ISSN 2710-3056

Grail of Science

Periodical scientific journal

№ 16 June 2022

The issue of journal contains

Proceedings of the III Correspondence
International Scientific and Practical Conference

GLOBALIZATION OF SCIENTIFIC KNOWLEDGE: INTERNATIONAL COOPERATION AND NTEGRATION OF SCIENCES

held on June 17th, 2022 by

NGO European Scientific Platform (Vinnytsia, Ukraine)
LLC International Centre Corporative Management (Vienna, Austria)

OUCI Open Ukrainian Citation Index

Euro Science Certificate № 22374
dated 15.05.2022

INDEX COPERNICUS INTERNATIONAL

ISSN: 2710–3056

INTERNATIONAL SCIENTIFIC JOURNAL

GRAIL OF SCIENCE

№ 16 June, 2022
with the proceedings of the:

III Correspondence International Scientific and Practical Conference

GLOBALIZATION OF SCIENTIFIC KNOWLEDGE: INTERNATIONAL COOPERATION AND INTEGRATION OF SCIENCES

held on June 17th, 2022 by

NGO European Scientific Platform (Vinnytsia, Ukraine)
LLC International Centre Corporative Management (Vienna, Austria)

Міжнародний науковий журнал «Грааль науки»
№ 16 (Червень, 2022) : за матеріалами III Міжнародної науково-практичної конференції «Globalization of scientific knowledge: international cooperation and integration of sciences», що проводилася 17 червня 2022 року ГО «Європейська наукова платформа» (Вінниця, Україна) та ТОВ «International Centre Corporative Management» (Відень, Австрія).

СЕКЦІЯ XXIII. ПЕДАГОГІКА ТА ОСВІТА

СТАТТІ

ARTICLE

DOI 10.36074/grail-of-science.17.06.2022.060

EFFECTIVE APPLICATION OF KNOWLEDGE MANAGEMENT IN CURRENT CRISYS CONDITIONS

Viktoriia Tuhaienko
Senior Lecturer
Institute of Law and Modern Technologies
Kyiv National University of Technologies and Design, Ukraine

Svitlana Krasniuk
Senior Lecturer
Institute of Law and Modern Technologies
Kyiv National University of Technologies and Design, Ukraine

Summary. *Data Mining is the detection in structured and unstructured data, previously unknown or hidden patterns and knowledge in the primary, accumulated as a result of business transactions, in order to form an appropriate knowledge base and make sound and optimal business decisions. It can be argued that in today's global economy, and with the emergence of new sectors of economic activity, the hybrid application of Data Mining and Big Data technologies leads to additional competitive advantages, and thus increase investment attractiveness and capitalization. The above trends and peculiarities of the application of automated Knowledge Management should be taken into account in further research and practical projects and real projects of effective implementation and use of Data Mining and Artificial Intelligence technologies in corporate information systems.*

The obtained results are relevant and applicable not only for local companies and organizations, but also for international applications in the context of global, national and regional (not only economic, but also pandemic, military, natural disaster etc) crisis phenomena.

Keywords*: Big Data, Data Mining, Intellectual Capital, Knowledge Management, Knowledge Management Systems*

INTRODUCTION

All enterprises (trade, production, research, service, etc.) register, record and store huge amounts of disparate information (quantitative, qualitative, textual, multimedia, etc.) on all aspects of their activities. Moreover the speed and detail of such flows are increasing.

In particular, the survey of European companies showed that almost half of them expect an annual increase in their data flows by 25%.

The analysis of modern international corporate management practice shows the following global factors that have a significant and lasting impact on information management:

- excessive space of decisions and their multidisciplinarity (when making managerial decisions, the number of various input variables, their combinations, and the corresponding options of complex and unbalanced scenarios increases);

- emergence and improvement of innovative IT-technologies (which, in particular, provide total capabilities for registration, transmission, storage, processing and automated analysis of all data, events and states);

- comprehensive globalization, on-line competition and complexity of the market structure of international multimodal services / goods lead to the emergence of new and growing influence of known factors of uncertainty and incompleteness of data, increasing "information noise";

- increasing the dynamics of fluctuations of subjective and objective factors, increasing the share of anomalies in the data, changing the patterns of their interaction, changing the significance of factors in already built models (there is an urgent need not only to automatically respond to these dynamics in real time, but and automate verification and retraining of existing models);

- radical increase in the flow of unstructured data of all types from stand-alone devices, sensors and sensors.

