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Implementation of BI Tools by Macedonian Business Companies

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Abstract

Dealing with the upsurge of information is certainly one of the most significant tasks of the information systems nowadays. Extracting information out of the immense data pools is a task assigned to information systems managers, who can have various titles and tasks. Companies are increasingly investing in information systems, since they believe that information systems will provide them with information which will position them on the market; with which they will acquire advantage over their competition and which will increase their profits and chances for survival in today's global competitiveness.

The era of globalization took its toll. The advent of BI systems although indispensable is lagging behind in the Republic of Macedonia. Experts attribute this to the way in which restructuring of the Macedonian companies took place, which according to the experts' estimates were inadequately managed. However, the globalization. The companies which have successfully dealt with the new dynamic circumstances managed to make use of the BI tools, which have "reflected" the organizational readiness for implementation of the global companies in the Republic of Macedonia. It goes without saying that this refers to the most lucrative businesses, i.e. the businesses that cannot go without using highly sophisticated BI tools and which use vizualization in the presentation of information.

The objective of this paper is to elaborate on a study on utilization of BI tools in the Republic of Macedonia and to give a review of BI software tools which have been implemented so far by the Macedonia companies and to make predictions about the utilization of these tools in the future in the Republic of Macedonia.

Keywords: Business intelligence, Data Warehouse, KPI, Data integration

1 Introduction

The companies in R. of Macedonia, in the transition period of the former Yugoslav republics, had low degree of readiness to handle the globalization and they weren't transformed in the proper way. One reason was the concept of privatization of the public companies in Macedonia, as well as the lack of managers educated and ready to handle the upcoming globalization. These were the reasons why the markets of the Macedonian products were lost, the companies were not competitive and they also lost their capital and went bankrupt. For some companies, the privatization means sale of its capital, firing employees, low salaries and working hard for surviving in the market. The companies which stayed in business succeeded to handle the global problems and found their place in the global market. They also succeeded to handle with the competition.

However, the companies that continued to work faced a different kind of problem. Such problems were obsolescence equipment, lack of information about what has happened in a specific area and how the competition works. This demands quick reaction of the company by replacing equipment and education of young and inventive people, who can follow this information and can prepare them for the managers' teams. With automation of almost all production and preparation processes and upcoming flow of data from operational information systems, the companies had to handle the flow of information themselves.

The data extraction from a huge database becomes a problem in R. of Macedonia as in the whole world. Transactional information systems (TIS) cannot give the proper information to managers, especially when they demand long-term data analysis for key performance indicators (KPI). From this data, it is possible to follow the trends or they can be supported in the decision making processes. The managers' demand aggregated data, which they don't have in their TIS and in the specified format. Some managers don't understand the "present time" and their companies' lapse lose the market share and go bankrupt. The companies that "woke up" in this time, stayed in the market and continued to run in the global market. Their managers knew what they must do to stay in the competitive market and how to utilize the power of information. These companies invest more and more in the manager's information systems. Many Management information systems (MIS) were offered from IT companies under different brand names, because the managers believe that these data will provide information that will give the company a good position in the market, a competitive advantage, increased profits and chance to sustain in the market. On the global market, there were many tools that support this concept, but they demand some prerequisites to gain information for the managers.

2 State of BI software in R. of Macedonia

Implementation of MIS and BI systems in R. of Macedonia lapses behind this in USA or Europe. There were many reasons for this, since the process of restructuring of companies in our country has been in progress. Experts emphasize the lack of educated managers which understand the power of information as well as lack of manager's skills to handle the global economy. The companies which are nimble in this dynamic environment succeed to implement BI tools, which copied the organizational readiness for BI implementation in the global Macedonian companies. These global companies were the most profitable and demand highly-sophisticated BI tools.

With this research about the use of BI in R. of Macedonia, we comprise about 50 companies, mostly from the capital city, Skopje. We do not use the method of statistical sample, but instead, we have selected the most profitable companies. From the collected information, we can see that they respect the value of information and they use data warehouses (DW) and tools for gaining BI information. Also, we made an internet research

for BI tools, which are already used for data analysis in these companies and some state institutions.

The level of use of BI in the Macedonian companies is derives mostly from this necessity, the company's payment ability (the software license prizes), or some precedent habit (mostly in the state institutions). The BI implementation is not a one-step process, but it demands precedes organizational readiness and strong manager's decision for BI software implementation. We found the best tools for BI in some state institutions, telecommunication companies, banks and insurance companies. The best world BI software companies, which can provide implementation of BI software, are presented in this market with their products as SAS, ORACLE, IBM Cognos BI, Microsoft OLAP Analysis services (Integration services), Navision BI and some in-house software solutions, developed in the company or purchase from the Macedonian IT companies. A big parts of company's conceder that the selection of BI tool is a strategic decision, and information about how to use it is confidential. The IT staffs from this part of the business environment are obligated to do procedures for use of BI tools and output information.

