

ASSESSMENT AND ANALYSIS OF THE EFFECTIVENESS AND EFFICIENCY OF PROCESSES IN SYSTEMS MANAGEMENT

This methodological problems of analysis of performance and efficiency of the processes in systems management.

Keywords: *analysis, efficiency, effectiveness, management systems, the coefficient of variation, the asymmetry, coefficient of excess.*

Introduction: In an increasingly competitive and globalized world economy, rapidly developing technologies, creating more and more complex machines and mechanisms with a new level of consumer properties, manufacturers striving to minimize the cost of production and the maximum length of useful life of equipment, increasing demand for quality products, services and activities, there is a need to address the totality of theoretical, methodological and practical problems of providing a systematic approach to systems management, and implementation of new forms and methods of effective management of the various components of attractive consumer goods and services, the formation of a number of factors control systems, timely and accurate assessment of the effectiveness and efficiency of processes in management systems. It therefore seems quite objective that efforts to enhance and ensure the effectiveness and efficiency of processes in systems of management in a market economy is a priority. Usually provide consistent levels of performance and efficiency of the product or service is the result of the establishment and operation of quality management systems and, based on events that affect both factors improve the quality - the immediate causes of improving the properties of the product or service, and on the existing environment of the factors - conditions for their implementation.

At present the management there is a set of parallel (or, to some extent overlapping) developments that hinder the harmonious development of enterprises as complex and holistic social and economic system that exists to handle all customer expectations. Known in the economic literature, the different approaches to the management of the company (the complex, dynamic, functional, integration, administrative, regulatory and marketing) are used in the construction of separate management systems regardless of their relationships and interactions.

It is also noted that the management system must be periodically internal evaluation analysis, which is one of the management tools to monitor and verify the effectiveness of new technologies, methods, models, management and operation of the system. Launched the new technology, techniques or models of management, the company's management to assess their impact, so the results of the internal evaluation and analysis of all elements of the system should allow the timely management of the company to develop a corrective action and identify reserves, the possibility of improving

both individual processes and the system as a whole.

Material interpretation: Despite the in-depth coverage of issues in the economic literature of quality management, today little attention given to evaluating the effectiveness and efficiency of processes in systems management. In addition, in the current circumstances, there is the need to find and develop new forms, methods, and systems for evaluating the effectiveness and efficiency of processes in systems management. The need to address this issue and to fill gaps in the theoretical, methodological and practical basis of evaluating the effectiveness and efficiency of the processes in the management system determines the relevance of the study. A characteristic feature of the development of new and improvement of existing processes in systems management is often required to obtain performance management effectiveness and efficiency of products and services information in structurally complex and multifaceted process characterized by the action of multiple and divergent relations, is associated with significant complications and financial and time costs. This in turn makes it difficult to establish in assessing the effectiveness and efficiency of processes in systems management clear-one correspondence between the parameters of process control management systems and performance indicators and efficiency of the production of goods and services. In these circumstances, the existing methods of evaluating the effectiveness and efficiency of the processes in the systems management based on deterministic mathematical models, are not completely effective, do not provide an objective picture of the processes in the systems management and timely develop sound strategy.

As currently used criteria for evaluating the effectiveness and efficiency of the processes in the management systems require a review of their application, it is possible and necessary statistical indicators, which include asymmetry, excess and performance variability, allowing in combination with other indicators to more adequately describe and analyze the processes under study.

Distribution figures, which include the coefficients of asymmetry and excess, is now in economic studies to assess the effectiveness and efficiency of processes in the management systems are used. Due to the fact that these characteristics of the distributions are the tool most sensitive towards changes, including negative ones, in the

analyzed processes, it is necessary to use them to provide immediate and more accurate assessment of trends occurring in the management systems.

The asymmetry gives an indication of the stationary test series, the presence and severity of transients, including trends. Ratio reflects the excess rate (slope) changes in the components of non-stationary random series and the presence of local non-stationary. Coefficient of variability is convenient for practical use, because it is a normalized estimate of the variance, which reflects the total capacity of all periodic and nonperiodic fluctuations of indices, and can be compared with the objects of study with different parameters.