That is, taking into account the specifics of modern management studied above, it can be argued that the classical functionality of regression, factor, analysis of variance in modern crisis conditions for domestic companies - is not enough.

After all, in order to formulate new prerequisites for effective management (including anti-crisis) decisions, you need new, objective knowledge about the hidden essences, connections and patterns of the studied subject area. To find and verify (including in the course of classical statistical analysis) current facts and hypotheses in the database or repository is not so difficult, but today's competitive information economy requires not just facts, but new, objective patterns, verified, interpreted and formalized in appropriate models of knowledge representation.

Only Data Mining technology can be the main source of such new objective management templates for a company operating in a risky, corrupt, competitive and crisis-ridden domestic market.

Despite the above obstacles, which have a significant and lasting impact on management activities in the field of international corporate management, analysis and diagnosis of domestic management practice showed that the systemic problem for domestic corporate management is still the lack of a comprehensive formalized business process management models and, as a consequence, subjectivism and intuitive (manual) control. In view of the above, it is possible to detail additional topical issues of anti-crisis management of Ukrainian corporations:

- lack of formalized descriptions of business processes and relevant corporate standards (or lack of automation of control over their implementation);

- "manual" and occasional management of service / goods quality and customer loyalty;

- significant impact on the performance of corporations incompetence / subjectivity / abuse by operational management;

- lack of automation and objectivity in forecasting demand, and, consequently, the decline in operational efficiency;

- sporadic and partial use of all accumulated and / or available internal and external data (especially real-time streaming data), weak or no impact of the above data analysis results not only at the operational level but also at the level of tactical and strategic management.

Thus, in addition to the above impact of Big Data, another factor that complicates the analysis of modern corporate data is that most of the data stored in DBMS, and especially streaming - have the character of spatio-temporal series, so there is need not only for classical statistical analysis of multidimensional time series, but also the need to find hidden unknown patterns and further construction of predictive spatial models.

One of the definitions of the term Knowledge Management (KM) is to enhance the effectiveness of the organization by improving the structure, discipline and practical activities for the collection and processing of knowledge in the corporation and providing them for collective use [1].

Corporate knowledge is the most important resource of a modern enterprise, and the effective use of this resource can significantly affect its competitiveness, investment attractiveness and capitalization [2]. In other words, corporate knowledge management is a technological process of working with information resources of the enterprise to provide access, retrieval and analysis of corporate information, which allows users to navigate the vast repositories of structured and unstructured information, and make faster decisions based on more complete information.

According to leading Western analysts and scientists in the field of KM, namely Thomas H. Davenport, John Seely Brown, David W. DeLong, Robert I. Sutton, Rajiv Sabherwal, Todd R. Croft, Thomas P. Jones, in the coming years, corporate investment in corporate knowledge management technology will grow at a rapid pace. After all, namely knowledge management in the near future will become a pass to the leaders of the economy, a key technology that determines the paradigm of global management in general. Their research shows that the main role of KM is not to reduce costs, but to significantly increase competitive advantage for companies that have implemented knowledge management. Only such an interpretation can explain the above view that knowledge management will soon become a key technology [3].

The real importance of knowledge management in modern business can be understood by considering the evolution of basic concepts of management, the change of which illustrates the consistent search for success at an ever-increasing organizational depth [4].

The initial basic concept can be considered financial-oriented management, which has existed for a long time in the era of the manufacturer's market. In the transition to the buyer's market, he was replaced by marketing management, in which the defining ideology of management was marketing. Marketing management is replaced by quality management, which absorbed it, which involves building a business based on the ideology of quality, including quality of organization and improvement of business processes aimed at meeting the correctly identified needs of customers. The transition to the knowledge economy took place when the search for a reliable basis for both more accurate and faster identification of customer needs and for the optimal organization of business processes began [5].

According to opinion polls, the vast majorities of entrepreneurs are aware and recognize that the lack of information, as well as distorted, inaccurate information about competitors, customers, partners leads to great losses. Western corporations,

which underestimate the importance of information management, lose about $ 450 million a year.

