A NEW APPROACH TO INTEGRAL INFORMATION SYSTEM OF A COMPANY FOR BUSINESS AND SUSTAINABLE DEVELOPMENT

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Abstract
Since computers and computer information systems (IS) have appeared, the necessity for the existing data processing methodology modification according to possibilities of computer data processing has been forced. The very IS based on computer data processing have its evolution, starting from partial, integrated and up to enterprise resource planning (ERP) systems. Most often problems in this area are: (1) the problem of getting the adequate analyses for the management and implementation of business policy because the obtained information is too old or incomplete; (2) implementation of information systems lasts inappropriately long and demands huge costs; (3) there is no significant rationalization of administrative work and papers. Changing these methodologies, one comes to standardisation of the database model as well as to minimising the data input flows for the database loading and updating. In this way, the quality of information for of management has been improved and the business rationalized. Therefore, we developed an integral IS that can improve business of the company and the sustainable development of the economy as well.

Keywords: Integral information system, ERP, management, business process, business information systems, business, sustainable development.

JEL Classification: M15, M41

Introduction

Sustainable development might be a welcome entrant to the business curriculum (Springett and Kearins, 2001). A social responsibility of companies and the approach to sustainable development should become integral parts of the economic growth used by businesses in order to create value for each of the stakeholders: customers, shareholders, business partners, company staff and for society at large (Olaru, et al., 2010). Therefore, sustainability can be achieved with business companies and more progressive values (Holban, 2010).

The use of information technologies in the business of companies and sustainable development, can affect essentially on their business results. However, the expectations of

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the business companies are far greater than what they offer at the moment. Automation of business IS has had its evolution beginning from partial IS, via integrated IS to ERP systems. ERP systems represent the cutting-edge technology in the automation of the IS of the company now (Silverston, 2001; Warning, Wainwright, 2000; Furneaux, Wade, 2011; Yoon, et al., 2011). Today's ERP systems have significant disadvantages from the user's view because:

- In 60% of cases implementation fails.
- Implementation lasts too long and ranges from 3 to 5 years and more.
- The purchasing, implementation and maintenance costs of ERP are high.
- Top management still do not get all relevant information when it is needed, etc. (Olson, 2004; Hwang and Grant, 2011).
- Costs of purchase, implementation and maintenance of ERP are high.
- Top management still do not get all relevant information when it is needed etc.

The paper starts from the fact that all the previous solutions to the business IS have been based on ideas of system analysis. The current computer science, though, is based on the idea that each IS should be designed, so in that context the methods of IS analysis and modelling have been developed (Kroll, Kruchten, 2003; Nurminen, et al., 2003; Huemer, 2006). The common features of these methods are based on an analysis of a function or a sub-function of the company in order to obtain the picture of the real system for a particular subsystem. The methods differ among themselves according to different ways of marking the identified processes and data flows. There are different notations and formalism to express business processes. Many of these notations such as BPMN or ARIS EPC models are widely used in commercial projects (Speck, et al., 2011).

When analysing processes, some methods start from the basic data flows and go all the way up to creating very complicated reports for the highest level of management, some start in reverse order, etc. (Weske, 2007). Despite the importance of classification, no well-grounded guidelines exist for choosing classes in IS modelling. Consequently, different analysts can build very different models of a given domain (Parsons, Wand, 2008). This basically means the following: if there are 100 designers for the same subsystem, there will be 100 different opinions or solutions to the IS for one business subsystem. The quality of a solution depends both on the designer's and the user's knowledge, respectively. In the scientific literature this problem is known as the problem of disagreement on technical terming between designers and users. The researchers and IT practitioners recognize the importance of understanding between IT and business (Huang and Quing, 2007). Today we have more than 1000 theories for IS design which are based on these ideas (Weske, 2007). The problems that existed 50 years ago relating to automated data processing are more or less still present.

