

UDC 657

JEL: M15, P11

**Ratushna N.L.,**

*PhD in economics, associate professor of the Department of Accounting SHEE "Kyiv National Economic University named after Vadym Hetman"*

## DEVELOPMENT AND DEPLOYMENT OF INTEGRATED MONITORING SYSTEMS: EXPERIENCE OF KOREAN COMPANIES

**Lozovik Y.M.,**

*PhD in Economics, Associate Professor of the Department of Strategy of Enterprises, SHEE "Kyiv National Economic University named after Vadym Hetman"*

- A** Market trends of business analytics were analyzed. The most popular business intelligence instruments were discovered, as well as their strengths and weaknesses, including application in a practice of foreign companies. Possibilities of application of monitoring indexes in a practice of trade companies were identified. The system of monitoring indexes was proposed for a trading company environment. Organization mechanism of monitoring system was described for domestic companies.
- K** Economic monitoring, integrated monitoring systems, Oracle BI, IBM Cognos, business intelligence.

### РОЗРОБКА ТА ВПРОВАДЖЕННЯ ІНТЕГРОВАНИХ СИСТЕМ МОНІТОРИНГУ НА ПІДПРИЄМСТВАХ: ДОСВІД КОРЕЙСЬКИХ КОМПАНІЙ

**Ратушна Н.Л.,**

*к.е.н., доцент кафедри бухгалтерського обліку ДВНЗ «Київський національний економічний університет імені Вадима Гетьмана»*

**Лозовик Ю.М.,**

*к.е.н., доцент кафедри стратегії підприємств ДВНЗ «Київський національний економічний університет імені Вадима Гетьмана»*

- A** Проаналізовані тенденції розвитку ринку бізнес-аналітики. Розглянуті переваги та недоліки найбільш розповсюджених програмних продуктів із бізнес-аналітики, що використовуються у практиці іноземних компаній. Визначені можливості застосування моніторингових показників для торговельних компаній. Запропоновано систему показників для проведення моніторингу середовища торговельного підприємства. Описані організаційні механізми забезпечення нової моніторингової системи на вітчизняних підприємствах.
- K** Економічний моніторинг, інтегровані системи моніторингу, Oracle BI, IBM Cognos, бізнес-аналітика.

### РАЗРАБОТКА И ВНЕДРЕНИЕ ИНТЕГРИРОВАННЫХ СИСТЕМ МОНИТОРИНГА НА ПРЕДПРИЯТИЯХ: ОПЫТ КОРЕЙСКИХ КОМПАНИЙ

**Ратушна Н.Л.,**

*к.э.н., доцент кафедры бухгалтерского учета ГВУЗ «Киевский национальный экономический университет имени Вадима Гетьмана»*

**Лозовик Ю.Н.,**

*к.э.н., доцент кафедры стратегии предприятий ГВУЗ «Киевский национальный экономический университет имени Вадима Гетьмана»*

- A** Проведен анализ тенденций развития рынка бизнес-аналитики. Рассмотрены преимущества и недостатки наиболее распространенных программных продуктов по бизнес-аналитике, которые используются в практике иностранных компаний. Определены возможности использования мониторинговых показателей для торговых компаний. Предложена система показателей для проведения мониторинга среды торгового предприятия. Описаны организационные механизмы обеспечения новой мониторинговой системы на отечественных предприятиях.
- K** Экономический мониторинг, интегрированные системы мониторинга, Oracle BI, IBM Cognos, бизнес-аналитика.

#### Problem definition

The tasks of acquisition of operational information, which is important for a company, recognition of its existing and potential problems, development of effective mechanisms of its resolution as well as preventive aims of counteraction, using monitoring technologies in a company are quite important and actual, since it identifies the possibility of company management to react to changes in business environment.

Exactly these tasks are forming an interest of domestic companies to develop new or to improve existing analytical monitoring systems as well as its effective usage in operational management. There is a need in a summarized (integrated) concept, which could involve the whole branch of business economics knowledge, but not its separate elements or fragments.

Thus, the economical monitoring should be realized at a united methodological and instrumental framework.

### Analysis of recent publications and unsolved aspects of community encountered problems

The modern trends of market in business analytics are foreseeing a transfer of BAM (business activity monitoring), CPM (corporate performance monitoring), CPI (continuous process improvement), BPI (business process intelligence) to the business management based on a concepts of business intelligence.

