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ORIGIN, DEVELOPMENT AND PROBLEMS
OF INFORMATION TECHNOLOGY ENTERPRISE MANAGEMENT

Abstract. *Modern enterprise information management systems are imperfect. They consist of many subsystems that need to be coordinated with each other. Changes in one area should be reflected in the other subsystems. All subsystems must adapt to changes in each of them. This is the scientific perspective. The purpose of the article – to analyse the existing information technology and systems of enterprise management. The article deals with the history of the development of information technology and systems of enterprise management. Highlighted the problems of information technologies and systems. The following problems are identified: 1) the plurality of control systems due to the differentiation of management tasks and development tasks for each group of relevant information technology; 2) the technical complexity of integrating separate technologies (individual products) to a single system; 3) the methodological complexity of integration. Methodological principles of integration of individual subsystems into a single system are proposed. These are the following principles: comprehensive integration, synergy, adaptability to changes in the methodology of the individual subsystems, robustness of the system, using the knowledge base of a unified information system for the implementation of the above mentioned principles. Define further directions of the development of the topic.*

Keywords: information technology; enterprise management; adaptability

Introduction

Modern information technologies of business management are strongly differentiated. There are many management systems that solve certain tasks. This raises the problem of integration of these technologies into (a single) whole set of information management. During integration occur problems that associated with the specifics of the enterprise and its project activity. These problems will be discussed in the article in the light of start up and development of information technology enterprises management as well as the principles of their solutions.

Goal and tasks of publication

The article deals with the evolution and diversity of enterprise management systems. A trend towards the integration of subsystems into a single management system will be described. The problems of integration will be also highlighted. Will be formulated the principles on which the proposed doing of the integration.

Basic material article

Modern management organizations (companies, institutions, companies, etc) systems are using information technologies for increasing efficiency in all areas of its activity. Project oriented organizations have to go to a new management level that requires the integration and coherence in planning, implementing and adjusting managerial influences. These design-focused information technologies should interact with technology management operations, which appeared in the computer age and make strong foundation for organizational development. Let's analyze them.

In the 1960's Information Technology and related production information system were in progress. During this period computers were using for solving organizational and economic management of enterprises. Such systems are called automated control systems and foreign literature data systems - data processing system. In the 1980s was formed division of systems for automated management of enterprises dealing with the organizational system, automated process control systems, concerning the technological system, and computer-aided design that were more similar to first one. Further differentiation of information technologies and systems become even deeper, and the difference between them more blurred. However, we can identify two main areas of development technology and automation systems and organizational performance technologies and systems automation (technology) activities. In case the first systems were more versatile on the application (organizational or business), the second (technological) were tied to the contrary subject area, which used – ACS(automation control systems) for food industry, steel plant control system, control system construction, etc [3].

However, the last trend of the differentiation trend information systems changed their integration to create a unified information system management. In this context, integration levels and APCS CAM data exchange through technological level and the level of

enterprises systems raises complex scientific and practical problems.

Information technology management technological objects in real time were used for process automation and translated into operational management systems (MES-system) monitoring systems and the account of power systems of immediate dispatching management, process control systems and integrated complex, which may include several components. Any of these systems were developed for a specific class of users - from senior executive officers to ordinary specialists, and thus it provides them with the information needed to address the strategic, tactical and operational objectives.

Notable among information technology management technological objects in real time system takes MES (Manufacturing Execution Systems). MES is unique because it is the link between targeted financial and enterprises operations ERP-systems and operational activities on the plant level, station or line.

Using data levels of planning and controlling, MES-systems control the current production activity in accordance with the orders, requirements design and technological documentation of actual condition of the equipment to ensure maximum efficiency and minimum cost performance of production processes. MES-systems work exclusively with the production of information, can adjust or completely transfer the plan during the work shift as many times as necessary. Remodeling can be done only once a day in ERP-systems because the large amount of administrative and accounting and financial information does not provide direct impact on process.

MES-systems are able to optimize manufacturing and make it more cost-effective due to quick reaction to events and application of mathematical methods compensation of deviations from targets. They also implement communication in real-time manufacturing processes with business processes and improve financial performance, including higher return assets, accelerating the turnover of funds, reduce the cost, time delivery, improve profit margins and productivity.

