Anna KONYEV[1]
Olena DOLGALOVA[2]

IMPROVEMENT OF PARTNERSHIP RELATIONS BETWEEN THE MANAGING ORGANIZATION AND THE OWNERS OF PREMISES IN AN APARTMENT BUILDING

In the article the system of monitoring and estimation of quality as the major element of realization of the client-oriented approach in the sphere of housing and communal services is considered. The proposed system of monitoring and evaluation of service quality is aimed at customer evaluation and integrated consideration of communal, housing, organizational, informational components and allows you to determine the effectiveness of the managing organizations. The organizational structure, based on the creation of two main units – back and front offices, which allows to implement a customer-oriented strategy, is also considered. Within the limits of the new organizational structure the system of revealing of need and opinions of owners of rooms in apartment houses by means of absentee voting with application of new information technologies is offered. Thus, the given system of monitoring and estimation of quality of housing and communal services will allow to realize feedback between consumers and the managing organizations, and to increase customer satisfaction of quality of services.

Keywords: housing and communal services, customer-oriented approach, monitoring, partnership relations, managing organization, consumers, organizational structure.

1. INTRODUCTION

Relevance of the topic is associated with the era of relationships that emerged at the end of XX century and continues to this day, characterized by the transformation of consumer orientation of organizations. Increased attention was paid to the establishment and maintenance of relationships with consumers, so this approach is called customer oriented. Increasing competition in the market of housing and communal services (HCS) equalizes the proposals of management organizations in terms of price, quality and the list of services

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[1] Anna Konyev, Heilbronn University, Reinhold Würth University, Campus Künzelsau, Germany; e-mail: ganna.konyeva@gmail.com. ORCID: 0000-0002-8851-8765.
[2] Olena Dolgalova, Donbas National Academy of Civil Engineering and Architecture, Ukraine (corresponding author); e-mail: elena.dolgaleva21@gmail.com. ORCID: 0000-0002-7281-2046.

offered, forcing them to look for new ways to compete for attracting and retaining customers. The attention is gradually shifting from the services to the consumer, who is becoming a legislator in the market, dictating his conditions, and expecting special treatment. The approach, based on the increased attention to the establishment and maintenance of relations with consumers, was called client oriented. A distinctive feature of housing and communal services is that the processes of their production and consumption are inextricably linked. This leads to the increasing importance of the orientation of the organization to the maximum satisfaction of the needs of consumers. Thus, in the emerging market relations success of management organizations in the market of housing and communal services is directly determined by the degree of compliance of the quality of services provided expectations and needs of consumers (Burmenko, Danilenko, Turenko, 2019).

Housing and communal services are the result of one of the life-supporting sectors of the national economy. By the number of consumers these services occupy a leading position and have a significant impact on the quality of life of the Ukrainian population. Historically, the radical changes in the sector of housing and communal services (HCS) were primarily associated with the formation of a new model of management, reflecting the market relations between the subjects and objects of management. The necessity of transition to the new model of management of housing and communal services was conditioned by demonopolization of the sector, division of functions of owners, customers, and contractors – suppliers of housing and communal services, as well as appearance of private ownership of objects of housing and communal services.

Model of management in housing and communal services formed nowadays is characterized by low level of population's satisfaction with quality of provided services, lag of technologies of services provision from the modern requirements of the society and irrational "price-quality" correlation from the point of view of consumers. This situation is directly related to the features of the current management system, focused primarily on combating utility problems "as they arise", rather than on long-term planning and the creation of conditions for minimizing the possibility of problems and sustainable development of the industry (Antonov, Bradul, Slavenko, 2020).

The relevance of the topic of the study is dictated by the need to improve the management of housing and communal services based on the formation of customer--oriented model that provides the needs of consumers of housing and communal services in the composition, performance, quality.

The purpose of the article is to improve the partnership relations between the managing organization and the owners of premises in an apartment building in the sphere of housing and communal services.

The object of the study is managing organizations of housing and communal services.

The subject of the study is a set of organizational and economic relations arising in the process of management of housing and communal services.