The analysis of use of BI software tools in R. of Macedonia are sublimated in the Table 1. All 50-thin companies, that were the object of research interest, are grouped in 7 sets, depending on the BI vendor and use of BI software.

Table 1 Analysis of usage BI tools in R. of Macedonia

SAS	IBM	ORACLE	SAP	Microsoft	else	No DW
4	12	6	1	12	1	17
7,55 %	22,64 %	11,32 %	1,89 %	22,64 %	11,89 %	32 %

This analysis show that 32% of the organizations that participated in the research don't use DW and BI tools yet, but they plan to use them in the future. 68 % own its DW in the larger or tight sense and use tools for data analysis and reporting. The largest percent of DW are by IBM (in the state institutions) and Microsoft (in the business companies). The most often used tool for analysis and reporting as end-user tool is the Excel Pivot tables and some Web tools which provide data visualization. The BI software market, as well as the tools for data analysis from DW or other databases become wider, every day they are multiplied and their capabilities become more and more powerful. These tools provide data integration from different databases and platforms, operating systems and they are available for all worlds' markets through the internet.

3 BI tools that are use

One of the biggest and oldest DW in R. of Macedonia is The State Statistical Office DW. It is installed on the SAS DW1 software solution on Windows platform (Windows server 2003). Our estimation is that it is the most professionally created DW with precisely defined procedures for extraction, transformation and data loading, used in the Macedonian territory (Figure 1). The software SAS Company's in R.M. possesses 3 DW implementations which are used for statistical analysis and BI and data mining tools.

1 www.sas.com

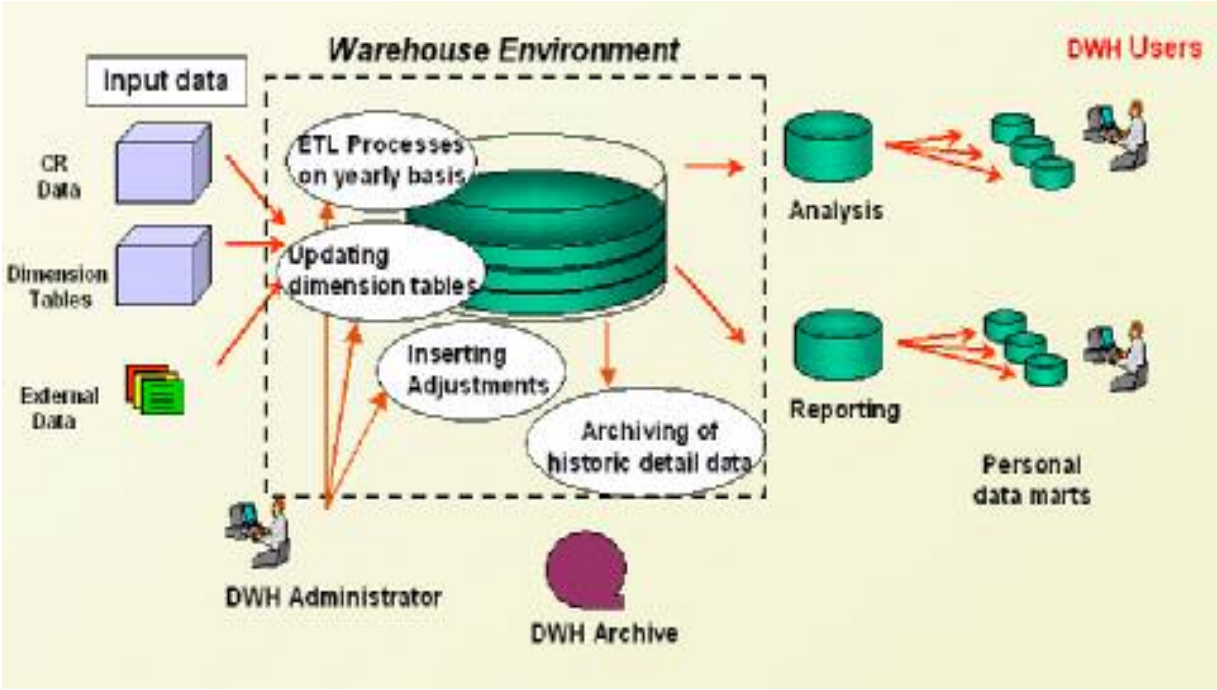

Figure 1: Conceptual scheme of State Statistical office DW

Data which is an object of data processing in the DW is taken from many administrative sources, areas from where data is obtained with some statistical researches made in State Statistical Office (SSO) and from Statistical Registry in SSP. The administrative data sources are: The State central registry (the final account report of subjects), The Office of Public finance (the taxes-information database), Ministry of finance (public revenue – the treasury accounts), National bank (monetary statistics), Sanitary insurance fund (contribution of sanitary insurance) as Retirement and invalid insurance fund (contribution for retirement and invalid insurance).