The relevance of investments in KM, in particular, is also motivated by changes in personnel migration. If in the 60's the average employee worked in the same company for more than 20 years, now employees change jobs on average every 4 years. With the dismissal of an employee the part of the information is inevitably lost, which management technologies can save for the company and the KM policy that is properly structured.

THE MAIN PART AND RESULTS

The concept of "intellectual capital" allows to move to the economic evaluation of knowledge possessed by the company. The main models of intellectual capital divide it into three components: human capital, which includes non-objectified personal knowledge, organizational capital, which includes objectified knowledge, and relationship capital - a set of established relationships with the entire company environment, especially with customers. Thus, if knowledge can be interpreted as a certain "intellectual capital", then this capital (as well as financial) can be "own" or "borrowed".

That is, knowledge in itself is not an asset, because the asset implies the property of the organization, and implicit and uncontrolled knowledge, like employees - is not the property of the organization. The components of corporate knowledge that are in the minds of employees should be treated as leased or borrowed assets. Or rather, as assets leased by the organization only for the next business day. Therefore, an important task of KM is the transformation of intellectual capital into intellectual assets, objectification of knowledge, extracting it from sources that are individual employees of the company. Then the risks of dependence on specific individuals will be reduced, and knowledge can be freely transferred, disseminated and effectively applied where it is needed for the benefit of the company [6].

Of course, not all intellectual capital can and should be transformed into intellectual assets. Much knowledge after formulation and systematization is deprived of a significant part of the substantive nuances based on individual interpretation and experience. Therefore, the second important task of knowledge management is a clear division of knowledge into formalized (objectified) and non-formalized, which will apply to each type of knowledge the most appropriate tools to maximize the total intellectual capital of the company.

In any case, knowledge, even if it is personal knowledge of the employee, is the property of the company, its valuable asset that can be managed: to extract experience and useful information, systematize and use to increase the efficiency of the enterprise and its market value [7].

In world practice knowledge management is used to achieve several goals, in particular: to preserve the knowledge of employees; reduction of training time for new employees; improving interaction and coordination between a company's divisions; generation of new directions of business and introduction of innovations; improving the quality of customer service; more efficient and faster decision making; and often to solve several problems at once [8].

If the goals of knowledge management are consistent with the strategic objectives of the company, the effect will be very significant.

Recently, large domestic holding companies have also begun to feel the negative impact of a number of factors related to the lack of KM practices in companies. And this process will be approached by the following trends. On the one hand, it is the arrival of foreign producers in our market, on the other hand, the leaders of many dynamic companies have realized the insufficiency and narrowness of the domestic market for successful development and maintaining the growth rate of their business. Domestic corporations have only such competitive advantages as: high share of the domestic market, knowledge of the specifics of the market, cheap natural and human resources. However, these are temporary factors, if they are not backed by sustained competitive advantages, the situation on the emerging markets will change quickly. As a result, many companies are beginning to look for new competitive advantages and stop at KM.

The company should urgently conduct pre-project work with KM, if: it has significant intellectual assets; it operates with large information flows; the company has specialists with different degrees of training in the same field; big profits depend on the work of managers.

Thus, knowledge management is especially important in companies that focus on intellectual resources: banking, law, consulting and others. And for companies in the material industries, integrated KM systems are not yet critical.

Thus, taking into account the above relevance of the KM industry, in the future will be presented not only the results of the study of the application of corporate knowledge management systems in emerging markets but also a variant of the taxonomy of such systems.

There are 4 stages in the development of knowledge management. In the early 1990s, KM was considered strategic rhetoric. Knowledge was then perceived as a source of innovation and a prerequisite for maintaining competitiveness in a changing post-industrial economic environment. New knowledge management specialists had to excogitate and invent everything themselves.

The second stage was characterized by the retraining of old IT ideas and training programs in the field of knowledge management.

The end of the 1990s marked the beginning of the third stage - the era of technology. Intranet, corporate portals, search engines began to suggest the effective exchange of information. Skeptics' suspicions that knowledge management is nothing more than another area of information technology have been confirmed.

