

# ORGANISATIONAL EDUCATIONAL SYSTEMS AND INTELLIGENCE BUSINESS SYSTEMS IN ENTREPRENEURSHIP EDUCATION

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## ABSTRACT

*This article presents problems of application of the corporate Information systems and discloses the need for teaching the corresponding application techniques within the framework of entrepreneurship education. Based on the analysis of insurance companies, this study finds ways to evaluate the level of information systems development within the enterprise. To accomplish the evaluation, we have analysed the factors, which influence upon the corporate Information systems. The results were obtained on the basis of assessments of nine (9) expert specialists, who have analysed 5 insurance companies. We have assessed the following factors: level of the innovation potential of an enterprise; degree of utilisation of the business analysis instruments at the enterprise; level of interconnections between the corporate information systems and business analysis; the needs of the corporate Information systems in the course of utilisation of the business analysis instruments. Analysis has shown that practically all groups are characterized by the worst values, except for the "Finances" group, within which intensity of utilisation of these technologies is at the moderate level. As the result, we have revealed those business instruments, which are important for an enterprise and which have high significance and efficiency values. Education should be founded on these techniques and instruments. The studies, which we have performed, have shown practical significance of the proposed methodology for assessment and utilisation of the information technologies (IT) by insurance companies, as well as for elaboration of plans of future development of these companies. The framework offered here will benefit the entrepreneurship students, as the theoretical information within it and the research findings may be applied to design and implement an education program.*

**Keywords:** Corporate Information Systems, Business Analytics, Technologies of the Business Analytics, Expert Assessment, Insurance, Entrepreneurship Education.

## INTRODUCTION

Entrepreneurship education is a global trend that gathers pace every year. In the modern world of continuous economic and business development, entrepreneurship education simply cannot remain unchanged because the economic level of the country depends on the success and professionalism of specialists.

At the present time, support of the solution-making process is meant as the process of recognition of the making-solution situation, as well as the process of determination of the

following factors: goal of the action, which must be taken; planning and generation of methods of implementation of the established goals; formation of the variant of this action with the help of the expert knowledge and with utilization of the mathematical programming methods; simulation of consequences of the acceptable solutions in order to assess their correctness. Solution is meant as a variant of one or another action, while resolution of the solution-making situation is meant as detecting the solution variant with the help of the support system of the solution-making process provided that this system is adjusted in accordance with the relevant subject domain. Future entrepreneurs should be aware of all current trends and technologies for enterprise development of to reach success in professional activity. This study identifies the problems associated with the functioning of modern entrepreneurial trends and these issues should be given attention during the training.

Analytics of the big data and business analytics are the breakthrough technology and innovative solution for development of an enterprise (Sun et al., 2017). Organisations use the data-warehousing systems and the business analytics systems (in other words, enterprise information systems (EIS) with the purpose of support to and improvement of its solution-making processes. Enterprises and organisations of all economy sectors have already obtained the ideas concerning the structured data, which were collected with the help of various corporate systems, as well as concerning possibilities of analysis with the help of the EIS (Janković et al., 2018). Students should also possess skills necessary to handle present-day corporate systems. Technologies of the business analytics (in other words, business intelligence hereinafter to be referred to as "*the BI*") have already attracted great attention from the part of both scientists, and practitioners. However, influence of the BI, as well as influence of the relative importance of the business analytics (hereinafter to be referred to as "*the BA*") upon the business performance management (BPM) is not adequately investigated yet. Results of the article (Richards et al., 2019) show that the more efficient implementation of the BI will be, the more efficient methods of planning and analysis methods are. Efficiency of the BI is closely connected with the BA, as well as with planning and measurement processes. Results of the study show that (despite of the fact that the BI and the BA contribute to the practice of the enterprise management) information needs are different depending on the level of uncertainty and ambiguity, which are characteristic features of the management practice.

Further, by "*the distributed procedure*" we shall understand such form of the incomplete regulation of activity (of the information process) in the course of the search for a solution to the relevant problem, in accordance with which general task of obtaining the end result is divided into a set of subtasks. Then, it is necessary to determine the following: contractor, subtask, time of performance, composition of the output data and their quality. In the case of additional particularisation of the specific methods of solving the subtasks, this procedure is transformed into the algorithm. Aggregation of procedures and algorithms (including mathematical and technical facilities of the data transformation) forms the integrated information technology.

