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OVERVIEW OF INFORMATICS DEVELOPMENT OF FORESTRY SECTOR IN HUNGARY (РАЗВИТИЕ ИНФОРМАЦИОННОЙ СИСТЕМЫ ЛЕСНОГО ХОЗЯЙСТВА В ВЕНГРИИ)

In the last decades, significant IT investments have been made in the Hungarian state forest sector. Investing in IT infrastructure has been a "necessity", because company management requires timely information, and maintaining digital connections is also a crucial factor in business. Information technology support for planning, management and recording of professional work became commonplace only later. On the one hand, this can be explained by the fact that the subject of management usually does not require fast actions or actions on a daily basis. On the other hand, administration of different phases of forest work became effective only when geographic information systems (GIS) emerged and compatible professional applications were developed. The author has examined the steps of adoption of IT tools, IT solutions and their effects.

В последние десятилетия были сделаны значительные инвестиции в IT в венгерском государственном лесном секторе. Инвестиции в IT-инфраструктуру были необходимы, так как экономическое управление компаний требует своевременного получения срочной информации, использования цифровых соединений, а также является важным фактором в бизнесе. Информационно-техническая поддержка для планирования, управления и записи профессиональной деятельности стала обычным явлением чуть позже. С одной стороны, это можно объяснить тем фактом, что субъект управления обычно не требует быстрого действия или действия на ежедневной основе. С другой стороны, руководство различными фазами работы стало эффективным только тогда, когда появились геоинформационные системы (ГИС) и были разработаны совместимые профессиональные приложения. Автором рассмотрены шаги введения IT-инструментов, IT-решений и их последствия.

Definition of the topic, aims, hypotheses

The paper deals with electronic data processing solutions and information systems in the state forestry sector and emphasizes two aspects: the development to the present stage and the analysis in how far these systems fulfill the needs of the sector.

The investigations were not extended to the whole forestry sector, only companies managing state owned forests were dealt with. The hypotheses of the investigation were as follows:

The relation of the forestry sector to information is different from that of the other sectors

The introduction of informatics into the forestrysector was a necessary step.

The infocommunicationdevelopments improved the security of the management

The infocommunication developments improved the efficiency of the operation

Material and methods

The work is a case study. The step of "field and laboratory data collection" was in this case a data collection using questionnaires and the completion of several personal interviews. The work has a broad time interval; the data collection was done three times, in 2001, in 2005 and in 2013. Among the questions of the questionnaire sent out in 2001 there were questions about the early stages of the "modern computer era" in the forestry sector. These were completed by the doctoral theses of Béla Lett (1986), József Ódor (1996) and the graduation thesis by Gyula Halasy (1997).

In the first part of this paper is an overview of the more than 50 year history is given based on special literature and other documents. Using his professional contacts the author of the publication could get hold of materials which were not publicly available, because they were in archives or in the drawers of some colleagues, and these pieces of information could make the publicly available publications more precise.

The questionnaires sent out in 2001 and 2006 contained only one series of questions, which were directed to the employees responsible for the information systems at the forest managers. The last survey was done using two questionnaires. One questionnaire was also directed to the person responsible for the information system and with the other the attitude of the users of the information system was surveyed. Another method of data collection was personal interviews. These were conducted under both formal and informal conditions. From these conversations either personal notes or recorded sound material were available. The author could collect a lot of information as a member of the informatics committee of the Association for The Forests on The Great Plainand the section of informatics in the Association of Hungarian Foresters.

The author applied for authorization of data collection at the forest companies addressing the general directors. Unfortunately not all answers were positive. Some of the leaders considered that the answers to the question are in the area of business secret and did not allow the data collection, or did not even answer the request.

Out of the questionnaires sent out to the twenty-two forest companies in 2001 eleven, in 2005 ten and in 2013 sixteen were returned. From the user questionnaires 283 were returned.

Results and discussion

Role of the information within the forestry sector

Before investigating the informatization of the sector we have to make clear what is the relation between information, information systems and forest sector.

A continuous data collection and analysis is needed so that a system can reach its optimal target state, in order to have relevant information about the system. In the knowledge of these information and the limiting factors decisions have to be made about measures which would lead the system nearer to the desired state.

The author has prepared a model of the use of data characterizing and describing forests (Fig. 1). Actors in the model use data about forests in different locations, resolutions and with different accuracy. The most important among forestry data is the Database of Forests, which dates back for the longest period of time (nearly half cebtury) and the structure of which is unchanged for the most important characteristics, and its data is also electronically available. The model also demonstrates that in making decisions other factors and limitation play also an important role. The most important is the legal environment, which effects the different actors with different intensity.

The author also investigated the information relation between the actors (Fig. 2). The connections represented by arrows are regulated in their form and intensity, while the brownish “background” colour means unregulated, “diffuse” informations. The strongest and the most intensive among the relations is the relation between manager and authority and the manager and the owner.

