

**УПРАВЛІННЯ ПІДПРИЄМСТВОМ**

UDC 3470.73 : 658.018

УДК 3470.73 : 658.018

**O. I. Gonchar**, Doctor of Economic Sciences,  
Professor,  
**I. V. Filipishyn**, Doctor of Economic Sciences,  
Assistant Professor,  
**O. S. Shcherbina**, Candidate of Economic  
Sciences

**О. І. Гончар**, д. е. н.,  
професор,  
**І. В. Філіпішин**, д. е. н.,  
доцент,  
**О. С. Щербіна**, к. е. н.

**INFORMATION SYSTEMS  
AS AN INSTRUMENT FOR THE ENTERPRISE  
POTENTIAL DEVELOPMENT**

**ІНФОРМАЦІЙНІ СИСТЕМИ  
ЯК ІНСТРУМЕНТ РОЗВИТКУ  
ПОТЕНЦІАЛУ ПІДПРИЄМСТВА**

**Urgency of the research.** The development of market relations, the opening of economic boundaries of countries, globalization and European integration determine the formation of the information economy and determine the need for enterprises the use of information technology as its main subjects.

**Target setting.** The quality of managerial decisions depends on the timeliness of information resources and the reliability of their sources. The problem of the search of information systems for the enterprises potential managing, providing competitiveness is being actualized.

**Actual scientific researches and issues analysis.** The automation of enterprise management is explored by scientists and practitioners. Known works by I. O. Notreba, V. A. Svyatnenko, N. M. Khorunzhak, A. P. Zloschastieva, N. M. Protas and other scientists.

**Uninvestigated parts of general matters defining.** Theoretical and methodological substantiation of introduction and improvement of information systems at modern enterprises requires further improvements.

**The research objective.** Systematization of existing information systems, criteria for selecting the most effective ones, their application for the development of entrepreneurial potential deserves particular attention.

**The statement of basic materials.** The authors prove that the needs of the enterprise, the existing technological level and qualified users are the main prerequisites for the introduction of information technology in enterprises. They contribute to the formation of an information system, information space, management efficiency and capacity development.

On the basis of the study of the evolution of information systems, the principles of their formation are singled out.

**Conclusions.** Modern information systems contribute to the implementation of a number of opportunities, the acquisition of various types of effects and capacity development in general.

**Keywords:** information; systems; information resources; technology; management; decision; effect; enterprise potential.

**DOI:** 10.25140/2410-9576-2017-2-4(12)-16-21

**Urgency of the research.** The development of market relations, the opening of the countries' economic boundaries for business, the processes of globalization and European integration determine the formation of the information economy. The main criteria of enterprise competitiveness are professional management, the ability to ensure efficient work of the personnel, to identify, to design, to

**Актуальність теми дослідження.** Розвиток ринкових відносин, відкриття економічних кордонів країн, глобалізація і євроінтеграція обумовлюють становлення інформаційної економіки та визначають необхідність для підприємств, як основних її суб'єктів, використання інформаційних технологій.

**Постановка проблеми.** Від своєчасності надходження інформаційних ресурсів та достовірності їх джерел залежить якість управлінських рішень. Актуалізується проблема пошуку інформаційних систем для управління потенціалом підприємств, забезпечення конкурентоспроможності.

**Аналіз останніх досліджень і публікацій.** Автоматизацію управління підприємством досліджують науковці та практики. Відомі праці І. О. Нетреба, В. А. Святненк, Н. М. Хорунжак, А. П. Злосчастьєва, Н. М. Протас та інших науковців.

**Виділення недосліджених частин загальної проблеми.** Теоретико-методичне обґрунтування запровадження та удосконалення інформаційних систем на сучасних підприємствах, потребує подальших удосконалень.

**Постановка завдання.** На особливу увагу заслуговують: систематизація існуючих інформаційних систем, критерії вибору найефективніших, застосування для розвитку підприємницького потенціалу.