Efficiency of operation of the modern enterprise within the information-oriented society depends on the rate and quality of satisfaction of the needs of each employee in the housekeeping information. However, presence of very great information data-warehousing systems within the enterprise information systems results in the prolonged and complicated processes of search of the required information. The information sought is frequently contained in different information systems within an enterprise. Ambiguity of terminology, specificity of structure of various components of the information data-warehousing systems, as well as different levels of

competency of employees of an enterprise create obstacles for integration of the available information. Therefore, future specialists should know ways to optimize the integration.

Modern entrepreneurship programs should follow all the above-mentioned trends because with highly qualified specialists, the enterprise will easily rise to a new level and improve the economic status of the country.

## REVIEW OF THE INFORMATION SOURCES

Universities all over the world (Zaleśny, 2018; Gamede & Uleanya, 2019) invest in entrepreneurship education through offering structured programs. Since entrepreneurship education seems to be important for economic development, the development of entrepreneurship education and effective teaching methods are discussed (Licha & Brem, 2018).

Analytics of the big data is widely regarded as the breakthrough of technological development in the business sphere (Ettlie et al., 2017; Mikalef et al., 2019). However, despite of the growing quantity of the firms, which initiate utilisation of the big data, there still exists a limited understanding of the methods, with the help of which various firms transform potential of technologies of operation with the big data into the business valuables. In order to ensure utilisation of the big data analytics and achieve an increase in productivity, relevant firms must develop essential possibilities in order to analyse the big data. Quantity of the firms, which have plans concerning making investments in the analytics of the big data, has decreased, and many firms, which have invested in utilisation of these instruments, have failed to ensure successful development of their projects (Ghasemaghahi, 2018). Therefore, it is necessary to produce those specialists, who know how to solve such problems and are able to do it. Employers readily admit that they need “*numerate employees*” with “*quantitative aptitude*,” “*data literacy*” skills, and a “*data-driven mindset*” (Harris, 2012; Overly, 2013).

The new aim of entrepreneurship education is develop in people an ability to understand and process the increasing volume of data, as well as the ability to use these data in the future for the benefit of mankind, from science to business.

Modern enterprises develop big data from various sources of the incoming and out coming data (ur Rehman et al., 2016). The incoming data sources process the data, which were generated (particularly) from the results of various business operations, such as production, supply chain management, marketing, and personnel management (Aslam et al., 2016). External data sources include the generated data, which were obtained from clients (directly or indirectly), obtained due to conducting analysis of the market, performance of pollings, performance of the product reviews, as well as due to studying the history of transactions. However, the expenditures, which are connected with utilisation of the cloud-based services, increase due to the analytics of the big data, as well as due to the activity, which is connected with development of the value for enterprises and for clients. According to the McKinsey & Company forecast (Henke et al., 2016), the US will face a shortage of 1.5. Million managers and analysts with the know-how to use the analysis of big data to make effective decisions. Many educational establishments have already modernized their education programs and put their information science programs to a broad use. For example, the London’s Imperial College Business School launched a project, which aim was to target the studies in the field of big data on business (Gârleanu & Pedersen, 2018). Entrepreneurship educational institutions should take note of this experience and at least conduct consulting on big data analytics. The effective practice includes

the use of real data from companies, non-profit organizations or government agencies to solve complex but practical problems (Suparno & Saptono, 2018).

Development of the competency centre in the sphere of the business analytics of the diversified insurance company is very important (Foster et al., 2015). The essential success was achieved for all participants due to change in the culture of the end users, utilisation of the moderator between the end users, as well as due to widening the area of the information technologies. Result of such experience is the set of the best practices for development of the competency centre in the business analytics sphere. Utilisation of such centre can result in the success of any company, because of relevant document with description of this centre includes the steps for development of the competency centre in the sphere of the business analytics. An important task of modern entrepreneurship education is to create these centres in educational institutions, as practice provides students the understanding of modern mechanisms used in business analytics (Centobelli et al., 2019).

Each university has in-house education programmes designed to meet the university's material and personnel resources. Wixom et al. (2014) identifies four key requirements to each programme:

1. The university should provide a broader range of BI skills within BI classes and programmes.
2. Universities can produce students with a broader range of BI skills using an inter-disciplinary approach.
3. The university should provide better access to BI teaching resources.
4. Academic BI offerings must align with the needs of practice.

Designed to meet these principles, the Columbia's new Institute for Data Sciences and Engineering will consist of five centres focused on digital and social media, smart cities, health analytics, cyber security, and financial analytics (Chiang et al., 2012).

The University of North Carolina, the Northwest University, the University of Denver, and the Stevens Institute of Technology have developed a master's degree programme in intelligence business to attract analytically strong students with undergraduate degrees in areas such as mathematics, science, and computer science, marketing, media, logistics, and insurance (Simons, 2013).