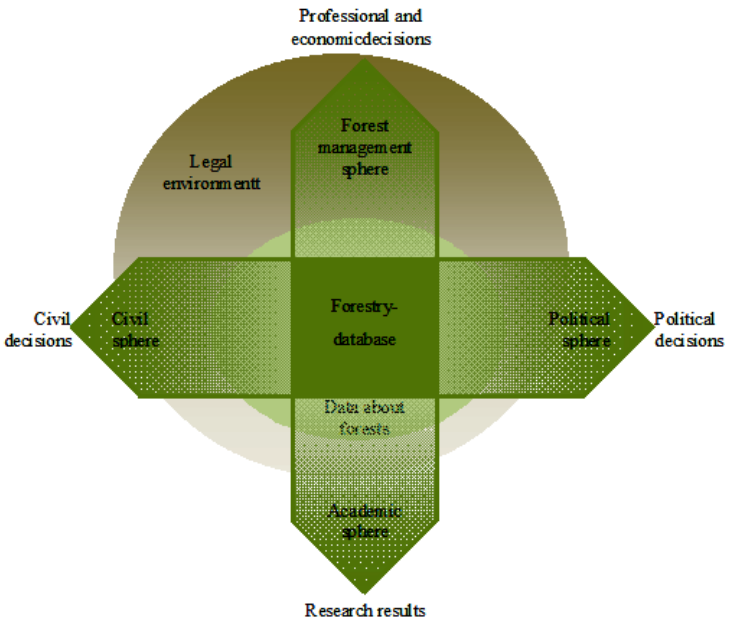

Figure 1. Model of use of forestry data

In the course of the investigations the economic approach was the most relevant among the many different definitions of information. According to this the information represents a part of the product, there is a supplementary connection between the raw material and energy used to manufacture the product and the information. As the energy, material and labor input decreases in the same amount the used information increases. Having this in mind the forest sector can be put in the lower left corner of the information intensity matrix introduced by Porter and Millar (Fig. 3).

In the forest sector the actual technological processes are short in comparison to the natural processes, and are inserted in consecutive interval into the flow of spontaneous processes. So neither the "product" nor the "process" of the forestry sector needs a large amount of information or fast information processing.

Analyzing the sector from the standpoint of information systems it can also be placed into the lower left corner of the strategic grid model of Cash, McFarlan and McKenney (Fig. 4).

This position means the supporting role of the information system. The placement comes at one hand from the low information intensity and at the other hand from the fact, that the companies produce their end product under differ "production circumstances" so they are not each other's concurrent in the classical sense of the word.