However, even today the idea of knowledge management has not lost relevance. There is still an awareness that knowledge can be a source of corporate advantage, which is expressed in product innovation, technology improvement, strategic decision-making, customer relations and so on. At the same time, everyone understands that corporations have not yet managed to fully unleash the full potential of KM as a management concept. According to analysts, most organizations will continue to implement strategies for knowledge management and personnel management separately, but during 2005-2010 the largest corporations will combine directions into a holistic program to accelerate innovation and increase employee productivity.

According to the forecast, by 2020th two thirds of the largest corporations will implement annually renewed KM projects.

Thus, entrepreneurs who are saving in this direction today will not be able to compete in the global economy in three or five years, when the recession will be overcome and the growth of the world economy will resume.

And now large global companies are actively working to create knowledge management systems that will formalize, customize and replicate the necessary knowledge. The impetus for this process was the fact that the intellectual capital of the company as a whole, much less than the total knowledge of its employees alone. This leads to inefficient use of corporate resources.

In this context, a knowledge management system (KMS) is not just a single product. Rather, it is a comprehensive strategy of the company, which aims to identify and benefit the company all the information available to it, experience and qualifications of employees in order to improve the quality of customer service and reduce response time to changing market conditions.

So, let's present the essence of the knowledge management system. It is built on a base to which only the company's employees have access. Each employee is obliged to share with the base the acquired knowledge and experience related to job responsibilities. Information comes from the corporation's employees to the database in much the same way as signals from nerve endings come to the brain. Gradually, the collective experience of thousands of people is formed into a single system of knowledge. Every employee of the company has access to certain areas of this database and can use in their activity the information stored there. The practical implementation of KM systems in business became possible only as a result of the development of network technologies, the Internet and powerful search tools. Currently, not all companies have a system for sharing and structuring experience and knowledge management, but its elements are found in almost every corporation. In other words, the KM system is designed to create a single information field of the corporation with the use of appropriate software to help each employee and the company as a whole. Table 1 offers a variant of the classification of KM systems.

Table 1

Classification of Knowledge Management systems

Knowledge base providers of customer service	This class of KMS manufacturers focuses on finding previously asked consumer questions and solutions, in order to provide both intermediaries and end users with answers to business questions. This classification group of KM systems often uses robust knowledge bases of third-party manufacturers (including Primus, ServiceWare, eGain, and Kana).	Peregrine, Siebel, PeopleSoft, Amdocs, Tivoli, Network Associates, Goldmine, CA, HP
Providers of single-channel knowledge bases	In this category, there are many manufacturers of KM systems, which when creating their systems involve the use of a single communication channel (such as the WWW), or provide support for special types of interface between the consumer and the database (e.g., virtual agents).	NativeMinds, Kanisa, noHold, Autonomy, Ask Jeeves, Interactive Intelligence, Artificial Life

Continuation of Table 1

Providers of multichannel knowledge bases	This class of KM system providers focuses on creating a single KM service space that can support different types of channels and points of interaction (such as: independent consumer search, autonomous search for an intermediary, autoresponders to e-mails, software agent services). The number of supported interaction channels varies greatly between different providers of ultrasound systems.	eGain, Kana, ServiceWare, Banter, Primus, FirePond, RightNow Technologies
Remote / intelligent service providers	The knowledge bases used by these vendors are aimed at providing a solution that is provided at a distance to solve consumer problems (usually with software or hardware). These knowledge bases are usually highly contextual and integrated directly into the application program or hardware.	Motive, SupportSoft
Providers of integrated solutions (managed services)	This group of providers in their contracts for the development / supply of KM systems provides a certain (but limited) time for the deployment of KM systems and its support.	Safe Harbor, Talisma

The authors also propose the second version of the taxonomy of KM systems:

- corporate KM systems (KM module in Microsoft Business Solutions-Axapta; Lotus Discovery Server and Domino Extended Search from IBM; GlobalxChange information system of the Oracle company;
- personal systems of KM (KB 908; SYNTEK-Inform);
- CRM-oriented KM systems (eService Suite; eServer; Kana IQ; e-FAQ; One Step; RoboAssist; Get-Answers; KnowledgeBase.net; JeevesOne).

Analyzing the latest scientific advances in this field (including the works of Clyde Holsapple, Karen Giannetto, Carla O'Dell, Albert H. Rubenstein, Herwig Rollett, Cliff Figallo, Milan Zeleny, etc.), it was identified the need for a thorough study of potential systemic problems in implementation and practical use of KM systems as a factor in their competitive success.