Big data analysis is necessary to all entrepreneurship specialists, including those employed in the insurance sector. The efficient insurance can be used as the measure for distribution, as well as the method of the risk transfer. In order to ensure that insurance would successfully perform these functions, prices of the insurance policies and variants of the insurance coverage must be based on the risk, as well as on the accurate information (Kirilov, 2008; Singh & Kumar, 2012; Rumson & Hallett, 2019). It depends on of the reliable evidence base, which ensures formation of the basis for selection of the relevant insurance politics. We have selected the insufficient quantity of the data and analysis of such data as the factors, which prevent insurance companies to perform their roles and functions.

In the sphere of insurance, the big data analytics (hereinafter to be referred to as "*the BDA*") is used for the following operations: development of the meaningful ideas; assurance of the sustainable value; measurement of productivity, as well as for development of the competitive advantages (Fosso Wamba et al., 2017).

Rapid expansion and potential influence of platforms for analysis of the big data have attracted interests of various specialist-practitioners and scientists (Yang et al., 2016; Fahmideh & Beydoun, 2019).

Due to the growing interests from the part of business companies to the big data analysis, there exists the following problem: what is the manner, in accordance with which various methods of access to the big data and various possibilities of the big data analysis, which can be implemented by the firms, can create the conditions, which cause business failures (Amankwah-Amoah et al., 2019). One of the problems, which occur in the course of the big data analysis, is the problem of the distributed planning of the batched jobs (Loeber, 2018; Wang & Hou, 2019). Other problems are the lack of suitable updated programs and the lack of high-level education, which rise from deficiency in professional analysts and from deficiency in local-scale business trends. The big data development results in occurrence of both possibilities and problems for the high-technology enterprises. As concerns the enterprises, which exist within the big data environment, it is very important for them to maintain their competitive advantages and increase efficiency of innovations. In addition to the capacity for organisational learning, as well as for utilisation of the advanced technologies, the corporate management plays the important role in the process of the innovative practice of an enterprise. Results of the study (Lin et al., 2018) show that managerial authorities exert the essential positive influence upon the efficiency of innovations, therefore, managerial authorities can increase role of an enterprise.

### Statement of the Problem

Information assurance must perform the following functions:

1. Provide users with the possibility to work in physical units, which are connected with the relevant information sources in accordance with the actual productive processes.
2. Ensure adequate mapping of the structure of interconnections between the indicators of various systems, programmes, and plans, as well as ensure data consistency.
3. Monitor conditions of obtaining of the aggregate indicators.
4. Provide users with the possibility to work in the dialogue with the detailed and consolidated indicators.
5. Obtain certificates concerning all situations, which are established for the relevant stages of the procedure and perform immediate corrective actions in respect of the values of indicators in order to ensure consistency of these indicators.
6. Ensure possibility support of calculations not only from bottom to top, but from top to bottom as well.
7. Ensure suitable dialogue interaction between users and computers.
8. Ensure development of the agreed solutions; work with the aggregate indicators, and multilateral cooperation.

General requirement to the entire system, which determines total survivability of the system, is as follows: assurance of the system efficiency, as well as assurance of convenience of practical use of the system (Petro & Stankova, 2015). In addition, there exists another important total requirement as follows: it is necessary to ensure possibility of development, operational modernization, and adaptation of the developed support system of the solution-making process in the course of the system operation.

It is possible to state the following generalised stages of the solution-making process in the course of development of the business analytics systems:

1. Identification of the information state of the object. At this stage, it is necessary to ensure functions of accounting, monitoring, and analysis of the data concerning the object. Solving the tasks of this stage must be ensured by the subsystem of monitoring and forecasting of the information state of the object.

2. Diagnostics of the solution-making situation and determination of goals of the action. The main task of this stage is to analyse situation and select relevant goals. To this end, it is necessary to develop the subsystem of diagnostics of the solution-making situations, which would be capable to trigger the subsystem of the expert methods and simulation.
3. Planning of actions. The subsystem of the actions planning and of the alternative solutions formation is the main subsystem at this stage.
4. Formation of variants of solutions includes the stage of selection of the variant solutions with the purpose of achievement of the established goals. To this end, it is necessary to implement the subsystem of assessment and selection of solutions.

The information and management system must include the following components: databases, safety assurance system, and telecommunication system. State-of-the-art level development of the hardware and software facilities has made it possible the countrywide management of the databases with operational information at various levels of management. Industrial enterprises, corporations, departmental structures, national regulatory and administrative authorities have accumulated big volumes of the data in the course of their activity. These databases include great potential possibilities in respect of utilisation of useful analytical information, on the basis of which it would be possible to reveal hidden trends, plan strategy for development, find out new solutions.