**Виклад основного матеріалу.** Авторами доведено, що потреби підприємства, наявний технологічний рівень і кваліфіковані користувачі – основні передумови запровадження інформаційних технологій на підприємствах. Вони сприяють формуванню інформаційної системи, інформаційного простору, ефективності управління та розвитку потенціалу.

На засадах дослідження еволюції інформаційних систем виокремлено принципи їх формування.

**Висновки.** Сучасні інформаційні системи дають сприяють реалізації ряду можливостей, одержанню різних видів ефектів і розвитку потенціалу загалом.

**Ключові слова:** інформація; системи; інформаційні ресурси; технології; управління; рішення; ефект; потенціал підприємства.

---

**УПРАВЛІННЯ ПІДПРИЄМСТВОМ**

---

implement and to improve business processes correctly, to manage organizational-administrative and economic activities effectively. Under these conditions modern information technologies and the information systems created on their basis becomes an indispensable tool in ensuring achievement of strategic goals, competitive advantages and sustainable development of enterprises.

Information systems become a strategic source of information and are applied at all levels of management of enterprises in various sectors of the economy. Processing efficiently and providing promptly the necessary information to make managerial decisions, information systems contribute to the success of the business, form the opportunity to create new products and services, develop new marketplaces, pick partners optimally, reduce costs and ensure the flexibility of pricing policies. At the same time, enterprises need to make changes in the organization of work, taking into account the requirements for the introduction of new information systems and technologies, changes in the enterprise management system and its potential.

**Target setting.** In the conditions of globalization of the economy, more attention is paid to the potential of the enterprise as an economic system to ensure its competitiveness. There is a need to identify reliable sources of information to ensure the effective functioning of management and development systems of the enterprise in order to develop the potential. The quality of managerial decisions in solving the economic entities tasks depends on timeliness of the receipt of information resources and the reliability of their sources. The problem of the information systems search that can ensure the development of the potential of the enterprise and increasing its competitiveness as a consequence is becoming acute.

**Actual scientific researches and issues analysis.** Many works of scientists and practitioners are devoted to the problems of automation of enterprise management processes. In particular, the problems of the introduction of information systems were considered in the works of I. O. Notreb, V. A. Svyatnenko [1], N. M. Khorunzhak [2]. An assessment of the effectiveness of their functioning was studied by such scholars as A. P. Zloschastiev, N. N. Protas [3] and other scientists.

**Uninvestigated parts of general matters defining.** Despite a significant number of publications on the definition of the information systems nature, the problems of their implementation and improvement, there are no current scientific developments regarding the peculiarities of their use as effective tools for the enterprise potential development.

**The research objective.** The systematization of existing information systems, their presentation as components of the enterprise potential development, the justification of recommendations for choosing the most effective ones require further research.

**The statement of basic materials.** The enterprise needs, the existing technological level and the availability of skilled personnel are the main preconditions for the formation of factors that predetermine the introduction of information technologies at enterprises, provide the creation of a modern information system and the transition to a new level of management, updating of business methods and development of entrepreneurial potential.

Since the 90s of the XX century attempts to implement certain information technologies and automated information systems at domestic enterprises were made.

According to O. H. Yesin [4], the first concept of building information management systems is Manufacturing Requirements Planning (MRP), the essence of which is to minimize the costs associated with stocks in warehouses and production facilities. The use of MRP systems allows you to reduce the amount of permanent stocks and plan the production process. Further optimization enabled closed loop MRP systems to create a manufactory resource planning system developed by the American Production and Inventory Control Society. According to the MRP II Standard System it has a full range of functions: forecasting, planning and controlling production processes throughout the life cycle of products - from resource planning to after-sales service.

The next concept of building information systems was Enterprise Resources Planning (ERP). ERP-systems are designed to plan all kinds of enterprise resources. The basis of ERP-systems is the principle of creating a single database containing all corporate business information.