Development from the beginning until now

Before dealing with the history of the development of the infor-

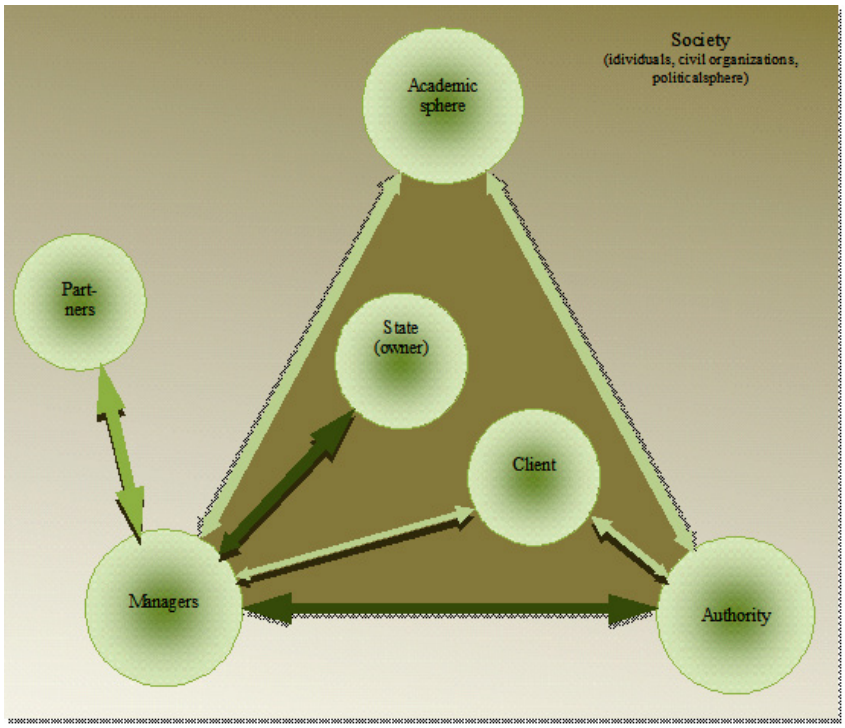

Figure 2. Information relations between actors in the sector and society

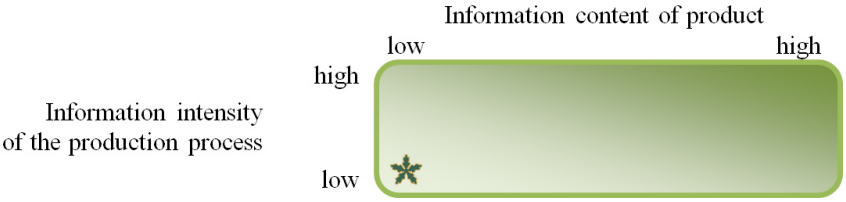

Figure 3. Matrix of information intensity

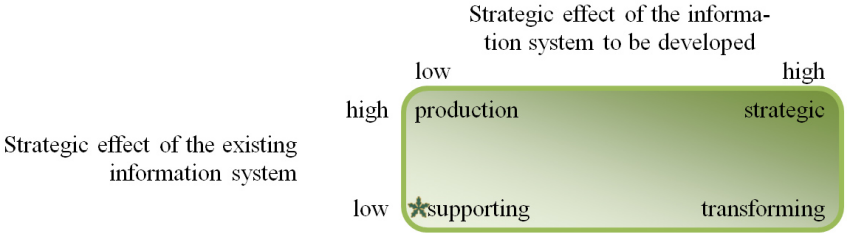

Figure 4. Strategic grid

mation systems it is necessary to review the history and changes of the structure of the state forests. The forestry law of 1879 (law XXXI) gave the basis to form the organizational structure of the state forests. They established royal forest inspectorates and management planning offices. The change in circumstances after the peace treaty in Trianon the organization which was working well had to be simplified. All the organizations had been terminated and unified forest directorates were created.

After nationalizing the bigger part of the forests the Hungarian State Forest Companies were formed which were subdivided into 22 forest directorates. This organization, called MÁLLERD was terminated in 1949 and a Forest Center was organized with 15 national enterprises and 78 forest companies. 12 forest management offices were created for preparing forest management plans. Forest inspection was assigned to 29 state forest inspectorates within the framework of the forest management planning offices. As of 1st of August 1950 78 state forest companies were established within 16 forest management unions. By 1957 the number of the companies was reduced to 32, in 1973 to 21, and these companies had different status. Companies within the EFAG group were profit oriented, and those in the EVAG group (mainly dealing with wildlife management) were budgetary institutions. Forest management planning and controlling tasks were separated again, and the State Forest Management Planning Service was established.

The state forestry organizations were supervised by the Ministry of Agriculture from the beginning, and then the supervision of three forest companies was transferred to the Ministry of Defense. The actual department for the supervision within the Ministry also changed. After the political change in 1989 the companies became private share companies and supervision was transferred to the State Holding, and starting in 2010 to the Hungarian Bank of Development.

The automation of the accounting started with accounting machines before the appearance of computers. In the forestry literature computers were first mentioned in August 1963. At the same time development work was in progress with the leadership of László Király at the department of Forest Management Planning of the State Forest Directorate to modernize forest management planning work with the electronic data processing of the management inventory data. The development was a success, in 1965 onefour forest estates were processed by the means of electronic data processing. In the forest management manual of 1971 this means was made compulsory.

The results of the research and development work started at the Department of Forest Management Planning and then continued at the Technical Office of Forest Management Planning Directorates were summarized in a thesis submitted for the degree of candidate of sciences by László Király in 1978. During studying this work the author discovered that professor Király uses the word “informatika” (informatics), though this was not common at that time. The Corpus of the History of Hungarian Language dates the first appearance of this word to 1987. This discovery refines Hungarian language history and puts the date 9 years earlier, and primacy has also to be given to forest terminology.

The author considers a meeting held in November 1972 in Kecskemét of vital importance concerning the introduction of computers into the sector. The minutes of the meeting could not be located, but the important topics can be reconstructed using the reportsof the people attending the meeting. Though the main authorities did not support the recommendations the developments were done according to the recommendations of the meeting.

A consequence of the changes in the history of the sector was an increasing independence of the companies. At the time of the strong central leadership the devices of the data processing were expensive and their use did not seem to be inevitable. There was no central concept or direction for these kinds of developments. When suddenly the affordable devices appeared the companies were quite independent, so there was no question about introducing a unified system. It is the author’s opinion that the continuous change, transformation is the reason that no unified computer system was introduced into the forestry sector.

The author does not see any evidence for the need of the introduction of a unified information system at the same time. The compulsory use of a unified accounting system is sufficient for the owner to judge the performance of the companies.

In the process of preparing forest management plans with computers it became evident, that good quality and stabile work can only be accomplished using own equipment. The Technical Office of

Forest Management Planning Directorates (ÁEMI) created its own computing center in the summer of 1976. There was an intention to use the equipment for other task in the sector as well.