The reason for this current state of affairs lies in the fact that this problem is not basically of the computer science nature, and that it cannot be completely solved by a single method of system analysis. The problem lies in other fields such as economics and organization science, i.e. in their processes for gathering (Săvoiu, Dinu and Tăchiciu, 2012), processing and analysing data, built on the data processing via paper. Approaches to information system integration (ISI), such as ERP systems, which integrate and draw data from a common database, are fundamentally bound up with organizational processes of accounting (Chapman and Kihn, 2009). The relation between ERP systems and various aspects of accounting are studied in the literature. For example, Quattrone and Hopper

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(2005) research accounting organization, while Dechow and Mouristen (2005) research use, perception and appearance of ERP system. Most companies preferred accounting configuration when introducing an ERP system, despite the ERP system's technological imperatives for change (Ahrens, Chapman, 2007). The development of computer technology has not brought changes in accounting processes, but it has rather been assumed that these processes should be saved and automated by some of the methods of system analysis. As these manual processes are not conceptually suitable for the integrated data processing, there are still inadequate solutions to their automation.

While the authors present in section one a brief literature review, the next part of the paper is dedicated to the information needs of the company's business and sustainable development versus the achievements of information technologies. The paper explains the hypothesis of causes and the suggestion for a new approach in the realisation of the integral information system of the company, and a lot of suggestions for realization of an integral information system of a company and sustainable development. Finally the last part describes the comparison of the integral IS concept with concepts of partial and integrated IS and offers an example of the buying power analysis of the integral IS that a company collected and processed for its needs, a significant example for the state of the economy, economic growth and sustainable development.

1. Literature review

ERP systems may have indirect effects on sustainable development. These assertions make research on ERP practices in entities located in emerging economies (Dumitru, et al., 2013). Consequently, we are interested in the effects of integrated and ERP systems on the organizational and business performance of a company that can also have an influence in the sustainable development of the economy. For that purpose, literature review consists of analysing disadvantages of integrated systems and ERP failures.

Integration of different data sources is a classic problem in the database field, although many methods of data integration and appropriate tools have been implemented in practice. However, there are some limitations in the form of complicated company application systems, different data sources, and so forth, whereas company requests for new application systems make the process of data integration extremely complicated (Ni *et al.,* 2010).

The integration problem of different IS has now grown so much in importance that a new scientific branch has been developed, known as "interoperability of business application systems" (Madurieira, et al., 2010). The interoperability of the software layer is negatively affected since many organizations often have different software infrastructure (Weske, 2007; Vicen, et al., 2010). Indeed, one of the difficulties enterprises is facing is the lack of interoperability of systems and software applications to manage and progress in their business (Goncalves, et al., 2011). An integrated IT infrastructure may also lead to unintended process rigidity when markets evolve, because changes involving technology can be complex, especially when automated processes or the tightly integrated backbone are in need of change (Lu and Ramamurhy, 2011). The integration of enterprise functions and business processes requires seamless information integration, and ERP systems have been identified as key components in enabling the integration of multiple facets of

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business information, e.g., forecasting, planning, purchasing, manufacturing, marketing, and finance (Yoon, et al., 2011). This leads to significant improvement in data integration.

According to Silverton (2001), the answer is still to build integrated data structures in order to provide good and accurate information. The only effective way to do this is to understand how the data and their relations fit together within an enterprise and to be able to see the data in a holistic integrated manner. It is necessary to understand the nature of the data in order to build effective systems. Instead of stating that corporate data modelling or CASE is the wrong approach because it just takes too long, the IS community needs to find a way to make it work effectively. By building common, reusable data structures, the IS community can produce quicker results and move toward integrated structures in both the transaction processing and data warehouse (DW) environments (Silverston, 2001).

ERP systems are heavily criticized for their failure to provide infrastructure support that management expects (Davis, Brabander, 2007). By adopting the ERP system, a company also has to adopt the developed business model and its associated business processes. Herefore, with regards to ERP systems, the concept of best practice is related to the development of the ERP system based on prior experiences and cases (Dumitru, Albu, 2013). While this represents an improvement for many companies, especially for those who never had well-designed processes, companies that have good business practice, still have to change it in order to be in compliance with ERP system (Chang, et al., 2010). As a number of ERP researchers have suggested, the success or failure of an ERP system implementation is rarely tied to the features of the technology itself, but rather it is often linked to the job and/or process reengineering that typically accompanies such systems (Morris, Venkatesh, 2010). The failure rate of ERP system ranges, according to one study, from 40 to 60 percent (Langenwalter, 2000), while another study states that to be between 60 and 90 percent (Ptak, Schragenheim, 2000). Also, as Devadoss and Pan (2007) claims, ERP failure rates are above 60% and more than half of top 10 IT failures, of all time, represent ERP systems from leading suppliers with losses ranging from 6 million to 100 million dollars and more. Being expensive, ERP is not always implemented. In this case, the introduction of the wrong dates could appear and also the difficulty of the up-to date process through taking the dates from the Excel tables or from some tables of relational databases unintegrated (Surcel, Bologa, 2008). Many failures in adopting ERP systems have primarily been due to the fact that organizations have not considered ERP systems to drastically change their existing business processes (Lee and Kang, 2008). Thus, even though ERP system has attained the highest level of integration, it has not found its place among many organizations around the globe due to its implementation complexities and surrounding risks (Hakim, Hakim, 2010).