The general property of all analyzed products can be summarized as follows: the better the software works with knowledge, the worse it is with group work. Team work systems that include database modules either do not contain advanced search or store information in its own format, which excludes the export of information [9].

Implementation of the knowledge management system contributes to the implementation of the following tasks:

- introduction and development of information technologies for corporate knowledge management on a scale that takes into account the needs and capabilities of a particular company;
- staff development, knowledge exchange and acceleration of their assimilation;
- ensuring timely organizational changes;

- integration of knowledge about the company and its business environment;
- ensuring maximum transparency of the company's information flows for staff, taking into account the requirements of information security and confidentiality.

Today, you can not use KM systems that focus exclusively on external sources, including online. In fact, something else is needed: an active interface that combines consumer-friendly analytical applications, external information resources, sources of internal (corporate) information. And this whole complex system must work harmoniously and constantly, serving diverse information requests.

Recognizing the current difficulties experienced by both the global economy and the domestic transformation economy, corporations need to start at least with the creation of an intranet system that must work effectively, the information in it should be systematized, regularly updated and constantly transmitted for use in office applications [10].

To ensure the work with the corporate KMS, it is necessary to meet several standard conditions: the availability of e-mail; availability of Internet connection; registration in the system (obtaining a registration name and a password); acquaintance with the work of the system; the presence of practical problems that need to be solved; ways to solve problems; work in divisions of the corporation.

There are traditional tools, mechanisms and procedures for knowledge management used by foreign and domestic companies (corporate knowledge repositories, corporate and intra-corporate web-portals, methods of motivating staff to share information, etc.). A number of specialized IT companies offer their developments and services in the software market for corporate knowledge management. When choosing such software, it is necessary to pay attention not only to its cost (including the cost of implementation and cost of ownership), but also to its modularity and scalability, which allows for flexible implementation depending on current and projected needs of the company.

You can also choose software to solve certain KM problems, such as a system for collecting information about your (and not only) company on the Internet.

In view of the desire of people to obtain the necessary information, while providing less information about themselves, the Internet is gradually becoming the best media environment for obtaining basic knowledge of KM. And the results of the analysis of the accumulated data will help not only in marketing research, competitive intelligence, but will also be suitable for monitoring and managing the company's image.

Sometimes such basic issues as ensuring the reliability of the software and hardware of KM systems, which is expressed in the desire to save on ensuring the reliability and smoothness of systems, including data backup and recovery, are underestimated. The loss of accumulated relevant information creates difficulties in relationships with customers, destabilizes the normal conduct of business processes, sometimes up to the return to the outdated method of doing business, and usually significantly worsens the company's market position at this time.

According to analysts, the technological part of building knowledge management infrastructure (portals, search engines, content, collaboration and learning) is only 20% of the project. The other is planning and organizational changes in the company - in politics, corporate culture and more. Therefore, focusing only on the technological aspect of the problem will not give the desired effect [11].

Therefore, no matter what complex intelligent corporate knowledge management technologies are used, they will not bring the desired result without active involvement in the process of personnel knowledge management. According to surveys conducted abroad, the leaders of many companies are disappointed with the results of knowledge management. It was not so effective because the technological solutions used in these companies were too complex. Their implementation was not accompanied by training of employees who did not understand the meaning of using these systems. People did not trust each other in the exchange of knowledge, did not see the benefits for their work from the exchange of knowledge. As a result, the use of technological products for knowledge management has not become part of the daily practice of these companies. It is obvious that knowledge management in them was identified with technological products that were introduced to solve the problems of knowledge management. The "technological component" is important, but not the only condition for the success of knowledge management.

For a technological solution to be beneficial, it must meet the real needs of the company. It is necessary to determine what applications will be solved at the initial stage of the KMS implementation - for example, transfer of experience and knowledge to new employees, or association of employees in the community and identification of "expert opinion" to create new products, or reduce information retrieval and standardization procedures, or in a complex. Before choosing a technological solution, it is important to conduct diagnostic activities (tests) in the company to determine the current objectives of KM.