Theoretical and methodological basis of the study were the scientific works of domestic and foreign scientists devoted to the theory, methodology and practice of management of housing and communal services organizations. In solving the problems of the study were used dialectical methods (analysis and synthesis, detailing and generalization, analogy, and modeling), as well as economic and statistical methods, methods of expert evaluations, observation, questioning.

2. STATEMENT OF THE PROBLEM

In modern scientific literature the study of quality and efficiency of management at different levels are devoted to the works of such Ukrainian and foreign scientists as D. Aaker, I. Ansoff, L.V. Bezzubko, Bondarenko, V.A. Vinokurov, E.V. Dolgaleva, P. Drucker, N.D. Zakorin, H. Iosihara, A.A. Kleiman, V.M. Kolpakov, V.I. Korolev, P.V. Magdanov, M.V. Melnik, D. Mercer, G. Mintzberg, T. Peters, A.G. Porshnev, B.A. Reisberg, A. Svirina, A.J. Strinkland, F. Taylor, A. Thompson, R. Waterman, G. Ford, G. Emerson, S. Young.

The specifics of management in the sphere of housing and communal services are reflected in the scientific works of V.V. Akimkin, S.I. Bazhenov, I.V. Genzler, S.N. Glazunov, M. Yeshchenko, T. Fasolko, H. Mukhalchenko, I. Udovychenko, M. Grossmann.

However, even though a significant number of scientific works are devoted to the theoretical foundations of management, their study revealed the lack of validity of management models in the sphere of housing and communal services. There are not enough works, which consider customer-oriented management in organizations of housing and communal services in the context of its development, structural dynamics, peculiarities of manifestation of interrelations of its elements. Solving the above problems is of scientific interest, requires further theoretical and methodological justification, as well as practical implementation with respect to the current stage of development of organizational and economic relations in housing and communal services in Ukraine, which distinguishes the research of the author of this article from the studies previously performed in this subject area.

3. MAIN RESULTS

Radical changes carried out in the sector of housing and communal services are primarily associated with the formation of a new model of management, which reflects market relations between the subjects and objects of management. The necessity of transition to a new model of management in housing and communal services is conditioned by: demonopolization of the branch; division of functions of the owner, customer, and producers-suppliers of housing and communal services; formation of private property on the objects of housing and communal services.

The problem situation in the housing and communal sector of Ukraine is well known. It is largely related to the conflict of goals and interests of the parties concerned. For example, owners of residential buildings are concerned that the quality of housing and communal services is decreasing while tariffs are growing. Resource supplying and contracting (servicing) organizations are dissatisfied with untimely and incomplete payment for the provided resources and services, and the state is concerned about the reduced availability of housing and utility services for most of the population (Selezneva, 2020).

In turn, the management companies (MC) believe that their interests are infringed by the state and local authorities. Dissatisfaction is experienced by management organizations, which qualitatively fulfill contractual obligations to resource suppliers, contractors, and owners of residential premises, but, nevertheless, are a constant object of criticism.

The author of the article proposes to use client-oriented approach in relation to housing and communal services as building partnership relations between the management organization and the owners of premises in an apartment house (MAB), aimed at meeting the quality of housing and communal services consumers and receiving a sustainable profit

by the management organization in the long term through the implementation of key competencies.

One of the main elements of building partnerships in the client-oriented approach is a system of monitoring and quality assessment of housing and communal services, which allows to build feedback between the consumers and the managing organization, improve information transparency, quality of services and competitiveness of the managing organizations themselves. The system of monitoring and quality assessment of housing and communal services means organized systematic observation of the satisfaction of owners of premises in MFBs with quality of housing and communal services.

Monitoring and assessment of quality of housing and communal services is carried out for objective solution of the following main tasks: provision and management of quality; selection of the best (optimal) option of service provision; planning of quality indicators; quality control; analysis of quality level changes.

In general, the system of monitoring and quality assessment should perform the following functions:

- Informational (serves to inform management organizations about the quality of services provided);
- Stimulating (encourages managing organizations to develop and implement measures aimed at maintaining and improving the quality of housing and utility services);
- Control (research of the dynamics of quality indicators of housing and utility services will enable managing organizations to control the process of reaching the goals and targets set);
- Mediatory (serves as feedback between the managing organizations and consumers of housing and utility services);
- Management (based on the quality indicators received, managing organizations will be able to develop preventive and corrective measures in the field of quality).