## METHODS

Analysis of the external environment of an insurance company is a very important component of the EIS, which is used for substantiation of the strategic solutions for development. Such analysis would make it possible to investigate all aspects of the EIS of an insurance company, as well as to select complex of those business entities and driving powers, which influence upon the innovative activity through various components of the macro environment.

Because of goal of the internal analysis of an insurance company is to increase profit, improve financial standing of an enterprise, penetrate to the new markets etc., then factorial analysis will be the main instrument in this situation. Specific feature of the system of the factors, which is proposed for analysis and review, is in the fact that this system does not include the group of those factors, which are connected with the resource potential. It is connected with the fact that access to the resources is determined by the factors, which are external factors in respect of an organisation; quality of material resources is regarded from the point of view of their correspondence with technological process and is included to the relevant group of the factors. In this situation, organisation of the logistics and maintenance support and their interoperability with suppliers can be regarded as organisational or communication factors.

Analysis of activity provides managers of the company with possibility to reveal potential of the competitive advantages, as well as to determine the spheres, which require emergency interventions in order to ensure survivability of this company in the market. We will perform analysis of the internal environment on the basis of the list of the internal environment factors. This list is sufficiently prolonged, because it characterises state of the internal environment from different perspectives. Such grouping of factors provides the analyst with a possibility to pay his/her special attention to those aspects of activity, which make it possible to see weaknesses of insurance company from the very beginning and achieve the established strategy.

In principle, performance of analysis of the EIS factors is reduced to performance of 4 tasks: estimation of the level of the innovation potential of an insurance company, degree of

utilisation of the BA instruments, level of interconnections of the EIS and the BA instruments, needs of the EIS in the course of utilisation of the BA instruments.

Solving of these tasks would make it possible to determine level of the information systems of an insurance company, analyse level of utilisation of the BA instruments, as well as to evaluate influence of the BA instruments upon the EIS.

In order to ensure solving the task concerning degree of utilisation of the BA instruments by an insurance company, it is necessary to engage expert specialists (employees of the insurance company or engaged specialists of consulting companies. The questionnaire was developed for the expert specialists: it is necessary to make marking (with the help of digit "1") against the technology, which is used at the enterprise. It is also necessary to answer to the following questions in the course of the expert investigation:

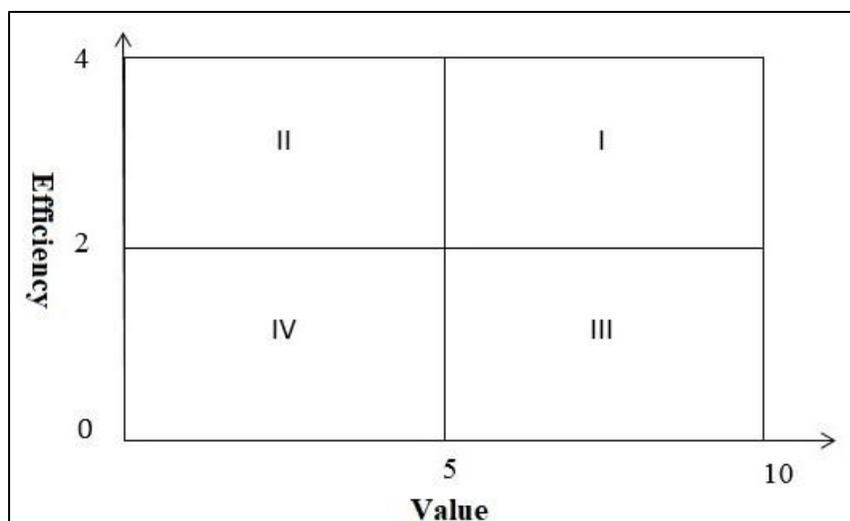
1. *"Whether the BA is the main approach or it is the single approach for solving the tasks (X1)".*
2. *"The main part of the tasks is solved with the help of the BA (X2)".*
3. *"The BA exists at the enterprise, but it is used very seldom (X3)".*
4. *"The BA is not used at the enterprise (X4)".*
5. *"It is difficult to answer to the question (X5)".*

The following proposition was made to the expert specialists: it is necessary to evaluate influence of each of these factors upon the EIS with the help of relevant markings (from 0 to 10). That is, if a factor has an inessential influence, then assessment would be 0, if a factor has essential influence, then assessment would be 10. If an expert specialist has concluded that several factors exert the same influence upon the object under investigation, then it is necessary to make equal assessments. Experts have been evaluated international, political, economic, social, institutional, technological, information and communication, as well as network factors.