In addition, these systems form data on current terms (including the real cost of production) necessarily for the better functioning of ERP-systems.

There are main following objectives before MES-systems in discrete manufacturing:

− operational planning and dispatching processes;

− financial analysis of costs pursuant processes;

− rapid redevelopment considering the current state of the manufacturing.

Technology HR (Human Resource Management, HRM). HRM-system is divided into "estimated", "accounting" and the system of labor administration by levels of automation control personnel that meet the

stages of development of application software solutions for personnel services. Full-featured HRM-systems, respectively, include "an outline", "current path", "HR-circuit" and the function generating reports.

Today there are three levels of automation of HR, payroll automation, automation of personnel management and workforce management automation.

Supply chain management, SCM. The term "supply chain management" was introduced for the first time in 1982 by consultant Booz Allen Hamilton Keith Oliver and in the 1990s, widespread, particularly embodied in information systems that implement the technology SCM. Such systems were evolutionized to systems application service provider (ASP), actively developed in 1998-2003., which later in 2003-2006. have changed the system based on-demand model. Now the technology supply chain management model based on software as a service (SaaS) [9].

Technology Supply chain management involves the management of the following components [7]:

− reduce costs throughout the supply chain, increased efficiency and the elimination of bottlenecks in the chain;

− planning and managing of all types of organizations in finding, purchasing, processing materials and delivery of products, proposition management, which includes coordination and collaboration with suppliers, intermediaries and customers;

− management of value-added materials, goods and related information between suppliers, production companies, resellers and consumers;

− integration of key business processes across the supply chain for creating value for customers and stakeholders;

− systematic and strategic coordination of business processes within the supply of a particular company and all related activities of the organization in order to improve long-term performance and supply chain organization.

Now technology Supply chain management is an integrated technology in the ERP [16], although sometimes it is implemented as separate software product. Research on supply chain management are included to the scientific field of logistics.

Technology MIS (Management Information System) – is a type of enterprises automation systems that integrate and summarize the strategy adopted in the framework of the conception or the information necessary for making management decisions.

The system of customer relationship management (CRM) – is a Corporative Information System (independent or a member of the ERP-system), which is aimed on improving customer relationships. Mechanisms of CRM implementation include gathering

information about customers, storage and analysis of the history of relations with these customers to optimize business processes of customer relationships [5].

Information about the client and his preferences is used to focus particular customer suggestions to increase the likelihood of their tolerance to the product (the project). For large-scale projects and large organizations CRM-system only effective based on the use of appropriate information technologies [2].

CRM-system features (modules) are classified functionality and levels of information processing. By the functionality they can be grouped into blocks of processes: marketing, processing of applications and requests, sales, service [11; 12].

The basic CRM functionality includes marketing subsystem, processing subsystem applications customers, the sales subsystem, subsystem service.

CRM-system implement these functions according to the Center for the Study of Information Technology and the University of California organizations [8]:

− managing contacts with customers – updating customer information, the preservation of the history of contacts;

− management of employees interacting with customers;

− exchange management information with customers;

− forecasting customer behavior;

− opportunity management – management motivating factor to attract potential customers;

− order management;

− document management;

− analysis of sales;

− storage of information on alternative products and their price characteristics;

− structuring knowledge – information about products, prices, promotions, studies of market segments or individual customers.

Technology of Business Process Reengineering (BPR). Starting in the 1990s the technology development and optimization of administrative processes in the field of management has gained great popularity. The main thrust of such technologies – minimizing the time of realization of processes, reducing the cost of the process, eliminating duplication of functions, restore the missing features [1, 4, 6]. Technology of reengineering business processes is implemented in software products BPWin, Bizagy, ARIS, and others.

ERP. In the early 90-s. analyst firm Gartner Group introduced the concept of Enterprise Resource Planning – ERP. In such systems accounting and financial component is included [15].

At the heart of ERP-systems is the principle of creating a common data repository containing all the corporate enterprises information: the planned, financial, manufacturing, data on personnel and others. The presence of a single corporate repository eliminates the need to transfer data from one subsystem to another. This system also provides simultaneous access to information for any number of company employees with relevant authorities. The purpose of ERP-systems is not only to improve the management of production activities of the enterprise, but also reducing the cost and effort to support its internal information flows. [17] Among the most common EPR there is Oracle business suite, SAP R3, 1C.

