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**Educational Framework for Business Analytics at Higher Education Level: Curriculum Structure, Subjects and Skills**


## Abstract

The acquisition of practical knowledge, identified by specific competencies and skills in the field of business analytics is a necessity. Academic universities must keep up with the needs of business. The aim of the paper is to identify the current educational framework for Business Analytics at the higher education level.

The work asks three research questions: (RQ1) In which fields of study business analytics issues are included?; (RQ2) What subjects are offered in the field of business analytics at universities?; (RQ3) What key competencies are developed in the field of business analytics at universities?

The pedagogical framework, which includes entry requirements, curriculum and subject-specific learning outcomes, was developed based on a review of ECTS cards of selected universities in East-Central European countries.



Keywords:

Business Analytics; fact-based management; big data analytics


## Introduction

There is a large collection of publications available on the subject of Business Analytics (BA). They concern digital transformation, technology and implementation. However, it seems that there is a lack of research that analyzes the educational framework in higher education. These are faced with several challenges related to BA education. Therefore, the aim of the paper is to identify the educational framework for Business Analytics at the higher education level.

The work asks three research questions: (RQ1) In which fields of study business analytics issues are included?; (RQ2) What subjects are offered in the field of business analytics at universities?; (RQ3) What key competencies are developed in the field of business analytics at universities?

The study discusses the pedagogical framework used for training practical skills in Business Analytics at the higher education level. It indicates (1) fields of study in which BA issues are discussed, (2) subjects, and (3) skills acquired by students. Based on the review, a pedagogical framework is proposed, which includes prerequisites, curriculum and subject-specific learning outcomes. This study can serve as a guide for educators regarding good practices in teaching practical skills in Business Analytics at the higher education level.

Our challenge was to create a Business Analytics curriculum at a technical higher education level with limited technology and faculty resources. This paper describes the conducted research and curriculum development aimed at complementing the existing educational program. Instead of a "stand-alone" curriculum, the proposed curriculum will be integrated into the existing educational program in accordance with best practices.

At the same time, the study contributes to filling the pedagogical and methodological gap in the field of Business Analytics. The results of the study can influence the experience of educators and contribute to improving the well-being of learners. Both academics and business practitioners may find the contribution of the conducted research interesting.

The paper is organized as follows. Section 1 provides an overview of the research on Business Analytics. Section 2 presents the methodology of the conducted research. Section 3 presents the research results along with answers to the research questions. The next section presents the Pedagogical Framework for Business Analytics at the level of technical higher education. The last section presents conclusions and indicates further directions of work.

## 1. Business Analytics

Businesses and supply chains are moving from a VUCA reality that is: volatile, uncertain, complex and ambiguous to a reality defined by the acronym BANI, which is brittle, anxious, non-linear and incomprehensible. Economic systems that seemed flexible and reliable, indestructible, are proving fragile in the face of the new reality. The amount of data, information and facts is disturbing, making the economic world even more restless and unstable. The logic of cause-effect chains has been shaken - decisions have disproportionate effects or their consequences occur with a long delay. The excess of data and information overwhelms, and makes it difficult to understand and provide credible answers.

In business, many challenges are observed that concern unclear situations, misreading signals from the environment, ambiguity and lack of experience in a similar problem. In this complex and competitive environment, huge amounts of data are analyzed in enterprises and supply chains, which concern various aspects. Dealing with such a large amount of data poses problems for organizations. Business Analytics (BA) comes to the rescue. It uses a large set of data and helps to create a fact-based management system using qualitative and statistical techniques. Due to its significant potential at the operational, tactical and strategic levels, it attracts attention and interest from both academics from various fields and practitioners from various industries.