As we define the objects of knowledge management, so we will manage them. If for the successful operation of the company it is important to use the past experience of employees, technological knowledge, if its work is based on the experience of past projects, then for their preservation and further use requires appropriate databases, search engines, etc. When you need to find a new solution, a new product concept - to discover the "hidden" and create new knowledge - the best tools will be virtual communities / forums and, of course, Data Science etc [12, 13].

Employees need to know about and be able to use the new technological tool, so its implementation must be accompanied by training programs and "navigation tools", such as "knowledge maps", "knowledge packages", user manuals.

Let us analyze the difficulties for building a corporate KM system. It follows from the above that building a knowledge management system requires not only analytical measures. The KMS will not work if the concept of the company as a whole is not restructured. A lot of knowledge bases that were based on the principles described above, filled with very valuable information, ceased to exist due to the fact that the staff either did not know how to use them, or forgot to do it in their daily activities. Thus, the most common difficulties for creating a knowledge management system can be divided into two main groups: analytical and organizational.

Analytical difficulties include technical problems of information transformation into knowledge. Since knowledge must have a certain level of abstraction, with selected criteria that determine the value of knowledge, it is meaningless, for example, to simply describe the experience of your company in the epistolary genre. The value of such knowledge, even if you describe the entire history of the company, is zero.

Organizational difficulties include: organizing the company's work with a knowledge base on an ongoing basis, plus reorienting the daily routine from instant response to the task of finding a possible solution to this problem using the knowledge base. The latter task seems to be the most difficult, as it requires significant changes in the company's usual algorithms, and this difficulty, of course, hinders the effective implementation of the KM project.

Like any project, deploying a knowledge management system cannot happen by itself or be done in the background. However, many companies do just that. The fact is that they often confuse data with information, and information with knowledge, and at the same time consider some knowledge obvious.

CONCLUSIONS AND PERSPECTIVES OF FURTHER RESEARCH

Therefore, we can conclude that in order to succeed in the developing of the KM system, the project for its creation must be designed according to the relevant rules of project management, i.e. it is necessary:

- to determine the purpose of the project, to plan the process and allocate appropriate resources;
- it is necessary to formalize the principles of filling the knowledge base and conduct training for all those who will enter knowledge into the system;
- to describe and conduct training on the basic principles of working with the KM system of all employees of the company. (For example, for a TV repair company, the way technicians work will change - instead of looking for a problem right away, a wizard should run a series of tests and enter their results into a database. The system will instantly provide a more accurate description of the problem and, more importantly, there are possible solutions to it.

If the problem occurs for the first time (there are no similar options in the knowledge base), the employee is obliged to provide information about the problem and how to fix it to the KM manager, who transforms it into new knowledge and saves it in the knowledge base);

- to develop analytical intelligence software agents for continuous search of information analysis. Such agents can be used on the basis of components of OLAP, CIS etc. Their meaning is in the independent analysis of a large amount of new and saved information and its comparison with the set criteria. The results of the comparison are consolidated by the system into knowledge and presented to management to support decision-making;
- to take measures to capitalize in the KM system of new and updated knowledge of the company;
- to make the knowledge management system integrated with other business support systems, where it is possible to automate the transformation of data into information and even knowledge.

Thus, when they say that there are no successful knowledge management projects in emerging markets, namely knowledge management is considered unpromising, it means that inefficient are the IT solutions for knowledge management that are not accompanied by appropriate organizational decisions. Further development of knowledge management strategy should involve a gradual transition of companies to the concept of such management theory as "learning organization".

References:

[1] Krasnyuk M.T. (2006) Problemy zastosuvannia system upravlinnia korporatyvnymy znanniamy ta yikh taksonomiia [Problems of applying corporate knowledge management systems and their taxonomy] *Modeliuvannia ta informatsiini systemy v ekonomitsi*: Mizhvid. nauk. zb. Zasnov. U 1965 r. Vyp. 73 / Vidp. red. V.K. Halitsyn. - K.:KNEU, 2006. – 256 s. [in Ukrainian]

[2] Ситник В.Ф., Краснюк М.Т. "Політика управління знаннями нафтогазової компанії як ключовий фактор підвищення її ефективності" (2002) *Проблеми формування ринкової економіки*: Міжвідомчий науковий збірник. Заснов. у 1992 р. Вип. 10 / Відп. ред. О.О. Беляєв. – К.:КНЕУ, 2002. – 326 с.