Estimation of the needs in utilisation of the BA instruments for the EIS is made as follows. Because expert specialists have sufficient experience and knowledge, the following proposition was made to them: to select the BA instruments for the EIS. From the very beginning, expert specialists form a set of the BA instruments of an insurance company for various subsystems, and then they perform proper selection of these instruments. Another proposition was made to the experts: to perform assessment of the BA instruments with the help of the scale from 1 to 10. That is, it is necessary to give an answer to the following question: *"Which instrument of the BA instruments exerts the biggest influence upon the EIS?"* and evaluate influence of each BA instrument in respective manner. If the BA instrument does not influence upon the EIS, then it is necessary mark assessment 1 and vice versa, if the instrument BA exerts the biggest influence, then assessment would be maximum.

Calculation of the degree of importance of the instrument is performed on the basis of the method of weighting factor. Relevant weighting factor is assigned for each BA instrument, which characterises importance of this instrument.

At the last stage, it is necessary to draw a graph, with the help of which it is necessary to perform comparison of results of utilisation of the BA instruments in respect of their significance and efficiency (Figure 1).



**FIGURE 1**  
**BA INSTRUMENTS UTILISATION: A COMPARATIVE SIGNIFICANCE AND EFFICIENCY ANALYSIS TEMPLATE**

This graph has four positions:

- I. High efficiency and significance of the BA instruments. The BA instruments are in full compliance with the needs of an insurance company.
- II. High efficiency and low significance of the BA instruments. Such BA instruments do not require immediate improvement.
- III. Low level of the system efficiency and high significance of the BA instruments. Such BA instruments are the top-priority instruments, which require immediate improvement.
- IV. Low efficiency and significance of the BA instruments. Such BA instruments are the second-rate instruments for improvement.

<b>Table 1</b>									
<b>EXTERNAL FACTORS: BA INSTRUMENTS</b>									
<b>Factors of influence</b>	<b>Experts</b>								
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
International factors	5	6	4	5	6	4	5	5	6
Political factors	6	7	7	8	6	6	6	8	4
Economic factors	6	6	7	7	5	6	6	7	6
Social factors	6	7	6	8	7	7	6	6	8
Institutional factors	4	5	5	4	4	6	3	4	5
Technological factors	6	5	7	6	5	6	8	7	5
Information and communication factors and network factors	7	10	8	9	9	8	6	10	9

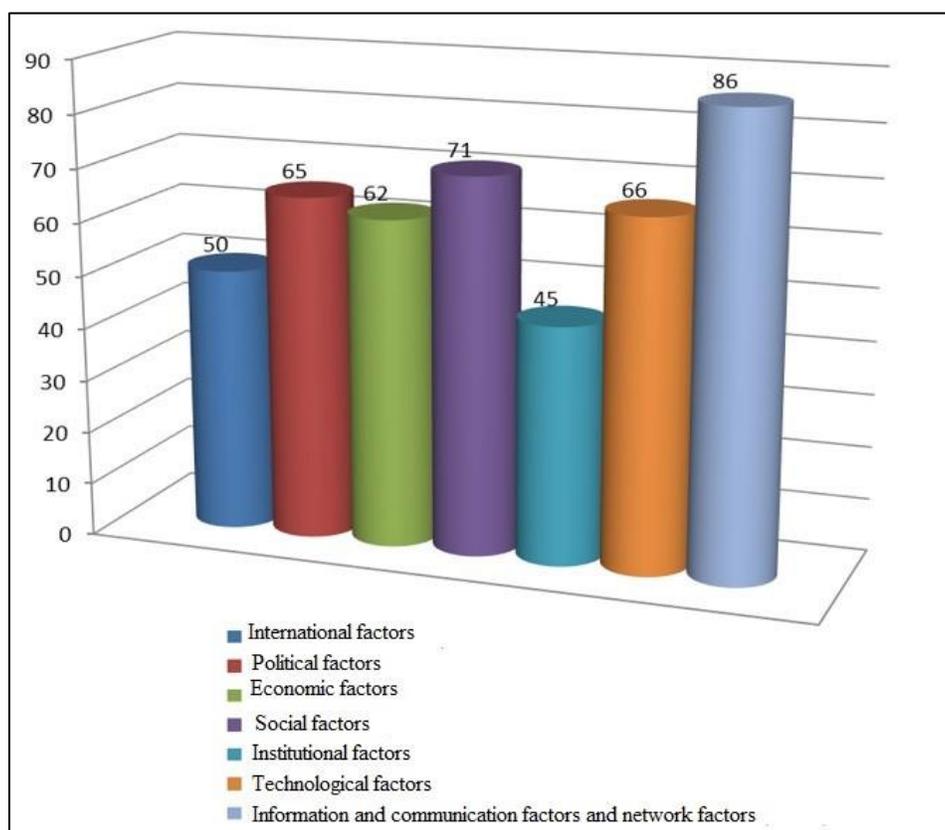
We use horizontal axis for assessments in accordance with the significance of the BA instruments, while vertical axis we will use for efficiency of the BA instruments. Depending on the position of the relevant points, we will obtain information on the state of utilisation of the BA instruments within an insurance company.