The conceptualization of Business Analytics is supported by a general evidence-based/data-driven paradigm for making business decisions. Specific BA activities are performed by the system (e.g. collection and storage) as well as by BA users (e.g. analysis), which are implemented using selected practices (e.g. data standards) and technologies (e.g. query analyzer) through a transformation process in which data is transformed into insights (Holsapple, et al., 2014). Al-Okaily & Al-Okaily point out that BA is used as a collective term that is used to describe concepts and methods for improving fact-based business decision-

making (Al-Okaily & Al-Okaily, 2022). On the other hand, Tavera Romero, et al., indicate that BA is defined as a process that is related to collecting, processing and analyzing often large sets of data. As a result, BA allows for making more informed and accurate business decisions. It enables, among others:

(1) general financial and non-financial analysis of the enterprise,

(2) identifying anomalies in the collected data,

(3) creating "what if?" scenarios with predicting their results,

(4) creating special reports to enrich managers' dashboards.

BA is considered as one of the most critical technologies (Al-Okaily, et al., 2022), which has become a key requirement in business operations and in later development phases in industrialization and Industry 4.0 (Tavera Romero, et al., 2021). At the same time, it is a trendy concept (from a scientific point of view) and required to create a unique image of the company (from a business perspective). Business Analytics goes beyond mere analytics and focuses its analyses on tasks related to prediction and prescription (Pinder, 2022). Typically, BA includes a long set of different analytical techniques to transform data into actions, known as descriptive, predictive, and normative (Schmitt, 2023; Maydon, 2017; Chen, et al., 2020). **Descriptive analytics** focuses on identifying patterns and trends in data. It involves visualizing data to gain insight into past and current business performance. It answers the question, “What happened?”. **Predictive analytics** provides actionable insights to forecast future outcomes and anticipate potential opportunities or threats. It answers the question, “What will happen?”. Prescriptive analytics aims to improve the accuracy of forecasts and provide better decision options. It generates new value for the organization and opportunities for future growth. It uses advanced analytical techniques to formulate recommendations or recommendations on actions that should have been taken. It answers the question, “What should be done?”.

Business Analytics supports improved data management and provides management with a constant stream of information (Sabherwal & Becerra-Fernandez, 2011). From a technical perspective, BA is defined as a set of technologies and tools that enable data mining, and analytical processing; these include data warehouses, operational research techniques, statistical modelling, and analytical tools (Sun, et al., 2022; Sangari & Razmi, 2015). From a managerial perspective, BA refers to providing practical (accurate and potentially useful) information supporting decision-making at various organizational levels (Alpar & Schulz, 2016). The third perspective is the BA competence, i.e. the ability to produce a "product" and use it in making business decisions in an effective way (Maghsoudi & Nezafati, 2023). We are therefore observing the development of organizations towards a more analytical culture. This development transforms and adapts organizational processes to manage the right information by the right people, at the right time and with the support of the right tools in order to support the ability to make less risky decisions in the organization. Solving the above challenges requires improving the competencies of specialists who will be able to understand the challenges and problems in the field of Business Analytics and will be prepared to respond and cope with complexity, uncertainty and rapid changes. Studies show that acquiring BA

capabilities can create business value and help in better utilization of resources (Hindle & Vidgen, 2018; Chatterjee, et al., 2019; Chatterjee, et al., 2024). Technological competence is identified as an important factor in BA adoption (Youssef, et al. 2022; Sun, et al., 2020; Horani et al., 2023). It concerns both technical knowledge and knowledge required to effectively implement and operate analytical tools. Educators at universities are taking decisive actions to transform curricula and teaching methods to adapt them to the demanding market requirements.

## 2. Research methodology

The source of data for the analysis in the conducted study were the syllabuses of subjects related to business analytics implemented in the fields of: logistics, management and economics. Detailed analysis was performed on the fields, subjects and competencies taught within them at universities from the Central and Eastern European region: Czech Republic, Estonia, Germany, Poland, Slovakia, Lithuania and Latvia. The selection of universities from which the syllabi were taken was expert in nature and resulted from two adopted criteria: high position of the university in the Times Higher Education ranking (www.timeshighereducation.com) and open access to subject syllabi. Unfortunately, in the case of Lithuania and Latvia, it was not possible to access open syllabi, therefore a decision was made to exclude programs originating from these countries from further analysis. The general characteristics of the entities studied are presented in Table 1.