Also in 1976 an association named FAINFORG (Common Enterprise for Information Technology and Organization in the Forest Sector) was established. Most of the forest companies were members of the association, and the association was directed by a board of directors consisting of the chief financial officers of the forest companies. Evaluating the operation of FAINFORG the author states that it contributed considerably to the development of the sector in terms of reorganizing the processes within the companies but with the appearance of personal computers the specialists and the business model of FAINFORG could not satisfy the needs of the companies and this led to becoming insignificant and finally to termination.

The education of electronic data processing started at the Faculty of Forestry of the University of Forestry and Wood Sciences in 1970 as an optional subject, and was made compulsory in the curriculum introduced in 1975. The group of subjects started to further develop with the arrival of professor Király to the Faculty and became praxis-oriented. At its best the offered material consisted of three semesters with the addition of six other subjects in special educational directions. The education of GIS systems was also initiated by the department of professor Király. The quality of the education is indicated by the fact that many of the persons responsible for informatics at forest companies are forest engineers graduated from the Faculty of Forestry.

Regarding education the education of operation research has to be mentioned. Operation research gives methods for optimizing practical problems, but the effective solution of the problems is impossible without computers. Because of this the two subjects became closely related even at early stages.

With the appearance of personal computers (PCs) the use of computers became more frequent at the companies. First – similar to other sectors – accounting was computerized. Parallel to this colleagues with knowledge of programming languages prepared small programs to support their work.

The first professional program was STEGA, introduced in 1988. The importance of the program is that it demonstrated how informatics can efficiently be used in management and inspection. It was a complex forestry information system based on PC which was used by both forest managers and forest authorities. It was the first program to accomplish electronic data exchange between authorities and forest companies.

The next step was the appearance of the Digiterra Forestry Information System in 2003. An important development was in the program that data were handled on GIS basis and were integrated from several external sources like the database of forests, the database of the state land registry and the forestry maps. This program package supported the operative tasks of forest management and control. It also supported work processes in the field by integrating the possibility of use of mobile devices.

The development of computer techniques and technologies enabled the establishment of a Forestry Database for the whole country. The on-line database form supporting GIS was completed in 2004. The web-based forestry map for the whole country opened the forestry database to the public.

At present forest managers have only indirect access to the system, in the development it is planned that they also will have direct access. In my opinion it would be useful to connect the database with other official databases to improve its accuracy and reliability.

A general statement can be made about developments in the sector that at the beginning independent solutions were developed, which had no connection or only limited connections to other systems. This was the period of the so-called island systems, the applications were working separately and there was no automatic exchange of data between them.

By the beginning ofthe 1990s it became evident to the leaders of the companies that homogenizing the companies information systems consisting of heterogeneous solutions would improve efficiency and reduce costsAn important development of recent times was the introduction of the common unified information system for the forest companies. The project started in 2008 with the announcement of the State Treasury managing the companies at that time but due to the resistance of the companies and technical problems the project was stopped in the summer of 2009. In 2010 the forestry portfolio was transferred to the Hungarian Bank for Development. The bank was investigating the situation of the

info-communication at the companies and restarted the stuck development project. According to the new concept the Unified Forestry Management System consists of four modules: accounting system, loan and human resources system, enterprise resources management system and forestry system. The first two systems were introduced on the 1st of January 2013; the other two systems are being tested.

In the last decade several forest companies tried to introduce mobile devices, but this happened only at three companies, the majority only accomplished tests. Hindrances in introducing mobile devices are the limited offer in types, their high price and their life cycle equals to the development time of a system.

Based on the above in the everyday praxis of the companies data can be recorded and transmitted both on paper and on electronic devices depending on the location of the origin of the data. The on-line presence on the field was not forced by the practice because the data originating from the field are not necessary to meet operative decisions. This is in accordance with the statement that only those service levels have to be developed to be supported by informatics which are needed to maintain the normal business activities. Because of the supporting nature of informatics in the sector data acquisition in the field and on-line data connection is not absolutely necessary.

The history of the introduction of informatics to the forestry sector is summarized on Fig. 5. The milestones marked are:

1. First successful electronic data processing in the sector
2. Starting informatics education at the Faculty of Forestry
3. All alphanumeric data of the Hungarian forests is available in digital form
4. Start of use of "modern" informatics tools at the forest managers
5. Digital data exchange between authority and forest managers (STEGA)
6. Electronic processing of surveying results (Digiterra Map)
7. Digitizing forestry maps
8. Professional system based on GIS (Digiterra EIR)
9. On-line support of the work of authorities (ESZIR)
10. Introduction of a unified system at forest companies

Analysis of the present situation

The hardware supply has considerably changed as compared to the situation in 1990. Today we reached a level where all colleagues who are working in office have a computer on their desks. The supply with computers is 98 %. The missing part is the district foresters, who don't have to work with computer every day,