## RESULTS

In order to perform experiment we have selected 5 insurance companies. Let us designate them with the help of the following conventional signs:  $\alpha$ ,  $\beta$ ,  $\chi$ ,  $\delta$ ,  $\varepsilon$  (names of these companies were changed in accordance with the conditions of the commercial contract). On the basis of the polling among the expert specialists (who are managers of five insurance companies), we have revealed weight of the factors, which exert essential influence upon the level of the EIS on the basis of the BA instruments. The group, which was consisted of 9 expert specialists and which was established in accordance with the level of awareness of the object under investigation, has performed assessments of influence of various factors.

Results of the diagnostic analysis of factors of the external environment are presented in Table 1.

In accordance with the results of the diagnostic analysis, we have built the diagram of influence of various factors upon the EIS based on the BA instruments (Figure 2).



**FIGURE 2**  
**RESULTS OF THE DIAGNOSTIC ANALYSIS OF INFLUENCE OF VARIOUS FACTORS OF THE EXTERNAL ENVIRONMENT UPON THE EIS ON THE BASIS OF BA**

Results of the diagnostic analysis point to the fact that information and communication factors and network factors exert the biggest influence upon the EIS based on BA (19%). Social factors are on the second place (16%).

The following factors contribute to the information development: level of the intellectual capital in the sphere of development of the computer technologies; utilisation of the state-of-the-art information technologies in the course of activity of insurance companies; ensuring the accessibility of the information on activity of the innovative infrastructure objects; access to the Internet; development of the information technologies and telecommunications; high quality of the hosting services; volumes of the Internet audience and rate of growth of this audience. The following factors exert negative influence: lack of information on innovations; lack of the information exchange for innovation management.

The social factors, which exert positive influence: quantity and quality composition of the labour resources; ensuring motivation of employees of an insurance company; assurance of high level of labour productivity; assurance of effective relations with employees; well-developed education and training system. The following factors exert negative influence upon development of the enterprise information systems: lack of economic and managerial knowledge of employees; resistance to changes; lack of incentives and conditions of the creative labour; exodus of scientists; low occupational status of innovators.

Calculated concordance coefficient is changed within the limits from 0 to 1.0. Because of the fact that in this case this coefficient is close to 1 ( $W=0.63$ ), therefore, it is evidence of the high degree of agreement of the points of view of various expert specialists. Then it would be possible to make conclusion on the fact that it is possible to believe in these data and there is no need in the repeated ranking of results.

An enterprise has high level of intensity of the BA utilisation, if obtained value is within the limits from 80% to 100%, moderate level, if obtained value is within the limits from 40% to 70%, and low level, if this value  $\leq 30\%$ .

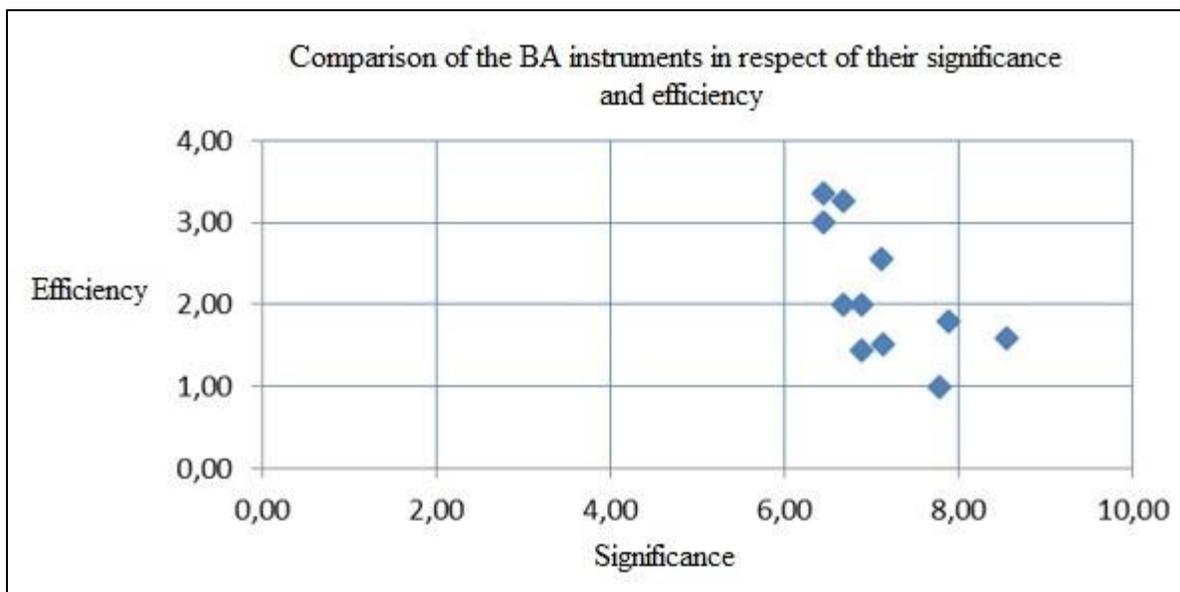
Intensities of utilisation of the BA instruments in various insurance companies are presented in Table 2.