In order to satisfy information requirements of the companies and improve the sustainable development of the economy, the following aims should be met: a) providing the IS that would make the management and planning more efficient; b) quick and easy implementation of IS; c) advancement of the business system organization; d) rationalisation of a number of documents; e) rationalisation of the administration.

2. Some necessary hypotheses

The solution of every problem depends to a great extent on the correct identification of the possible causes. Looking for the information system solution we proceeded from the

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logical conclusion that one information system is based first of all on the achievements of the following scientific disciplines: a) economic sciences; b) organization sciences; c) computer sciences

From these three scientific disciplines stated, the economics science belongs to the oldest ones, because a part of it, accounting, dates even from the XVI century. A lot of segments of the economic sciences deal just with the methodologies of data collecting, processing and analysing in order to get information for more effective management. These methodologies have been developed and improved for centuries on the only information means up to now called paper and pencil. A lot of theories linked particularly to the analysis of some economic processes remained only theoretical assumption without possibility for practical use.

The organization science belongs to the younger scientific disciplines and appears with its founders Frederic Taylor and Henry Fayol, the last of them being more interesting because he laid a foundation of the existing conception of the business system organization, through his works he published at the beginning of XX century, and due to the business system divided into the technical, commercial, financial, protective, accounting and administrative functions (Fayol, 1949).

If we analyse the functions stated, we will notice that about 90% activity are collecting, processing and analysing some data in order to get the relevant information on the basis of which the business or managing organs would make rational business moves. From that fact the conclusion is drawn that Fayol divided the business system into functions representing rather information entities than the technological need, in order to reach his basic goal i.e. the effective management of the business system. Thereby, he defined his five principles of management as follows: a) planning; b) organising; c) controlling; d) co-ordinating; e) checking.

The dividing of the business system into six functions is not so irrational solution. However, the development of the production power in XX century looked for more and more information for the successful management and carrying out business policy. That longing for information indicated on the business system, so that the business functions started splitting both into horizontal and vertical level. In order the information system to function, new data flows have been entered by which data are carried between a great number of subsystems. The imperfection of that development of organization in big companies is reflected in the following:

- A great number of subsystems make the organization and management to be complex.
- A great number of data flows make the information system to be complex.
- Data flows appearing in the form of different documents, specifications and forms differ both in the form and in the content even when the companies with the same subject of activity are concerned.
- Accumulating the administration, etc.

The automation of such a real system does not lead to the more essential improvement in the field of management and more rational business that can improve sustainable development. The computer science as one of the youngest scientific disciplines that appeared in the second half of XX century has set a goal for itself to automate the information system on the basis of achievements in the computing technology (Comer et

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al., 1989). Thereby, in the process of automation it has been directed to use the existing achievements of the economic theory and practice as well as the achievements of the scientific work organization that were based on the technical possibilities of industrial revolution that is on methodologies of paper and pencil. For these reasons we have today the automated information systems that did not bring great progress in improvement of managing information and sustainable development.

3. Suggestion for realization of integral information system of a company and sustainable development

On the basis of the above stated hypotheses about the possible causes of software development unsuitable to the needs of companies and sustainable development, we made the conception of an approach for the realization of an integral information system that would automate the information processes as logical entities in the whole business system. The ideas on which this concept is based are as follows: a) defining the phases of reproduction as natural functions of the business system; b) modifying or adopting the methodologies of the business results analyses that are not based on paper and pencil; c) modifying the methodologies of accounting and planning through the possibilities of the third technological revolution.