The main component in the monitoring system is assessment of the quality of housing and utility services. In the modern world the practice of assessing the quality of various services has become widespread enough. However, the study of domestic experience in assessing the quality of housing and communal services suggests that in most cases there is a general rating assessment of the activities of management organizations, but not the quality of services provided by them (Tebekin, 2021).

This is caused by the fact that managing organizations do not realize that assessment of the quality of housing and utility services is an important aspect on the way to improve the quality of services and competitiveness of the managing organizations themselves. That is why many management organizations are characterized by low information transparency, lack of desire to work more closely with consumers, violation of norms, standards, and rules of provision of housing and utility services. Quality assessment of housing and communal services is essentially a set of consistently performed stages, including selection of a method of quality assessment, a set of indicators of properties of assessed housing and communal services, determination of their values and calculation of the complex indicator of quality.

The main purpose of quality assessment is to obtain information about the quality of services provided by management organizations from consumers for targeted activities aimed at meeting quality requirements of housing and communal services and their improvement.

The choice of indicators to assess the quality of housing and utility services was based on the following methodological principles: consistency (the selected indicators must characterize the object of research as a system and have an ordered structure); representativeness (adequacy of the choice of indicators for the complex assessment of the quality of housing and utility services in the absence of overlapping indicators); objectivity of the assessment; understandability of the evaluation methods (consumers of housing and utility services are representatives of different social strata, age, education levels, so the methodology must be understandable to everyone); regularity of the assessment (it means that for the timely response to the changes in the quality of housing and utility services it is necessary to regularly assess their quality).

It is worth noting that the level of quality of housing and communal services may be affected by the following factors:

- infrastructural (quality of housing and utility services will be most likely higher in the areas of new buildings, and lower in the areas of the old buildings, which can be explained by different level of housing amenities);
- socio-economic (consumers' personal attitudes and beliefs, their income level);
- psychological (previous experience of similar services in other cities, districts; time of residence of the consumer in a particular place) (Larin, 2013).

The proposed algorithm for assessing the quality of housing and communal services includes the following steps:

1. Choice of a method for assessing the quality of housing and communal services. Since management organizations need to identify the opinion of consumers about the quality of services provided, accordingly, a sociological survey is the most appropriate for this purpose. It should consider the fact that consumers of housing and utility services are representatives of different social strata, have different levels of education, and the method of quality assessment must be understandable to everyone. That is why it is suggested to define the assessment of quality on a five--point scale.
2. Determination of the number of survey participants. A selective method of polling is offered, for example, five representatives of each entrance from among the most active owners of premises in the apartment building.
3. Definition of directions of quality assessment as well as indicators included in each direction and periodicity of assessment. Now there is no unified standard or algorithm of assessment, so the author's method suggests determination of quality indicators in six areas (Table 1) with each area having different number of indicators.

Table 1. Directions for assessing the quality of housing and communal services

No.	Name of direction	The content of the direction
1	Utilities	Utilities
2	Residential	Residential
3	Household	Household
4	Organizational	Organizational
5	Informational	Informational
6	Social and Psychological	Social and Psychological

Source: personal contribution of the authors.

Thus, the total number of indicators reaches thirty (Table 2). The frequency of the assessment is supposed to be once a quarter since the collection and processing of the results is quite time-consuming.

