CONSIDERATIONS REGARDING THE IMPORTANCE OF DATA MINING IN CONSULTANCY FOR THE ECONOMIC ENVIRONMENT

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Abstract: Data mining represents a new challenge, starting from the premises that during the last years a lot of data were stored. In these circumstances, the need of storing and processing data can find a response in some specialized institutions that are able to assure data mining. This article presents the results of a research made with the purpose of identifying the need of companies from The Center Region of Romania to be the beneficiaries of consulting services possible to be provided by The Research Institute of Transilvania University of Braşov.

Keywords: Data mining, Knowledge discovery in databases, Business consultancy

1. Introduction

Managing a large amount of data stores over time, varied data (graphic or multimedia type) in online or offline status, provided from own researches or other sources requires coherent actions for integration, consolidation and aggregation, reorganization and storage, and also processing in relation to the company's marketing objectives (Orzan, 2001). Areas such as knowledge Discovery in Databases (KDD) or Data Mining (DM) have become increasingly important for organizations and businesses.

This paper was designed to identify the need to create a large database of the companies from The Center Region of Romania, grouped by several criteria and for the purpose of identifying the need for these economic agents to call for specialised consultancy services, consultancy that could be given by specialists and researchers of the Institute of Research and Development of Transilvania University of Brasov.

The paper is divided into 4 parts: in the first part there are presented the premises that led to this research (both from the perspective of the context that led to the emergence of the need for processing of the Big Data databases and from the perspective of the potential of

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The Research and Development Institute of Transilvania University of Braşov to manage such data), the second part is dedicated to presenting the research methodology, part three presents the results of research, and part four concludes these results.

2. Objectives
2.1. Defining aspects regarding Big Data databases and Data Mining

Davenport, Barth and Bean state that organizations swim in an ocean of expanding data, which are either too bulky or too unstructured to be managed and analyzed by traditional methods (Davenport, et al 2012). New data sources contribute to the development of organizations ' activity-clickstream data from the WEB, social media content (tweets, blogs, ads on Facebook networks, etc.) and video data from online marketing, as well as video entertainment (Florian et all, 2016). Big Data includes an extremely wide range: from voice data generated in callcenters, to genomic and proteomic data from biological research and medicine. Note that only a very small part of this information is formatted in rows and columns, according to conventional databases (Gandomi et all, 2015), which implies some difficulty when extracting and processing them.

Data mining technologies are, in a simple acceptance, an automatic detection mode in a database of relevant patterns of information. Data Mining uses a number of statistical and artificial intelligence techniques that make it possible to build models that can prewatch customer behavior (Orzan, 2014).

2.2. Premises regarding the involvement of Transilvania University of Brasov in satisfying the need for business consultancy

Transilvania University of Brasov is the largest university in the center of the country, a university offering programs in 43 fields of science, linking research fields reflecting its comprehensive structure, with a balance between the technical field and socio-human field in the process of consolidation. Starting from these premises, it is intended to position the university as a key resource for regional and national development and to encourage the development of strategic partnerships with representatives of the economic environment and civil society.

In the Institute of Research and Development, activities are carried out in order to exploit the experience and resources developed through numerous grants and contracts and they are conducted in advanced scientific research in the complex field of sustainable development in 29 scientific research centres. The Institute supports cooperation between scientific research centres in integrated approaches, in line with priority themes at regional, national and international level. The areas of scientific research covered are the following: high-tech products for motor vehicles, industrial informatics and robotics, numerical simulation, testing and mechanics of composite materials, economic engineering and production systems, advanced manufacturing technologies and systems, advanced welding technologies, advanced metal, ceramic and MMC composites, advanced electrical systems, built-in electronic systems and advanced communications, Process control systems, sustainable forest and cinegetic resource

management, forest logging, forest planning and land measurements, Eco-Design of furniture, restoration and certification in the wood industry, innovative technologies and advanced products in the wood industry, the design centre of the PRO-DD Institute, Eco-Biotechnology and equipment in agriculture and food, systems of renewable energies and recycling, advanced mechatronic systems, mathematical modelling and software products, economic research, positive psychology and education for a sustainable community, quality of life and human performance, excellence in musical interpretation, fundamental research center and preventive strategies in medicine, research centre in applied medicine and interventional strategies in medical practice, innovation and cultural creativity, research of theoretical and applied linguistics, justice and constitutional reform, communication and social innovation.

Through its infrastructure, The Research-Development Institute is the right framework for conducting doctoral and post-doctoral programmes, for the development of national and international projects, for cooperation with the economic environment and Institutions involved in the formation of highly qualified human resources.

3. Material and Methods
3.1. Establishing the objectives and the hypotheses

The objectives of the research have been established in such a way as to help achieve its purpose – the creation of a large database including economic operators of certain categories in The Centre Region and providing advisory services to companies.

Thus, the following general objectives have been established:
- identifying of companies in The Centre region of Romania, which have
- a minimum turnover of 100,000 euro, constituted with the share capital 100% domestic and the realization of a database their catalogue;
- identifying of the opinions and perceptions of the economic agents included in
- the study on the level of student training when entering the labour market;
- identifying of companies ' opinions on the establishment of communication links to the business environment with the university, through consultancy services from Transilvania University;
- identifying the main categories of goods of the producers included in the
- study and their percentage for export.

