USE OF INFORMATION SYSTEMS TO SUPPORT DECISION MAKING ACCORDING TO ANALYSIS MACHINES

Ing. M. Mráz., Ing. O. Urbanovičová, PhD., prof. h.c. prof. Ing. P. Findura, PhD., Ing. M. Prístavka, PhD.
Slovak University of Agriculture in Nitra, SLOVAKIA
miroslavmraz9@gmail.com, olga.urbanovicova@uniag.sk, pavol.findura@uniag.sk, miroslav.pristavka@uniag.sk

Abstract: Content of this thesis is to introduce information system and its use to support decision making in the selected farm. In this thesis we looked at using information system AgroCont the company ISAT, Ltd. the holding OVD - orchards association Dvory nad Žitavou. Agricultural enterprises have to keep the required documentation on the activities on land and know it thoroughly in accordance with European Union legislation introduced in regulations of Slovak republic. Using individual modules of the system we created in-house analysis outputs. The subsequent evaluation of the information we have proposed possible solutions and changes that may be helpful for better decision making, more efficient use of labor and machinery, but also for cost savings in normal operation. In conclusion, we evaluated output, which are designed to analyze the machinery and we have proposed measures and possible changes.
Keywords: agriculture, information systems, inspection authorities, internal analysis.

1 Introduction

The current economic environment is strongly influenced by the rapid development of information technologies and the quality of information systems is clearly one of the strategic factors for the expansion and competitiveness of each company (VOŘÍŠEK, 2003).

For this reason, many agricultural companies are moving to a fully automated and computer-aided information system that can be defined as a set of people, methods and technical resources that ensure the collection, transmission, storage and presentation of data for the purpose of generating and providing information to the recipient of the information used in system management (TVRDÍKOVÁ, 2000). IS is composed of several components. These are data, technical, technological and organizational means, human element and the real world, which forms the environment of the system (BULČÍKOVÁ, VLASÁK, 2004). The agricultural information system can be defined as the system in which the generated agricultural data is collected, transformed, processed and consolidated so as to go back in such a way that we can use it to help farms (RÖLING, 1988).

After the accession of the Slovak Republic to the European Union, a number of measures and requirements have been created in agriculture, which we must observe.

The creation of regulations and monitoring their compliance is the task of several control bodies, including the Ministry of Agriculture of the SR, CCTIA and PPA. Agricultural holdings must keep accurate documentation of activities on agricultural land and be able to document compliance with applicable land-related legislation (Ministry of Agriculture of the SR, 2003). With the help of the information system we can use communication and transformation of information in time, space and form so that it can be used better than in the original state. It is a system by which we add value to processed and communicated information (VEČEŘOVÁ, 2008).

In order for every organization to function properly, it is important to have a quality and reliable IS that enables you to make quick, high-quality decisions, flexibly and efficiently acquire, transmit and process information (JANOŠČOVA, 2014).

The information system consists of four subsystems on:
- Collection and transmission of information,
- remembering information,
- information processing,
- distribution and display of information (KUČERA, ŠKORECOVÁ, 1993).

2 Materials and methods

The article is focused on using the information system AgroCont (Fig. 1) from ISAT, s.r.o. to support decision-making by means of in-house analysis in selected agricultural enterprise OVD - fruit cooperative Dvory nad Žitavou. OVD is one of the largest and most promising orchards in Slovakia, 200 ha of orchards are farmed in this cooperative and has its own 1000 t cold store and a modern warehouse with ULO technology with a capacity of 1200 t.

