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FEATURES OF THE IMPLEMENTATION OF SMART TECHNOLOGIES IN ACCOUNTING PROCESSES IN ENTERPRISES IN THE ROCKET AND SPACE INDUSTRY

The use of information technologies in rocket and space industry enterprises to automate design, production management, logistics, financial, economic, and accounting processes is a prerequisite for carrying out economic activities. The successful automation of the enterprise management system increases the efficiency of management and enhances labor productivity by accelerating the exchange of information in coordinating various issues, switching to digital (paperless) document flow, reducing the influence of the human factor, and making it possible to adopt typical decisions automatically. Information systems and processes at enterprises must be interconnected because work management and accounting are impossible without information support in real life. Information systems not only record the results of business processes. They ensure the achievement of the set goal in compliance with numerous accounting requirements. The article examines the theoretical aspects of implementing corporate information systems to support the management activities of enterprises today. The primary problems and tasks of implementing enterprise management information systems have been identified. The scientific novelty of the results obtained from this scientific research lies in enhancing corporate business management software based on a unified ERP database and supporting space rocket enterprises by developing new programs, which allow accounting to be carried out using up-to-date information technologies. The practical value of these results lies in the development of recommendations that Yuzhnoye State Design Office and other enterprises can apply. ERP systems allow you to online monitor the activities of all structural units, the completion of assigned tasks, and the achievement of key indicators. Programs of this class will facilitate the process of making the right management decisions by providing management personnel with relevant, targeted, and up-to-date information.

Keywords: automation, ERP system, rocket and space technology, programming, data processing, database.

Застосування інформаційних технологій на підприємствах ракетно-космічної галузі для автоматизації процесів проєктування, управління виробництвом, логістики та фінансово-економічних і бухгалтерських процесів є обов'язковою умовою для здійснення господарської діяльності. Успішна автоматизація системи управління підприємством підвищує ефективність самого управління, дає зростання продуктивності праці за рахунок прискорення обміну інформацією в процесах узгодження різних питань, переходу на цифровий (безпаперовий) документообіг, зменшення впливу людського фактора та можливості автоматизованого ухвалення типових рішень. Інформаційні системи та процеси, що здійснюються на підприємствах, повинні бути взаємозумовлені, тому що в реальних умовах забезпечення робочого процесу та управлінського обліку без інформаційної підтримки не можливе. Інформаційні системи забезпечують виконання поставленої мети з дотриманням численних вимог до обліку, а не лише фіксують результати бізнес-процесів. У статті розглянуто теоретичні аспекти впровадження корпоративних інформаційних систем підтримання управлінської діяльності сучасних підприємств. Визначено основні проблеми і завдання, що виникають у процесі впровадження інформаційних систем управління підприємством. Наукова новизна отриманих результатів полягає у вдосконаленні корпоративного програмного забезпечення для управління бізнесом на основі єдиної бази ERP з урахуванням вимог підприємств ракетно-космічної галузі за рахунок розроблення нових програм, що дає змогу проводити бухгалтерський облік із застосуванням сучасних інформаційних технологій. Практична значущість отриманих результатів полягає в розробленні рекомендацій, які можуть бути використані в діяльності ДП «КБ «Південне» та на інших підприємствах. ERP-система дає змогу в оперативному режимі контролювати діяльність усіх структурних підрозділів, виконання поставлених завдань і досягнення ключових показників. Програми такого класу покликані полегшити процес прийняття правильних управлінських рішень, забезпечуючи управлінський персонал актуальною, адресною, повною, корисною та порівняльною інформацією.

Ключові слова: автоматизація, ERP-система, ракетно-космічна техніка, програмування, оброблення даних, база даних.

Introduction

Accounting procedures in the rocket and space industry are constantly being transformed into digital form, with a focus on transmitting information to regulatory bodies, paying taxes, and exchanging electronic documents. Especially in the context of a modern and dynamic market, having flexible yet safe software that allows you to make quick decisions using detailed analytics is highly important. Therefore, the difficulty of incorporating new digital technologies into accounting processes is an objective requirement. Given the continuous introduction of new products and offers on the internet, it is crucial to examine the issues concerning the implementation of smart technologies at enterprises in the rocket and space industry.

Corporate business management software based on a unified ERP (Enterprise Resource Planning) database is applied at Yuzhnoye State Design Office. This ERP is used when it is necessary to automate the work of various departments and establish reporting on dashboards with the visualization of key indicators.

The purpose of the study is to provide a general description of ERP-based technologies used in the accounting of enterprises in the rocket and space industry of Ukraine, with a separate assessment of their functionality and feasibility, and to refine these technologies to meet the needs of the accounting processes at Yuzhnoye State Design Office.

1. Overview of the ERP system

The ERP system consists of several modules, each responsible for a specific business process. These modules of ERP systems are interconnected, which allows them to exchange data and form a complete analytical summary of all operational processes of the company.

ISpro is a multifunctional software suite for enterprise management optimization. This software was created by a Ukrainian developer.