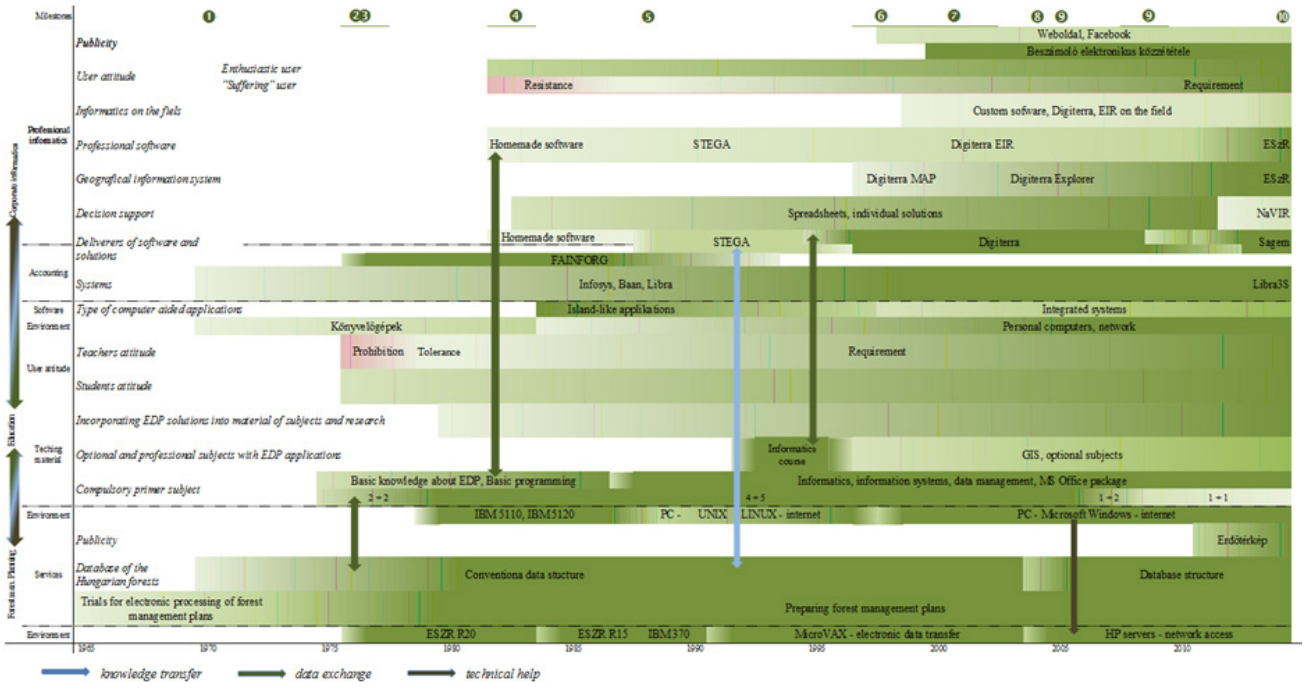

Figure 5. The history of IT development of forestry sector

so several of them share one computer. The survey showed that the management and the administrative staff have to use the computer, without computer they cannot accomplish their work. Only 5 % of the district foresters indicated that they use computer every day.

The departments dealing with informatics were subordinated without exception to the chief financial officer of the companies, and this situation remained until today. At the beginning these departments handled all informatics needs of the company. The increase of the number of tasks and/or the requirement of special knowledge forced the companies to buy special services from external companies, but they kept the "sensitive" applications in house. Some of the companies however completely dismantled its informatics groups and buys all the informatics services. Looking at the average in the sector two-third of the activities is solved by own departments and one-third is outsourced. The typical outsourced services are web and mail server services and maintenance.

In the past decade the support for different activities steadily increased with different intensity (Fig. 6). It is not surprising, that the rate of change is the smallest in the case of accounting. This was the area where there were professional solutions available before the general computerization.

The relatively low level of office automation might be surprising, that despite the use of MS Office programs the average of the support of office procedures is just above sixty percent. One has to know, that the term office automation has been extended. Today under office automation we understand not only the preparation of documents and presentations with computers and using E-Mail, but also the handling of documents: receipt, filing, archiving, monitoring and retrieving of documents.

The support of the professional activities also increased after the millennium thanks to the development work of Digiterra.

The operation efficiency of an organization is determined by the quality of the decisions. The quality of the definitions depends on the availability of information needed to make that decision. One of the most important tasks of the information systems is to provide leaders with information necessary to make their decisions. The survey in 2005 showed that the leaders asked for the necessary information in form of summarized data in Excel tables. According to the last survey at more than 80 percent of the companies there is a regular production of reports in a pre-defined form, and in the same proportion do leaders request ad hoc reports. Compared to decision support the methods