Tab. 1 General characteristic of the research sample; own work

| Country | **Universities** | **No of analysed competencies** |
|---|---|---|
| Czech Republic | Škoda Auto University<br>Tomas Bata University in Zlín | 19 |
| Estonia | Tallinn University<br>TTK University of Applied Sciences<br>University of Tartu | 12 |
| Germany | International School of Management (ISM)<br>IU International University of Applied Sciences<br>Ludwig-Maximilians-Universität München | 14 |
| Poland | Gdansk University of Technology<br>Jagiellonian University<br>Poznan University of Technology<br>WSB University Gdańsk | 21 |
| Slovakia | University of Žilina | 1 |

It was assumed that the research methodology being developed would have to lead to providing answers to the three research questions posed:

- RQ1: In which fields of study business analytics issues are included?
- RQ2: What subjects are offered in the field of business analytics at universities?;

- RQ3: What key competencies are developed in the field of business analytics at universities?

The research methodology is presented in Figure 1.

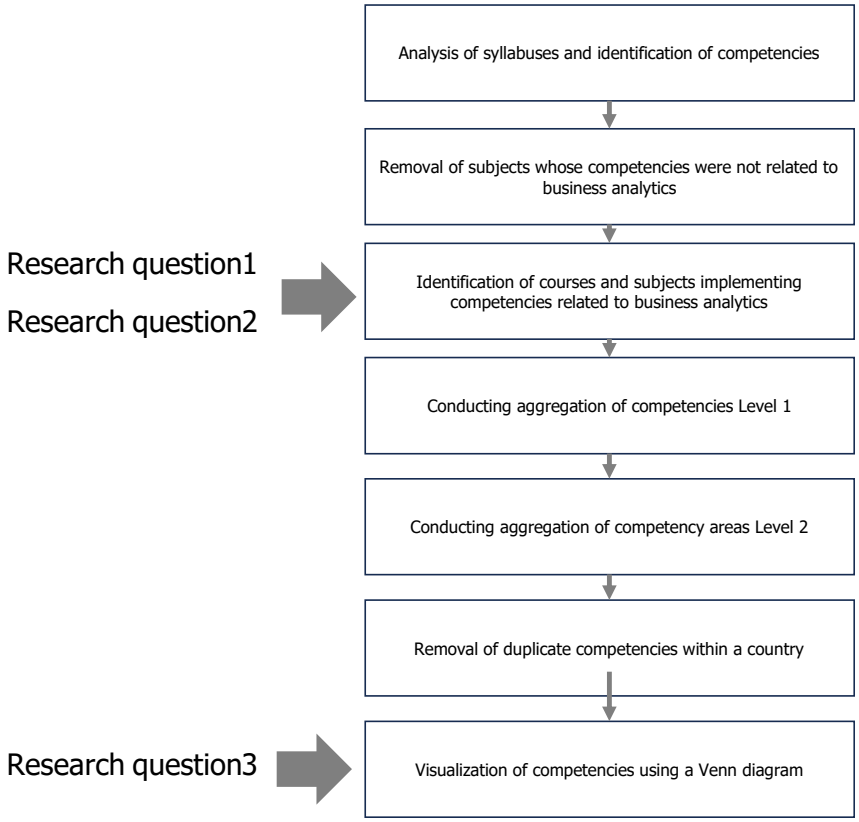


Fig. 1 Methodology of the study; own work

In the research method, a two-level data aggregation was carried out:

• Level 1: Basic unification of the names of competencies distinguished in the syllabuses, consisting in removing duplicates and combining only and exclusively those competencies whose names differ only grammatically.