Modern ERP II is the result of the improvement of ERP-systems; it is being developed and implemented in different countries of the world, including Ukraine. According to various resources,

**УПРАВЛІННЯ ПІДПРИЄМСТВОМ**

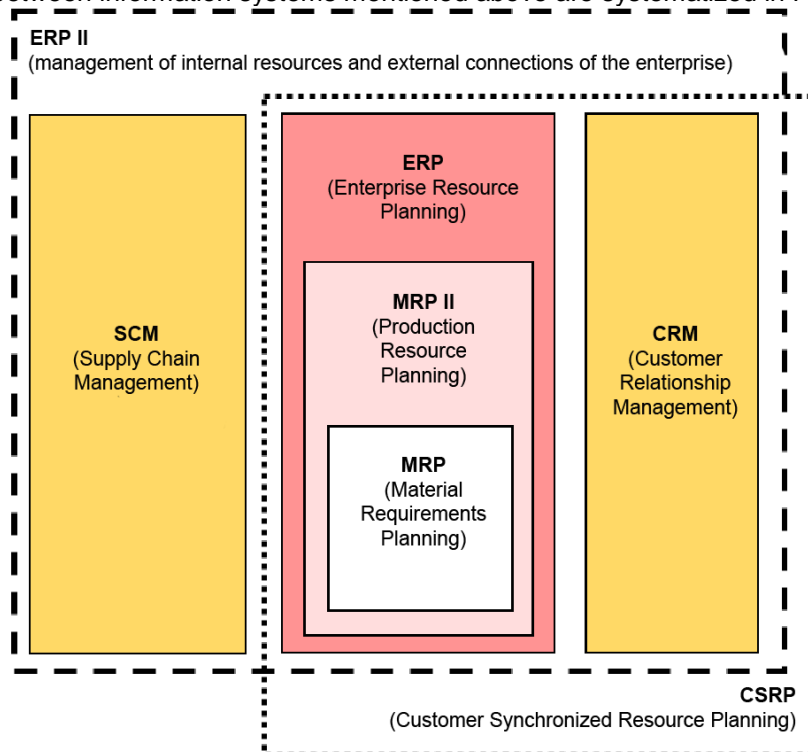
there are currently more than 500 corporate information systems in the world market. The undisputed vendors of ERP systems are SAP AG, Oracle, J. D. Edwards, PeopleSoft, Baan. Their share accounts for more than half of the volume of information market developers. Among other developers of corporate information systems can also be noted: producers of SCM-systems – Manugistys and Numetriks; producers of CRM-systems – Siebel, Vantiv, Clarifi and Pivotal; E-Commerce System Producers – Ariva, Commerce One, IBM and Broadvision. In addition, such prominent companies as Brain, Sage Group, Symix Systems, Geac Computer, SCT, IBS, Epicor Software, QAD / BMS, Exact Software, IFS and others are prominent in the corporate information system market.

In particular, the Microsoft Dynamics AX 2012 information system is supported in forty five languages and is actively deployed into the enterprises, both in developed countries and in countries with a slow development.

Modern enterprises are also gradually implementing project management systems, service management, quality management, Pond-Draining System, SIC-Inventory Control, personnel management information systems, automation systems for project design and technologizing production (CAD / ASPDTP – CAD / CAM / CAE / PDM).

The information technology market is developing very dynamically, relying on the needs of the business environment, so there appear enterprise information management systems - the Customer Synchronized Resource Planning (CSRP), which implemented resource planning technologies, integrated client-oriented strategy modules, and synchronization of interaction with buyers and customers. This is a new generation of information systems. If MRP, MRPII and ERP are focused on the internal organization of the enterprise, the CSRP systems contain a complete cycle of business technology from the design of the future product, taking into account the customer's requirements for warranty and after-sales service [4].

The relations between information systems mentioned above are systematized in Fig. 1.



