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ECONOMIC INTELLIGENCE IN THE SYSTEM OF INTERNATIONAL ECONOMIC RELATIONS: CHARACTERISTICS OF THE CURRENT SITUATION AND PROBLEMS OF DEVELOPMENT

The object of research is economic intelligence in the system of international economic relations. The paper presents the author's position on the objective conditions for the dynamic development of economic Intelligence. The authors reasonably substantive definition of the categories «economic intelligence» and «business intelligence» as such, which are synonymous categories. An objective factor in the intensive development of economic Intelligence is the demand of the world community for the development of the digital economy. The world's leading states have announced the transition to a digital economy. One of the most problematic areas of the digitalization process is the problem of training personnel capable of using software and hardware integrated into the world's Business Intelligence systems (BI systems). In the future, the authors see the elimination of this problem in the establishment of the training of intelligent, competent specialists. These specialists must have the ability to analyze information and select the best solutions. They must be ready to use the tools of the world's BI systems. Have all theoretical and practical skills that will enable them to make the right intellectual management decisions in the daily life of their companies.

In the course of the study, data from the analysis of a large range of scientific literature and WEB-resources related to the object of study were used. The authors propose a matrix chronological reflection of the evolutionary path of development of BI-systems in the international market of information services in the first twenty years of the XXI century. The authors compared evolutionary trends in the first and second decades of the 21st century. The comparative analysis indicated an increase in the intensity of the development of the world business intelligence market in the second decade. To prove the correctness of the results obtained, the authors cite digital data from world statistics, which testify in favor of the author's research. Thus, both the author's comparative qualitative analysis and the quantitative assessments of world analysts gave the same logical conclusion.

Keywords: *Business Intelligence, digital economy, intelligent management solution, personnel training, international economic relations.*

1. Introduction

The article examines the evolutionary development of the Business Intelligence market at the beginning of the XXI century. During this period, there is an increase in the production of Business Intelligence (BI) services. The reason for this is the transition to the digital economy of all the largest economies in the world. For effective management decision-making in conditions of turbulence and uncertainty of the economy, prompt and timely processing of big data using artificial intelligence is needed.

The results of this study showed that as of today, three clear leaders in the Business Intelligence market are being identified: Microsoft, Qlik and Tableau. Especially experts determine the progress of Microsoft, has created a software product Power BI, based on cloud computing, machine learning and Cortana voice interface. Introduced to the market by Microsoft, Power BI is becoming widely consumed by users because it is both robust and simple in practical use.

Scientific foresight of the economic future of international economic relations at the present stage of the development of civilization is due to the availability of

specialists who are able to operate with Business Intelligence products. It should be noted that the countries of the world in this matter are very differentiated. Let's consider the implementation of Business Intelligence on the example of Ukraine.

When developing long-term programs for the development of international relations in Ukraine, it is mandatory to take into account the forecast risks in the field of foreign economic cross-border activities [1–3]. It is possible to avoid these risks with the effective use of Business Intelligence, which, in turn, requires high-quality special training of economic personnel capable of using Business Intelligence [4–6]. These questions become especially relevant as Ukraine integrates into the European and world community [7, 8], which indicates the relevance of choosing a research topic.

So, *the object of research* is the economic intelligence in the system of international economic relations. *The aim of research* is to characterize the current state and development problems of the global Business Intelligence market environment.

2. Methods of research

The research used the following scientific methods:
– method of analysis in the study of trends in the development of the market for BI systems;
– method of classification in the construction of evolutionary matrices of BI systems in the international market of information services;
– method for comparing the intensity of market entry of BI systems products in the first and second decades of the 21st century;
– method of logic when defining at the definitional level the concepts of «economic intelligence» and «business intelligence» as such, which are synonymous;
– method of generalization for the formation of the final result of the study.

To achieve the aim of research, an analysis of a wide range of scientific publications of scientists-economists was carried out, including the last decade [9–11]. The data of official statistics were examined [12, 13]. Among the studies considered, the experience of the Odesa National Economic University [14], as well as the analysis of WEB-resource sources on the coverage of information from the research object [15] and the experience of the English scientific school [16], deserve attention.

The generalization of the results of the investigated information and scientific sources indicated the lack of use of modern BI systems in Ukraine and very often their inaccessibility for small and medium-sized businesses of Ukrainian entrepreneurs. The problem of training and retraining of personnel, capable of using Business Intelligence technologies for the practical management of a company and collecting information about counterparties in the market, turned out to be very important.