To observe how close is the link between the business environment and the university, the respondents has been asked to assess several aspects of the graduates of Transilvania University of Brasov employed in companies, in order to identify their degree of satisfaction with regard to the level of practical training of students and to identify factors that should be taken into account in the future approach of theoretical and practical training of students.

The general assumptions of the research took into account the following aspects: a large proportion of the companies from The Centre Region redirect part of its production to export; creating large databases that generate specific catalogues is not a common practice in Romania; companies form The Centre Region of Romania are calling a small degree to consultancy services from specialists; a large proportion of the

companies believes that consultancy services do not really help the company's development; most of the companies included in the study do not know that the Development Research Institute of Transilvania University of Brasov offers business consultancy services; companies from The Center Region of Romania wish in great measure to receive further details on the consultancy offer of Transilvania University of Brasov through its research institute.

The statistical assumptions of the research have attempted a more relevant statistical transposition of the scientific assumptions.

3.2. Determination of sample size and structure

The investigated population is represented by companies from Romania-The Centre Region (Braşov, Sibiu, Covasna, Alba, Târgu Mureş and Harghita counties. Companies that correspond to certain criteria - 100% domestic social capital and a turnover of at least 100,000 euros in the previous year – were selected. Establishing the sample size was made taking into account the allowed error (3%), the level of confidence (95%), the estimation of the percentages in case of success/non-success (50%/50%), but also of financial and organizational aspects, resulting in a sample of 120 companies.

For the selection of sample members, a sampling framework consisting of the list of all companies in The Center Region of Romania falling within the list above, applied to the simple random sampling method was used. For this purpose a random number generator was used using the "Random Numbers Generation" function from the Microsoft Excel system Tools/Data Analysis menu (Constantin, Tecău, 2013).

The validity of the sample was verified by applying within the SPSS base an analysis of frequencies for the variable indicating the type of capital.

4. Results

By following the analysis of the answers to the questions and by the testing the conclusions, it can be appreciated, firstly, that a percentage of 70% of the interviewed subjects stated that they benefited from expert advice in their work. They also claim that consultancy services had a positive impact on the development of their work.

In a deeper analysis it is found that most of the companies holding 100% domestic capital have never benefited from specialised consultancy services, but they have considered it more appropriate to approach a strategy based on own employee knowledge.

A percentage of 70% of the interviewed companies representatives said they had not heard of the existence of the Development Research Institute of Transilvania University of Brasov, indicating a weak link of communication between the educational environment and the business environment of The Center Region of Romania. 66.7% of companies said that they have heard of the Research and Development Institute and they collaborated with it, while 33.3% have only heard of the existence of this institution without resorting to its services. Following the idea of future collaborations, 75% of those interviewed said they would be delighted with this idea of consultancy provided by The Institute of Development and Research of Transilvania University of Braşov.

It was found that 30% of respondents employed students from Transilvania University in the last two years of activity. Following the analysis of the statistical situation we find that most companies that have employed graduates in recent years (a percentage of 45.5%) declared to be in a situation of uncertainty regarding the level of practical training of the students they hired. In the second place, there are companies that declare themselves unsatisfied by the practical training of students. Interviewed about the degree of satisfaction with the level of theoretical knowledge of students they have hired in recent years, companies have found themselves in the same situation of uncertainty. This time, in the second place from a percentage point of view is the companies that declare satisfied and very satisfied with a percentage of 27.3% for both levels.

5. Conclusions and Discussions

The creation and storage of Big Data databases has led to the emergence and development of new areas such as knowledge discovery from databases or Data Mining, generating the need for specific processing. This context favours an increase in the role of institutions that can achieve this type of data processing, both from the perspective of storing and processing data and, also, from the perspective of their use with a view to providing specialized advice to the business environment. Transilvania University of Brasov, through the Research and Development Institute, can become a provider of consultancy services, by having the capacity to meet the needs of diverse domains.

To determine the degree of interest that firms in The Centre Region are experiencing to be the beneficiaries of consultancy services offered by the Research and Development Institute, a survey was conducted.

The results showed that a significant high proportion of the firms in The Centre Region benefited from this type of services, positively appreciating its effects. This proportion shall no longer be retained in respect of firms with 100% domestic capital which are not only beneficiaries of specialist advice but are not aware of the opportunities offered by The Research and Development Institute of Transilvania University of Braşov in this respect. The attitude of these firms could be interpreted as a consequence of a relative lack of concern, but also as a consequence of the existence of their own specialists in firms. This attitude is no longer sufficient, however, under Big Data conditions, which require a different type of approach. On the basis of that conclusion, it may be emphasised the need for better communication between the university and the business environment, both in the sense of awareness of the importance of accessing more complete Big Data bases and, also, of the request for specialised consultancy services, especially considering the fact that most of the interviewed subjects showed interest in establishing such collaborative relationships.

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