**Fig. 1. Relationship between existing information systems**

## УПРАВЛІННЯ ПІДПРИЄМСТВОМ

Enterprise management system can be represented as an information system with various information flows in the form of documents, orders, requests, which are addressed within the enterprise, outgoing or incoming from the external environment. In accordance with the levels of enterprise management we can distinguish data / transaction processing systems – operational level; information management systems, management information systems – tactical level; automated decision support systems – strategic level.

The characteristics of information systems by management levels improved on the basis of the source [5] are given in Tab. 1.

Table 1

### The Characteristics of Information Systems by Management Levels

Information Systems Characteristic	Data / Transaction Processing Systems	Information Management Systems	Decision Support Systems
<i>Base System Technologies</i>	Technologies focused on operational (transactional) data processing (Online Transaction Processing – OLTP)	Technologies of interactive analytical data processing (On-Line Analytical Processing – OLAP)	Methods of statistical analysis, expert systems, mathematical and simulation modeling, intelligent data analysis (Data Mining technology) (artificial neural networks, systems for finding logical rules in data)
<i>Functions</i>	Registration in the database and the processing of elementary events, the accompanying flow of business processes	Automation of accounting, as well as personnel accounting, warehouse accounting, transport department, sales department and financial operations, integration with information systems of production automation	Solving the constantly arising decision making tasks
<i>Performers</i>	Direct performers of business processes (storekeepers, workers, cashiers, accountants, administrators of department) – operational managers	Highly qualified staff of information and computer units of the enterprise – middle-management	Management of firms, enterprises – top managers
<i>Aim</i>	Ability to find out quickly the state of the company in all workplaces at any time	Analysis of performance indicators, planning and monitoring of their implementation	Solving tasks of business processes management of the enterprise at the strategic level, that is, at the level of top managers
<i>Task</i>	Solving tasks of business processes management of the enterprise at the operational level	Collection of orders for the production program formation	Output and promotion of new products on the market, search for new markets, selection of sources of funding, attracting investors, engineering and reengineering business processes
<i>Documents</i>	Payment orders, limit-fetched cards, bills, expendable and profitable orders	Tactical plans	-
<i>Time Frame</i>	Not more than one day	From several days to several weeks	A year or more
<i>Examples of software products</i>	1C: Enterprise 7.7, Parus, BEST	1C: Enterprise 8.0, Galaxy	Analyst's Notebook, IBase, IBridge, Analyst's Workstation

Data / transactions processing systems (in the foreign literature – Data Processing System (DSP), and in the domestic literature – automated control systems (ACS)), should be synchronized with information management systems for technological processes in the enterprise if there is such a need.

---

**УПРАВЛІННЯ ПІДПРИЄМСТВОМ**

---

The data processing system makes it possible to monitor transparently the execution of business processes so that at any given time it is possible to find out quickly the state of the enterprise in all workplaces.

Modern technical support enables enterprises to introduce integrated information systems that automate operational and tactical levels of management. They are called corporate information systems or management information systems. Such information systems are ramified with complex architecture and many users.

Decision support systems are a working tool for persons who approve decision. Problems of decision support systems are characterized by the difficulties of formalizing aims and constraints, which predetermines the prevalence of qualitative assessments. The information available to decision makers is usually incomplete, vague and controversial. Decision support systems are usually implemented in the form of human-machine dialog systems. Due to the use of complex programming methods, such software products are expensive and therefore not included in the standardized run-adapted programs. The senior management will acquire them if necessary as a stand-alone product, depending on the management needs [5].

In practice, the division of information systems by management levels is less clear and definite. As Professor L. O. Tereschenko [6] notices, this is "due to the fact that each level does not exist by itself, apart from the others. Decisions taken at the upper level are limitations in decision making at the lower level. It is for this reason that management information systems should be able to take into account these constraints at least".

Also, depending on the level of functionality, the information systems mentioned above can be divided into:

- Single-function (implement separate functions of enterprise management);
- Multifunctional (carry out automation of many functions of enterprise management - accounting, accounting of personnel, warehouse accounting, financial calculations, sales and supplies, etc.);
- Full-featured – these are complex information management systems of the enterprise, in which all management functions are automated. They have the means of corporate governance.