• Level 2: Combining competencies into competency areas in accordance with the following specifications:

o Statistics: biostatistics, regression models, correlation, differences between groups.

o Data visualization: Pareto charts, control charts, graphical presentation of data.

o Logistic data analysis: inventory analysis, logistic operations analysis

o Research process design: research sample design, experiment design.

o Data collection, storage and analysis: data analysis process, data management systems, data types, data storage, data collection, data preparation for analysis, data classification methods.

The methodology assumes the use of both qualitative and quantitative research methods. Data visualization was also used in it. The results of the research conducted by the methodology described above are presented in Chapter 3.

## 3. Wyniki badań

### RQ1: In which fields of study business analytics issues are included?

In accordance with the adopted methodology, the study programs related to business analytics were analyzed at selected universities in five countries from Central and Eastern Europe. The list of courses that implemented content related to business analytics is presented in Table 2.

Tab. 2 Fields of study; own work

| Country | Field of study | No of competencies |
|---|---|---|
| **Czech Republic** | Business Economics and Management | 6 |
| | International Supply Chain Management | 11 |
| | Logistics and Quality Management | 25 |
| | Management and Marketing | 1 |
| | Security of Logistics Systems | 2 |
| **Estonia** | Data analytics | 7 |
| | Logistics and supply chain | 3 |
| | Purchasing and Procurement Management | 5 |
| **Germany** | Applied Statistics (MSc) | 1 |
| | Business Intelligence & Data Science | 5 |
| | Data Science | 8 |
| | International School of Management | 1 |
| | MBA – Supply Chain Management | 6 |
| **Poland** | Management | 2 |
| | Economic analytics | 13 |
| | Informatics, BI | 2 |
| | INFORMATION MANAGEMENT | 5 |
| | Logistics | 7 |
| | Management | 5 |
| **Slovakia** | Distribution Technologies and Services | 1 |

Regardless of the country analyzed, content related to business analytics is most often presented in courses related to management, logistics, supply chains, mathematics, computer

science and statistics. The names of the courses themselves may be different and depend on the policy of creating the offer by individual universities.

**RQ2: What subjects are offered in the field of business analytics at universities?**

The analysis was made more detailed by moving from the level of fields of study to the level of subjects. Competencies that are ultimately examined in the described study according to the rules of the Bologna system are assigned to subjects. The lists of examined subjects in five countries from Central and Eastern Europe are presented in Tables 3-7.

Tab. 3 Analysed subjects in Czech Republic; own work

| Country | Subject | No of competencies |
|---|---|---|
| **Czech Republic** | Logistics | 1 |
| | Applied Statistics | 3 |
| | Business ICT technologies | 1 |
| | Computer data processing | 1 |
| | Computer Simulation of Logistics Processes | 3 |
| | Data Analysis and Databases | 6 |
| | Data Collecting and Processing | 2 |
| | Data Visualisation and Big Data | 2 |
| | Database uses in business | 3 |
| | Enterprise Logistics | 2 |
| | Logistics of Emergency Situations | 1 |
| | Organization and Management of Production | 1 |
| | Safety of logistics processes | 1 |
| | Statistical Methods for Quality Management | 3 |
| | Statistics | 4 |
| | Statistics for Economists | 5 |
| | Supply Chain and Channel Management Simulation | 1 |

Tab. 4 Analysed subjects in Estonia; own work

| Country | Subject | No of competencies |
|---|---|---|
| **Estonia** | Data Processing and Statistics | 5 |
| | Methods of data science and artificial intelligence | 7 |
| | Statistics | 3 |

Tab. 5 Analysed subjects in Germany; own work

| Country | Subject | No of competencies |
|---|---|---|
| Germany | Business Analytics | 1 |
| | Business Intelligence | 2 |
| | Current Topics in Applied Statistics | 1 |
| | Data Science and Analytics | 6 |
| | Inference and Sampling | 3 |
| | Knowledge Discovery and Big Data Management | 3 |
| | Machine Learning & Artificial Intelligence Techniques | 2 |
| | Optimization Techniques | 1 |
| | Simulation & Forecasting Techniques | 2 |