We should also bear in mind, that there is a certain contradiction in a translation of the term “Business Intelligence”. The English word “Intelligence” has a multiple meaning: knowledge transferred or obtained during a study, research or experience; a possibility to perceive; a readability to understand; an action or a status in a process of perception; intelligence or intelligence data. This fact creates a new problem of core understanding of the term “Business Intelligence”, which is quite often considered as the term “Intellectual Data Analysis” or as a term “Business Intellect”. Due to this fact, we use in this article an initial, English variant of Business Intelligence.

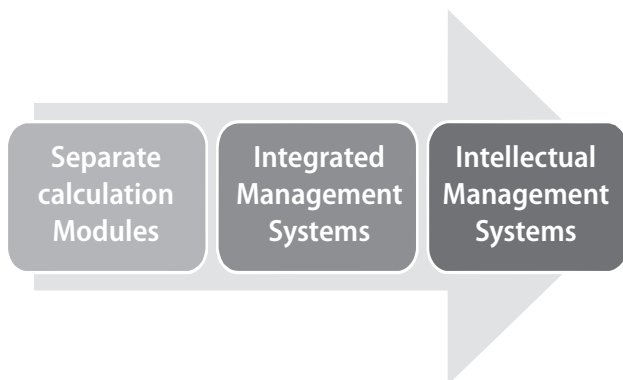


Fig. 1. EVOLUTION OF BUSINESS MONITORING SYSTEMS

At a current stage of society development, having information technologies in many spheres, we can see a development of intellectual systems, usage of cognitive methods and instruments of work with databases, building of business analytic systems, development of a software as well as determination of other important tasks.

Similar tasks are already under attention of many domestic and foreign scientists: Abdikeev N., Averkin A., Barsegyan A., Beniaminov E., Grinberg A., Emelyanova N., Korol I., Kupriyanov M., Oreshkov V., Paklin N., Partika T., Romanov V., Samoylenko A., Spirli E., Stepanenko V., Telnov Y., Holod I. [1-7]

Methodology and instruments of monitoring execution for production statuses at a level of operational planning, in contrast to strategic and tactical levels, are better developed and quite good described in a scientific and practical literature. This is due to fact, that

business tasks at a level of operational planning could much easier be formalized and estimated with quantitative figures. At a level of strategic and tactical planning, a monitoring itself could be realized only based on unclear and inexact information. It initiates a constant demand searching new approaches to methodology and its improvement, as well as to development of new methods and methodic in business monitoring.

### Goal of the article

Generalization and systematization of information for a development of business monitoring system. To do this, the following tasks should be solved: quantitative and structure ordering of monitoring department, estimation of existing software (database architecture development, interface development, development of instruments and business logic), technical parameters (servers, data- and knowledge bases, integration to other departments), informational security etc.

### The main research material

Building of integrated system of economic monitoring involves different knowledge branches and demands coordinated work of cross-functional specialists: database architects, software developers, business analytics, specialists of mathematical modelling and artificial intelligence specialists.

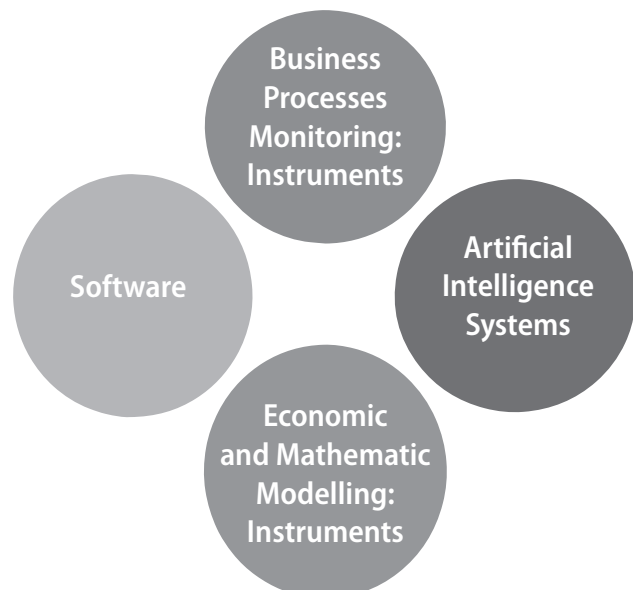


Fig. 2. INSTRUMENTS OF INTEGRATED MONITORING SYSTEMS

Potentially, there is a constant choice in front of monitoring department staff: whether to integrate own monitoring systems to a common management system of a company, or to use already existing software products. We should also bear in mind, that the most of existing software products are not oriented to integration into common business management system. At the same

time, most of products are quite flexible in working with different databases, knowledge bases, and are able to execute different calculations and to build reports.