Table 2. Indicators for assessing the quality of housing and communal services

No.	Indicators
1. Ensuring the proper quality of public services	
1	Cold water supply (compliance with standards and regulations; composition and properties of water; water pressure; water supply interruptions)
2	Hot water supply (observation of standards and norms; composition and properties of water; water pressure; water supply interruptions)
3	Wastewater supply
4	Heating (observation of standards; timely heating season start; temperature regulation depending on the outside temperature)
5	Electricity supply (presence of interruptions)
6	Gas supply (no interruptions; ensuring of the normative pressure)
2. Ensuring the proper condition of the apartment building	
1	Cleaning of garbage chutes
2	Condition of House Communal Infrastructure
3	Maintenance of attic and basement facilities
4	Maintenance of the roof (sweeping the snow in winter)
3. Ensuring the proper condition of the adjacent territory	
1	Timeliness of garbage removal
2	Improvement of the adjacent territory
3	Cleaning of the adjacent territory
4. Organizational and managerial activities of the managing organization	
1	Provision of additional services
2	Timeliness and accuracy of charging for housing and utility services
3	Promptness of execution of requests from residents
4	Management of debtors and defaulters of housing and utility services
5	Participation in city and district contests
5. Level of information provision	
1	Availability of up-to-date information on stands, bulletin boards, etc.
2	The quality of the website of the managing organization.
3	Availability of contact information.
4	Disclosure of information about the work of the managing organization.
6. Interaction with consumers of housing and utility services	
1	Regularity of tenant meetings.
2	Attendance of meetings by tenants.
3	The culture of interaction between the employees and the management of the management organization.

Source: personal contribution of the authors.

4. Outreach work with consumers of housing and communal services. This work involves reporting at the annual meeting of owners and the managing organization of the implementation of assessment of the quality of housing and communal services by consumers. Representative of the management organization explains the purpose, objectives, frequency of quality rating of housing and communal services.
5. Collection and processing of quality indicators of housing and communal services.
6. Definition of a complex index of quality. The complex assessment of quality is calculated by the following formula:

$$Q_0 = \sum_1^n K_i \cdot Q_i \tag{1}$$

where Q_i – the value of directions on a five-point scale;
            K_i – value of the weighting coefficient of the indicator Q_i, with the sum of all weighting coefficients

$$\sum_1^n K_i = 1 \tag{2}$$

Values of weighting coefficients of indicators Q_i are calculated according to the following formula:

$$K_i = \frac{2(n - k_i + 1)}{n(n + 1)} \tag{3}$$

where k_i – rank number of the i-th direction;
            n – the total number of directions to assess the quality of housing and communal services (Grossman, 2000).

The indicator Q_i will be calculated as follows:

$$Q_i = \frac{\sum_1^n q_i}{n} \tag{4}$$

where q_i – value of indicators on a five-point scale in each area;
            n – the total number of indicators to assess the quality of housing and communal services in each area.

During the study, the expert method determined the numbers of ranks k_i in all areas of assessment, then calculated the value of K_i – weighting factor of the indicator Q_i.

Thus, a comprehensive indicator of the quality of housing and communal services can be calculated by the following formula:

$$Q_0 = 0{,}26\, Q_1 + 0{,}2\, Q_2 + 0{,}152\, Q_3 + 0{,}21\, Q_4 + 0{,}11\, Q_5 + 0{,}068\, Q_6 \tag{5}$$

where Q_1 – communal; Q_2 – housing; Q_3 – housekeeping; Q_4 – organizational; Q_5 – information; Q_6 – socio-psychological direction.