The statistical researches are made in the areas of: Foreign trade market, inside trade market, industry, building and construction sector, tourism, agriculture, poll for household spending, prize statistic and poll for labour

The data loaded in the DW (Figure 2) are checked with SAS DW coded program. With all transformations, we calculate the new variables, called category for calculation of GDP (gross value, semi-phase spending, the added value, number of employees, depreciation). The final outputs are settled in many different summary tables, grouped depends on institutional sector (Figure 3). This data are disseminated as public data and placed in the SSO web site.

A tool for data analysis and reporting used in SSO is SAS Adjustment analysis tool, Corrections and Reporting tools which are the parts of SAS EIS software tool. It is powerful and user-friendly software with many possibilities.

Another sophisticated tool for BI used in R. of Macedonia is IBM Cognos BI software tool. This is very complex software which offers different business solutions for data integration, data warehousing, CRM tool, data mining and visualization tolls. We found a couple of Macedonian companies that have used some solutions from this palette. For BI solution, usually they use Cognos BI as tool for data integration, DW, CRM, data analysis and reporting. The depicted BI system use ORACLE DW for DW with embedded ETL procedures and defined BPM procedures. Cognos BI provides analysis in many dimensions

and measures, for one or more products, groups, stores, regions or salespeople. For predictive data analysis the managers and marketing researchers use IBM SPSS Discovery.

