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THE IMPACT OF BUSINESS INFORMATICS DEVELOPMENT ON BUSINESS OPERATIONS IN SLOVENIAN WOOD INDUSTRY COMPANIES

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Abstract

The rapid development of business informatics is greatly influencing (global) business environment formation, while informatisation of business has, at the same time, a significant impact on assuring adapted business operations due to this (changeable) environment. Informatics is closely connected with almost every (business) field in companies. Thus, the theoretical analysis in the article shows business (and production) informatics course of development and its impact on business operations in (also) Slovenian wood industry companies. A practical analysis in those companies was made with the aid of the opinion pool method in the years 2000 in 2003. The major deficiencies were established first of all in the (contentual) coverage of business processes by the information system. However, information technology in these companies seems to be relatively up-to-date. According to those (established) deficiencies, possible solutions were indicated to solve the current situation in Slovenian wood industry companies, which was one of the main objectives of the performed research.

Ključne besede: business informatics, business information systems, wood industry firms,
Slovenia

VPLIV RAZVOJA POSLOVNE INFORMATIKE NA POSLOVANJE SLOVENSКИH LESNOINDUSTRIJSКИH PODJETJIH

Izvleček

Nagli razvoj poslovne informatike ima velik vpliv na oblikovanje (globalnega) poslovnega okolja, hkrati pa informatizacija poslovanja pomembno vpliva na zagotavljanje temu (spremenljivemu) okolju prilagojenega poslovanja. Informatika je tesno povezana praktično z vsemi (poslovnimi) področji v podjetjih. V prispevku smo s teoretično analizo ugotovili smernice razvoja poslovne (in proizvodne) informatike in njihov vpliv na poslovanje (tudi) slovenskih lesnoindustrijskih podjetij. Iz analize stanja v teh podjetjih, ki smo jo opravljali s pomočjo metode klasičnega vprašalnika v letih 2000 in 2003, smo ugotovili večje pomanjkljivosti predvsem pri (vsebinski) informacijski podprtosti poslovnega procesa, medtem ko je informacijska tehnologija v teh podjetjih razmeroma sodobna. Glede na te pomanjkljivosti smo poiskali in nakazali možne rešitve trenutnega stanja v teh podjetjih, kar je bil tudi eden izmed ciljev te raziskave.

Key words: poslovna informatika, poslovni informacijski sistemi, lesnoindustrijsko podjetje, Slovenija

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1 INTRODUCTION

UVOD

Although globalisation and the formation of information society as such, and particularly globalisation of business environment, has been around for a number of years, its importance has experienced a dramatic increase in the last few years, especially due to the fast development of informatics. Contemporary technological achievements in the field of information and communication technology (ICT) offer entirely new opportunities to the globalisation process. What needs to be mentioned here is especially the development of data support medium, computer networks, securing of data transfer, fast information processing and the transfer of data to users, effective support in decision-making, computer exchange of data, etc. Due to these achievements and the rapid growth of the Internet used for business, globalisation is acquiring a new meaning in the business world. Many emphasise the achievement of undoing the distances as one of the most important transformations of all times (ZAHRA, 1998). Information technology with the Internet is merely the technological basis of global operation. If we want a company, which otherwise uses state-of-the-art information technology, to really work globally, this technology needs to be harmonised with its organisation and strategy.

Informatisation of business is not equally important for all companies and its contents differ among companies themselves. Consequently, the state and the goals of informatisation among companies are different to a certain extent. There are, however, certain characteristics of groups of similar companies, e.g. wood industry firms. Therefore, the article will discuss the theoretical and practical aspects of manufacturing wood industry companies. Some previous analyses have determined that these companies do not have suitable business informatics if this was to be the fundamental basis for a faster, clearer and more effective global business operation. The existent state of informatics in many cases does not enable introduction of e.g. suitable manufacturing information systems into the processes of production management; in other words, it often does not enable even use of the basic (information) tools of business operation.

2 HYPOTHESIS AND OBJECTIVES

HIPOTEZE IN CILJI

As already mentioned, business informatics has a great influence on the development of (global) business environment. From this we can infer that the development of business informatics bears great weight also on the development of individual companies. Therefore, the article will check and prove three theses with a theoretical analysis: (1) that informatics has a great influence on assuring environment adjusted and successful business operation, and that this influence is specific for (Slovenian) wood industry companies; (2) that Slovenian wood industry companies are ill-prepared for the globalisation processes, and here we will ascertain the differences between the theoretical analysis of the influence of informatisation of business on business success and the actual state of informatisation of business in wood industry companies; (3) that there are very small differences among Slovenian wood industry companies at the informatisation of business level. Proving the last thesis will base on the performed analyses of the state of Slovenian wood industry companies, and at the same time we will derive from the institutional organisation theory.

The aim of the research was:

- to study current trends and changes in the field of business informatics,
- to determine and analyse the state of informatics in Slovenian wood industry companies, and
- on the basis of the established inconsistencies to form a proposal of changes in the field of business informatics in these companies at model level.