Tab. 6 Analysed subjects in Poland; own work

| Country | Subject | No of competencies |
|---|---|---|
| Poland | Advanced function of spreadsheet | 2 |
| | BI analysis - case study | 1 |
| | Big Data in Management | 1 |
| | Business Analysis | 1 |
| | DATA MINING | 4 |
| | Data mining and predictive analytics | 1 |
| | Essentials of Statistics | 1 |
| | Fundamentals of Statistics | 2 |
| | ICT in Management | 2 |
| | Infobrokering and white intelligence | 1 |
| | Information Technology | 1 |
| | Informational decision support | 1 |
| | Introduction to information management | 1 |
| | METHODS OF QUANTITATIVE ANALYSIS | 4 |
| | Preparation of data for analysis | 1 |
| | QUALITATIVE DATA ANALYSIS METHODS | 5 |
| | Research Methods | 3 |
| | Statistics | 1 |
| | Statistics in the work of a data and information analyst | 1 |

Tab. 7 Analysed subjects in Slovakia; own work

| Country | Subject | No of competencies |
|---|---|---|
| Slovakia | Statistical analysis | 1 |

The set of subjects is definitely more extensive than the list of fields of study. However, certain regularities can be identified in it. In the vast majority of cases, content related to

business analytics is presented in subjects: related to data, mathematics, statistics, research methodology, BI as well as logistics and management.

**RQ3: What key competencies are developed in the field of business analytics at universities?**

Key competencies were distinguished after the second level of aggregation and combining competencies found in individual syllabuses into competence areas. Selected competencies are repeated in the analyzed countries, therefore, for their more transparent presentation, a Venn diagram was used (fig. 2).

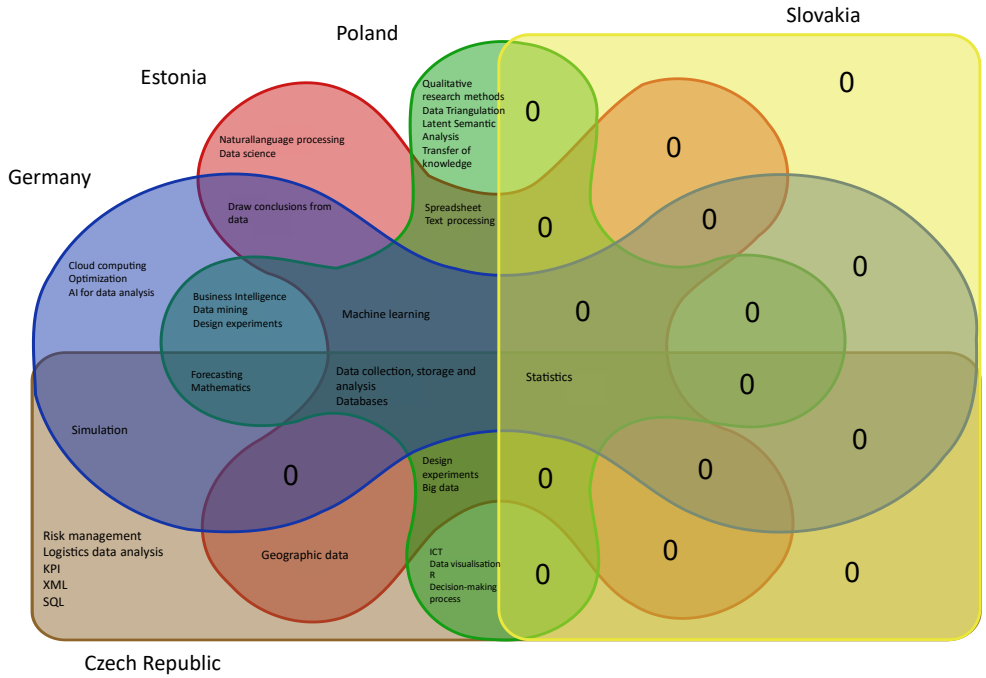


Fig. 2 Identified competencies - Venn chart; own work

The Venn diagram clearly allows you to visualize which competencies are repeated in the analysis (in different countries). The competencies that are most often repeated are those that are located in the central part of the diagram. It can therefore be seen that business analytics in all or most countries is combined with competencies such as machine learning, data collection, storage and analysis, statistics, big data, spreadsheets, design experiments or text processing. For each country, you can also distinguish individual competencies that are not repeated in others.