The implementation of customer-oriented strategy by the managing organization depends on its organizational structure. The author offers the organizational structure based on creation of two main divisions (fig. 1):
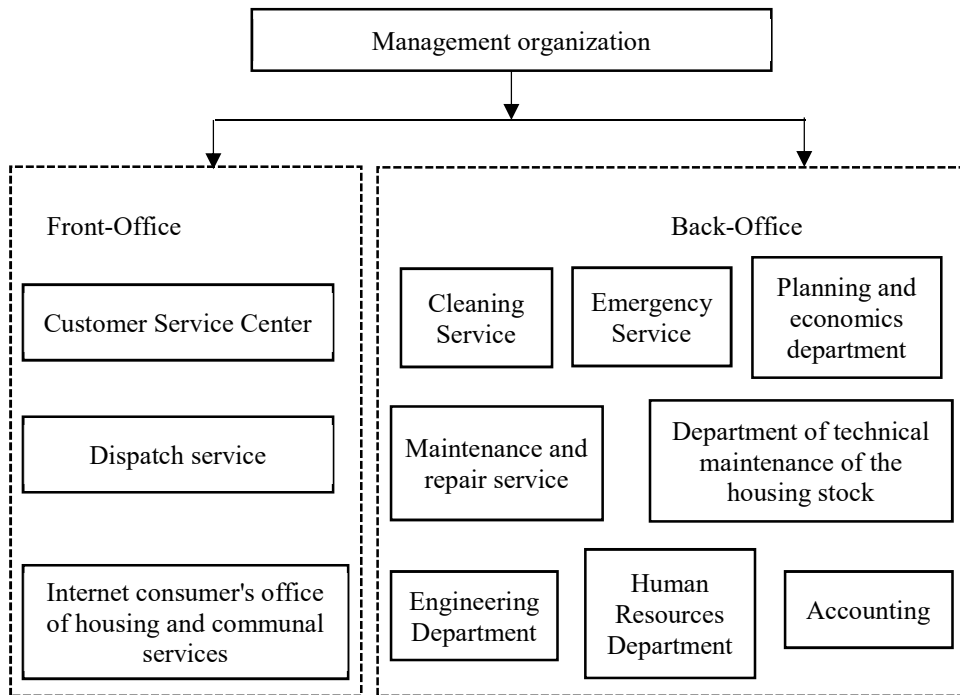

Figure 1. An example of solving a problem using the dynamic programming method

Source: personal contribution of the authors.

1. Division on work with clients (front-office) is engaged in interaction with clients, development of client-oriented strategies. The head of front-office and his subordinates are responsible for profitability of relations with clients. Tasks of front-office are definition and the analysis of requirements of clients to quality of housing and communal services, coordination of contracts on management of MFB, realization of monitoring of satisfaction of consumers of quality of housing and communal services, including their estimation by owners of premises in MFB on various directions.
2. Internal service units (back office) support front office activities with their services. The head of the back-office and his subordinates are responsible for projecting services at the prices set by the head. When applying the client-oriented approach in the process of providing housing and communal services, the introduction of new information technologies is important. Practice shows that the procedure for holding meetings in person to discuss arising issues and problems in the management of MFBs is complicated by the lack of space and enough attendees for a quorum. This leads to lack of mutual understanding between employees of management

organizations and premises owners in MFBs, as well as numerous violations in the process of providing housing and communal services. In particular, the creation within the front and back office organizational structure of an Internet consumer's cabinet is caused by the need to make decisions on various issues related to management of the MFB, which can take place in the form of absentee voting of premises owners. This will make it possible to identify the needs and opinions of premises owners in the MFB through absentee voting.

In general, the system of monitoring and evaluation of the quality of housing and communal services will allow:

- determine the effectiveness of organizations to manage the property of apartment buildings, to ensure the quality provision of housing and communal services;
- at regular assessment of the quality of housing and communal services it will be possible to identify the best managing organizations, which will allow others to be guided by them and to adopt the best practices in this sphere;
- to build feedback between the consumers and the managing organizations, which will lead to greater satisfaction with the quality of the housing and communal services;
- timely development and implementation by management organizations of preventive and corrective measures aimed at maintaining and improving the quality of services.

The difficult economic situation in the housing and communal economy is compounded not only by the state of the national economy of Ukraine but also by the natural monopoly of suppliers of goods and services in this sphere (providers of housing and communal services). Due to ineffective regulation of their activities by the state, providers of housing and communal services shift their economic problems to consumers and the state, but their activities tend to be ineffective. As a result, this hinders not only the social, but also the economic development of the national economy.

Among the directions of socio-economic reforms that have been taking place in Ukraine in recent years, an important place belongs to the reform and development of housing and communal services in general and one of its leading components – housing. The urgency of the urgent task of reforming the housing and communal economy is determined by the severity of the problems that have accumulated in this sector. In 2021, the draft "Strategy for the development of housing and communal services for 2022–2027" was developed. (minregion.gov.ua, Housing and communal services development strategy for 2022–2027, 2021). The provisions of this project note the directions of formation, implementation, and coordination of state policy in the field of housing and communal services.