By using IS Agrocont and its individual modules, internal analysis can be created. By means of in-house analyzes, we have proposed possible solutions, changes and possibilities of using the information system in managing the farm. In order to be able to create individual in-house analyzes to help us obtain the necessary information, used to analyze the current state of business operations and material flow, we need to follow a few steps and meet some specific conditions.
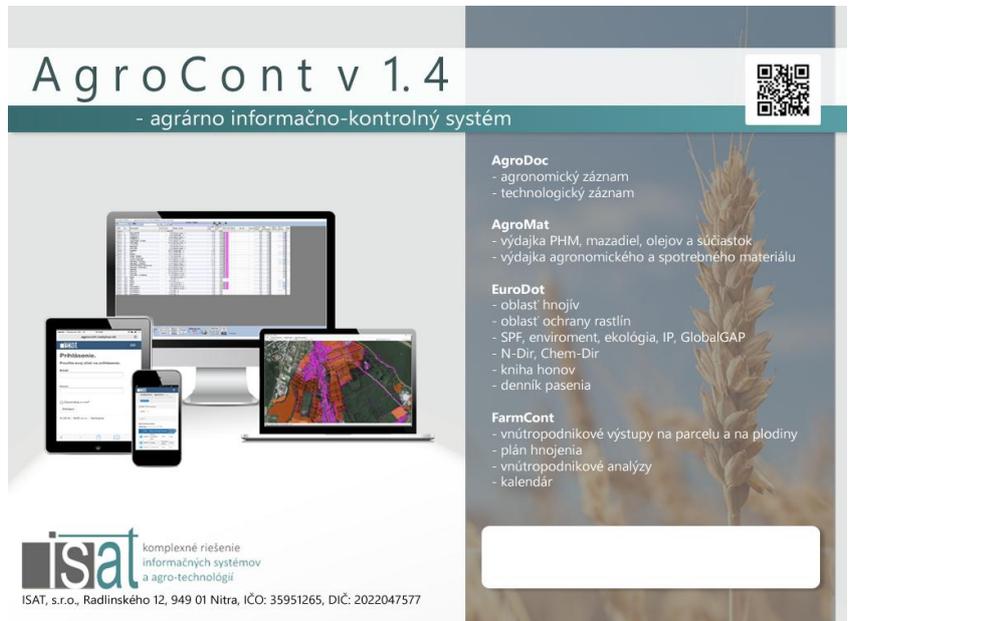
The following parts of the IS were used to create an internal analysis:
- Overview and adjustment of code lists,
- work order and job statement,
- outputs for in-house analysis.

It is necessary to set the overview and adjustment of code lists and to edit the dials (Fig. 2), which can be characterized as a database of all input data, which the company has to register and set before using this system.

We will use the AgroDoc module for the registration of input data, where the "Work order and job statement" (Fig.3) is in electronic form. It is a basic statement that the enterprise is obliged to use and is used to help manage and record the work of each business. With this report we can record long-term records of individual employees and their day-to-day operations and material flow, which help us, for example. wages.

Outputs for in-house analysis are created in the FarmCont module. This module provides information, outputs and analysis to the managers. It gives us an overview of the operations performed and the flow material and will use it to create machine analysis. The data base from which the analyzes will be generated is used for the calendar year 2018.

Fig. 1 AgroCont (Custom)

Fig. 2 Overview and adjustment of code lists

(Custom)

Fig. 3 Work order and job statement (Custom)