## 4. Pedagogical framework

The pedagogical framework for Business Analytics at the technical higher education level was developed based on a modified, for the social sciences, Kern approach to designing medical science curricula. The model presented by Kern et al. in Curriculum Development for Medical Education: A Six-Step Approach includes 6 steps (Kern et al., 2009): (1) Problem identification and general needs assessment; (2) Student needs assessment; (3) Goals and objectives; (4) Educational strategies; (5) Implementation; (6) Evaluation and feedback.

At the beginning of the curriculum design process, the problem identification, general needs assessment and student needs assessment were conducted on the basis of a literature review, ECTS card review and a survey of the target population (students, academic teachers and practitioners).

The prepared Business Analytics curriculum includes clear educational strategies. The key proposed assumption is the integration of the curriculum according to the BAS4SC standard. This means interoperability, which includes Business Analytics as a complement to other parts of the general curriculum. This element was indicated as the most effective and efficient method of achieving the common goals and objectives of the program. This approach also includes the acquisition of Business Analytics competencies from the year of studies to their completion. Individualized and team learning was also proposed, which, combined with educational experiences and case studies, will support the activation of students, rather than being passive observers. Individualized learning supports the pursuit of mastery. Team training and acquisition of skills will also contribute to the acquisition of other important team skills, including communication skills, leadership and other soft skills. Students also have the opportunity to perform group tasks as a team member and as a team leader. The use of case studies and educational experiences in the form of exercises and diverse (also in terms of complexity) tasks is representative of professional practice. We believe that the proposed educational strategies will ensure the education of self-sufficient, motivated and creative graduates who recognize a business problem, and transform this problem into an ambitious solution. They should therefore be prepared to anticipate and create solutions, not just react passively. Three courses have been developed that create a pedagogical framework for Business Analytics. The coverage of the program content according to the BAS4SC standard with the content included in the syllabuses of the field of study is presented in Table 8.

Tab. 8 Name of the course and number of required program content according to the BAS4SC; own work

| No. | Name of the course according to the BAS4SC standard | Number of required program content according to the BAS4SC |
|---|---|---|
| C1 | Advanced using of spreadsheet to analyze logistics data | 16 |
| C2 | Business Intelligence | 16 |
| C3 | Statistical method to analysing a logistics data | 16 |

For the C1 – Advanced use of a spreadsheet to analyze logistics data course, prerequisites have been established. They include: (1) Knowledge of logistics processes; (2) Basic mathematical and statistical skills; (3) Basic knowledge of production transport, and stock replenishment. The program content of the C1 course according to BAS4SC standards is presented in Table 9.

Tab. 9 Program content of the C1 course according to BAS4SC standards; own work

| **Program content of the C1 course according to BAS4SC standards** | **Computer systems in logistics** | **Activity based costing in logistics** | **Inventory management in the supply chain** | **Purchasing strategies** | **Contemporary distribution methods / Logistics support analysis** | **Digital supply chains /Supply chain design** |
|---|---|---|---|---|---|---|
| | **ECTS** | **Sem.** | **ECTS** | **Sem.** | **ECTS** | **Sem.** |
| | 4 | 1 | 4 | 2 | 4 | 2 |
| Introduction to spreadsheet analysis | x | | | | | |
| Data Visualization Methods | x | | | | | |
| Optimization in Supply Chain Management | | | | | | x |
| Controlling in Supply Chain Management | | | | | | x |
| Supply Chain and Sourcing | | | | x | | |
| Outsourcing (Make or Buy) | | | | x | | |
| Network Optimization | | | | | | x |
| Forecasting Techniques | | | x | | | |
| Inventory Management | | | x | | | |
| Transport Optimization | | | | | x | |
| Transport Optimization using Microsoft Excel regarding spreadsheet analysis | | | | | x | |
| Distribution network optimization using Gravity Point | | | | | x | |
| Case study 1 | | | | | x | |
| Cost-Benefit Analysis for Business | | x | | | | |
| Techniques of time series forecasting | | x | | | | |
| Case study 2 | | x | | | | |