According to this document to the main strategic objectives of the further development of housing and communal services should include the following:

- Ensuring the preservation of the proper technical condition of the country's housing stock and its improvement.
- Achieving effective management of apartment buildings.
- Introduce a client-oriented approach to providing communal services.
- Creating conditions for stabilizing the financial and economic condition of heating, centralized water supply and centralized drainage enterprises.
- Heat energy is affordable for consumers, and the processes of its supply are climate neutral.
- Ensuring sustainable development of affordable and safe centralized water supply and centralized drainage in settlements of the country.

- Ensure prevention of domestic waste generation and increase the volume of separate collection of their resource-valuable components and develop infrastructure for their treatment and disposal.

However, it is difficult to implement them in conditions of non-transparency and unreliability of information of suppliers of housing and communal services. This also hinders the regulation of their activities by the state. To solve these problems, we have developed an appropriate monitoring methodology, which is based only on subjective assessments of experts on the condition of housing and communal services in cities that do not consider economic performance of suppliers. As a result, there are no grounds for economic regulation of their activities, but it is on them should be based new approaches to the state regulation of the socio-economic efficiency of suppliers of housing and communal services in the national economy.

Providers of housing and communal services are natural monopolists for services on maintenance of houses and buildings and adjacent territories, water supply and sewage, heat, gas, and electricity supply. Their activities in this area are determined by the Law of Ukraine "On housing and communal services" with amendments introduced by the Laws of Ukraine of December 2020 N 1060-IX (minregion.gov.ua, 2020). On the part of the state the regulation of suppliers of housing and communal services is performed by local administrations, and state regulation in the sphere of housing and communal services is aimed at:

- achieving mutual alignment of interests of consumers (affordable prices) and service providers (financial results attractive to creditors and new investors);
- creation of a favorable regime for the functioning and development of natural monopolies for the public benefit;
- determination of the real structure of tariffs based on the principle of effective and equitable allocation of costs to the cost of services for different types of consumers;
- encouraging suppliers to cut costs and reduce excessive employment, improve the quality and reliability of services provided to consumers, increase the efficiency of investments, etc;
- creating conditions for the development of competition to the extent that it is possible under the existing economic conditions (for example, ensuring free and open access of competitors to infrastructure networks).

However, implementation of the above tasks is complicated by an objectively existing contradiction between consumers and suppliers of the housing and utilities sector regarding the cost of goods and services. Lack of effective methods of state regulation in the conditions of their natural monopoly leads to the deepening of contradictions. For instance, because of an unjustified increase in tariffs, the economic efficiency of housing and utilities providers increases, but the living standards of the population and, consequently, the social efficiency of the national economy decrease.

Unlike other sectors of the national economy, the formation of tariffs in the sphere of housing and communal services is inherently subjective. For example, electricity tariffs for the population are fixed and set by the state, while water and heat tariffs are regulated by local governments and vary by oblasts, districts, and cities. But the cost of services for consumers in the sphere of housing and communal services is determined not only by the value of the tariff, but also by the volume of consumption, which is regulated by the state.

As a result of exaggerated norms, for example, for water consumption, the cost of consumed water increases significantly (Ruzhynska, 2019).

Increase of tariffs is beneficial to providers of housing and communal services, but besides subjective, there are also objective conditions of their overestimation. First, it is commercial losses of heat, electricity, and water due to the high degree of wear and tear of transmission devices. However, most suppliers do not use funds received from tariff increases to improve their condition. Meanwhile, the economic efficiency of housing and utilities providers is determined not only by their profits, but also by the corresponding costs. The only way to solve the above-mentioned contradictions is to stimulate the state to lower them.

Incentives should be targeted and aimed at achieving certain results aimed not only at increasing the economic efficiency of providers of housing and utility services but also at improving the quality and reducing the cost of services for the population. With a permanent deficit in the state budget and budgets of local governments, the only source of incentives is incomes of providers of housing and utility services. They can only be regulated by changing the tariffs for services. That is why it is necessary to introduce some order into the tariffs.