3 Results and discussion

By Output Analysis - The machine has an overview of all the operations and activities that have been performed on each machine. From the output we got the graph, which we see in Fig. 4, where we can see the ratio of the individual variables of each machine and thanks to that we can easily compare, evaluate and analyze them. Based on the observed differences and differences, we find out which machines are being used more, less, and suggesting possible solutions and changes.
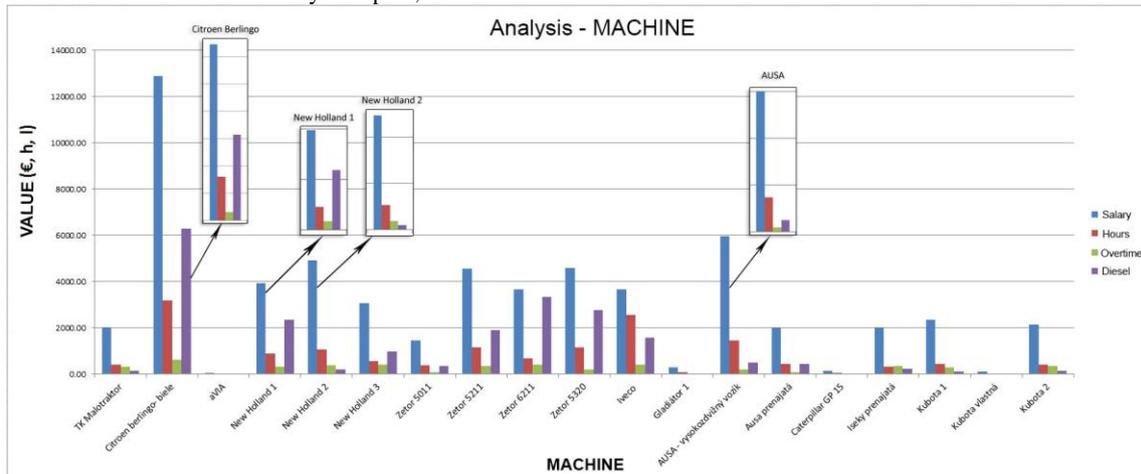

Fig.4 Output Graph Analysis - Machine (Custom)

For selected machines, we compared parameters such as labor cost, machine hours, overtime, and diesel. After a thorough analysis of the graph in Fig. 4, we focused on the following machines:

- Citroen Berlingo,
- New Holland,
- AUSA.

These outputs were obtained from the FarmCorn module as a result of the long-term recording of the Work Reports in the AgroDoc module. On each fleet machine, we focused on the following:

- Citroen Berlingo – has the largest wage and diesel costs, according to the figures found. This is due to the fact that the car already has advanced age and is used for many business operations within the company, such as. distribution of fir trees to orchards, auxiliary works in orchards and others.

Following the evaluation of Citroën Berlingo, the following solutions and changes may be proposed:

- The largest financial resources for oil consumption must be spent on the car because it is very used and has a high operating cost. A possible solution is to sell this car as best as possible and invest in buying a new car that is less consuming and powerful enough to work in the field, which the farm needs. In this way, the cost of diesel could be reduced, possible repairs to the old machine, and a new car could be used more efficiently throughout the cooperative.
- New Holland – by comparing the New Holland 1 and New Holland 2 tractors, it can be seen that for both machines the wage costs are similar to the hours worked but the different diesel costs.

Following the evaluation of New Holland tractors, the following solutions and changes may be proposed:

- Detailed analysis revealed that the high costs of New Holland 2 workers' wages are due to the large number of repairs carried out in the workshop. The proposed solution is that the company should consider whether it is worth spending a lot of money on constant repair or investing in a new or used machine if it needs it and can use it. Otherwise, they should shut down the machine or choose another solution, whichever is best.
- AUSA – is a forklift that is used for harvesting cherries at higher heights, or for ancillary work at harvest and in stock. According to these values, it can be seen that this machine has high wage costs. After analysis, it was found that this is due to the large number of fixes that make up half the cost of this machine.

Following the evaluation of AUSA, the following solutions and changes may be proposed:

- Up to half of the cost of wages was spent on the constant repair of this machine in the workshop. As with the previous machine, an enterprise must assess in the long run whether it is worth investing in repairs or buying a new or used machine to do its job at a much lower cost. Continuous costs are inefficient in terms of paying for repairs, buying spare parts and, last but not least, workers cannot work when the machine is repairing itself, which generates a profit for the business.
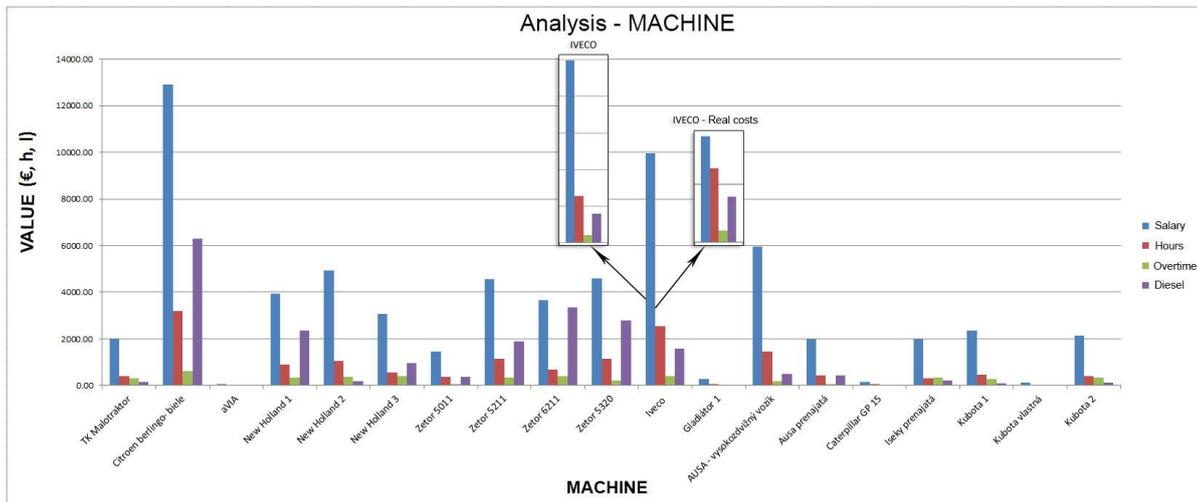
FIG. 5 *Output Chart Analysis - Machine, IVECO (Custom)*

When analyzing the machine we found this error:

- IVECO – this machine is used to deliver and transport the goods it receives in the warehouse. After a detailed analysis, it was found that a large part of the work operations were assigned to this machine incorrectly. The amount of registered work operations called warehouse maintenance was not to be allocated to the IVECO because it was the preparation of goods for distribution. Incorrect data can be used in Fig. 5 to see the difference between the real cost of an IVECO car and the cost of a faulty work operation. The values of IVECO values given The real costs were obtained by deducting from IVECO all incorrectly assigned work operations called warehouse maintenance, thanks to which we got the real status of these quantities.

Possible solutions to this problem:

- This finding merely confirms the correct analysis of the type of work, where there was also a number of work operations allocated to the type of warehouse maintenance work, resulting in inaccurate and distorted information on individual quantities relating to warehouse maintenance. In this case we will use the same solution, the company has to correctly determine a new type of work in the job statement, in our case the preparation of the goods for distribution, which would solve the situation and facilitate the whole registration.

4 Conclusion

The aim was to introduce the information system and its use to support decision-making in the selected farm. In the work we dealt with the use of the information system AgroCont, from the company ISAT, s.r.o. on the farm OVD - fruit cooperative Dvory nad Žitavou.By using this system and its individual modules, we have created in-house analyzes to suggest possible solutions, changes and possibilities of using the information system for managing the farm.

In the Machine Analysis, we selected four machines after a detailed analysis. The first was Cintroen Berlingo, which had the highest wage and oil costs. The reason was that the car was already old and very used, so we suggested to the company to sell it and buy a new one with less consumption and better usability in the field. We also compared New Holland 1 and New Holland 2 tractors, where we found that they had similar wage costs but different diesel consumption. This was due to the fact that a number of repairs were carried out on the New Holland 2 tractor in the

workshop. We have designed a solution for the enterprise to consider whether it is better to shut down the machine and purchase a new or used machine if it is able to use it. Another machine was the AUSA forklift, where we assessed that up to half of the cost of wages was spent on a large number of repairs. As with the previous machine, the company must evaluate in the long run whether it is worth investing in repairs or buying a new or used machine. The last machine that was subjected to analysis was IVECO, and it was found that a large part of the work operations were assigned to this machine incorrectly. The suggestion was for the company to correctly determine the type of work in the job statement, in our case the preparation of the goods for distribution, which would solve the situation and facilitate the entire records.

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