For the C1 course – Advanced using of spreadsheet to analyze logistics data, the subject learning outcomes cover three areas: knowledge, skills and competencies.

In the knowledge area, the course enables:

- K1 - The student knows the basic principles of supply chain management.
- K2 - The student knows the basic principles of optimizing processes implemented in supply chains.
- K3 - The student knows the basic principles of data visualization.

In the skills area, the course enables:

- S1 - The student is able to apply various methods of optimizing supply chain processes.
- S2 - The student is able to apply forecasting methods to create sales forecasts and consumption of production materials.
- S3 - The student is able to conduct a benefit analysis for various business conditions.

In the competence area, the course enables:

- C1 - The student is able to assess the quality of logistics data and use it to control the supply chain.
- C2 - The student is able to use a spreadsheet and its functionalities to improve the quality of logistics data.
- C3 - The student is able to apply methods supporting business decisions (based on data analysis) in the areas of optimizing transport, production and stock replenishment.

For the C2 - Business Intelligence course, prerequisites have been established. They include: (1) Knowledge of logistics processes; (2) Basic mathematical and statistical skills; (3) Basic knowledge of management, in particular management of material flow in the supply chain. The program content of the C2 course according to BAS4SC standards is presented in Table 10.

Tab. 10 Program content of the C2 course according to BAS4SC standards; own work

| **Program content of the C2 course according to BAS4SC standards** | **Computer systems in logistics** | |
|---|---|---|
| | **ECTS** | **Semester** |
| | 4 | 1 |
| Understanding and Interpreting Data | x | |
| Business Data Analytics | x | |
| Data Mining and Knowledge Discovery | x | |
| Machine Learning | x | |
| Business Process Management and Process Mining | x | |
| Enterprise Resource Planning (ERP) Systems | x | |
| E-Logistics | x | |
| GIS in Logistics | x | |
| Data Visualization Methods and Tools | x | |
| Data Ethics and Security | x | |
| Data cleaning and preparation | x | |
| Data visualization in Power BI | x | |

| | |
|---|---|
| Case study 1 | x |
| Regression analysis, Monte Carlo simulations | x |
| Decision trees and Neural networks | x |
| Case study 2 | x |

For the C2 - Business Intelligence course, the subject learning outcomes cover three areas: knowledge, skills and competencies.

In the area of knowledge, the course enables:

- K1 - The student knows the main assumptions and components of business intelligence.
- K2 - The student knows the concept of data mining and its role in searching for valuable information from databases.
- K3 - The student knows data visualization methods.

In the area of skills, the course enables:

- S1 - The student is able to apply various data analysis methods to search for regularities in data sets.
- S2 - The student is able to apply geographic information systems (GIS) to make decisions in logistics.
- S3 - The student is able to apply data visualization methods to present data and the regularities occurring in them.

In the area of competencies, the course enables:

- C1 - The student is able to identify and assess ethical challenges in the area of business intelligence.
- C2 - The student is able to present important conclusions using data visualization methods and tools.
- C3 - The student is able to apply data-supported methods for making business decisions and solving problems in an effective manner.

For the C3 course – Statistical method to analyze logistics data, prerequisites have been established. They include: (1) knowledge of logistics processes, (2) basic knowledge of mathematics, applied mathematics and basic statistics; (3) knowledge of issues related to basic computer skills, simulations and supply chains. The program content of the C3 course according to the BAS4SC standards is presented in Table 11.