To provide the research with practical value, matrices for displaying the evolution of Business Intelligence systems on the international market of information services have been built. This illustrates the use of the descriptive method. An analysis of empirical data from the Kyiv National Economic University named after Vadym Hetman (Ukraine) for 2018–2020 was carried out. The curriculum for the preparation of PhD in the specialty «Public Administration and Administration» was studied.

The results of planning the discipline «Methodology of economic research» [6] are interesting. The increase in the number of hours for studying the discipline, starting from 2021, indicates an increase in the role of studying the discipline, forms the competence and intelligence of a specialist in making managerial decisions.

Analysis of empirical data from Simon Kuznets Kharkiv National University of Economics indicated the presence of university training in Ukraine with the inclusion of the discipline «Business Intelligence» in the curriculum. This is proof of the academic attitude to the training of managers of a new formation, responding to the challenge of the time in the content of digitalization of economic relations in the world.

As the analysis of modern literary sources shows, the organization of innovative forms of cross-border cooperation in the region is one of the most important areas of research. A large number of scientists pay attention to them, and the authors of this work are no exception in their studies [7]. It is becoming very promising to study the problems of big data management of transnational companies and international cooperation, which carry a priori a great ability to take economic risks in case of erroneous decision-making.

It is known that the risks of foreign economic transactions of economic entities correlate with a large number of indicators. Including – with the size of exports and imports, domestic prices, changes in national currencies, interest rates, aggregate demand and GDP, employment levels, and the state of macroeconomic equilibrium. In addition, with the criteria for compliance with the concept of sustainable development. All of this makes up massive amounts of data.

This topic was studied in works [1, 2, 14]. The result of the work of these authors is the demonstration of very intelligent methods of visualizing information on the problems of managing foreign economic activity. Their research brings managers closer to the need to use in practice the world's scientific achievements in the field of Business Intelligence [12, 13, 16]. At the same time, while maintaining full compliance with national legislation [17].

3. Research results and discussion

According to [15], the category Business Intelligence in science and practice is used to designate computer methods and tools for organizations that ensure the translation of a transaction of business information into a human accessible form. BI also includes means for mass processing of processed information. Experts believe that at present this term does not have an unambiguous interpretation [15].

The term has been in the scientific dictionary since 1958, thanks to the work [18], where it was interpreted by the author as «an opportunity to understand the connections between the factors provided». Later in 1989, an analyst in [12] defined Business Intelligence as a generic term describing «concepts and techniques for improving business decision making using business data-driven systems». The term, in its content, received evolutionary changes in parallel with the development of BI systems. To achieve the aim of research, the authors built matrices for displaying the evolution of the BI system on the international market of information services – in the first and second decades of the XXI century (Tables 1, 2).

Table 1

Evolution of Business Intelligence systems in the international information services market in the first decade of the XXI century

Year	Event on the market for the introduction of a software product of the Business Intelligence class	Characterization of the capabilities of the VI system as a result of software innovations
2003	Cognos Series	For the first time, a software product of the Business Intelligence class becomes available through a browser; to work with the WEB-interface, you no longer need to download Java applications. The software product easily integrates with other online analytical data processing systems, including SAP and IBM DB2
2007	Microsoft Dynamics CRM Analytics Foundation	Users can research aggregated customer data, conduct analysis, and create reports. Executives have all the tools they need to make the right decisions. The product integrates with Microsoft SQL Server 2005, Microsoft SharePoint, Microsoft Office Business Scorecard Manager and Microsoft Office Excel and can interact with the Microsoft Performance Point Server 2007 platform
2007	Oracle buys BI systems leader Hyperion	The acquisition of Hyperion makes the American company, of which Oracle Larry is chairman, a leader in the enterprise management systems market. Hyperion EPM software and Business Intelligence (BI) solutions from Oracle, which include tools for collecting, processing and analyzing information along with analytical applications, have compiled an effective management system that includes: planning, budgeting, information consolidation, operational analytics and reporting system
2007	Business Objects invites to test Web 2.0 tools	Business Objects publishes Web 2.0 prototypes of business intelligence on its Business Objects Labs website, which it invites customers to test. The company has published another BI Annotator prototype, which provides the ability to combine external data streams with structured information on the corporate warehouse. Another new tool from BI Desktop that displays up-to-date analytical information on the «desktop». There is also Business Objects Masher for combining online services and BI Coordinator, a module for Windows Live Messenger that allows to exchange analytical data using an IM service
2007	Business Objects launches SaaS service for business intelligence	Business Objects launches Business Intelligence OnDemand SaaS service, which will enable companies to access a wide range of business intelligence tools included in the Crystal Reports, Crystal Xcelsius and Web Intelligence packages on demand
2008	FB Consult became an official partner of QlikTech, the world leader in Business Intelligence	FB Consult has signed a partnership with QlikTech to offer the cutting edge, fully featured business intelligence (BI) platform QlikView. QlikView provides a vision of operational efficiency, providing flexibility and responsiveness to changes, thereby increasing the overall transparency of business management

Note: developed by the authors based on [15]

Both in the first and second decades of the 21st century, three most important aspects remain relevant:
– level of funding and support from the state;
– the degree to which the project is needed for a particular business;
– the volume and quality of available business data.