3 METHODS

METODA DELA

3.1 THE COURSE OF THE RESEARCH

POTEK RAZISKAVE

The research was performed at several consecutive and separate levels. The first level included examination of the references available from the field of business informatics in

periodical press, professional and scientific publications (publications of researches, books) and Internet sites. The purpose of this level of research was to acquire information about the state and trends in the field of information and communication technology, its influence on (global) business environment, and together with that on organisation and operation of companies, and about current approaches in informatisation of business.

At the second level, we assessed the state of business informatics in Slovenian (wood industry) companies by first checking the attainable data. For the concrete analysis of the state in Slovenian wood industry companies, we made use of two approaches: the approach of using an opinion pool method and the approach of conducting a personal survey.

3.2 IMPLEMENTATION OF THE PRACTICAL PART OF THE RESEARCH IZVEDBA PRAKTIČNEGA DELA RAZISKAVE

With the opinion pool method, we were establishing the state of business informatics, information technology and information systems (as organisational characteristics) in wood industry companies. Assessment was made twice in the period of three years. In the year 2000, the analysis was carried out with a written questionnaire, sent by regular mail to Slovenian wood industry companies. For completing estimations, gained by processing 42 returned and completed questionnaires, a more thorough analysis of the state and critical assessment of business informatics in several Slovenian wood industry companies were carried out (partly with applicable and partly with research projects). For these analyses we mostly used the method of personal survey. In 2003 we performed a similar analysis with the aid of a questionnaire in electronic form, sent directly to E-mail addresses of the people responsible for informatics in Slovenian wood industry companies. In processing the data from the returned questionnaires, we were able to establish absolute values of the acquired answers as well as relative changes among the estimations. The sample included small, medium and large companies, but no influence of the company size on the estimations was determined; wherever there were important changes in estimations, we dealt with them accordingly. All the studied companies were manufacturing companies, mostly dealing with furniture production. For this reason, the influence of activity was negligible and was not included in the information processing.

4 RESULTS AND DISCUSSION **REZULTATI IN RAZPRAVA**

4.1 THEORETICAL ANALYSIS OF CHANGES IN BUSINESS INFORMATICS

TEORETIČNA OBDELAVA SPEMEMB NA PODROČJU POSLOVNE INFORMATIKE

4.1.1 Informatics and globalisation of business environment

Informatika in globalizacija poslovnega okolja

The rapid change of business environment and its globalisation are causing an increase in market opportunities, business chances as well as in risks. With the process of globalisation, key characteristics of business operation are changing, too. The old way of business, based on a standard market, is no longer possible for modern companies operating on the global market. The global market and the global business environment are bringing about the existence of new economy. This is based on speed, adjustability and creativity. Constant change is no longer an exception but a rule. Companies have to realise and understand in the greatest possible extend the (mentioned) changes going on in the environment, both local and global. They also need to find the possibilities of adjusting to changes. The rapid development and enforcement of information and communication technology (IcT) and its services (electronic business, virtual markets, etc.) is doubtlessly having a strong influence on the development of global business environment. This technology is greatly influencing the organisation of companies (technological and information support to both organisational and business functions) as well and with that the adaptability and adjustment of business to the changed market conditions. Moreover, informatics is having a great influence on the quality and up-to-date decision-making, and on performing of marketing activities. This is making informatics in companies of strategic importance.

4.1.2 The influence of business informatics on business fields in companies

Vpliv poslovne informatike na poslovna področja v podjetjih

As already established, informatics is having a great influence on all business and organisational fields. This makes it indispensable for forming contemporary, more adjustable organisational structures. A dynamic network and a virtual organisational structure are, for instance, enabled exclusively with the use of modern ICT. Needs for such company organisation arise when a company faces an overdemanding task. Linking of companies can be temporary or more permanent, depending on the aim of the association. Such an aim can be producing a more complex product or service or performing a certain project. Companies can organise partner relations not based only on the market but also on co-operation and trust with outsourcing (ROZMAN, 2000). This form of organisation enables putting together the so-called virtual teams and thus to gain much more knowledge in a certain project than would be possible in other structure forms without additional employment. As opposed to “conventional” teams, virtual teams work without space, time and organisational limitations in ways enabled by current telecommunication technology (LIPNACK/STAMPS, 1997).

The current information tools offer effective support in dealing with employees and their capabilities, in that they enable building effective human resource information systems (HRIS) for dealing with employees and their capabilities. Other than that, it creates new demands for employee education. Employees need to acquire new knowledge for using the current information technology and new information tools. HRIS are getting more and more important in practice especially because of their advantages in the sense of lowering administration costs, more effective control of the company employees, improvement in planning and additional education of employees with the method of decision support, better control of individuals (their behaviour), an improved system of communication among employees, etc. (BOUDREAU, 1993).

Modern information technology and its business use are greatly interfering with the field of organisational culture of companies. The biggest changes can be observed in norms and work rules as well as in ways of mutual co-operation among employees and outsourcers. What also changes is the social aspect of work, where the most important

place goes to humanisation of work and education of employees in the use of modern (information) tools.