Applied to the problems addressed by the management systems, this approach has the advantage of the basic requirements for integrative management system are reliability, speed of action, the simplicity and maximum focus on the goals of the system. The use of this methodological approach is not limited by a large number of indicators of the efficiency and effectiveness of processes in facilities management from the perspective of diverse requirements. Proposed by calculating statistics estimate the effectiveness and efficiency of management systems designed to demonstrate their effectiveness in a time range that take operational decisions to improve the systems themselves and management processes.

The above approaches and principles of interpretation of empirical data to rapidly and more accurately assess the processes in the management system and the effects of regulatory mechanisms, as well as to monitor the efficiency and effectiveness of different influences.

Demonstrate the presented approach to the evaluation and assessment of the effectiveness and efficiency of processes in systems management for example in health care services in Russia.

At present, Russia and other countries exacerbated the problems associated with the health of the population. Growing negative trends in the population structure, manifested primarily in its aging, deteriorating health and demographic indicators increase the need for public services in the health sector. Due to increase in demand for medical services is the formation of health care as the largest sector of the economy and an increase in economic benefits and economic value of the health care system in maintaining and improving the health of the population [1].

The main feature of the health sector as a sector of the economy is that it not only provides medical care to the population, but also contributes to the preservation and strengthening of physical and mental health of each person, that is a that saves resources industry. At the same time, the health sector is a resource sector of the economy, for which at present particularly acute problems of rational planning and effective use of material, labor and financial resources.

Place on the market of health care processes are inextricably linked to the demographic situation in the country, population dynamics of different age groups, levels of fertility and mortality, morbidity and other indicators. However, of paramount importance to assess and analyze the effectiveness and efficiency of the processes in the systems management market for services like health care sector of the economy has an index number of health workers, and above all, the number of doctors and nurses, the quantity and quality of labor which depends on the number of services and economic performance of healthcare institutions.

As a consequence, to assess and analyze the effectiveness and efficiency of the processes in the systems management market health services were selected indicators: number of physicians of all specialties and nurses, the number of doctors and nurses per 10000 population, the population per physician and per worker nurses in Russia from 1995 to 2010. from the site of Rosstat [6].

The total number of doctors in Russia includes persons with higher medical education, working in the medical, health organizations, social services, research institutes, institutions, personnel training, the unit of health authorities, etc. The total number of nursing staff included persons with secondary medical education, engaged in medical, health organizations, social services, care centers, schools, children's homes, etc.

Data analysis of indices showed that the number of physicians in all specialties, as well as the number of doctors per 10 000 population for the entire study period in Russia increased. Analysis of the number of nurses showed that during the period under review the total number of nurses in Russia is constantly decreasing, while the number of nurses per 10 000 population also declined.

In order to identify the specific, special features that characterize the performance indicators and performance management systems and processes in the market of health services during the study period, based on available data from Russia was made grouping of number of physicians of all specialties and nurses, the number of doctors and nurses to 10 000 population, population per physician and per worker nurses in 2000 and 2010 and subsequent analysis of the resulting group distribution series with indicators of variation and distribution patterns. To examine the status and influence of the mechanisms of regulation of the market of health care services have been calculated coefficients of variation, asymmetry and excess, audited their materiality. Selected results are presented in table 1.

Analysis of the coefficient of variation in the study period showed that the total number of Russian doctors per 10 000 population and population per doctor uniform, the variation in the Russian regions is small, and the aggregate number of doctors in all specialties in 2000 and 2010 heterogeneous, the variation in the Russian regions is essential. In this variation of the number of doctors in all specialties and the number of physicians per 10 000 population increased slightly in 2010 compared to 2000. Variation of population per physician decreased in 2010 compared to 2000, which describes the processes in the market for health positively.