[3] Ситник В.Ф., Краснюк М.Т. (2007) *Інтелектуальний аналіз даних (дейтамайнінг)*: Навч. посібник. — К.: КНЕУ, 2007. — 376 с.

[4] Гращенко І.С., Краснюк М.Т., Краснюк С.О. (2019) Гібридно-сценарне застосування інтелектуальних, орієнтованих на знання технологій, як важливий антикризовий інструмент логістичних компаній в Україні. *Вчені записки Таврійського Національного Університету імені В. І. Вернадського.* Серія: Економіка і управління. Том 30 (69). № 1, 2019. – Київ, 2019.

[5] Krasnyuk, M., Hrashchenko, I., Krasniuk, S. & Kustarovskiy, O. (2019). Reengineering of a Logistic Company and its Information System Taking into Account Macroeconomic Crisis. // *Modern Economics*, 13(2019), 141-153. DOI: https://doi.org/10.31521/modecon.V

[6] Yurii Kulynych, Maxim Krasnyuk and Svitlana Krasniuk (2022). Knowledge discovery and data mining of structured and unstructured business data: problems and prospects of implementation and adaptation in crisis conditions. *ГРААЛЬ НАУКИ*, №12-13, квітень 2022. 63-70. https://doi.org/10.36074/grail-of-science.29.04.2022.006

[7] Krasnyuk, M.T., Hrashchenko, I.S., Kustarovskiy, O.D. and Krasniuk, S.O. (2018) Methodology of effective application of Big Data and Data Mining technologies as an important anti-crisis component of the complex policy of logistic business optimization // *Economies' Horizons*, No. 3(6), pp. 121–136, doi: https://doi.org/10.31499/2616-5236.3(6).2018.156317

[8] Kulynych Yu., Krasnyuk M., Tkalenko A., Krasniuk S. (2021). Methodology of Effective Application of Economic-Mathematical Modeling as the Key Component of the Multi-Crisis Adaptive Management. *Modern Economics*, 29(2021), 100-106. DOI: https://doi.org/10.31521/modecon.V29(2021)-16.

[9] Maxim Krasnyuk, Yurii Kulynych and Svitlana Krasniuk (2022) KNOWLEDGE DISCOVERY AND DATA MINING OF STRUCTURED AND UNSTRUCTURED BUSINESS DATA: PROBLEMS AND PROSPECTS OF IMPLEMENTATION AND ADAPTATION IN CRISIS CONDITIONS. *ГРААЛЬ НАУКИ*, №12-13, квітень 2022. 63-70. https://doi.org/10.36074/grail-of-science.29.04.2022.006

[10] Hrashchenko Iryna, Krasnyuk Maxim, Krasniuk Svitlana (2020) ITERATIVE METHODOLOGY OF BANKRUPTCY FORECAST OF LOGISTIC COMPANIES IN EMERGING MARKETS, TAKING INTO ACCOUNT GLOBAL/REGIONAL CRISIS *Збірник наукових праць «Проблеми системного підходу в економіці»*, Випуск 1 (75) / 2020. – С. 138-147. DOI:10.32782/2520-2200/2020-1-43

[11] Kulynych Y., Krasnyuk M., Krasniuk S. (2022) EFFICIENCY OF EVOLUTIONARY ALGORITHMS IN SOLVING OPTIMIZATION PROBLEMS ON THE EXAMPLE OF THE FINTECH INDUSTRY. *ГРААЛЬ НАУКИ*, №14-15, травень 2022. 63-70. https://doi.org/10.36074/grail-of-science.27.05.2022

[12] Krasnyuk, M., & Krasniuk, S. (2020). Comparative characteristics of machine learning for predicative financial modelling. Збірник *наукових праць ΛΌГОΣ*, 55-57. https://doi.org/10.36074/26.06.2020.v1.21

[13] Krasnyuk, M., Tkalenko, A., & Krasniuk, S. (2021). RESULTS OF ANALYSIS OF MACHINE LEARNING PRACTICE FOR TRAINING EFFECTIVE MODEL OF BANKRUPTCY FORECASTING IN EMERGING MARKETS. *Збірник наукових праць ΛΌГОΣ*. https://doi.org/10.36074/logos-09.04.2021.v1.07