Going from the hypothesis that a great number of functions or subsystems are artificial creations resulted from a great number of paper methodologies for data collecting, processing and analysis, we consider the business system for realisation of integral information system from the viewpoint of reproduction phases and define purchase, production, selling, and finance business functions as bases for data collecting and processing.

As regards the data processing each of the functions mentioned above generates two input data flows. This conclusion was taken by research of data processing for existing IS concepts, that was taken in many business companies of production and service type where a dozen to hundred various documents were found. Their number has been increased because of various subsystem requests to recognize certain transaction on the base of document names. Number of documents, their forms and context differ from company to company. For that reason, it was taken an idea for generalization of these documents to 8 generic data flows following the reproduction stages as the natural company functions. Every data flow has its sub variants which name and processing logic are regulated by justified coding system of this concept.

There are two types of data flow that affect the business results of a company, identified in the purchasing function. These are:

1. Supplier invoice, and
2. Raw materials or other nondurable goods purchase requisition form.

This can be illustrated with the example of purchase. A purchasing plan should be the basis of each purchase. Receiving a purchase order is a part of purchasing plan and it doesn't belong to documents that change business result of the company. An order can be put in a written form, by means of a purchase order, verbally, over the phone, if there is no written record of placing an order, and finally, via e-mail. However, a purchase is completed only after the invoice from the supplier has been processed.

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Warehouse operations basically consist of only two transactions, goods and materials entering and exiting a warehouse. However, there are many documents in practice that are in the function of warehouse entry/exit registration like: dispatch note, goods return note, record of the commission reception of goods, purchasing calculation, buying-up note, cashier's form for purchased goods on a market, fiscal account for purchasing goods in a shop, raw material purchase requisition form per production order, raw material purchase requisition form for nondurable goods, issuing notes for selling goods and many others. Some companies have even 50 kinds of documents for registration of warehouse entrance and exit.

Many variations of entry and exit in warehouse operations are generalized and solved as certain variants of the invoice for purchasing materials or goods and ascertain variants of the purchase requisition form for raw materials or goods from warehouse. Every variant of these invoices that is purchased requisition forms is coded and logically linked with the coding system of the 8 data flows.

In the production stage, two data flows which affect the business results of a company have been identified. These are:

3. Production order, and
4. Two types of working list:
   - Determined by man-hour,
   - Determined by production quota.

Other documents like standards for time spending, standards for materials spending, maps, production cartograms etc. don't belong to documents that affect company business results. For example, the standards are classified as the part of the environment that is the production coding system.

On the selling stage, two data flows which affect the business results of a company have also been identified. These are:

5. Goods received note,
6. Dispatch note.

Two data flow given above, represent the generalization of various kinds of receiving notes from the production, like: receiving of semi-finished goods, receiving of finished goods, products coding replacement etc. When the dispatch of goods is considered the generalization is also present here. The generalization was made for huge document numbers that are used for issuing goods from warehouse like: dispatch goods note for domestic customers, dispatch goods note for export, dispatch note for retail store, dispatch note for sale on commission, dispatch note for goods given as a gift, etc.

Beside these generalized documents there are other types of documents in the reproduction selling stage like: order forms, sales contracts, sales agreements, offers etc. However, their processing doesn't affect the company's business results. Regarding to this concept, planning and external data classes include these documents.

In the financial function, two data flows which affect the business results of a company have also been identified. These are:

7. Statement of account, and
8. Pay in/pay out cashier's form.

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The next problem to be solved is the defining of data base that should represent the source of all the information wanted or needed for more efficient management and more rational business. When defining a database model, the following criteria have served as a starting point:

- A database model should be comprehensive, i.e. it should represent the source for getting all necessary analyses for operational, mid-level and strategic management.
- It should be universal, i.e. it should not depend on the business activity, organizational structure and the aim of the business policy.
- It should be clear enough to enable easy maintenance and upgrade.
- It should have good performance, i.e. the processes of uploading a database should have satisfactory performance along with processes of reporting and analysis.