Informatics and especially Internet services are having a great influence on marketing. KOMENAR (1996) states the following advantages of the Internet use in marketing on the global market: efficient communication abilities, active user hinterland, cost favourable promotion, marketing and distribution, and open access to globally divided multimedia information sources. Besides this, the same author ascertains that a company using the Internet (especially the web services) can reach great results in lowering the costs of printing advertising messages about products and services, in increasing the company image, in promotion of products and servicing, and in outside and inside communication.

4.1.3 Informatisation of business with emphasis on informatisation of production processes

Informatizacija poslovanja s poudarkom na informatizaciji proizvodnje

Globalisation of the business environment and with that an increased significance of (looking for and) developing competitive advantages, are demanding faster and more complex decisions at all levels of business, and new knowledge and employment needs are forcing companies to be faced with a demand for more and better quality data, and especially accurate, reliable and due information. A modern computer based information system has to be able to follow business processes in company and those changes in the environment that could affect its functioning and existence (KROENKE, 1992; LAUDON/LAUDON, 2000). Besides gathering, saving and processing of data and transferring the information to decision-making managers at all levels of operation (lowering the uncertainty of business), it also has the task of enabling the company as many services of electronic business as possible (technological part). The latter is namely also one of the necessary conditions for a successful performance on the global market. Due to the great significance of informatics, the actions of informatics need to be appropriate for that. In a growing number of (also Slovenian) companies, a noticeable increase of informatics can be noted as managers of informatics are usually just below the level of the chief company executives and in this way they directly co-operate in creation and enforcement of business policy and company strategy (KOVAČIČ/VINTAR, 1993).

Planning of informatics needs to derive from strategic planning of global information needs of the company, which reflects in the company role, aims and strategy (ROBSON, 1994).

The basic characteristics of modern information systems (IS) and directions of their development are most of all: supporting the state-of-the-art information and telecommunication technology; building IS (software) with object technology enabling their transparency and good documentation; openness and independence from computer platform; high linkage among different IS and the possibility of linking many types of IS together; high reliability, accuracy and safety of operation; low maintenance; adjustment with recent legal norms (e.g. electronic signature).

The production technology in manufacturing companies is more and more connected with business information systems and thus has a direct influence on adjustability of business operation. Settings are lately the most important characteristic of technology. For this purpose computer controlled centres (machines) are used, called CNC (Computer Numerical Control) machines. Two-way data connections and the links between production technology and business information system are the basis for constructing a system of computer-linked manufacturing (CIM – Computer Integrated Manufacturing), which from the point of view of adjustability represents the most developed form of manufacturing process operation (GRONAU, 1994).

To satisfy the goals of planning, attendance and production, such as higher quality production planning, better tracing of the production process, better use of production capabilities, better monitoring of reaching deadlines of production, etc., it is important not only to intervene in the production process organisation and its planning but also in the informatisation of this process, whose success greatly depends on the success of the production process reengineering. The production process informatisation prevents creation of information bottlenecks that have a great influence on quality and response of business, and along with that it ensures a more economical use of raw materials and their traceability through the production process.

To set up a suitable production information system, one needs adequate information technology (networking for data transfer among electronic appliances, installing suitable

technology for automatic monitoring of the current of products (e.g. technology for bar code), setting up industrial terminals for mutual communication of planning – production, etc.), where the ability of their being dustproof and resistant to blows needs to be ensured. Information support for managing the production process must be based on an integrated conceptual, programme and appliance computer platform. In architecture of such platforms, an important place is taken up by MES (Manufacturing Execution Systems), which connect transactional IS for planning and systems for controlling and supervision of physical processes running in actual time (the so-called SCADA systems). The MES system enables managing (especially tracing) of all production elements, i.e. products, material flows, quality, material, work, and consequently the expenses. With the aid of these systems, we can generate detailed schedules and identify the final ability elements. The main task of these systems is to provide users with an access to reliable information about the production operations and elements in real time, and decision-making on the basis of these.

4.2 RESULTS OF THE PRACTICAL RESEARCH IN SLOVENIAN WOOD INDUSTRY COMPANIES, AND DISCUSSION

REZULTATI RAZISKAVE V SLOVENSKIH LESNOINDUSTRIJSKIH PODJETJIH IN RAZPRAVA

4.2.1 Information infrastructure

Informacijska infrastruktura

In studying information infrastructure, we limited ourselves to establishing the state of computer networks and the number of personal computers per employee in wood industry companies. In the 2003 survey, we ascertained that all questioned companies had computers connected to the computer network, which is a real step forward compared to the year 2000 when almost 20% of the surveyed companies admitted to not having a computer network. The majority of the companies in that use the architecture of a network adjusted to the needs of information systems made to work in the client / server way. In 2003 we also determined that companies had a very low number of computers that were not connected to the network (approximately 3%). And we need to emphasise that in more than 80% of the companies there are no unconnected computers!