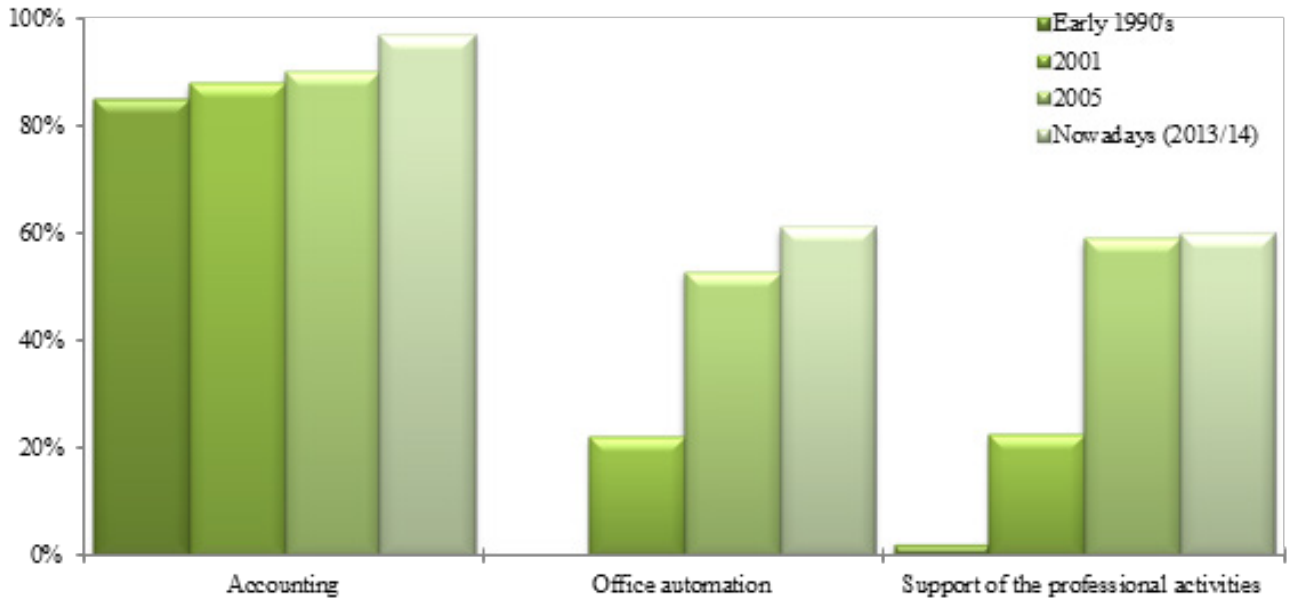

Figure 6.Changes in computer support of the main activity area

used in the preparation for decisions the proportion of the "usual" methods" shows a less favorable proportion. In the authors opinion the low information content of the products and the low information intensity of the production process do not require the use of more sophisticated decision preparation methods.

In a "computer-ecosystem" (hardware + software + user) the weakest links is the user, who is at the top of the system. The reliable and ergonomic tools and the programs with appropriate services are in vein their inappropriate use will deliver faulty data and will lead to incorrect decisions. That's why it is important to investigate the attitude of the colleagues using the tools of informatics.

A strong coincidence can be shown between frequency of computer use and judgment of the importance of the applications. In four out of the five categories people use computers every day, and these four categories are who have a positive relation to computer use. Five percent of the district foresters state that there are hindered by computers in their work and 85% responded that they can do they work with or without computer in the same way.

Behind the neutral or negative attitude one could suspect without any further investigation their lack of practice of computer use. On the contrary the survey showed, that the majority of these people – though not everybody – has at least one computer at home.

The "quality" and the self-confidence of the computer use of employees is largely determined by their informatics education and their digital literacy. District foresters have the greatest lag in this respect. This is the group who received the least education in these terms. In the responses they reported only one training category, and a quarter of them did not receive any education. Nearly hundred percent of employees in the other four categories reported several training categories and there was none of them who would not have received training in some form. It is also remarkable that there were people who financed their courses by themselves. Within this group lots of people keep their knowledge up to date by teaching themselves. Only three percent of the whole employee numbers did not receive any informatics training. This is a big improvement compared to the data in 2001 when this ratio was 45.9 %.

The lack of special equipment suitable for field use from the tools of district forester was identified as a problem by the author. Field informatics tools at leaders are usually not GIS tools supporting work organization and inventory but tools for surveying measurements. In the past 8 years these GPS systems became standard tools for foresters. Forest companies today buy the more accurate GPS/GNSS equipment because of the requirements of the EU subsidies.

Analyzing satisfaction with the tools available it can be stated that all user groups are more satisfied with the hardware than with the applications running on them. On the whole sample and using the analogy of the five degree marks hardware received a better, than four mark, software received a mark considerably worse than four. Among the groups all groups except for district foresters gave a mark four to hardware. The judgment by the leaders working in plants is a bit weaker; this can be due to the fact, that they should have used computers in the fiels more frequently. A nearly opposite tendency is in the judgment of the available software. Employees working in management and leadership gave a worse mark than district foresters. Those working in administration judged both hardware and software to be good. This might be due to the fact, that they don't have to use "special" equipment, and the work what they are doing was computerized first and therefore the programs in use are well tested.