<b>Table 2</b>					
<b>INTENSITY OF UTILISATION OF THE BA INSTRUMENTS IN INSURANCE COMPANIES</b>					
	<b>Insurance company</b>				
	$\alpha$	$\beta$	$\chi$	$\delta$	$\epsilon$
Intensity of the BA utilisation	Low	Low	Low	Low	Low

Intensity of the BA utilisation in these insurance companies is low, main quantity of positive answers are connected with indicators X3 and X4. Results of various groups (management, logistics, sales and marketing, finance) have shown that the worst indicators characterize practically all groups except for the "*Finances*" group, where intensity of utilisation of technologies is at the moderate level.

Estimation of the level of interconnections of the EIS and the BA instruments. It was proposed to determine level of interconnections as the sum of the quality assessments of expert specialists with the help of the scale from 0 to 10. Insurance company has high level of interconnections, if obtained assessment is within the limits from 8 to 10, moderate level, if obtained value is within the limits from 4 to 7, and low level, if it is within the limits from 0 to 3 (Table 3 and Figure 3).

<b>Table 3</b>					
<b>ESTIMATION OF THE LEVEL OF INTERCONNECTIONS OF THE EIS AND THE BA INSTRUMENTS</b>					
	<b>Insurance company</b>				
	$\alpha$	$\beta$	$\chi$	$\delta$	$\epsilon$
Estimation of the level of interconnections of the EIS and BA instruments	High	High	High	High	High
	8.2	8.28	8.29	8.32	8.22



**FIGURE 3**  
**COMPARISON OF RESULTS OF UTILISATION OF THE BA INSTRUMENTS IN RESPECT OF THEIR SIGNIFICANCE AND EFFICIENCY FOR AN INSURANCE COMPANY**

The BA instruments, which have high significance, are important ones for an insurance company. In accordance with the results of processing opinions of the expert specialists, we have obtained high assessments in respect of significance. This fact is explained by the fact that specialists see value in the analytics, however, in this case more than one half of the analysed information systems and analysis instruments have shown low efficiency from the point of view of the business processes. The BA instruments with high assessments are the instruments, which are applied in bookkeeping departments, as well as in the sphere of finances, while the BA instruments with low assessments are the instruments, which are applied in the strategic planning and management of resources. Moderate values of the system efficiency are connected with the instruments that are intended for operations with clients. The BA instruments with low assessments were not introduced to the business-processes of the companies, which were investigated, and this is explanation of the obtained assessments.

## DISCUSSION

Information systems in the insurance companies are one of the main factors of their successful functioning. Due to the fact that role of the information technologies is the main role, in the conditions, in accordance with which this activity must be performed, it is not possible without support of the information technologies (both technological aspects, and in the sphere of application of these aspects) (Hilker & Zajko, 2015). Over the last years in Kosovo, development of safety is determined to a large extent by application of the IT technologies at all levels of activity from the point of view of insurance, as well as in the assets of insurance production from the point of view of their of management and of planning.

German association of employers (BDA) has captured imagination of both practitioners, and scientists due to its high operational and strategic possibilities in various branches of economy (including marketing, financial services, insurance, retail trade, public health service, and production (Fosso Wamba et al., 2017). For example, productive firms, including GE, Rolls Royce, and Ford, successfully use the BDA for technical maintenance and risk management of the supplier. In addition, the BDA has improved its business-analytics in respect of behaviour the clients, as well as for creation of profiles of consumers. As it can be seen, modern opportunities increasingly impose new conditions and requirements to the labor market. Therefore, entrepreneurship education should take into account the latest research, methods and practices. This will help to produce highly qualified and competitive professionals at both national and international levels.