Some papers (Gao and Krogstie, 2009) point to the significance of gathering knowledge about organizations and business requests before it comes to the modelling processes. The comprehensive research of economic theory and practice in accordance with computer science rules for database modelling serves as the foundation for the creation of this database model concept. Based on the above knowledge, a newly designed database model is divided into 12 packets of data classes, where each class packet consists of a set of classes, i.e. tables, with specific features. The packets of classes are divided into:

1. Documents (This class packet contains tables where the original contents of every entered document is stored);
2. Organizational units (This class packet contains codebook tables of a company's organizational structure);
3. Business partners (This class packet contains codebook tables referring to business partners);
4. Business processes (This class packet contains tables with records of business processes such as procurement, production, sales, etc.);
5. External data (This class packet consists of data tables from the surrounding environment of the company, the purpose of which is to obtain adequate marketing analyses);
6. Planning data (This class packet contains a set of tables of all business plans);
7. The funds or assets of a company (This class packet contains a set of tables intended for the analyses of a company's assets);
8. Data on employees and working hours (This class packet contains the necessary tables relating to human resources, recording and calculating their working hours);
9. Balance data (This class packet contains a set of tables relevant to all types of accounting analyses);
10. Financial data (This class packet contains a set of tables relevant to carrying out various analyses required by the financial management);
11. The coding system of a company (This is a set of tables on the coding system of a company);
12. Management data (This class packet contains the data necessary for managerial analyses thus making the existence of DW redundant (Jeusfeld, Quix and Jarke, 1998).

The above mentioned packets of data classes contain the following four groups of data of natural, financial, balance and planning type. Such concept of data classes is similar to the existing theories that propose the need for defining object databases (James, 1977). Such

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database model for the entire enterprise consists of over 300 tables and several hundred relations.

The packets of data classes and their association to the standardized database model are shown below. The packets are marked with Ks, starting from K1 to K12 so as to create data glossary.

