

## **I. CURRENT ECONOMIC PROBLEMS**

### **I. АКТУАЛЬНЫЕ ЭКОНОМИЧЕСКИЕ ПРОБЛЕМЫ**

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#### **AUTOMATION OF MANAGEMENT REPORTING BY MEANS OF BUSINESS INTELLIGENCE**

***Abstract:** With the growth of volumes and types of data that are accumulated in various information systems of large companies, a rather serious need arises to improve the means of processing statistical data. To automate the reporting that underlies management decision-making, the use of Business Intelligence tools is proposed.*

***Keywords:** Big data, business intelligence, OLAP, data warehousing, decision-making.*

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#### **АВТОМАТИЗАЦИЯ УПРАВЛЕНЧЕСКОЙ ОТЧЕТНОСТИ С ПОМОЩЬЮ СРЕДСТВ BUSINESS INTELLIGENCE**

***Аннотация:** С ростом объемов и типов данных, которые накапливаются в различных информационных системах крупных компаний, возникает достаточно*

*серьезная потребность в совершенствовании средств обработки статистических данных. В целях автоматизации отчетности, на основе которой принимаются управленческие решения, предлагается использование средств Business Intelligence.*

**Ключевые слова:** *Большие данные, бизнес-анализ, OLAP, хранилища данных, принятие решений.*

A significant role in managing the organization is information. The need to adapt to the changing external and internal environment makes the effective use of management reporting an important condition for doing the business.

The goal of the data analysis process is to transform raw data into business-friendly knowledge. Thanks to this, the company's management can quickly receive accurate and up-to-date information about the company's activities and make management decisions on its basis. Therefore, the company allocates funds for automation, acquires accounting information systems and hires analysts whose responsibilities include reporting. Theoretically, after the introduction of a number of corporate information systems the manager will be able to quickly receive a summary of the state of affairs of the company, but in practice, it turns out that this information may be contradictory or reflect only a part of the overall picture.

There are several reasons for the low efficiency of management reporting to be considered:

1. High labor costs for the preparation of reports.

A complete analysis of the data in the accounting system is impossible due to the lack of the necessary functionality. Therefore, manual processing is required to create reports that would be visual for making management decisions. Often large organizations use several corporate information systems, for example, for accounting for various types of business. To combine information from all databases third-party programs creating summary reports have to be applied.

- 2) Data inconsistency.

The structural units of one large enterprise form their own reporting packages. The composition of the indicators in the reports can be the same, but calculated differently, because employees use their own unique calculation methods.

3) Data does not comply with the principle of timeliness.

The process of delivering a report to the leader can consist of many links, each of which is fraught with delays.

4) Inaccurate data.

Employees who generate summary reports are not always interested in the transparency of the process. The low level of formalization allows them to indicate distorted data in the reporting intentionally. This way the decision maker does not receive reliable information about the current state of the business.

The most promising way to increase the effectiveness of information for making management decisions is to use Business Intelligence (BI) tools. In a broad sense, the term «business intelligence» is a combination of technologies, software and practices aimed at achieving business goals through the best use of existing data [1].

Business intelligence software (Business Intelligence tools) is able to consolidate data from various sources (other information systems, databases, individual files), process and visualize the results, presenting them in an understandable form: visual graphs, charts, information panels.

The main features of modern class BI systems are divided into four categories: data storage, data integration, data analysis, presentation of data.

*Data storage.*

Data for business analysis are placed in the Data Warehouse (DWH). Information about the company's activities is consolidated from disparate accounting systems and structured in an optimal way for better analysis and fulfillment of requests.

*Data Integration.*

The source data are located in sources of various types and formats, while it must be converted into a single universal format that supports the data warehouse to solve business analysis problems [2]. In order to prevent this problem, ETL-tools (Extraction, Transformation, Load) are used to extract and integrate data between transactional

systems in BI solutions. These tools are designed to extract data, convert it to a specific format, and upload it to the data warehouse.

#### *Data analysis.*

For complex data analysis in BI systems, OLAP technology is used (Online Analytical Data Processing). The main idea of this technology is to build multidimensional tables that users can access using queries. Multidimensional tables are formed from the original data arrays, which are aggregated and structured in a certain way, forming an OLAP-cube. Multidimensional OLAP-cubes allow you to analyze data in real time and generate reports in various sections and at any depth of detail [3].

Modern BI systems also contain Data Mining blocks. Data Mining tools allow to build mathematical and simulation models of the company's business processes and predict certain events.

#### *Presentation of data.*

Advanced visualization is one of the distinguishing features of Business Intelligence tools. Instead of ordinary tables with columns and rows, data is presented in the visual form using a variety of interactive images, infographics and diagrams.

Thus, BI solutions are quite versatile and can solve many problems. They contribute to the improvement of an organization; provide monitoring, forecasting, as well as analysis, collection and processing of information [4].

The benefits of using a BI solution are obvious. Firstly, due to the automated extraction of data from accounting systems and their subsequent transformation, the time for preparing data for analysis will be reduced, which will lead to an increase in the speed of making managerial decisions.

Secondly, the efficiency of the data analysis process itself will increase. The use of properly structured reporting throughout the company will reduce the time to search for and eliminate inconsistencies and errors that are inevitable with manual data processing.

The use of Business Intelligence tools will optimize the current business process, minimizing the effort involved in reporting and improving the quality of management information support.

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