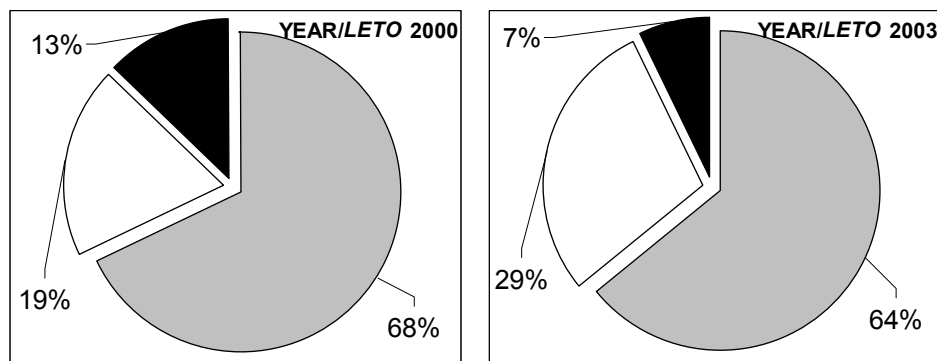
The most widely spread network operation system is still Windows NT (NT technology, so also 2000, XP,...) as it is used by almost 65% of the wood industry companies. The rest use Novell Network (~25%) and some versions of Unix, as well as Linux. The interesting thing is that the data has not changed dramatically in this field and neither has the average number of computers per employee. In considering all the employees, this number was 0.21 computers/employee, where the smallest value was 0.07. With such a number we cannot talk about a state-of-the-art computer equipment, but what needs to be stressed here is that this is mostly about manufacturing companies, therefore this state is understandable. On the other hand, if we look at the number of computers per only non-manufacturing employees, we can say that equipment is very good as it reaches the value of 0.89 computers/employee. Both findings are in accordance with the results of some other surveys (Research of Internet in Slovenia (RIS); Republic of Slovenia: Statistical yearbook) that deal with all Slovenian companies.

On the basis of the survey finding, we can conclude that the state of the information infrastructure in wood industry companies is good. Therefore, the (technological) foundation of the development of business informatics is ensured. However, due to fast development of information technology, companies need to continue technological updating, and investment in information technology has to be strategically planned and adapted to the needs of the business operation process for them to be effectively used.

4.2.2 Business information systems

Poslovni informacijski sistemi

The average age of the purchased (with no development of their own) business information systems in wood industry companies has fallen from 3.6 years in the year 2000 to 3.27 years in 2003, which definitely is a very encouraging data. However, the oldest information systems are way over 10 years old, the newest less than a year.



Legend / legenda:

- up to 3 years / do 3 leta
- more than 3, up to 5 years / več kot 3, do 5 let
- more than 5 years / več kot 5 let

Figure 1: Age of information systems in years 2000 and 2003 (in Slovenian wood-industry companies)

Slika 1: Starost informacijskih sistemov v letih 2000 in 2003 (v slovenskih lesnoindustrijskih podjetjih)

The structure has changed relatively, too (see Figure 1), as the ratio of information systems older than 5 years has been reduced. The ratio that has increased the most is that of systems between the ages of 3 and 5. These data show the trend of information systems modernisation that has lately been present in wood industry as well.

With business information systems, it is extremely important that they support at least the strategically important business fields in companies. From Figure 2 it is evident that the two by far most covered fields from the point of view of informatics are the fields of finance and accountancy, and the field of bookkeeping. This coverage has on the one hand been dictated by the state with its regulations; on the other hand, the manufacturers of software and information systems find it easiest to support this part of operation especially due to the uniformity of applications, which can be used in practically all types of companies with minor adjustments. Users are usually satisfied with the modules

covering these fields because of their clearly defined (also by law) elements. A small decrease in values had been noted with both evaluations, but it is estimated that this is merely a consequence of higher information awareness among the users than the actual coverage of these processes.

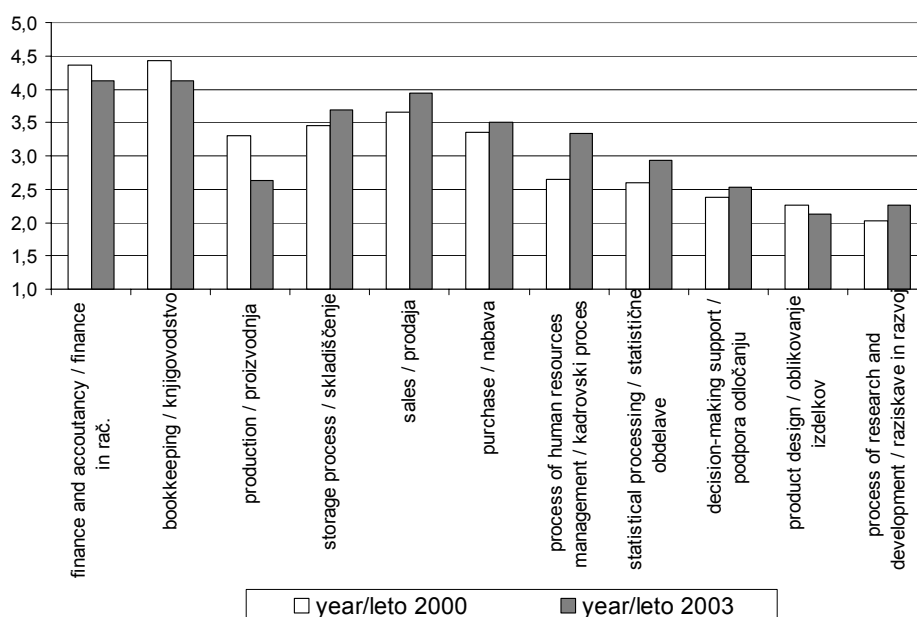


Figure 2: The coverage of business processes with information system (in Slovenian wood-industry firms) (evaluation: 1-unsatisfactory coverage, 5-excellent coverage)

