these technologies, especially on an industrial scope - for analyzing NDVI images (a map of indicators of the amount of photo synthetically active biomass) of tens of thousands of hectares of arable land, counting the number of apples in thousands of hectares of gardens etc. This makes it possible timely and point wise to solve the problems of poor germination, insufficient of green mass, to identify hearth of the spread of diseases and pests, to predict the harvest with a sufficiently high degree of accuracy and, as a result, to more accurately plan of harvesting, transporting, storage facilities work.

Among the technologies that can be implemented in the Kazakhstan agro-industrial complex are software systems for farm management, robotic systems, drones for monitoring of agricultural objects, technologies of precision farming based on the Internet of Things. Using of that technologies makes it possible to estimate the condition of the soil and plants, increase the yield of land, optimize the cost of fertilizers and plant protection products, and identify areas that need an additional irrigation.

An example of another system that allows agricultural enterprises and farmers to switch to the

rational using of fertilizers, based on the needs of a particular area of the field, is the product of JSC TerraPoint. Based on the data of the chemical analysis of the soil, the digital map of farmland is compiled. Taking in attention the condition of the soil, farmers are given recommendations on the optimal planting of crops, the amount and type of fertilizers and plant protection products. Then «smart» agricultural machinery - seeders, sprayers, spreaders - receive the task cards.

There are certain specifics in the field of accounting and internal audit in agricultural organizations. It is due to the presence of accounting objects typical only for agriculture. These objects include biological assets, animals, plants. Such a feature as the seasonality of production also strongly affects on accounting, on the formation of costs and production costs, the procedure of creating of reserves.

Modern IT technologies can greatly facilitate the process of accounting of specific objects in agriculture. For example, some agricultural holdings for accounting of their suitable for agriculture lands, forests, as well as to assess the surface area of their own water resources, use aerial photography using drones that transmit images online and allow to assess the area of arable land, forests and water resources. This makes it possible to carry out an inventory of the company's land and water objects much faster than with traditional geodesy methods. In addition, this method, supplemented with the appropriate software for data analysis, makes it possible to estimate the density of the growth of green biomass, the density of forest stands, the saturation of meadows with grass, etc.

GPS trackers and agro navigators are a useful technology for accounting of the work of agricultural machinery, in particular for accounting of the hours worked of drivers and fuel consumed. Using of these devices allows you to see in real time where the agricultural machinery is located, in what mode is it (work or rest), what fuel consumption, what area of cultivated land, etc. Also high-quality internal control of expenditure of resources is provided.

Modern IT technologies make it possible to improve the accounting of labor and its payment. This issue is especially relevant for agriculture, where the labor of seasonal workers is used, where the places of work are geographically distant from the central office or accounting office. In this case, such a tool as mobile card readers, connected to the special program and the Internet, allows you to quickly register the moment of going to work, all breaks and time of leaving from work for employees who are pre-issued with ID cards.

One of the most important objects of accounting in agriculture is a finished product. Depending on the type of activity that the agricultural organization is engaged in, the finished product can be a harvest of crop products, vegetables or fruits, meat, milk and dairy products, etc. In all of these types of activities in modern organizations, they are equipped with a new technologies, for example, new combines with a harvest accounting system, equipped with measuring devices, which are available to transmit information via the Internet to a central office or warehouse, a new robots for milking milk, immediately transmitting information about the volume of received milk to the accounting department, a personal ID cards of employees, making it easy to record how much vegetables or fruits a person has harvested, etc.

Today, the use of IT in agriculture is not only about the use of computers. Different digital technologies allow you to control the full cycle of crop or livestock production - “smart” devices measure and transmit the parameters of soil, plants, microclimate, etc. All this data from sensors, drones and other equipment is analyzed by special programs. Mobile or online applications can help farmers and agronomists to determine the right time for planting or harvesting, to calculate the fertilization scheme, predict the harvest, and much more [3].

The study conducted by McKinsey in 2016, predicts that 86% of tasks of accountants and auditors can potentially be automated [4]. In Oxford University study [5], accountants and auditors are listed among professionals who may suffer from computerization. Deloitte claims that the UK could lose about half a million of jobs in the financial sector due to automation.

Accounting and many others (including on the Kazakhstan market) state that they are developing artificial intelligence applications for automating accounting and accounting tasks. As a rule, in these applications, artificial intelligence recognizes photographs and scans of documents,

translates them into a machine-readable format, classifies them, makes basic checks. The task of recognition and classification is certainly important from the point of view of accounting, and now an accountant spends a lot of time on stuffing data from a paper into a computer, but there is no threat to the accountant as a specialist.