Tab. 11 Program content of the C3 course according to BAS4SC standards; own work

| **Program content of the C3 course according to BAS4SC standards** | **Operation research and optimization theory** | |
|---|---|---|
| | **ECTS** | **Semester** |

| | 4 | 2 |
|---|---|---|
| Introductory statistics | x | |
| Statistics for business analytics | x | |
| Understanding and interpreting the data; Sampling and Experimental Design; Hypothesis testing; Discovering regularities in data | x | |
| Simulation, modelling and analysis in Logistics and Supply Chains | x | |
| Linear Regression with Single and Multiple Regressors | x | |
| Introduction to Operations Research | x | |
| Statistical Data Processing SPSS | x | |
| Business Analytics Foundations including R, SQL | x | |
| Demand forecasting, visualising and feature engineering of time series in supply chains | x | |
| Artificial Intelligence and Machine Learning in Operations Research | x | |
| Statistics exercises using Excel | x | |
| Statistics exercises using SPSS | x | |
| Case study 1 – simulation and modelling | x | |
| Case study 2 – operational research | x | |
| Case study 3 – statistical modelling in R & SQL | x | |
| Case study 4 – foundations of artificial intelligence | x | |

For course, C3 – Statistical method to analyse logistics data, the learning outcomes cover three areas: knowledge, skills and competencies.

In the area of knowledge, the course enables:

- K1 - The student knows statistical methods, concepts and principles.
- K2 - The student knows sampling methods, design of experiments, and hypothesis testing.
- K3 - The student knows the basics of business analytics, including R, SQL.

In the area of skills, the course enables:

- S1 - The student is able to apply various statistical methods and use software to improve supply chain processes.
- S2 - The student is able to apply statistical data processing to data and processes.
- S3 - The student is able to forecast, visualize and perform time series analysis of data generated by supply chains.

In the area of competence, the course enables:

- C1 - The student is able to critically evaluate the reliability and validity of statistical analyses.
- C2 - The student is able to identify business problems or challenges that can be solved using statistical analysis. This includes formulating clear problem statements, selecting appropriate statistical techniques, and applying analytical methods to generate solutions and recommendations on business and logistics issues.

- C3 - The student is able to design statistical models to solve complex business problems and optimize logistics processes, including forecasting, demand modeling, optimization modeling, simulation, and predictive analytics.
- C4 - The student is able to effectively communicate statistical concepts, analysis results, and insights to both technical and non-technical stakeholders. This includes visually presenting data, preparing clear and concise reports, and explaining statistical results in a way that is easily understood by a variety of audiences.

**Conclusions**

To sum up the results of the conducted research, two levels of conclusions should be indicated: detailed and general.

In the detailed level, it is possible to indicate what subjects and what competencies should be implemented as part of the education of a BA. In this respect, it is possible to indicate basic subjects, which should include issues in the field of statistics, databases, data warehouses and analytical tools. Specialist subjects should focus on the application of analytics in various areas of business, such as: financial, marketing, human resources or supply chain analytics. However, it should not be forgotten that a business analyst is a person who performs their tasks most often in the specifics of a project, cooperating with other specialists. Hence, it seems so important to prepare future analysts for teamwork, and managing a project team.

In the general level, it is necessary to indicate observations that will lead to the creation of educational programs that are attractive from the point of view of the labour market and entire economies. From the perspective of BA, the following seem to be particularly important in this respect:

- Continuous adaptation of educational programs to changing needs and emerging trends in BA.
- Providing students with access to the latest technologies and analytical tools so that they can develop their practical skills.
- Developing soft skills such as communication, teamwork and creative thinking.

The limitation of the conducted research is its limitation only and exclusively to the analysis of educational programs of universities from Central and Eastern Europe. In further research, the authors intend to analyze educational programs from other regions of Europe as well as North America (USA and Canada), Australia and Asia (in particular Japan, South Korea, China, and India).

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