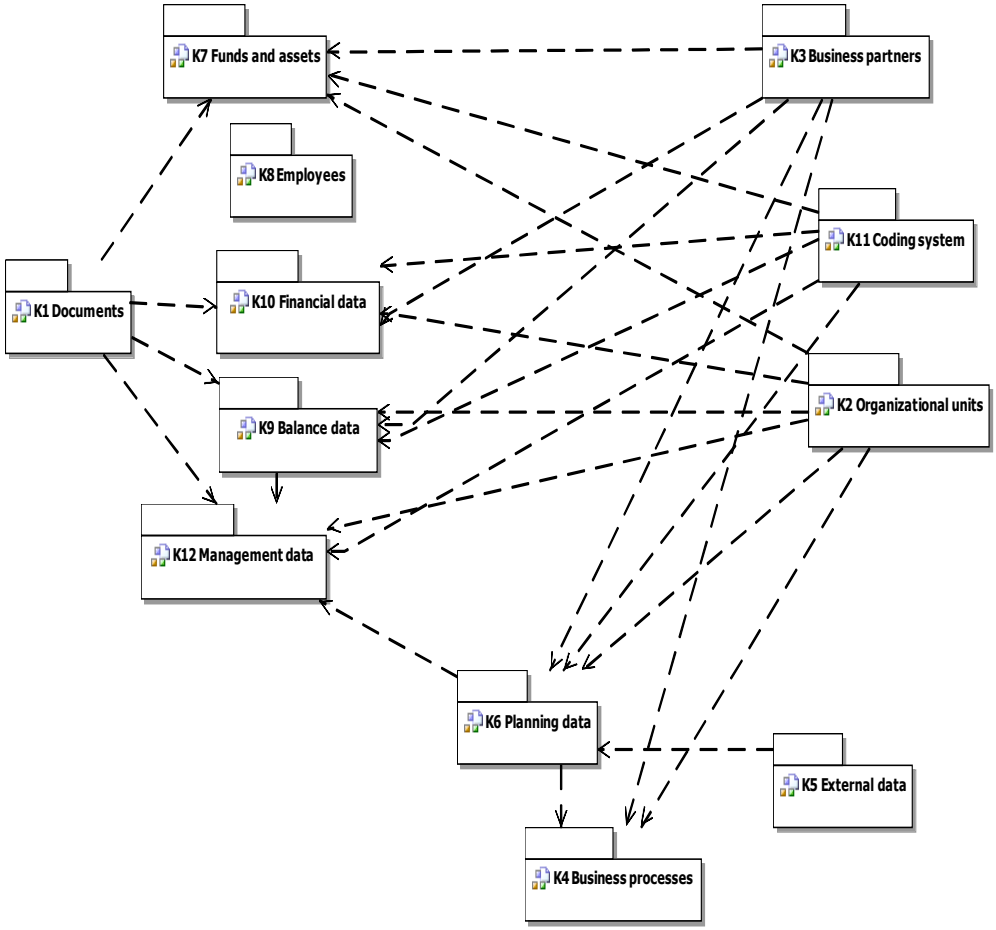

Figure no. 1. General database model review by packets of data classes and associations among them

In figure 1, a packet: K1 Documents represents sourced data; the packets: K7 Funds and assets, K8 Employees, K10 Financial data, K9 Balance data, K12 Managerial data, K6 Planned data and K4 Business processes represent derived data; the packets: K5 External data, K2 Organizational units, K11 Coding system and K3 Business partners represent static data. Sourced data packets memorise documents in their source form.

Derived data packets represent transformed sourced data for the needs of various subsystems to obtain analyses of the company's business operations easier and faster.

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Static data packets represent system environment which, in interaction with sourced data, enable transformation of data from sourced to derived ones.

The aim of such a concept of database model is to easily create, based on classes content, various analyses relevant to the operational, mid-level and strategic types of management as well as sustainable development.

4. Comparison of the integral IS concept with concepts of partial and integrated IS

In order to understand the idea of integral IS for business of the company and sustainable development, we are going to analyse briefly the existing concepts of partial and integrated IS comparing to the concept of the integral IS (the partial IS concept being based on the idea of automation of information flows and processes for only one subsystem of the company where the set of the independent subsystems makes the IS of the company).

Such an approach of the IS automation has both the advantages and disadvantages. The advantages are as follows:

- The automation of a subsystem is relatively simple;
- There are finished modules at the very low prices on the software market;
- The automation can be carried out dynamically according to needs;
- It doesn't require the significant resources etc.

The disadvantages of such a concept are as follows:

- The quality of managing information is even further at the lowest level;
- The business is not rationalised with regard to decrease both the number of documents and the number of administrative personnel;
- The organization of the business system is not changed and improved respectively.

The concept of the integrated information systems is based on the idea that the information systems for every subsystem of the company are designed, but at the same time also the data flows are designed for transferring data from one subsystem into another one. The goal of that concept is to speed up the database updating in this way and so to provide the more qualitative managing information. Disadvantages of that concept are as follows:

1. The continuous data transfer between subsystems does not occur because the input data flow for the next subsystem represents the database state from the previous subsystem. As the database of the previous subsystem is updated by entering some documents causing thereby naturally also the errors, so by continuous transferring the database states into the next subsystems the errors that can be corrected with difficulty are transferred through all the subsystems as well. For that reason we have in the practice the situation that the users of the information system of such a type either give up the automatic data transfer between subsystems or do it occasionally most frequently once a month when they are sure that all the mistakes in the previous subsystems are eliminated.
2. Because there is no continuity of the permanent updating of database this concept did not improve essentially the quality of managing information.
3. In the theoretical sense this concept doesn't improve the methodologies related to data collecting, processing and analysing.
4. The introduction of such a conception of integrated information system is far more complex and is connected to the great time dimension.

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It differs from the previous concepts because it has a unique database model representing the source of all desired or required information classified into twelve groups or classes, and is updated permanently by entering only eight types of documents.

If it happens that a document is entered with a mistake that has not been discovered by the programs for entering, it is updated naturally so with that mistake through all of data classes. However, when that mistake is identified, the document is returned in order to be corrected and so all the effects of updating through the whole base are cancelled.

5. The buying power analysis using integral IS

A large number of companies have necessity for data on the country level that could help them to improve their business and sustainable development. For that purpose, we will show one of the analyses from a marketing module of the integral IS. This example also can be significant for the state of the economy, economic growth and sustainable development.