Information systems of the insurance management envisage comprehensive insurance. System of management is intended for: provision of support to business-processes of new or existing insurance schemes; assurance of availability of the accurate information in respect of the insured persons; increase of the speed of operations; assurance of efficient management of claims; reduction of fraudulent practices (Singh & Kumar, 2012; Loeber, 2018).

Students should know about concepts related to data processing and storage, like:

1. Data-warehousing systems or data warehouses.
2. Operational analytical processing (On-Line Analytical Processing, OLAP).
3. Intelligence analysis of such data (Data Mining).

As of today, several methods of development of the business analytics systems are known and are essential for teaching in entrepreneurship. Majority of them is based on the technologies of the data-warehousing systems and display-windows of the data. It is possible to use ones of four the most popular kinds of architectures for various subsystems:

1. Functional architecture.
2. Independent display-windows of the data.
3. Two-level data-warehousing system of the data.
4. Three-level data-warehousing system of the data.

Future entrepreneurs should be aware of that in order to ensure development and support of efficient models of the data-warehousing systems and display-windows of the data it is necessary to ensure availability of the relevant simulation facilities.

1. Support to traditional ER-simulation (for simulation of the data-warehousing systems of the data), as well as support to the multidimensional simulation (for simulation of display-windows of the data).

2. Open access repository of the metadata (possibility of the data exchange with application of the ETL class, OLAP/Reporting, repositories of the metadata, instruments for monitoring quality of the data).
3. Support to collective development (monitoring of versions, check-in, and check-out).
4. Support to the properties, which are determined by user (UDP)–in order to ensure increase of the multitude of the metadata, which are supported by the model.
5. Support to possibilities of checking quality of the models (naming standards of various objects, completeness of description of the objects).
6. Support to the repeated utilisation of components of the models.
7. Support to reverse engineering.
8. Multiple-platform support (support to the industrial DBMS).

Enterprises face new challenges, not only in big data management but also in big data analysis, which calls for new approaches to obtain insights from highly detailed and rich contents (Russom, 2011). Enterprise data management and advanced data, text, and Web analytics are needed for turning data into actionable insights and intelligence (Chiang et al., 2012). Therefore, there is an urgent need to develop new and practical education programmes so that specialists can meet all the requirements imposed to a modern-day entrepreneur.

Chiang et al. (2012) emphasize that only programmes in intelligence business systems allow learning both data management and analytics. However, to succeed in this area, students must constantly expand their knowledge and improve skills. Therefore, developing such programmes and studying their effectiveness is a continuous process and a large field to address.

During the last few years, big data have attracted attention of researches of the information systems. These documents present various points of view in respect of the themes of investigations of the big data, analyse certain problems. This article is devoted to our contribution to analysis of these themes and its usage in in the development of new curricula for students of entrepreneurial education.

## CONCLUSIONS

At the present time, enterprise information systems are introduced in many companies and the present-day students must know how to handle them. Business analytics is the growing branch, which ensures continuity of innovations for development of various enterprises. Information resources of an enterprise play key role in the assurance of innovations with the help of the BA technologies. In the course of introduction of the BA technologies, it is very important to know current level of maturity of the business-processes at an enterprise. Introduction of the BA technologies will be more efficient for various enterprises, which have already determined the majority of its business-processes and described them in their integrated models.

In order to determine level for development of the information systems of an enterprise, we have analysed the factors, which influence upon the EIS. We have performed assessments of the innovation potential level of an enterprise, assessments of degree of utilisation of the BA instruments by the enterprise, assessments of the level of interconnections of the EIS and the BA instruments, as well as assessments of the needs of the EIS in the course of utilisation of the BA instruments. It was proposed to perform analysis of the factors of external and internal environments, which influence upon the level of utilisation of the EIS on the basis of BA. This estimation consists of the four stages and it is implemented with the help of the expert specialists, who are leading specialists of an enterprise.

We have analysed external factors of the EIS on the basis of the BA, and revealed the factors, which influence upon the operation of the EIS in the most possible degree. We have compared results of utilisation of the BA instruments in respect of their significance and efficiency. Analysis of utilisation of the business analytics instruments within the insurance branch of economy has shown that degree of introduction of the IT-technologies is still very low.

Therefore, entrepreneurship students should be engaged in the use of updated IT technologies.

It is necessary to pay more attention to the business analysis instruments in entrepreneurship education, which are very important for an enterprise and have high significance and efficiency values.

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