Slika 2: Pokritost poslovnih procesov z informacijskim sistemom (v slovenskih lesnoindustrijskih podjetjih) (ocene: 1-zelo slabo pokrit, 5-zelo dobro pokrit)

Sales, purchasing and storage have a satisfactory coverage. These processes are much more complicated for installation into the information system due to their characteristics and user demands, but the procedures in these processes are relatively easily defined. Because of an increased importance of logistics, the recent years have seen better information support of these three processes, the process of sales being the most prominent one. The latter has the closest link with introducing new approaches in

marketing and new communication ways with customers (e.g. online sales and customer operation).

With production process information coverage in the year 2000, we were determining the estimation to exceed expectations. The reasons for this were sought especially in different user demands, mostly of the opinion that production-planning coverage with the information system already meant the production process support; they understood differently the integration process of production planning in the information system (in some companies planning is carried out with general programmes, e.g. Excel, and still they consider this to be information support process). A clearer picture of production process information support was seen in 2003, when it fell from 3.31 to 2.63 at relatively small standard deviation (~ 1). We are estimating that information coverage of the production process has not decreased but has (in some cases) actually improved. In general, the production process had good coverage in companies where non-solid wood furniture (made from wooden boards) is produced, while in production of solid wood furniture the process did not have such good coverage. In solid wood furniture production (e.g. chairs), production monitoring is quite difficult due to a high number of component parts and work operations (manual as well as machine); in production planning it is important to consider the fact that quality of some items during the working process will become unsatisfactory owing to the specific nature of material, and therefore careful planning is questionable and difficult. Information coverage of the remaining five processes was relatively poor in the year 2000, but in recent years a visible progress has been noticed in information coverage of the human resources management, as the employees are becoming the (most) important strategic source for companies due to their abilities and knowledge, and therefore they need special treatment. Similarly, noticeable progress can be seen in information support to decision-making, making it of higher quality and better argumentation. Information coverage of the process of development was indeed better in 2003 than in 2000, but it is too early to discuss its satisfactory coverage.

4.2.3 Basic business informatics course of development

Osnovne smernice razvoja poslovne informatike

In researching the basic (strategic) guidelines of business informatics development in wood industry companies, no major differences between the two surveys (the year 2000 and 2003) have been discovered. According to our expectations based on relatively bad estimations of information coverage of the production process from the previous point, the main guideline is development of informatics to support planning, controlling and monitoring the production process. In the evaluation from Figure 1 it needs to be emphasised that the majority (almost 70%) of the estimations were 5 (the most important). A relatively small standard deviation in this estimation confirms the levelling of estimations between the surveyed companies. Support to the sales / purchase process in the sense of informatics development in supporting non-paper operation and with the goal of achieving faster responses to demands from the market also gained a high estimation.

Table 1: Ways of organisational changes in view of their importance (in Slovenian wood-industry companies) (1-not important, 5-very important)

Preglednica 1: Osnovne smernice razvoja informatike (v slovenskih lesnoindustrijskih podjetjih) (ocene: 1-najmanj pomembna, 5 najbolj pomembna)

Guideline / <i>Smernica</i>	Year 2003 / <i>Leto 2003</i>		Year 2000 / <i>Leto 2000</i>	
	Average/ <i>Povprečje</i>	Standard deviation / <i>Standardni odklon</i>	Average/ <i>Povprečje</i>	Standard deviation / <i>Standardni odklon</i>
Support to the production process / <i>Podpora proizvodnemu procesu</i>	4,47	0,88	4,63	0,53
Support to the sales/purchase / <i>Podpora prodajno/nabavnemu procesu</i>	4,13	0,78	4,30	0,75
Support to the development process / <i>Podpora razvojnemu procesu</i>	3,69	0,98	3,88	0,86
Support to the decision-making process / <i>Podpora procesu odločanja</i>	4,00	0,50	4,05	1,00

Efficient information support to the decision-making process and the development process definitely is having an important impact on long-term success of company operation, but companies assign a little less importance to this in their guidelines.

Results of these guidelines are already visible (see previous point), especially in the very much-improved information support to the sales and purchase process, a little less to the latter two. Some vagueness was present in the production process coverage; therefore, it was handled separately.

4.2.4 Production process informatisation analysis

Analiza stanja informatizacije proizvodnega procesa

Not considering the high importance of information support to the production process in company strategic planning, the level of information coverage of this process was low. For this reason we sought the key problems in informatisation of production in wood industry companies. Analysing the level of the production process support, we were ascertaining the level of coverage for individual production activities on the one hand, and the estimation of importance of information support of individual activities on production informatisation on the other. Results are comparable to some other surveys (e.g. JOVAN, 2001, who performed his analysis in Slovenian manufacturing companies). By far the highest level of information support in the production process was established in preparation of necessary production documents and in documenting the production procedure. This is also evident from Figure 3.