From the analysis of the Tables 1 and 2, an increase in the intensity of the development of the digital technologies market in the field of Business Intelligence is obvious. In the second decade of the 21st century, growth trends are intensifying. This fact is confirmed by the data of world analysts. According to [12], in 2012 the world market in the field of Business Intelligence is estimated at +13.1 billion USD. According to the forecasts given in [13], in 2021 this amount will double and will amount to 26.88 billion USD. In Ukraine, with the aim of integrating into the international digital economy, work has begun on the training and retraining of personnel. Noteworthy is the experience of S. Kuznets Kharkiv National University of Ecomomics, which was among the first state higher educational institutions (SHEI) to introduce the discipline of Business Intelligence for masters [5].

As topics for study, the discipline's working curriculum includes: BI tools, examples of using Microsoft Power BI for visualizing business data and creating reports, studying the features of cloud computing technologies in solving BI problems.

After completing the course, masters are able to analyze the platforms of modern web portals, search services and APIs (Apllication programming interface) of social networks and general web service solutions. They understand the peculiarities of using BI systems in the tasks of scaling web solutions and supporting the failure-free operation of information systems under conditions of heavy load on web services and web resources in the case of big data processing.

Future masters study the basics of cloud services applications. Their practical goal is to master the BI platform, in order to calculate the economic data of a modern enterprise, integrated into international associations. The course is based on the preliminary study of the following disciplines:
– intellectual methods and means of information processing;
– organization and technology of cloud computing;
– research methodology.

In order to train specialists to work in the digital economy and artificial intelligence, SHEI began to pay more attention to scientific research methods. Noteworthy is the experience of the Kyiv National Economic University named after Vadym Hetman (KNEU, Ukraine), where there is a tendency to increase loans for studying the discipline «Methodology of Economic Research» (Table 3) [6].

An example of an academic attitude towards the implementation of the theoretical foundations of economic Intelligence in Ukraine is the Kyiv School of Economics. It functions and carries out its educational activities for those who want to increase the efficiency of their company by introducing new modern tools.

The refresher course is titled Fundamentals of Business Intelligence and Data Visualization in Tableau. The course is targeted at the following audiences:
– specialists in marketing and communications, consulting, sales, analysts, etc.;
– journalists and analysts of public organizations;
– scientists and researchers;

– students and postgraduates of various specialties of social sciences (economics, psychology, sociology, political science, history, etc.)

Table 2

Evolution of Business Intelligence systems in the international information services market – the second decade of the XXI century

Year	Event on the market for the introduction of a software product of the Business Intelligence class	Characterization of the capabilities of the VI system as a result of software innovations
2010	SAP launched SaaS service for Business Intelligence	SAP has released its first full-fledged SaaS application – SAP BusinessObjects BI OnDemand. The system is designed for medium-sized businesses and provides quick access to data, keyword search, reporting tools, data visualization and exchange, and for this it is not necessary to switch between different applications
2010	Market entry of the PinPoint service	PinPoint is a business analysis tool that provides a visual and intuitive presentation of data from many different sources (including information systems, databases, flat files, web applications, corporate portals, MS Office documents and news feed). PinPoint makes it easy to create dashboards and works both online and offline
2011	Oracle introduced a new version of the business intelligence system Oracle Business Intelligence	The manager can view analytics for data from ERP and CRM in an easy-to-use graphical form, initiate actions and run workflows directly on the mobile device, which helps to reduce the time required for decision-making and contributes to the agility and agility of the organization as a whole
2012	Microsoft held a web presentation of the new generation of SQL Server 2012 DBMS	A version of Business Intelligence has been developed, which includes modern functions for data analysis and visualization. In addition, the Enterprise Edition is planned, in which, in addition to all the features of the BI option, there will be security functions, as well as data storage in the column
2013	BusinessQ – web-based business analysis system for small and medium-sized companies	BusinessQ Business Intelligence is designed specifically for small and medium businesses. It is a fairly simple low cost web application. It takes only an hour to study and configure, and then all the necessary information in a visual form comes to the user. It is possible to create not only static reports, but also interactive dashboards (dashboards) for the manager, so that it is aware of the important indicators of the company
2014	System integrator CROC has launched a business intelligence service «Business Intelligence as a Service» (BIaaS)	The system is built on the EMC Greenplum product and is a Big Data solution. Using this tool, it is possible to analyze and compare large amounts of information, build key indicators and make business decisions, bypassing the stage of capital expenditures for the acquisition of software, licenses and possible infrastructure modernization
2014	Oracle Introduces New Business Intelligence Cloud Service	The system allows to analyze data from a variety of sources, including Oracle applications deployed in the cloud or directly in the enterprise, to quickly create rich, interactive analytical programs. Clients can receive information and analyze it anytime, anywhere from mobile devices
2014	IBV Connects Watson Super Computer AI to Twitter for Business Users	The Watson Analitscs service allows to build analytical tables and graphs using queries written in human (English) language, makes it possible to optimize production logistics
2016	Microsoft, Qlik and Tableau become leaders of the Business Intelligence market	Analyst firm Gartner has built a diagram where three clear leaders stand out: Microsoft, Qlik and Tableau. Particularly noted is the progress of Microsoft, whose Power BI solution, based on cloud computing, machine learning and Cortana's voice interface, is both powerful and easy for users
2019	Google bought business intelligence service Looker	Looker became part of Google Cloud, which integrates Google cloud services