The operation of multifunctional and full-featured information systems is carried out in multi-user mode; therefore such systems should be integrated. Integrated information system is based on a single software and hardware platform and a common database. In the integrated information system, individual functional subsystems (subsystems of personnel management, logistics, production, accounting, financial management, etc.) are interconnected and based on a single technological process of information processing.

According to Allied Market Research [7], the global ERP system market will reach \$ 41.69 billion till 2020, with an average annual growth rate of around 4.2% between 2014 and 2020. The emergence of cloud technologies in the market will lead to a paradigm shift in deployment techniques. Cloud ERP systems require significantly less investment in IT resources and offer greater flexibility. Thus, customers will switch from on-premise solutions to cloud-based ERP systems. In addition, the function of access to ERP from mobile devices will be further developed.

**Conclusions.** Modern information systems enable the implementation of such opportunities as: long-term and operational planning; development of new types of products; formation of production plans in accordance with sales plans; production management; planning of the movement of raw materials and materials; planning and accounting of finished goods movement; planning resource requirements for rhythmic production; processing, analysis and approval of applications from the enterprise divisions to the necessary materials; provision of a continuous production cycle; optimization of materials placement; construction of databases and classifiers of enterprise materials; providing a deep level of detail of cost elements. The listed opportunities can be used as a tool for enterprise capacity development.

The main requirement that must be observed is the effect of using information systems should be higher than the costs of its development, implementation and operation, which is a promising direction for further research.

## УПРАВЛІННЯ ПІДПРИЄМСТВОМ

## References

1. Sviatnenko, V. A., Ntreba, I. O. (2012). Praktychni aspekty vprovadzhennia informatsiinykh system upravlinnia na vitchyznianskykh pidpriemstvakh [Practical aspects of implementation of information management systems at domestic enterprises]. *Visnyk Kyivskoho natsionalnoho universytetu imeni Tarasa Shevchenka. Ekonomika – Bulletin of the Taras Shevchenko National University of Kyiv. Economy*, 137, 26–30 [in Ukrainian].
2. Khorunzhak, N. M. (2013). *Teoriia ta metodolohiia obliku u biudzhethnykh ustanovakh v umovakh informatyzatsii suspilstva [Theory and methodology of accounting in budget institutions in the conditions of information society]*. Ternopil: TNEU [in Ukrainian].
3. Zloschastiev, A. P., Protas, N. M., Zloschastieva, T. A. (2013). Udoshkonalennia upravlinnia pidpriemstvom z vykorystanniam informatsiinykh system i tekhnolohii [Enterprise management improvement with the use of information systems and technologies]. *Naukovi pratsi Poltavskoi derzhavnoi ahrarnoi akademii. Ekonomichni nauky – Scientific works of the Poltava State Agrarian Academy. Economic sciences*, 1(6), 3, 141-147 [in Ukrainian].
4. Yesina, O. H. (2016). Otsinka ekonomichnoi efektyvnosti zastosuvannia informatsiinykh tekhnolohii na pidpriemstvi [Estimation of economic efficiency of application of information technologies at the enterprise]. *Hlobalni ta natsionalni problemy ekonomiky – Global and national problems of the economy*, 13, 972-976. Retrieved from <http://global-national.in.ua/archive/16-2017/192.pdf> [in Ukrainian].
5. Adamyk, O. V., Sysiuka, S. V. (2016). Informatsiini systemy upravlinnia pidpriemstvom: vybir bazovoykh tekhnolohii ta prohramnoho zabezpechennia [Enterprise Information Systems: Choice of Basic Technologies and Software]. *Hlobalni ta natsionalni problemy ekonomiky – Global and national problems of the economy*, 14, 891-895. Retrieved from <http://global-national.in.ua/archive/14-2016/178.pdf> [in Ukrainian].
6. Tereshchenko, L. O., Snizhko, O. S. (2011). Informatsiini tekhnolohii v upravlinni [Information technology in management]. *Investytsii: praktyka ta dosvid – Investments: practice and experience*, 12, 28-31 [in Ukrainian].
7. *ERP Software Market by Deployment (On-premise deployment and Cloud deployment) and Function (Finance, Human resource, Supply chain and Others) - Global Opportunity Analysis and Industry Forecast, 2013-2020*. (2013). Allied Market Research: USA, Canada. Retrieved from <https://www.alliedmarketresearch.com/ERP-market> [in English].
8. Anisimova, O. M., Anisimov, D. O. (2017). Riven vykorystannia informatsiinykh system yak vazhlyva skladova potentsialu u korporatyvnomu upravlinni [Level of use of information systems as an important component of potential in corporate governance]. *Visnyk Khmelnytskoho natsionalnoho universytetu – Bulletin of the Khmelnytsky National University*, 4(250), 146-149 [in Ukrainian].