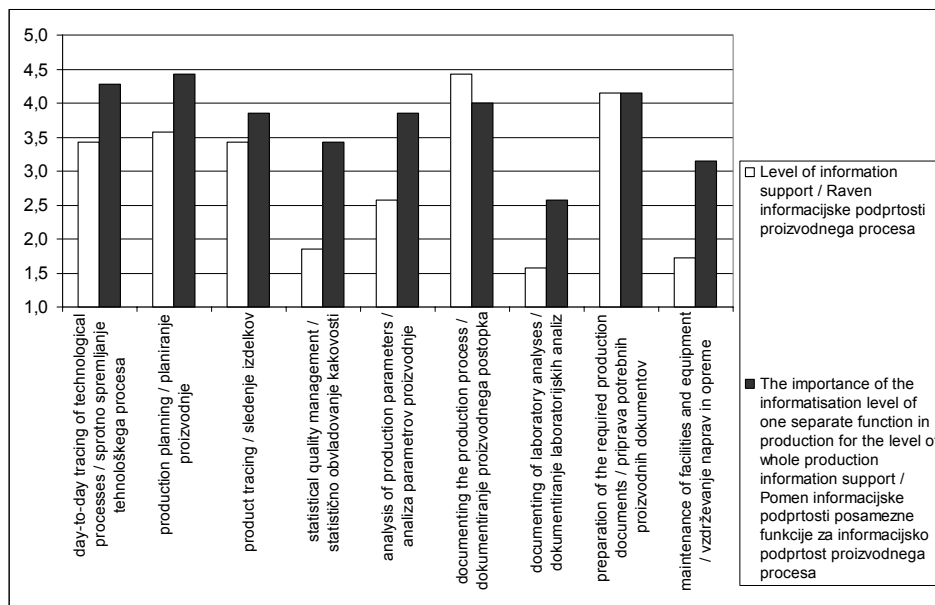


Figure 3: Level of information support for individual processes and the importance of these for the level of production information support in the year 2001 (in Slovenian wood-industry companies) (evaluation: 1-unsatisfactory support, 5-excellent support)

Slika 3: Raven informacijske podprtosti proizvodnega procesa in pomembnost za informacijsko podprtost proizvodnje v letu 2001 (v slovenskih lesnoindustrijskih podjetjih) (ocene: 1-zelo slabo podprt, 5-zelo dobro podprt)

As already mentioned, the highest level of information support to the production process in Slovenian wood industry companies was established in documenting the production procedure and in preparation of necessary production documents, both of which belong to the most important factors of the production information support. The level of information support to tracing products is just as high, which again is in accordance with this activity importance. With day-to-day tracing of the technological process and with production planning, we can ascertain that the level of information support is good; the companies themselves even estimate that these two activities are most important for information support. Other factors of production information support are either less

important and thus less supported or quite important but their informatisation has not been carried out yet (e.g. statistical quality management and the analysis of production parameters).

The biggest problem of manufacturing, therefore wood industry companies as well, is lowering the series size and the increase in number of (smaller) orders. Other than that, there is a trend of an increased number of special orders, which sometimes makes even the explicitly mass productions (e.g. production of interior doors) to become more orientated toward the individual. We can claim that the mastery of (such a changed) production process is above all an information problem.

In production planning, we determined the greatest deficiencies in production tracing, as data about production state is virtually non-existent or it is not up-to-date and rather inaccurate. Production planning is made difficult also because of inaccurate and not up-to-date stock examinations of the basic materials, which is especially true for some types of materials such as stock of wood (proper quality, appropriate moisture content and dimensions, etc.), as delivery time, i.e. time for material preparation (drying), is fairly long. The consequence of inadequate production planning and tracing is also big inter-phase stocks, which (needlessly) take up production space, and along with that represent expenses. Finally, we also determined that due to (information) disconnectedness of contemporary CNC production machines, i.e. systems between themselves and with the production planning process, they are often unused (this goes for their quantity capabilities and abilities of quality treatment); on the other hand, on computer controlled machines (CNC, NC) in the studied wood industry companies only about 20% (on average) of production operations are carried out on work-pieces (this ratio depends on the type of production of course, but in the best cases it reaches up to 40%). This is also one of the limitations in reengineering of production process and its informatisation, as investment in new, state-of-the-art production technology is very high; therefore, an improvement in this field is not expected shortly.

5 FINAL DISCUSSION ZAKLJUČNA DISKUSIJA

Recent technological achievements in the field of information and communication technology (IcT) are offering completely new opportunities to the process of globalisation and the existence of information society. Indirectly this is having an affect on development of business environment, and on building new foundations for success of company business operations.