Note: developed by the authors based on [15]

Table 3

Comparative characteristics of the work program in the discipline «Methodology of Economic Research» for the preparation of PhD at KNEU in the specialty «Public Administration and Administration» in 2018–2020

Year	Form of education	Semester	Number of ECTS credits (cr.)	Final control form	Language(s) of instruction
2018	Full-time (part-time)	1	3 module 1 – 1.5 cr. module 2 – 1.5 cr.	Pass-fail exam	Ukrainian
2019	Full-time (part-time)	1	3 module 1 – 1.5 cr. module 2 – 1.5 cr.	Pass-fail exam	Ukrainian
2020	Full-time (part-time)	1	4 module 1 – 2 cr. module 2 – 2 cr.	Pass-fail exam	Ukrainian

Note: developed by the authors based on [6]

As part of the study, a reference is made to the experience of 3 scientific institutions. Of course, this is not the limit of the potential of higher education. It is necessary an instant extrapolation of the accumulated results. Practitioners need to know that the goal of such training should be the ability to analyze and choose the best solutions when using software and hardware integrated into global BI systems and further conduct business intelligence.

4. Conclusions

The study revealed:

1) the world has entered the era of digital technology, called the whole complex of the human-machine community Business Intelligence or economic intelligence;

2) three world-famous companies have become modern leaders in the Business Intelligence services market since 2016: Microsoft, Qlik and Tableau;

3) international relations, relations between individual divisions of transnational corporations, logistic intercontinental tasks, etc. require a large number of scenarios for the development of an event based on processing big data to make a correct managerial decision. These data have recently received a special status «Big data» in the business dictionary.

Based on the research results, the following conclusions can be drawn:

1) any intellectual system by itself is dead and incapable of acting: it is «launched» by a person using «living intellect»;

2) to collect, process and store large amounts of information, to integrate into the Business Intelligence environment for building statistical reports or an interactive dashboard (dashboard) for the manager, so that it is aware of the important indicators of the company's performance, the relevant knowledge of the Business Intelligence user is needed.

The scientific novelty of the research consists of:

– building a matrix for displaying the evolutionary development of Business Intelligence systems on

the international market of information services in the first and second decades of the XXI century;

– finding the further development of the theory of Business Intelligence, namely: the fact of unambiguous interpretation of the categories «economic intelligence» and «business intelligence» is justified, that is, this concept is synonymous.

The research results will be useful to scientists and practitioners, namely:

– in countries with weak economies, including Ukraine, which was considered as an example in the study, there is a deficit in the use of modern BI systems and very often they are not available for small and medium-sized businesses.

At this historical stage of the development of society, there is a very acute issue of training and retraining of personnel who are capable of using Business Intelligence technologies for the practical management of a company and collecting information about counterparties in the market. This experience is already emerging in Ukraine, thanks to the work of the leading SHEI of Ukraine and the Kyiv School of Economics. The purpose of these institutions is to train intelligent, competent professionals. These specialists have the ability to analyze information and select the best solutions. They are ready to use software and hardware, integrated into the world's B systems. All these theoretical and practical skills will enable them to make the right intellectual management decisions in the daily life of their companies.

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