Recently has acquired urgency of Business Intelligence, which provide analytical processing of incoming information management and generation of options for management decisions for the consideration of the head. They are decision support systems with intellectual component [10].

Among all the variety of information technology and enterprise management systems, there are two groups of them – the subject field of the control system (process automation systems), and enterprise management systems (organizational automation systems). In recent decades, the institutional system, select a project management system [14].

Thus we can identify the following problems of information technology enterprise management:

1. The plurality of control systems due to the differentiation of management tasks and development tasks for each group of relevant information technology;

2. The technical complexity of integrating separate technologies (individual products) to a single system;

3. The methodological complexity of integration.

In connection with the trend of centralization of management and the vector integration of individual systems into a unified enterprise management system, the major problem is not a technological complexity but methodological [13]. Finally the technological complexity is solved by the development of appropriate interfaces of information technology, which is a feasible task.

The problem of non-compliance methodologies is more significant. It is conceptual, and if it is impossible to solve it could prevent effective integration of the subsystems and thus – to inefficient management. Therefore, we offer principles for solving the problem of the complexity of the methodological integration of individual subsystems of management.

1. A comprehensive integration – in accordance with these principles should integrate into a single system all existing information management subsystem management.

2. Synergy – this principle is aimed on obtaining positive results and additional benefits from the combination of all subsystems into a single subsystem.

3. Adaptability to changes in the methodology of the individual subsystems – principle provides for the necessary amendments to the subsystem with the change in the methodology of one of the subsystems.

4. Robustness of the system – to ensure its resistance to changes in the environment of the enterprise.

5. Using the knowledge base of a unified information system for the implementation of the above mentioned principles.

Conclusion

The article deals with the evolution and diversity of enterprise management systems. A trend towards the integration of subsystems into a single management system and highlighted the problems of such integration. The principles are formulated on which is proposed to make such integration. Further research can be focused on the development of mutually adaptive (or bi-adaptive) enterprise management system, in which management subsystem development projects might be methodologically enterprises to adapt to changes of operational management of the company and vice versa.

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ВИНИКНЕННЯ, РОЗВИТОК І ПРОБЛЕМИ
ІНФОРМАЦІЙНИХ ТЕХНОЛОГІЙ УПРАВЛІННЯ ПІДПРИЄМСТВОМ

Анотація. Сучасні інформаційні системи управління підприємствами не є досконалими. Вони складаються з багатьох підсистем, які повинні бути узгоджені між собою. Зміни в одній підсистемі мають відображатися в інших підсистемах. Всі підсистеми повинні адаптуватися до змін в кожній з них. У цьому полягає наукова проблематика. Проаналізовано наявні інформаційні технології та системи управління підприємствами. Висвітлено історію розвитку інформаційних технологій і систем управління підприємствами. Виділено проблеми таких інформаційних технологій і систем. Запропоновано методологічні принципи інтеграції окремих підсистем в окрему систему. Визначено подальший напрямок розвитку даної теми.

Ключові слова: інформаційна технологія; управління підприємствами; адаптивність

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ВОЗНИКНОВЕНИЕ, РАЗВИТИЕ И ПРОБЛЕМЫ
ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ УПРАВЛЕНИЯ ПРЕДПРИЯТИЕМ

Аннотация. Современные информационные системы управления предприятиями не являются совершенными. Они состоят из многих подсистем, которые должны быть согласованы между собой. Изменения в одной подсистеме должны отображаться в других подсистемах. Все подсистемы должны адаптироваться к изменениям в каждой из них. В этом заключается научная проблематика. Проанализированы существующие информационные технологии и системы управления предприятиями. Отражена история развития информационных технологий и систем управления предприятиями. Выделены проблемы таких информационных технологий и систем. Предложены методологические принципы интеграции отдельных подсистем в отдельную систему. Определено дальнейшее направление развития данной темы.

Ключевые слова: информационная технология; управления предприятиями; адаптивность

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