It was also analyzed if the applications available are necessary, or if they are still some processes which were worth automating. It became evident from the responses that employees supervising professional have a great demand toward professional programs, though there are some programs which they consider unnecessary. The need is especially explicit at the level of decision-makers. The need for changes is less with employees working in administration. This could be predicted in advance, because the programs they use are the most mature ones.

The author has also investigated what employees use computers for outside of the strictly professional work at their workplace and at home. Among the categories the most important is the use of web (getting information) and communication, transferring data in an electronic way, though the proportion of this was different among the different levels of control. Less emphasis is on the access of internal information sources (intranet)

and on transferring files from server to server.

When analyzing computer use at home it has to be stated that the role of computers as electronic data storage devices has increased even in private life, sixty to ninety percent uses its devices for storing their personal data. The big number of devices for recording data in digital form in a household also contributes to this high proportion.

The high proportion of work at home (reading work E-Mails and answering them, using intranet, entering and processing data) was especially emphasized by the author. This proportion is above sixty percent in the management but is around thirty percent at the administrative workers and district foresters. This fact is not useful according to research in occupational health. The stress level of the employee is increasing and is not able to relax from the problems what leads to health problems.

In the form of an open question the respondents indicated the appearance of which application made their work easier. Many pointed to the word processing and spreadsheet capabilities of office packages. They also stated that the office packages enabled faster work, more professional look and the reduction of number of errors. Work is made faster with these packages in a way that similar documents have to be produced only once, and later their content has only to be updated.

The respondents described the fast access to the documents due to electronic storage as a major advantage in work. Employees with higher education in informatics also indicated, that the storage of data in relational databases gives the possibility to create unplanned, ad-hoc queries in the standard SQL language.

The appearance of GIS, and within this the field GIS is also considered to be a qualitative step. GIS applications give the possibility to create thematic maps in a fast and error-free way.

Summarizing the statements outlined above it can be stated that the spreading of informatics in the forestry sector follows the model described by Hüsing and Selhofer (Fig. 7). The spreading of informatics means shows an S-shaped curve, which shows different shapes depending on the groups if the group is developed or not developed. The forestry sector has reached the saturation stage of the curve denoted by 3.

In the process of late adaptation some of the groups are lagging behind, which is then expressed in the form of social and territorial inequalities. In Fig. 7 the "Total population" (---) means the whole sample, "Disadvantaged group" (---) means the group of district foresters.

District foresters live and work on the periphery in areas which are poorly supplied with informatics resources. For the effective use of informatics "digital literacy" is needed, thus the ability of using these equipment. The investigations showed that this is missing in the category of district foresters. Between the groups we can differentiate those, who are able to use the possibilities, those who use the possibilities, probably with less

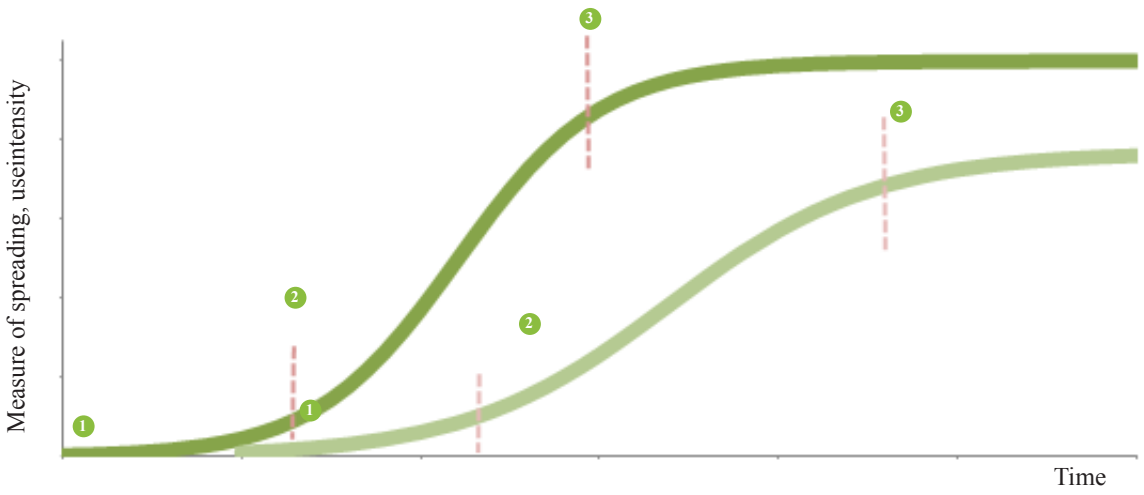

Figure 7. Spreading IT equipment within a population

efficiency – or due to some obligation – and those, who don't usethe technology at all. A big part of the district forester category comes into the second group.

The acquisition of IT equipment is investment. It is very important also in the case of IT investments what kinds of values are generated by the investment for the company, and how the profile of the company changes on the short and long run. With such expectations investments into information technology had also to be evaluated in the aspect of business, and the individual investments had to be supported with calculation of return.