With the theoretical analysis of the influence of informatics on ensuring environment adapted and successful business, we determined a range of influences, the most important among which are Internet services and electronic business, integrated business information systems with the emphasis on production informatisation and tools and services to support decision-making in companies. This proves that informatics does have an important influence on ensuring environment adapted and successful business. Its basic role is to support managerial process of planning, organisation and control by enabling qualitative decision-making. With analysing the state (of problems) in wood industry companies, we were establishing their problems and ascertained that this statement is true also for (Slovenian) wood industry companies, where some particularities were emphasised. This confirmed our first thesis.

On the basis of the established differences between the theoretical analysis of the influence of business informatics on the (organisation of) companies and the actual state of informatisation of business in wood industry companies, we inferred that Slovenian wood industry companies are not adequately prepared for globalisation processes in the field of business informatics. Informatisation of operation is problematic especially in supporting the production process, and deficiencies are also found in introducing electronic business in the present operation. Some characteristics and differences are also the consequence of the specificity of wood industry companies, having an impact also on business informatisation. These can be found especially in the specificity of the most important work object (i.e. wood), affecting primarily the performance the production, sales and purchasing processes. We encounter, for instance, the problem of a great number of retraining work-pieces and due to this many problems in tracing and production planning. Bad information support of individual parts causes problems in

material flows (bottlenecks), in overusing of material, in production planning, etc. This confirmed our second thesis.

In processing data from the analysis of the state in wood industry companies, we determined that the differences between the acquired data are not characteristic (in most cases standard deviation from the arithmetical mean was very small), from which we may induce small differences among Slovenian wood industry companies to do with information support of the business process. This confirmed our third thesis.

We determined and proved the importance of informatisation of business in ensuring adapted (and adaptable) organisation of business. Here we need to mention above all informatisation of managing (planning, tracing, etc.) the production process considering all the particularities of this process in wood industry companies. Before the production process informatisation can take place, according to the present state in wood industry companies, the following has to be carried out: (1) defining thoroughly the production process particularities; (2) informing the employees about the advantages brought on by informatisation; (3) qualifying and educating the employees for new working obligations; (4) ensuring mechanisms for tracing and controlling in manual gathering of information; (5) forming a project group which will co-operate actively (with authorisation and responsibility) in the project of informatisation; (6) defining the level of production information support still being economically justified; (7) modernising the production technology enabling introduction of state-of-the-art information technologies.

One of the key conditions for successful globalisation of business is also ensuring organisational and technological conditions for introducing and the introduction of electronic business itself. Due to the growing importance of fast and founded decision-making, the informatisation of the decision-making process ensuring (appropriately processed and represented) data and information for decision-making at all decision-making levels in a company is getting increasingly important as well. On the basis of the established current trends in the field of business informatics and the problems in wood industry companies, we put together recommendations for change in the field of business informatics in these companies at a model level, which led us to reach the aim of the research.

6 CONCLUSIONS

ZAKLJUČKI

The globalisation process of the business environment is no doubt very closely associated with the development of business informatics. Rapid development of information and communication technology is being observed, intensifying the effectiveness of data processing, transfer and security. Along with this development, there is a change and upgrading of the contents of business processes as well as possibilities of their information support. Effective use of novelties in the field of business informatics enables companies to develop a range of competitive advantages, some of which are even crucial for its existence (i.e. successful business) due to a close connection with the global business environment. This is of course also true for Slovenian wood industry companies. Within the framework of the theoretical research, we analysed some of the most important elements of this development and their impact on business operation. Within the framework of the practical research it was established that Slovenian wood industry companies do not consider some of these development elements in their business operation, as they are introducing them in their operation too slowly. An interesting realisation comes to mind that the analysis included companies, which acknowledge the informatics to have the status of strategic importance, yet on the other hand informatics in the (present) strategies of these companies only has a relatively inferior position. From this we can induce that companies are getting to know the opportunities being enabled by the introduction of state-of-the-art business informatics, yet they (still) do acknowledge it to have primarily an infrastructural part in strategy performance.

In our estimations and findings from the analysis of the current state of affairs, the majority of Slovenian wood industry companies are adequately equipped with information technology; some greater deficiencies have on the other hand been established in content information support of the business process. Problems mostly derive from an inadequate organisation of business, especially in some areas. The production process in these companies was studied more into detail, and a range of deficiencies was established, almost all deriving from the problem of this process organisation.

Solutions of the described deficiencies in Slovenian wood industry companies arise from theoretical findings. Some of the most important ones have also been indicated in the research. Managers of Slovenian wood industry companies find similar solutions and required measures for organising the situation in this field. With the method of script (part of the questionnaire), we determined that managers of Slovenian wood industry companies believe that in order to enter the global market a certain degree of business informatisation is by all means needed as well as use of competitive advantages of the state-of-the-art information technology. At the same time they realise that development of informatics, business process reengineering and its informatisation are the three key factors of successful global business operation. This proves the accuracy of our findings and claims, and at the same time indicates that the state in this field in Slovenian wood industry companies will continue to improve.