In particular, an especial attention should be given to products of Oracle, which is leading the market of business software. Oracle Corp. owns a bulk of intellectual assets, in particular, Java, which is considered nowadays as one of the best tool to create client-server technologies. Among that, Oracle develops different databases as well as libraries. One of the best products for a business analytics is the program package BI (Business Intelligence), which is a ready constructor, allowing executing different operations with data and includes a big quantity of libraries and graphics tools. To adopt such a product to needs of a concrete company, there is a need in special knowledge, in particular: database skills, SQL skills, UML, skills in XML and HTML. Main advantage of BI complex is a possibility to work with any databases and a big quantity of graphical interfaces. Cost of software varies depending on quantity of net users and a package selected (libraries quantity).

Main disadvantageous of such complex – BI – could be summarized in a following way:

- The big cost of purchase and yearly payment (license) for software and servers, depending on quantity of users;

- Absence of possibility to change a source code or interface

The main analog of described software complex is IM Cognos – business analytic software to work with Big Data.

The outcomes indicators of company functioning as well as business environment are loading into intermediate depository of structured data. The data load is realized by a special part of software – Cognos Data Management. Next stage is building intermediate data depositories in data cubes – OLAP, resulting tables and indicators. To support these databases, there is a need in a specialize administrators. To execute requests and reporting tables there is a need in a business analytic staff, having deep knowledge in different databases (Oracle, DB2, MySQL), SQL itself, HTML, XML and Java. Business analysts work with a technologies of query and data visualization – a tool called Business Intelligence and Financial Management. The most spread module is a Report Studio. The main software components are Reporting Application, List Report, Filter, Crosstab, Data Graphically, Prompts, Calculation, Maps, Statistical report, Report Building.

For a successful work with different modules of Cognos a special IBM training and certification are needed, which is usually provided by teaching centers of IBM. At the same time, IBM covers a possibility to use own server technologies.

A software complex Cognos is aimed to answer questions:

1. What is a nowadays status?
2. What are the reasons of changes in targets?
3. What is considered to be changed?

The executed analysis of software products by Oracle and IBM allows concluding, that these complexes are ready to use constructors for data management and visualization. The main problem is the absence of instruments for a monitoring of business environment.

Nowadays, we can observe a big quantity of business analytic system, deployed in operational work in foreign companies. Due to data security, many systems in companies are internal, having own requirements to hosting and usage. At the same time, internal system provides certain flexibility in code, functions and interface changes. Modern analytical systems cover different areas if business operations: finance and budget management, taxation, staff operation, approval and early warning systems. Some of internal systems are considered like the best in a world practice – for example, Supply Chain Management system by Samsung Electronics. Demand management, based on market sensing, could improve production synchronization and increase accuracy of planning, influencing cost of goods produced.

In fact, some Korean companies, which operate in unstable environment in Ukraine, were first to take some actions and to initiate business environment monitoring. Monitoring creates big data, which is followed by a special internal analytics. In such cases companies use own analytic resources and outsourced data gathering resources. For example, at LG Electronics Ukraine, monitoring function has been realized by execution of separate monitoring of retail prices, quantity and quality of display, promotions, sell-out of products, out of stock indexes as well as partner stock parameters.

Sometimes, certain reporting data show a situation, that 80% of sales are made by 5 models, displayed in a brand zone. At the same time only 20% of volumes are made by 50 other models displayed. Reporting forms of such indicators are kept unlinked and in different databases.

In previous periods, cancellation of retail sensing services, provided by analytic company, giving not correct information as well as wrong KPIs lead to ineffective operations and segment market share decrease in 2003-2008.

To solve a problem, main attention of a company should be given to correct market segmentation as well as to better understanding of key end users. At the same time, special analytical skills are needed to work with information and new approaches to identify factors, influencing target KPIs fluctuation.