Of course, these technologies can bring a lot of specialists to the labor market, who previously engaged in auditing and analyzing contracts. However, there is no information anywhere, what percentage of errors can artificial intelligence make when it is analyzing a text compared to a man - and this directly affects the responsibility of the auditor [6].

If we talk about the theoretical aspects of the automation of auditing, here, as in accounting, machines can facilitate the work, but the main place will still remain for a person capable of professional judgment. AI is generally very useful and able to help in a number of situations with manual data processing - and this is a very significant part of traditional audit work. Data retrieval, collation, validation are examples of where this is possible. AI significantly speeds up digitization of the traditionally manual data entry or extraction processes, which significantly reduces the time required for their preliminary preparation for verification.

Using of the modern IT technologies can bring great benefit in internal audit or internal control in agricultural organizations. With the usual organization of these services, when modern technologies are used in limited extent, the main disadvantage is a long time for getting of information and, as a result, a longer analysis and a slower management decision-making. IT technologies make it possible for internal auditors to monitor ongoing business processes in real time or receive complete information from them via the Internet.

For example, using of cloud services or block chain technology allows you to install a stable connection between the accounting department, warehouses, production departments and internal auditors. The need for an internal auditor to go to the accounting department or to a warehouse for the checking of the accuracy or correctness of a document is no longer so high. To do this, it is enough to place this document in a secure digital service, access to which is limited. The internal auditor will check this document much faster than if he had to come to the place of creating or receiving of this document.

One of the most important tasks which is set for internal auditors is to implement of measures for ensure of the safety of existing resources [7]. With the usual organization of internal control without the use of IT technologies, the most common way to accomplish of this task is to take an inventory. Since its implementation takes a long time, and the organization of this process is associated with a large amount of paperwork, then taking an inventory too often is a problematic. And this increases the risk of violations in the warehouse.

Modern systems such as cameras of video surveillance in real time, measuring equipment, connected to the Internet and capable to transmit information instantly, various programs with artificial intelligence, that allow quick measurements, calculations and analyzes of available resources, etc., make it possible for internal auditors to carry out constant control over the safety of existing resources without the need of regular inventory.

A similar picture is observed in relation to other areas of accounting. For example, accounting of settlements with suppliers, with banks, with customers, with personnel for remuneration, etc. The correctness of these calculations becomes much easier to control for internal auditors who have access to accounting information systems and are able to use various programs to analyze large amounts of data.

As can be seen from the results of the research, the introduction of IT technologies opens up wide opportunities for accounting and internal audit in agricultural organizations to increase the efficiency of their work. But at the same time, there are certain obstacles for the implementation of such systems. The main obstacle is the high cost. This applies to equipment for automating of various processes, measuring equipment, systems for accounting of manufactured products, labor accounting, smart video surveillance and analysis systems, etc. In addition, the installation of such systems is associated with payment for the services of companies involved in installation and subscription services, personnel training. The ability to cover such a high cost is available only for

fairly large agricultural organizations; small and medium-sized enterprises generally cannot afford such costs.

The second obstacle is the insufficiently high level of qualifications and skills to work with modern IT technologies among employees of agricultural organizations. Usually, such organizations work in rural areas, a large number of employees do not have higher education and skills in working with modern technologies. The process of retraining workers is time-consuming and expensive.

The Ministry of Agriculture of the Kazakhstan is implementing the E-APK project, which sets itself ambitious goals - digital technologies should help to double the productivity of agricultural enterprises by 2021. For the digital transformation of agriculture, specialists with new knowledge are needed, as well as new «smart» solutions that will come to their aid.

Digital solutions are increasingly penetrating at all segments of agriculture. To achieve growth in profitability, it is extremely important for agribusiness to make the most of innovative technologies. The same companies that in the near future will be able to combine their business into a single system based on a digital platform will become the undisputed market leaders.

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Ғылыми зерттеуде корреляциялық – регрессиялық талдауды пайдалану

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Түйіндеме: Бұл мақалада қоғамдағы құбылыстардың өзгерістеріне қатысты экономикалық байланыс туралы, яғни байланыстардың нәтижесін цифрлық немесе сандық тұрғыда корреляциялық – регрессиялық талдау негізінде анықтау жөнінде сөз қозғалады. Мақсаты: айналамыздағы болып жатқан жағдайлардың ең мәндісін, сонымен қатар бір фактордың басқаларға әсерін бағалау.

Кілт сөздер: байланыс, корреляция, регрессия, талдау.