7 POVZETEK

Proces globalizacije poslovnega okolja je tesno povezan z razvojem poslovne informatike, ki ima velik vpliv na njegovo spreminjanje in oblikovanje, hkrati pa učinkovita uporaba novosti na področju poslovne informatike omogoča podjetjem, da razvijejo vrsto konkurenčnih prednosti. Nekatere med njimi so za podjetja zaradi tesne povezanosti z globalnim poslovnim okoljem celo nujne za njihov obstoj oziroma uspešnost poslovanja. To seveda velja tudi za slovenska lesnoindustrijska podjetja.

V okviru teoretične raziskave smo analizirali nekatere najpomembnejše prvine tega razvoja in njihov vpliv na poslovanje podjetij. V okviru praktične raziskave, ki smo jo opravljali s pomočjo metode klasičnega vprašalnika v letih 2000 in 2003, pa je bilo ugotovljeno, da slovenska lesnoindustrijska podjetja določenih prvin tega razvoja pri svojem poslovanju ne upoštevajo oziroma jih prepočasi uvajajo v svoje poslovanje. Zanimivo pa je spoznanje, da v analizo vključena podjetja priznavajo informatiki status strateškega pomena, po drugi strani pa ima informatika v (trenutnih) strategijah teh podjetij razmeroma podrejen položaj. Večje pomanjkljivosti so bile ugotovljene predvsem pri vsebinski informacijski podprtosti poslovnega procesa, medtem ko je informacijska tehnologija v teh podjetjih razmeroma sodobna.

Proizvodni proces je ne glede na svojo osrednjo vlogo, ki jo ima v lesnoindustrijskih podjetjih, po naših ocenah zelo slabo informacijsko podprt, kar povzroča vrsto problemov. Slednje smo podrobneje preučevali in glede na ugotovljene pomanjkljivosti predlagali, da je pred informatizacijo proizvodnega procesa treba glede na obstoječe stanje v lesnoindustrijskih podjetjih ta proces najprej temeljito prenoviti in opredeliti njegove posebnosti (predvsem pri planiranju in proizvodnji), določiti stopnjo informacijske podprtosti proizvodnje, ki je še ekonomsko upravičena, in posodobiti proizvodno tehnologijo, da bo omogočala uvajanje sodobnih informacijskih tehnologij.

Rešitve prikazanih pomanjkljivosti v slovenskih lesnoindustrijskih podjetjih izhajajo iz teoretičnih ugotovitev. Nekatere najpomembnejše so v raziskavi tudi nakazane. Zanimivo je, da tudi ravnatelji slovenskih lesnoindustrijskih podjetij vidijo podobne možne poti in potrebne ukrepe za ureditev stanja na tem področju. S tem dokazujejo pravilnost naših ugotovitev in trditev, hkrati pa nakazujejo, da se bo stanje na tem področju v slovenskih lesnoindustrijskih podjetjih (kmalu) izboljšalo.

8 REFERENCES

VIRI

- BOUDREAU, J.W. et al., 1994. Just Doing Business – human resource information systems in the global organization.- v knjigi: Deans, P.C. (ed.), Karwan, K.R. (ed.): Global information systems and technology – focus on the organisation and its functional areas. Idea group publishing, Harrisburg, London: 424-443.
- GRONAU, N., 1994. Führungsinformationssysteme für das Management der Production. R. Oldenbourg Verlag, München, Wien, 247 s.
- JOVAN, V., 2001. Pregled stanja na področju avtomatizacije in informatizacije v slovenskih proizvodnih podjetjih.- v knjigi: Učinkovito informacijsko spremljanje in upravljanje proizvodnje v lesnopredelovalnem podjetju – zaključno poročilo. RCL, Pivka: 83-94.
- KOMENAR, M., 1997. Electronic marketing. John Wiley & Sons, Inc., New York, Chichester, Brisbane, Toronto, Singapore, Weinheim, 549 s.
- KOVAČIČ, A., VINTAR, M., 1994. Načrtovanje in gradnja informacijskih sistemov. DZS, Ljubljana, 316 s.

- KROENKE, D.M., 1992. Management information systems. Mitchell McGraw-Hill, New York, 804 s.
- KROPIVŠEK, J., 2001. Globalizacija poslovnega okolja in njen vpliv na oblikovanje organizacijskih značilnosti lesnoindustrijskih podjetij. Doktorska disertacija. Univerza v Ljubljani, Ekonomska fakulteta, Ljubljana, 241 s.
- LAUDON, K.C., LAUDON J.P., 2000. Management Information Systems. Sixth edition. Prentice Hall International, Inc., London, etc, 588 s.
- LIPNACK, J., STAMPS, J., 1997. Virtual teams: reaching across space, time, and organizations with technology. John Wiley & Sons, inc., New York, Chichester, Weinheim, Brisbane, Singapore, Toronto, 262 s.
- ROBSON, W., 1994. Strategic management and information systems; an integrated approach. Pitman publishing, London, 570 s.
- ROZMAN, R., 2000. Analiza in oblikovanje organizacije.- Ekonomska fakulteta, Ljubljana, 154 s.
- ZAHRA, S.A., 1998. Competitiveness and Global Leadership in the 21st Century. Academy of Management Executive, 12 (4): 11-12.