## Література

1. Святненко, В. А. Практичні аспекти впровадження інформаційних систем управління на вітчизняних підприємствах / В. А. Святненко, І. О. Нетреба // Вісник Київського національного університету імені Тараса Шевченка. Економіка. – 2012. – Вип. 137. – С. 26–30.
2. Хорунжак, Н. М. Теорія та методологія обліку у бюджетних установах в умовах інформатизації суспільства: монографія / Н. М. Хорунжак. – Тернопіль : ТНЕУ, 2013. – 248 с.
3. Злосчастєв, А. П. Удосконалення управління підприємством з використанням інформаційних систем і технологій / А. П. Злосчастєв, Н. М. Протас, Т. А. Злосчастєва // Наукові праці Полтавської державної аграрної академії. Економічні науки. – 2013. – Вип. 1 (6). – Т. 3. – С. 141-147.
4. Єсіна, О. Г. Оцінка економічної ефективності застосування інформаційних технологій на підприємстві [Електронний ресурс] / О. Г. Єсіна // Глобальні та національні проблеми економіки. – 2016. – Вип. 13. – С. 972-976. – Електрон. версія друк. вид. – Режим доступу: <http://global-national.in.ua/archive/16-2017/192.pdf> - Назва з екрану.
5. Адамик, О. В. Інформаційні системи управління підприємством: вибір базових технологій та програмного забезпечення [Електронний ресурс] / О. В. Адамик, С. В. Сісюка // Глобальні та національні проблеми економіки. – 2016. – Вип. 14. – С. 891-895. – Електрон. версія друк. вид. – Режим доступу: <http://global-national.in.ua/archive/14-2016/178.pdf> - Назва з екрану.
6. Терещенко, Л. О. Інформаційні технології в управлінні / Л. О. Терещенко, О. С. Сніжко // Інвестиції: практика та досвід. – 2011. – № 12. – С. 28-31.
7. *ERP Software Market by Deployment (On-premise deployment and Cloud deployment) and Function (Finance, Human resource, Supply chain and Others) - Global Opportunity Analysis and Industry Forecast, 2013-2020* [Електронний ресурс] / Allied Market Research: [офіц. веб-сайт]. – Електрон. дані. – USA, Canada, 2013. – Режим доступу : <https://www.alliedmarketresearch.com/ERP-market>
8. Анісімова, О. М. Рівень використання інформаційних систем як важлива складова потенціалу у корпоративному управлінні / О. М. Анісімова, Д. О. Анісімов // Вісник Хмельницького національного університету. – 2017. - №4(250). – С. 146-149.

Received for publication 17.09.2017

## Бібліографічний опис для цитування :

Gonchar, O. I. Information systems as an instrument for the enterprise potential development / O. I. Gonchar, I. V. Filipshyn, O. S. Shcherbina // Науковий вісник Полісся. – 2017. - № 4 (12). Ч. 2. – С. 16-21.