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APPLICATION OF INTELLIGENT TECHNOLOGIES IN ECONOMIC SECURITY SYSTEM OF A BANK

The article explores the key features of implementation of intelligent technologies in banking to create knowledge bases, the possibilities of their applications to develop reference models for banking business processes, as well as the background for further development of situational simulations and information and analytical support to ensure the integrated system of economic security.

Keywords: *knowledge bases; banking business process model; reference model; business process reengineering.*

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ВИКОРИСТАННЯ ІНТЕЛЕКТУАЛЬНИХ ТЕХНОЛОГІЙ В СИСТЕМІ ЕКОНОМІЧНОЇ БЕЗПЕКИ БАНКУ

У статті розглянуто основні особливості впровадження інтелектуальних технологій в діяльність банку для створення баз знань, можливості їх прикладного використання з метою розробки референтних моделей банківських бізнес-процесів, а також передумови подальшого розвитку ситуаційного моделювання та формування інформаційно-аналітичного забезпечення для створення комплексної системи економічної безпеки.

Ключові слова: *бази знань, модель банківських бізнес-процесів, референтна модель, реінжиніринг бізнес-процесів.*
Табл. 1. Літ. 10.

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ИСПОЛЬЗОВАНИЕ ИНТЕЛЛЕКТУАЛЬНЫХ ТЕХНОЛОГИЙ В СИСТЕМЕ ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ БАНКА

В статье рассмотрены основные особенности внедрения интеллектуальных технологий в деятельность банка для создания баз знаний, возможности их прикладного использования для создания референтных моделей банковских бизнес-процессов. А также предпосылки дальнейшего развития ситуационного моделирования и формирования информационно-аналитического обеспечения для создания комплексной системы экономической безопасности

Ключевые слова: *базы знаний, модель банковских процессов, референтная модель, реинжиниринг бизнес-процессов.*

Problem setting. One of the fundamental demands of modern society is the effective use of knowledge and intelligent information technologies gained to create an up-to-date adaptive system of economic security for a bank. The importance of intellectual potential as a marketable intangible asset based on the personnel competence and professionalism, as well as on knowledge and technology standards is rais-

ing rapidly (Moiseeva, 2007). Since the intellectual capacity is a dynamic category involving its ability to manage corporate knowledge, there arises a need to develop an intelligent information system able to gradually accumulate, store and organise information, building up an effective 'knowledge base' and transforming it into the bank intellectual capital. Such systematisation might not only improve the efficiency of bank's performance but would contribute to strengthening its economic security significantly.

Latest research and publications analysis. An academic interest to the issues of intelligent technologies application increases with the development of information society. Scientists investigate the social, technological and economic aspects of intelligent technologies and systems design, as well as the possibilities of their application in various areas. A number of authors, in particular (Abdikeeva, 2002; Andreichikova, 2004; Pavlov, 2011; Moiseenko, 2009; Shapiro) refer to the issues of evolution and use of intelligent technologies in information systems.

Unresolved issues. Today, the increased competition in the banking sector necessitates new research on intelligent technologies applications to build up a competence-related 'knowledge base' within the bank staff in the overall economic security framework.

The research objective is structuring of the current information technologies available to create knowledge management systems, as well as defining intelligent technologies as a key element of information and analytical support for the modern system of economic security in a bank.

Key research findings. The intellectual capital of any commercial bank is the most valuable, highly efficient and mobile type of capital. Knowledge management and intellectual capital raising are based on the application of intelligent systems, information technologies and resources, which in turn facilitates high labile level of the bank's economic security. Basic directions of building up a knowledge management system are presented in Table 1.

Table 1. **A structure of knowledge management system in a bank***

Knowledge management subsystem	Basic components
Information technologies for knowledge accumulation	- distributed knowledge and data bases which accumulate knowledge across diverse areas; - digital libraries for information, knowledge and technology.
Information technologies for knowledge processing	- computer-based group work arrangement or corporate information system focused on building up and making use of shared knowledge by the company staff; - geoinformation systems applied for process and event simulations; - classic search technology applied for retrieval of reference and background information on various contemporary issues; - information and analytical systems, expert and analytical systems, engineering and design systems and others aimed at increasing the scale of information access tailored to company needs; - new search engines and information technology focused on integrating analytical processing of distributed information under probable uncertainty.
Information technologies for knowledge dissemination	- Internet networks based on the modern standards of data transmission. - distance learning systems for business education (webinars, video lessons, case studies).