This control system consists of interconnected and relatively independent subsystems. It is one of the advantages, as compared to other similar products. This system does not offer unnecessary accounting sections. On the contrary, it makes it possible to design a program according to the needs of the enterprise, allowing saving money.

The ISpro software has a modular architecture and is divided into individual systems. Each system is relatively independent and can be operated as part of the software suite or separately from it. Each system contains groups of modules and individual modules. Each module is designed to automate the accounting of one of the company's activities. In addition, the software includes a system for the administration and maintenance of general directories. They are mandatory and ensure software functioning at any system configuration (Fig. 1).

Fig. 1. Subsystems of ISpro

The ISpro software is based on generally accepted principles for the implementation of similar systems and some original solutions.

The system enables continuous accounting, that is, accounting of all aspects of an enterprise's economic activity. The program has adequate description tools to display any fact of economic activity. The specifics of this solution is its modular architecture, which allows you to quickly adapt it to the required functionality and integrate it with other systems. This approach makes it possible to modernize, structure, and combine information processes in the shortest possible time. The system keeps continuous records, i.e. it registers operations when they are carried out. For accounting purposes, the continuous process is divided into accounting periods, whose durations are determined by the program [1].

The system supports interdependent accounting, that is, accounting is carried out in a single data field. All operations are entered once. The entered information is immediately

displayed in all necessary sections of the account.

The system is built on the principle of entering and storing information in documents. A document is an elementary information unit of the system and a means of data storage.

Despite its diverse functionality, ISpro does not provide solutions to the full scope of problems to completely cover the needs of an enterprise in terms of labor and salary accounting.

2. Advantages and disadvantages of ERP systems

The principal advantages of using an ERP system are:

1. One integrated system instead of several separate ones.
2. An ERP system provides a large number of objects that users may need in the future.
3. A unified security system protects accounting data from external and internal threats.
4. Once entered into the system, data becomes available to all users who are authorized to access this information.
5. A single information system effectively solves the problem of inconsistency for data with which different categories of users work.
6. The mechanism for entering some documents based on others significantly reduces the personnel labor costs and the number of mistakes made.
7. The possibility for managers of different levels to control the actions of subordinates in real time.

The primary disadvantages are:

1. An ERP system depends on user skills. The efficiency of the system can be significantly reduced or completely paralyzed due to the unprofessional work of one user.
2. The necessity of training personnel to work with an ERP system. This problem is especially relevant for Yuzhnoye State Design Office since not every enterprise can afford it.
3. The price is quite high, and the procedures for setting up and using ERP systems are time-consuming.
4. The difficulty of adapting ERP systems to the specifics of the company's activities and business processes.
5. The purchased ERP system may be incompatible with the information systems used at the enterprise [2].

3. Application of the ERP system at Yuzhnoye State Design Office

Implementing an ERP system at Yuzhnoye State Design Office requires improving this system according to an in-depth analysis of the use of artificial intelligence, the features of implementing artificial intelligence at Yuzhnoye State Design Office, and the reasonability of using it in accounting.

Let's consider the development of ERP technologies for the needs of the Yuzhnoye State Design Office using the example of specific software products (Fig. 2).

Fig. 2. Launch of the software developed at the Yuzhnoye State Design Office

For adaptation to the specific needs of Yuzhnoye State Design Office, the corporate business management software built on a single ERP database was improved by the development of new software that made it possible to meet the requirements of the labor and salary department.

Algorithm for improving ERP for the needs of Yuzhnoye State Design Office

The system provides the following. In the register of orders, a tabular order is created using the menu item Register / Create Tabular Order [3]. Tabular orders are intended for the accelerated application of accruals (surcharges, rewards, bonuses) or deductions (one-time deductions) for a group of employees. That is, all this does not make it possible to create a non-trivial solution that would allow pumping

bonuses according to the requirements of the labor and salary department at such an enterprise as Yuzhnoye State Design Office. For this task, it was necessary to develop software using Delphi Xe and MS SQL.

First of all, we need to run a .exe file that in our case is located in c:\706_надбавки__c SQL_2020\Nadb (Fig. 3).

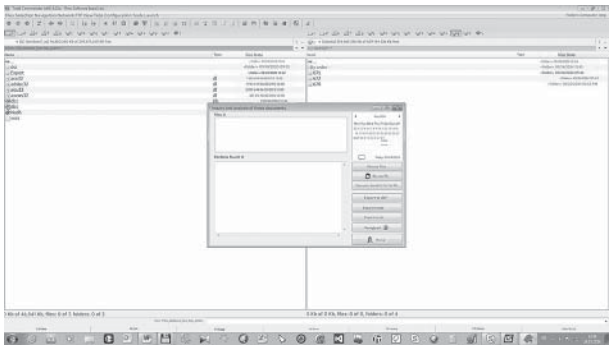

Fig. 3. Document data downloading and analysis in progress

Data is transferred in Excel files formed according to the template (Fig. 4).