Because the nature of the asymmetry indicates the direction of development in the study of variation of features for which there is an interest to increase them (number of physicians of all specialties, the number of doctors per 10 000 population, etc.), right-sided asymmetry indicates the progressive development - about it goes in the direction of increasing index, and left-sided asymmetry, therefore, indicates a regressive development. In the study of variation of features for which there is an interest in reducing their (population per physician, etc.), right-sided asymmetry indicates shortcomings in the development of the process under study, left-handed - the progressiveness of its development, the fact that the latter is in downward target.

All the data for the study period of the asymmetry of the studied parameters, as a positive and non-zero, indicate right asymmetry. On the one hand, it describes

Table 1. Estimates of variation and distribution characteristics for the analysis of the market of health care in Russia

| Indicator | The coefficient of variation, % | The asymmetry | coefficient of excess | t-test for asymmetry | t-test for excess |
|--|---------------------------------|---------------|-----------------------|----------------------|-------------------|
| Number of physicians in all specialties in 2000 | 72,0 | 0,84 | -0,36 | 3,11 | 6,21 |
| Number of physicians in all specialties in 2010 | 73,6 | 1,02 | 0,24 | 3,80 | 4,17 |
| Number of physicians per 10 000 population in 2000 | 21,2 | 0,58 | 0,36 | 2,15 | 6,27 |
| Number of physicians per 10 000 population in 2010 | 23,2 | 0,47 | 0,04 | 1,88 | 0,88 |
| Population per physician in 2000 | 22,8 | 0,92 | 2,38 | 3,46 | 42,69 |
| Population per physician in 2010 | 21,2 | 0,24 | -0,74 | 0,90 | 13,26 |

not only the presence and severity of transients in the market for health care, but also the progressive development of the market of health care in Russia in terms of the number of doctors in all specialties and the number of physicians per 10 000 population, and increasing the effectiveness and efficiency of processes in management systems, health care, and the other - not account for the development of the process under study, as against the population per doctor has an interest in reducing it, and right-sided asymmetry indicator "population per physician" indicates its possible increase. Moreover, we note that during the study period there was an increase of asymmetry number of doctors of all specialties and reduce the asymmetry of the population per physician, which positively characterize the processes occurring in the market for health care.

Kurtosis index, calculated on the investigated characteristics of the health care market, shows its progressive development. Since the coefficient of kurtosis reflects the rate (slope) changes in non-stationary random components and the presence of a number of local non-stationary, it can be argued that in Russia there are positive changes in the components of non-stationary random series. Checking the level of asymmetry and kurtosis coefficient for statistical significance confirmed their essential for almost all indicators.

Grouping of number of nurses, the number of nurses

per 10 000 population, population per employee nurses in Russia in 2000 and 2010. and subsequent analysis of the distribution with parameters variation and distribution patterns confirmed the negative processes, characterized by the number of indicators of nurses, the number of nurses per 10 000 population, population per employee nurses and place on the market of health care.

Therefore, the above approaches and principles of interpreting empirical data allowed a more accurate assessment and analysis of functional states and market development services to health care than the standard methodology employed market research services healthcare.

At the present stage of practical use of statistical methods presented above approaches and principles of interpretation can afford to effectively solve many problems, some of which are reflected in [3, 4, 5], to assess and analyze the functional state of the market on the various sectors of the economy, monitoring of process effectiveness and efficiency in the management system, including the various effects on the markets for goods and services of various sectors of the economy, etc. The possibilities of this methodology is far from exhausted. Simplicity and accessibility of the method, its high information in the development of computer hardware and software in the future, will undoubtedly extend its scope.

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РЕЗЮМЕ

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Розглянуто методологічні питання аналізу показників результативності та ефективності процесів у системах менеджменту.

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Дюкина Татьяна

Оценка и анализ результативности и эффективности процессов в системах менеджмента

Рассмотрены методологические вопросы анализа показателей результативности и эффективности процессов в системах менеджмента.

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