NUMBER OF POPULATION ANALYSIS ACCORDING TO NUMBER OF EMPLOYEES PER CITY

Community code	Community name	Country name	Number of citizens	Number of employees	Number of citizens per employees
96	JAGODINA	SRBIJA	37,326	13,820	2.700
49	KRAGUJEVAC	SRBIJA	146,607	56,928	2.575
50	KRALJEVO	SRBIJA	56,616	26,922	2.103
52	KRUSEVAC	SRBIJA	58,114	36,769	1.580
58	LESKOVAC	SRBIJA	61,963	30,210	2.051
73	NIS	SRBIJA	175,555	74,833	2.346
164	NOVI PAZAR	SRBIJA	51,906	15,637	3.319
168	PIROT	SRBIJA	40,262	17,997	2.237
80	POZAREVAC	SRBIJA	43,844	10,534	4.162
85	PROKUPLJE	SRBIJA	28,243	11,041	2.558
99	SABAC	SRBIJA	54,829	24,926	2.199
92	SMEDEREVO	SRBIJA	64,257	15,746	4.080
100	UZICE	SRBIJA	53,666	29,821	1.799
107	VALJEVO	SRBIJA	58,324	26,117	2.233
114	VRANJE	SRBIJA	51,695	24,253	2.131
116	ZAJECAR	SRBIJA	40,067	18,015	2.224
		TOTAL SUM :	1,023,274	433,569	2.360

Figure no. 2. Number of population analysis according to number of employees per city

The analysis from figure 2 shows that one textile product company may collect data about the number of citizens and the number of employees from various cities. In this way, the buying power of the citizens of these cities is perceived by the company.

This analysis was made for some cities of Serbia and it shows how many unemployed people coming on one employee at some city. Marketing managers of the company should make decisions about the city that is suitable for new store opening, on the base of this analysis. Also, this analysis illustrates the dynamic development of employment per cities from the aspect of sustainable development of the economy.

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Conclusions

The goal of this paper was to summarize one of the ideas for the realisation of the business IS for more rational and efficient business of economic companies and sustainable development. The idea itself has been realized and adopted in over fifty companies of different economic activities. The recognition of integral IS concept has both the practical and the theoretical effect on the business of the company and sustainable development as a consequence. The practical benefits of this concept usage are manifested in the business companies and sustainable development through the following contents:

- The new quality of managing information is obtained because there are unlimited possibilities for different analyses of business system states due to the existence of the time and logical data consistency of natural, financial, balance and planning nature.
- The number of documents is reduced essentially, from some tenths or hundreds to only eight ones regardless whether the company with 40 or 4 000 employees is concerned.
- The need for administrative jobs decreases essentially and up to 10 times in relation to classical approaches.
- The speed of implementation is reduced on relatively short time, from several months for small and middle companies to mostly two years when a company with over 4 000 employees is concerned because the database model and flows for updating are standard.
- The conditions for a more rational organization of the business system with minimal number of functions are formed.

The theoretical aspect of this concept is considered through the following three scientific disciplines: economic science, science of work organization and information sciences. The economic science, as a science having as its subject of learning also methodologies related to the data collecting, processing and analysis can reach its further development as well as the development of informatics if it directs its researches to the following ways:

- Outlining the database general model that should represent the source of all information required for all kinds of economic analyses, where the very technique of database designing is based on existing techniques of the database modelling;
- Making new technologies of the analyses of the business results which are based on the unique model of a database;
- Identification and definition of database flow as sources for loading and updating the unique database model;
- Making methodologies for loading and updating the unique database model on the basis of the basic data flows.

The computer science has shown that the system of the analysis is not able to meet the requirements and needs of the business companies by the existing concepts. Our standpoint is that as long as the information system is designed by some of the system analysis concepts, the software crises will exist as well.

The organization of a company with a large number of subsystems is more a consequence of imperfection of existing concepts of data collecting, processing and analysis than the technological need. Using the concept of an integral information system, the need for a lot of subsystems practically ceases. In that way, the space for further researches is opened in order to achieve more rational and sustainable organization of the business system.

In favour of the integral IS idea we give the example from the accounting theory and practice. The account plan, as a standard form or model of the database for the needs of

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accounting had been developed by the accounting science and practice. Therefore, the standardisation of the database model and data flows of the integral IS is the best way of the faster progress in the use of the computer technology for the improvement of the business and sustainable development.

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