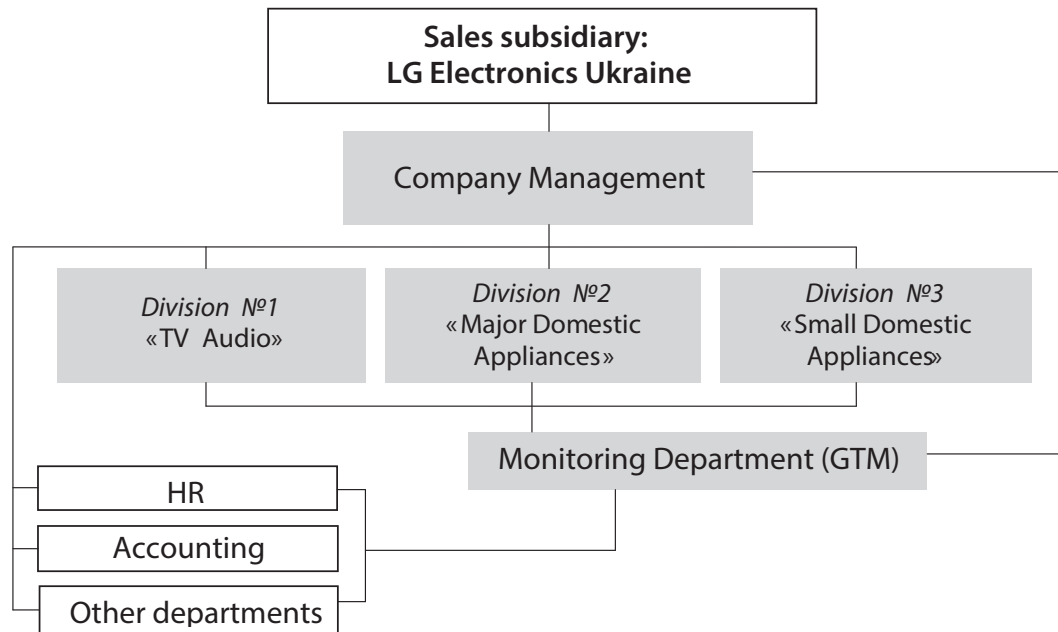


Fig. 3. BUSINESS MONITORING FUNCTION IN LG ELECTRONICS UKRAINE

Among analytical skills, a time itself is becoming more crucial factor. The possibility to use information properly and effectively until company owns information monopolistic is becoming more important. A time could be very short, and this identifies an effectiveness and timeliness of business reaction to competitors' actions.

Mistakes by forecasting (overestimation or underestimation) of transfer and sales volumes can be identified based on signals from a recognition of big deviations from a sales trend, in particular – appearance of overstocks or out of stock situations. To do this there is a need in monitoring of main market players based on dynamics in:

- Fact product presence in channels
- Turnover of stocks
- Retail and wholesale prices and it deviations
- Service and marketing spending

In a case of overstock and decrease of stocks turnover appears stock and cost problem. There could be different reasons of overstock situation:

- Too high prices in comparison to analogues or substitutes
- Absence of new models
- New products presented by competitors
- New companies at market, having lower costs
- Active marketing spending by competitors
- Mistakes by planning

Another situation - is out of stock or products deficit, initiating increase of substitute or competitive volumes.

One of the very important things in a competitive environment is to identify a correct pricing strategy. Main well known rules could be described in a following way:

1. At markets with big stocks a strategy should foresee price decrease or marketing and service spending increase. Though, too big price decrease could lead to volumes decrease, since there will be no trust to a brand power.

2. If price is too high, consumers could loose an interest to a product, minimizing market demand [6, 81-82]

Main task at a stage of products sales is differentiation of promotions based on:

- Quality in service
- Development of own dealers network
- Correct commercial and financial policy

An effective usage of these factors allows demand increase, which, in fact, does not lead to profit increase. Initially, these working factors increases profit; later – lead to profit decrease. Having too big spending on these non-pricing factors, we could exceed gross profit, leading company to loss. So, there is a task of effective balancing of promotional spending and sales goals.

Quite important is also company interaction with retail and wholesale companies, independent dealers, agents and end users. Companies act like product suppliers, so, are responsible for in time supply to retail chains according to contracts. Of course, bearing in mind any unforeseen situations, in particular: absence of delivery, delay in transfer, bad quality (assortment or defect).

It can influence work results of sales companies – volumes decrease, sales profitability decrease. Production companies should, as usual, cover expenses for defect or assortment problems and almost all other expenses.

Among that, to guarantee a better service for customers (bad products return, repairs and technical problems solving) there is a need to invest into service centers. To



secure a potential loses and minimize risks, there is a usual agreement part included, regulating responsibility.

To avoid possible resources and time loss at a company level could be created a special knowledge and data base about trading companies, noticing all possible violations as for payments, advertisement and quality of services provided. A special ranking could help to avoid in a future such possible loses.

So, the decision as for necessity of implementation of total or selected monitoring of key performance indexes is the subject of interest in many companies. For example, a production and sales company is selling mobile devices at domestic market. The quantity of trading (retail) companies involved is quite big and it is quite hard to monitor all possible segment and changes at business environment. In general, such tasks could be effectively solved, but with quite big and maybe ineffective investments.