It has been known for a long time that the cost of informatics investments can be estimated relatively well, the profit of these cannot be estimated, or can only be estimated with big uncertainty. Direct profit can be proven only in few cases of informatics investments, and in many cases the informatics services add up with the activities of other departments, so the profit coming from informatics shows up only indirectly.

Because forestry is not an information-intensive sector, thus it does not need up-to-date data in all areas the informatization did not change the basic management conditions, but became inevitable for people working in the sector. We can state, that without the introduction of informatics the operation of the companies according to the existing laws (the amount and complexity of data to be reported, the short time period available for reporting) would be impossible.

The number of administrative employees was reduced due to the introduction of informatics systems, but the amount of work, the number and complexity increased. If we compare the data delivery obligations before and after computerization we can say that they increased both in quantity (a lot more type) and quality (more details). This task is solved by the companies with fewer employees, so the productivity increased (according to its definition).

Information technology became a mass product with its products and applications, so it cannot provide a competitive advantage on the long run, because its available to all competitors, it can be purchased and in short time copied. Because strategic competitive advantage can only be given by rare resources information technology has to be handled among the basic infrastructure. This is supported by the fact, that none of the companies reported that they did some preliminary or follow-up analysis concerning the returns of the informatics investments.

A strong tendency of standardization can be observed in information technology which is related not only to products (computers, software, systems) but also to best practices in sectors which are then built in into standard IT solutions. Using information technology as a part of the standard infrastructure is nowadays rather a basic requirement for survival than a potential competitive advantage.

The author has determined the one time and close to the data source data entry as the direction of development. This means in technological terms a greater integration of the parts and the use of informatics in the field.

Summary

In forestry changes took place like in other sector of the economy: the different manual registries and information systems were replaced by computer solutions. The first such changes were introduced in forest management planning. As of today all forestry data of the country is stored in an online database.

The informatics education is present in the forestry higher education since 1975, and provides qualified specialist for both the authorities and for forest managers.

The information technology solutions introduced at the forest companies did not produce a demonstrable improvement in productivity. This statement is in accordance with the generally accepted opinion that informatization has different effect in different sectors and improves productivity where the product or service can be digitized. There is no such product or service in the forest sector, so this was not the reason for informatization.

If we compare data delivery obligations before and after informatization we can state that this increased both in quantity (more types) and quality (detailed reports). This task is solved with less people by the companies, so productivity "per definition" increased, at a better quality level. Quality work, faster and more accurate information delivery and the reduction of operation risks mean an indirect profit for the companies. Another detectable effect of the system that costs can be allocated more precisely and as consequence savings occur. In economy cost reductions can also considered as a factor of profit.

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CONTROL EXPERIMENT AGAINST AN INVASIVEWEED, THE BLACK CHERRY (*PRUNUS SEROTINA*)

(КОНТРОЛЬНЫЙ ЭКСПЕРИМЕНТ ПРОТИВ ИНВАЗИВНОГО ВИДА ЧЕРЕМУХА ПОЗДНЯЯ (*PRUNUS SEROTINA*))

Приводятся экспериментальные данные искоренения инвазивного вида Prunus serotina. На 20 опытных участках были использованы 8 видов гербицидов и их соединений. Обработка Prunus serotina проводилась путем полива, нанесения и опрыскивания гербицидами. Эксперимент показал более эффективное применение нанесения.

Introduction

Europe is characterized by its biological diversity. The non-native plans are aggressively spreading more and more and that means threat to the continent.

The importation of foreign plants can be conscious (introduced) or unconscious (not introduced). Many non-native plants tolerance to broad, fast ontogenesis, plenty of harvest and efficient seed dispersal, and it has vegetative reproductive capacity. These features greatly facilitate the successful colonization in new environments and massive proliferations. Allelochemicals released by the alien plants are further great benefits to newcomer species of native vegetation conquest. One of the most dangerous invasive woody plant species in the Hungarian forestry is *Prunus serotina*.

Introduction of the *Prunus serotina*

The official scientific name is *Prunus serotina* EHRH. Within the Rosaceae family it belongs to the genus *Prunus*, classified within the Subgenus *Padus*. Four variety can be separated, var. serotina, var. eximia, var. rufula, and var. virens.

Comes from the eastern part of North America. Economically significant within the territory where distributed.

The first appearance date from Hungary is 1897. Initially planted as an ornamental tree, but also experimented with economic exploitation of the forest in the first half of the 20th century. The *Robonia pseudoacacia* also from America, is one of Hungary's most important economic tree species. Large, unmixed populations are growing in the sandy lowland areas. The *Prunus serotina* was planted in to the unmixed *Robinia pseudoacacia* with the aim to create a second level of the canopy. In terms of the Economic growth they had high hopes, but the Hungarian agricultural areas