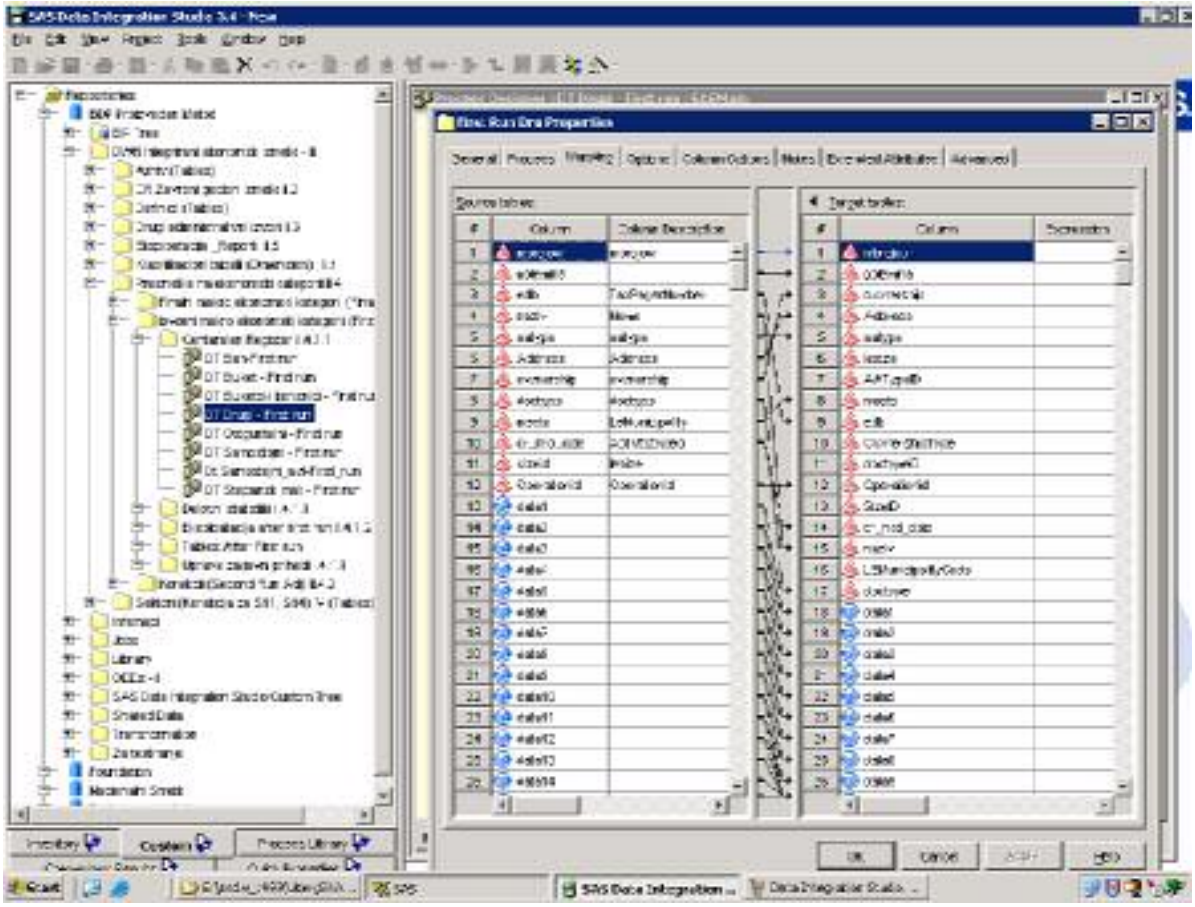

Figure 2: SAS Data Integration studio – First run procedure

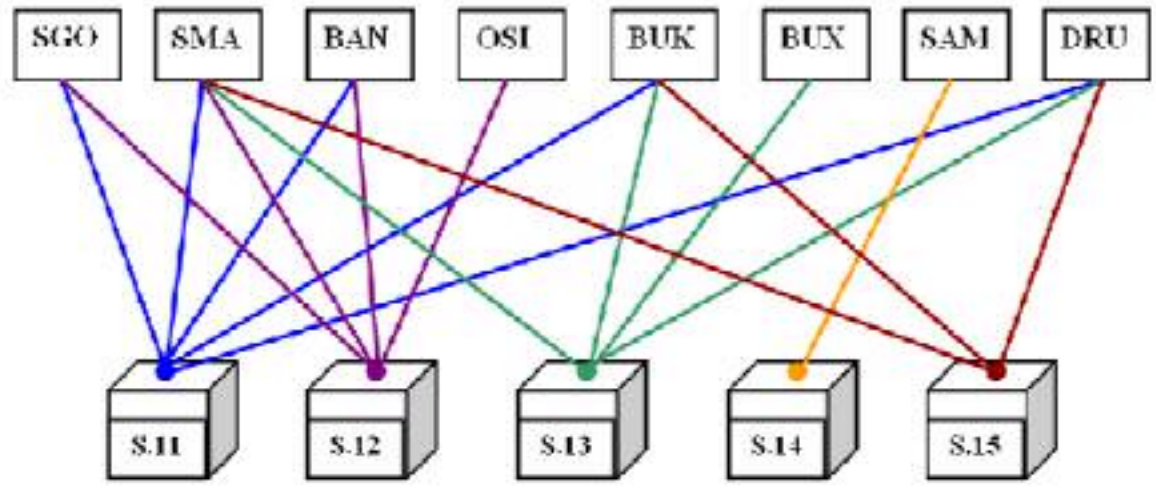

Figure 3: Summary tables for different institutional sectors

The biggest part of BI tools used in R. of Macedonia is created from TIS posted on the Microsoft platform. A tool for data extraction, preparation and creating of multidimensional data cubes with OLAP solution is Microsoft Analysis services and Integration services. These

solutions may be very professional and can give excellent results, depending on the professional skills of DW programmers. These tools are used in many high-profitable companies, such as banks and insurance companies. As the end user tool, they usually use created files in Excel Pivot tables.

Navison software solution is BI software which is present in our country. The target group for this software BI tool is the middle size of business companies (with about 50 employees). The company must defined KPI factors, which will be the objects of observation and adjustments. These packages provide permanent control of cost and benefit, depending on different parameters. This software tools provide business processes integration on the operational layer and also some aggregated tables for business analysis.

In some Macedonian business companies, we found customized software solutions for gaining information like BI, but they are limited on observation of specific parameters and obtained from TIS. These solutions have a limited expansion possibilities and necessity of engaged IT staff for application and data maintaining. The visualization possibilities are limited and demands comprehensive data preparation and additional visualization tools. These solutions cost a lot and make problems with the flow of IT staff in companies.

4 Conclusion

The Macedonian companies have the increasing need of usage of BI software tools for gaining relevant business information. In our research for using BI tools in R. of Macedonia, which was made with 50-thin biggest companies and state institutions that use this kind of software tools, we gained information about BI software tools implemented and outputs provided from these tools. Mostly, these BI tools are used in the global business companies and state institutions. We estimate that the most significant reasons for this are the expensive licenses for the use of this type of software tools, lack of information about the benefit of the use of these software tools and managers' week education of IT. However, with the upcoming of a new managers' generation and their increased education for use of IT in attainment of business goals and the power of information, there is a new tendency for increasing the use and requirement of BI software tools in business companies and state institutions.

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