There is an alternative approach. Using it, companies focus their attention at the most important (key) segments. Based on these segments analysis companies can forecast an overall market situation. Such approach is quite risky due to fact that due to wrong identification of key segments companies may lose.

The big importance for company has a fact of extraction of analytical department of operational monitoring into a separate function (department) to guarantee in time information gathering as well as its correct calculations and interpretation, preparing an easy to use kind of data. In another case, an involvement of other departments staff into a monitoring process (projects, programs and plans), could lead to some misuse, grounding a not qualitative control of operational activity and results.

Among other functions, monitoring department should guarantee operational information for line management as for current market situation, estimation of

KPIs deviation and qualitative estimation of normative parameters. Executing these functions, a monitoring department can not interfere activities of line departments, executing any recommendation functions. In a case of necessity analysts could execute a detailed and independence analysis to overcome, for example, crisis periods. Thanks to in time analytic information delivery line managers can react immediately, driving department activities to reach goals effectively.

### Conclusions

Analysis of modern trends at the market of business analytics indicates overall shifting trend: transfer from integrated monitoring systems to business intelligence systems.

The main advantage of Oracle BI and IBM Cognos products is a possibility to connect to any kind of existing databases, guaranteeing big quantity of graphical interfaces. The main disadvantage is the absence of mechanics to execute monitoring of main indexes and processes. It creates an interest at companies' level to improve existing and create new methods and models of business analysis.

Analysis of monitoring systems of Samsung and LG sales subsidiaries in Ukraine shows that these companies tend to selected monitoring. It confirms a situation that companies cannot guarantee overall coverage of appliances market in Ukraine in 2014.

Some troubles are identified, revealing disadvantages of current monitoring systems, build by Korean companies in Ukraine. There were some approaches proposed, to develop an independent level of monitoring function (department).

Further researches for this problem should be connected with a development of mathematic methods to identify normative and goal values as well as creation of complex monitoring indexes.

1. *Abdykeev N.M.* Projection of intellectual systems in economy. M.: Ekzamen, 2004. 528.
2. *Artem'ev V.I.* What is Business Intelligence? [Online], available at: <http://www.osp.ru/os/2003/04/182900/>
3. *Венятынов Е.М.* Algebra methods in a theory of databases and knowledge presentation. M.: Nauchnyj Mir, 2003. 184.
4. *Romanov V.P., Abdykeev N.M. and Averkin A.N.* Cognitive business analytics: Textbook. M.: YNFRA-M, 2011. 511.
5. *Romanov V.P., Partyka T.L. and Emeljanova N.Z.* Projection of economic informational systems: methodology and modern technologies. M: Ekzamen, 2005. 256.
6. *Lozovyk Ju.M., and Gal'perina L.P.* Production practice. Training for students. International Economy 6.030503 – Mizhnarodna ekonomika. K: KNEU, 2014. 135. ISBN 978-978-966-483-950-8.
7. *Paklyn N.B., and Oreshkov V.Y.* Business analytics: from data to analytics. SPb.: Pyter, 2009. 624

1. *Абдикеев Н.М.* Проектирование интеллектуальных систем в экономике / Н.М. Абдикеев. – М.: Экзамен, 2004. – с. 528.
2. *Артемьев В.И.* Что такое Business Intelligence? / В. Артемьев // Открытые системы. – № 04, 2003. – Режим доступа: <http://www.osp.ru/os/2003/04/182900/>.
3. *Бениаминов Е.М.* Алгебраические методы в теории баз данных и представлении знаний / Бениаминов Е.М. – М.: Научный мир, 2003 – 184 с.
4. *Романов В.П.* Когнитивная бизнес-аналитика: учебник / Романов В.П., Абдикеев Н.М., Аверкин А.Н. – М.: ИНФРА-М, 2011 г. – с. 511.
5. *Романов В.П.* Проектирование экономических информационных систем: методология и современные технологии / Романов В.П., Партыка Т.Л., Емельянова Н.З. – Уч. пос. – М: Экзамен, 2005 г. – с.256.
6. *Лозовик Ю.М., Гальперина Л.П.* Виробнича практика. Тренінг для студентів напряму підготовки 6.030503 – Міжнародна економіка / Юрій Миколайович Лозовик, Любов Павлівна Гальперіна. – К.: КНЕУ, 2014. – 135 с. – ISBN 978-978-966-483-950-8.
7. *Паклин Н.Б.* Бизнес-аналитика: от данных к знаниям / Паклин Н.Б., Орешков В.И. – СПб.: Питер, 2009. – 624 с.

Submitted: 29.05.2015