* developed with reference to Uskos and Kuzmin (2004), Martyniuk (2011), Shapiro (2012).

One of the most important areas in raising the intellectual capacity of a bank is a system of knowledge dissemination, since not only its accumulation but their effective use is crucial to enhance the bank's economic security. This implies the bank's need for continuous personnel training and development, as well as designing a system of information and analytical support to maintain economic security. In this regard we therefore propose to build up a model of information and analytical support able to meet modern requirements and standards, based on the principles of consistency, integration and reliability (Martyniuk, 2011).

Building and developing a bank's economic security system might involve a number of various methods, the most efficient of them, to our opinion, is the design of analytical and synthetic models of banking business process.

"A model of banking business process" is an information object which establishes relationships between the elements of a bank's business model and specifies the sequence of functions, operations and actions under the interaction of its discrete elements.

The functional relevance of business environment identifies 4 basic trends in building business models subject to the key management systems: strategic management, business process management, organisational structure and personnel management and quality management (Uskos and Kuzmin, 2004).

A number of pilot applications of the information and analytical model, based on the "Software AG & IDS Scheer" software tools, acknowledged its high adaptivity while using it at different simulation levels.

A reference (generic) model is a synthesis of the best descriptions (documents, patterns, decisions, practices) of a discrete object given its specific features. The role of an object might be attributed to the overall bank performance, its subdivision activity, business process, management of economic security system etc.

A reference model facilitates to accumulate and organise knowledge and experience in a bank or in the banking sector in general. In other words, this makes a specific knowledge base.

It is worth mentioning that a reference model is not universal, i.e. not the one to be applied in an equally efficient way to all the banks, objectives and cases. A reference model might comprise universal components (such as a specification of reference indices for a bank's business processes), as well as the specific ones (e.g., a business process model for the "Deposit policy management"). When covering the major areas of banking operations a bank reference model is called a composite model (Martyniuk, 2011).

To maintain optimisation and automation of the bank deposit business process reengineering a reference model for the "Deposit operation" with setting up the criteria for the functional and cost analysis has been developed. Reengineering of the entire deposit bank policy has also been accomplished. A number of pilot applications to implement the information and analytical model based on the "Software AG & IDS Scheer" software have been delivered.

The information and analytical system developed is a set of methodology and tools which enable to use the most maintainable instruments to build up BPM (Business Process Management) systems for a discrete bank, to a great extent simplify and speed up the implementation of a business process approach, mitigate various

risks (technological, financial, transactional), and optimise the system of the bank's economic security. The principal value of AIS (Automatic Information System) is that the implementation of the bank business requirements is held within the framework of an integrated management model by way of harmonisation of the individual managerial and analytical techniques with the use of customised IT instruments (Masura and Shapiro, 1999; Shapiro, 2012). For the successful integration of the IBPM system into the bank information infrastructure a search for optimal IT solutions should be perceived as a key factor for a bank.

Pilot applications evidenced that the program modules of IBPM Studio allow not only successfully implement the analytical system of the balanced evaluation indicators but also bind it to the bank organisational process structure, its current knowledge bases, as well as the entire bank's information platform.

Conclusion. Analysis of the intelligent information technology applications in the decision-making support systems revealed the absence of their strategic use for managing the "effective decision-making" processes. Thus, the following objectives remain paramount, in particular, identification of major controversies in creation of knowledge bases, determining the directions of their further development, management of learning process and their use in building up an effective system of the bank's economic security.

The use of modern information technology tools to a certain extent enables resolving a number of methodological and procedural problems under the information and analytical support design, building up integrated reference models, as well as specifying the key parameters for the bank's economic security system simulation (Moiseenko, 2007).

Application of the IBPM Studio software products enhances maintenance of the business process simulations at each of the hierarchy level, as well as monitoring their performance effectiveness. In the process of imitation modelling cost analysis, resource utilisation analysis, analysis of the existence of information gaps, process semantics analysis, process quality analysis have been delivered supported by the current information systems, which enables mobile analysis of the causes of deviations from the planned indicators, establishing compliance with the requirements, standards and regulations, and also creating a multifunctional information and analytical support for the bank's economic security system.

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