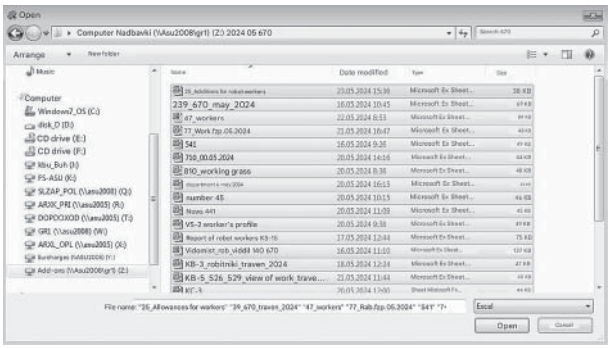

Fig. 4. Document uploading

Further, we use exclusively the tools offered by ISpro. In the end, we have the following (Fig. 5).

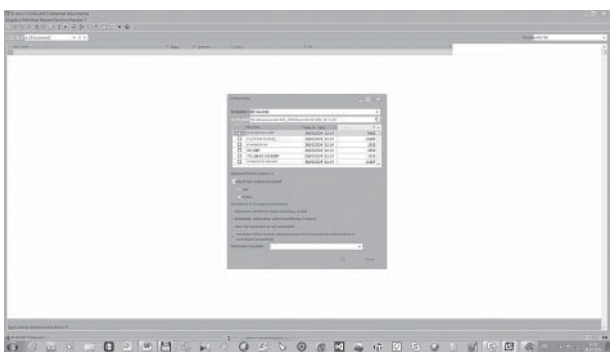

Fig. 5. Data import

During the implementation of the software suite at Yuzhnoye State Design Office, it was possible to improve corporate business management software based on a single ERP database, taking into account the requirements of enterprises in the rocket and space industry, and:

•Automate many accounting processes. It will significantly reduce labor intensity and the risk of errors in the company's accounting.

•ISpro provides the ability to generate various reports and analytical data. This software allows quick analysis and making grounded decisions for the company.

The screenshots below show the list of reports implemented in the Labor and Salary Accounting module (Fig. 6).

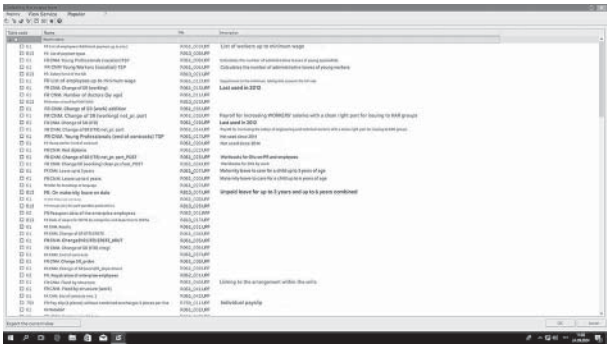

Fig. 6. Selection of the original form

•Using an ERP system allows the one-time entry of primary data; using one information base, helping minimize discrepancies between the book-keeping and management accounting systems and requiring no development of an additional structure for entering management data. At Yuzhnoye State Design Office, the online operational control of personnel accounting was created in the ISpro system using the Delphi and SQL programming languages, which made it possible to conduct operational management of all divisions of the enterprise.

•Eliminate the necessity of data import from one software product to another. The ERP system allows enterprise managers to build an effective information system that generates relevant data for better results. It allows you to manage finances and personnel. Many registers for the labor and salary department were updated, which significantly reduced the burden on this department.

•Personnel training is among the critical aspects of the successful transition of the

enterprise to a new modern level of activity. With the effective implementation and successful operation of automated systems, the company gets a serious advantage in the market, which allows it to reduce costs, increase profits, and successfully expand business. For the human resources department, all routine processes, usually time-consuming, were transferred to an automated mode, which allowed this department to work more harmoniously.

The scientific novelty of the obtained results consists in the improvement of corporate business management software based on a single ERP database, with the requirements of enterprises in the rocket and space industry taken into account, through the development of new programs that allow accounting with the use of modern information technologies.

The practical value of the obtained results lies in the development of recommendations that can be used in the activities of Yuzhnoye State Design Office and other enterprises. The ERP systems allow enterprises to continuously monitor the work of all their structural divisions, the fulfillment of assigned tasks, and the achievement of key indicators. Programs of this class are designed to facilitate the process of making the right management decisions and providing management personnel with relevant, targeted, complete, useful, and comparative information.

Conclusions

A general description of ERP-based technologies used in the accounting of enterprises of the rocket and space industry of Ukraine is given with a separate assessment of the functionality and reasonability of these systems.

The advantages and disadvantages of using ERP-based technologies at Yuzhnoye State Design Office are discussed.

Corporate business management software based on a unified ERP database has been improved, taking into account the requirements of enterprises in the rocket and space industry, through the development of new programs that allow accounting using modern information technologies.

It is shown that the use of modern information technologies in the economic activity of enterprises is one of the priority areas for their development. The application of up-to-date technologies requires the reorganization of accounting at the enterprise, leads to the automation of certain areas of professional activity of accountants, and sets the task of acquiring new skills and abilities [4].

The issue of the effectiveness of introducing smart technologies and integrating them into the accounting processes of enterprises of the rocket and space industry of Ukraine requires further research [5].

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