TEACHING AND REAL APPLICATION PRACTICE OF IBM COGNOS BI, SPSS MODELER, ILOG CPLEX AND SAP ERP: BELARUSIAN STATE UNIVERSITY EXPERIENCE

S.N. Sirenko, e-mail: sirenkaSN@bsu.by, S.V. Markov, e-mail: markov@bsu.by
V.I. Malugin, e-mail: malugin@bsu.by

Belarusian State University, Minsk, Belarus

Belarusian State University (BSU) IT Competence Center was organizing training IT courses and seminars for students and professors of natural-science faculties, International Relations and Economical faculties since January 2012. At the beginning of all training activities BSU together with its strategic IT partner and sponsor JV IBA have defined such IBM and SAP solutions as Business Intelligence with Cognos BI, predicative analysis with IBM SPSS Modeler, commerce, marketing, and supply chain with ILOG CPLEX Optimization Studio and SAP ERP as the main directions of their collaborative work. To outpace the modern challenges and overcome 'train the trainer' skill gaps at all levels IBA specialists have prepared for us such courses as "Introduction to IBM Cognos TM1", "Basics of IBM SPSS Modeler and Data Mining", "Working with IBM Cognos BI", "Foundations of SAP ERP", "Programming with SAP ABAP" and so on.

We must outline that all these processes were also really supporting and developing by 3 departments of Belarusian State University:
1. Department of Pedagogic and Education Problems Development (Sirenko Svetlana, associate professor, PhD) [1].
2. Department of Optimal Control Methods (Markov Sergey, associate professor, PhD) [2].
3. Department of Mathematical Modeling and Data Analysis (Malugin Vladimir, associate professor, PhD) [3].

The above mentioned departments are taking the most active part in IBM Academic Initiative and SAP University Alliance Programs and their courses of training BDA / BAO replenish and enrich each other. Our main lecture courses cover such important fields as Statistical Data Analysis, Data Mining, Econometric, Computer Simulation, Optimization and Pedagogic of IT Education.

The new trend in our teaching process is a preparation of specialists in Big Data analysis. The above-mentioned disciplines provide an introduction to the special topics of mathematical and statistical analysis methodology. An algorithmic and programmer's skills of Data Analysts are provided by the training courses "Algorithms and Data Structures", "Data models and database management systems", "Parallel and Distributed Computing", "Intelligent Information Systems" and so on. For example, this year at the BSU Faculty of Applied Mathematics and Computer Science the first set in the master's "Algorithms and systems to handle Big Data" was held.

To prepare our students for real practice in BDA/BAO BSU and its partners - The United Institute of Informatics Problems of the National Academy of Sciences of Belarus, National Bank of Belarus and JV IBA - propose a set of project seminars where they can get a good experience in learning the main concepts of Big Data and Analytics. We'll describe here some of them.
1. The first research project is connected with the application of multivariate statistical analysis and econometric modelling to assess the creditability of non-financial Belarusian companies with SPSS Statistica. On the basis of company's financial reports data obtained within the National Bank's monitoring system it's necessary to propose a system of credit measures called "relative statistical credit ratings", which includes: company ratings, the branch of the economy ratings and the integral indicator of creditworthiness of the national economy [3].

2. The second project is dealing with working out analytical system of efficiency of the main production which helps operative monitoring to be carried out, estimation and the forecast of its efficiency on the basis of all feasible information of the Belarus metal Works (BMW) production – one of the leading enterprises of ferrous metallurgy in Europe. During this project students must work out methodology and tools of monitoring of key indicators of production efficiency and production sales.
3. The third project is the project of Smarter City - "smart trip system" (the automated system of payment and control of trip in Minsk municipal passenger transport). In the future the automated systems of payment and trip control can be integrated on the basis of one iCard. It will allow to optimize a routing network and to correct number of transport vehicles working on a line. And it will be very interesting and useful for the students.
4. The last project objective is to develop algorithms and effective using of IBM and SAP Products such as ILOG CPLEX Optimization Sudio and SAP ERP for solving in real time a complex product delivery problem (Smarter City Problem) Efficient implementation and usage of the proposed intellectual service requires a high educational level, a profound knowledge of contemporary mathematic methods and algorithms, and special IT skills of the students (dispatchers). Furthermore, they should be able to work in an interdisciplinary team and constantly improve their IT competencies, that is, they must be T-shaped.

The students must understand that BDA/BDO have become now a new methodological base for both research and practical activities in various spheres of science, business, education, healthcare and social life, facilitating their convergence, integration and interaction. But they can potentially provide more competitive advantages if they are used together with ERP and Optimization for more profound information processing of modeling, prediction and selection of effective strategies and solutions for the management of complex multi-element systems

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