To regulate tariffs, there should be a set of tariff ceilings - lower and upper limits for tariffs set by the government and local authorities. Within the lower and upper limits of tariffs, the activities of providers of housing and public utilities are incentivized. Their increase is carried out on the condition that the provider of housing and communal services has achieved certain positive results. If he has not obtained them, the tariffs are reduced. This approach is adequate to the problem with feedback, known as the problem of adaptation, (Dolgalova, 2018).

To solve such a problem, the actual values of the performance of housing and utilities providers must be constantly compared with the baseline. For this purpose, it is necessary to carry out their current monitoring. It should be conducted for providers of services on maintenance of houses and buildings and adjacent territories, water supply and drainage, heat, gas and electricity supply, and comparison of results should be carried out only within the framework of one type of economic activity.

The results of activity of suppliers of housing and communal services are the consequence of different factors and are characterized by appropriate factor indicators. If because of monitoring we choose the best values of factor indicators, their totality will characterize the results of activity of conditional reference supplier (CRP) of housing and communal services. They are basic for analysis, control, and decision-making on the part of the state and local authorities to stimulate the activity of real providers of housing and communal services.

The results are used to determine the following indicators:

$$f_{ij}, i = \overline{1, n}, \qquad j = \overline{1, k}$$

– is the absolute indicator of the rating by j-th factor, which shows the proximity of the i-th housing and communal services provider to the CRP in points ($f_{ij} \in [0, `1]$);

$$r_{ij}, i = \overline{1, n}, \qquad j = \overline{1, k}$$

– relative (weighted) rating indicator for the *j*-th factor indicator, which determines the distance of the *i*-th housing and communal services provider from CRP for the *j*-th factor indicator as a percentage ($r_{ij} \in [0,1]$);

b_{ik} – is a generalized indicator of the rating score, which considers the significance of the factor indicators of the *i*-th housing and communal services provider, which are determined by expert judgment. It determines its rating score by the maximum distance from the origin (CRP factor indicators). The necessity of introducing such an indicator appears with the differentiation of the aggregate assessment of housing and communal services suppliers. The highest value of the indicator corresponds to the best performance in the delivery of service in the sphere of housing and communal services;

R_i – total rating score of the *i*-th housing and communal services provider. It considers the significance of various indicators when calculating the proximity rating for CRP. The supplier with the lowest value of the total expert rating has the highest rating.

The following methodology is used to calculate the absolute and relative rating indicator.

First step. The values of their rating score (F_j) are determined by expert method within the framework of one type of economic activity of n providers of housing and communal services for k factor indicators (a_{ij}) and an appropriate array of data is formed:

$$\begin{cases} \varPi_1 = (a_{11}; a_{12}; \dots; a_{1k}), \\ \qquad \dots \\ \varPi_n = (a_{n1}; a_{n2}; \dots; a_{nk}). \end{cases} \tag{6}$$

Second step. For each factor indicator (F_j) he maximum value of the rating score is found, which is the corresponding characteristic of CRP:

$$CRP = (max(a11,\dots,an1); \dots max(a1k,\dots,ank). \tag{7}$$

Step three. The absolute ranking score (f_{ij}) is used to determine the distance of housing and utilities suppliers from CRP for each factor indicator (F_j):

$$\begin{cases} f_{i1} = max(a_{11}, \dots, a_{n1}) - a_{i1}, \dots, \quad f_{ik} = max(a_{1k}, \dots, a_{nk}) - a_{ik}, \\ \qquad\qquad\qquad\qquad \dots \\ f_{n1} = max(a_{11}, \dots, a_{n1}) - a_{n1}, \dots, \quad f_{nk} = max(a_{1k}, \dots, a_{nk}) - a_{nk}, \end{cases} \tag{8}$$

The result is such an array of data:

$$\begin{cases} \varPi_1 = (f_{11}; f_{12}; \dots; f_{1k}), \\ \qquad \dots \\ \varPi_n = (f_{n1}; f_{n2}; \dots; f_{nk}). \end{cases} \tag{9}$$

Fourth step. The values of the relative indicators of the rating of housing and communal services providers (r_{ij}) are determined and summarized in Table 3 (F_j):

$$
\begin{cases}
r_{i1} = \dfrac{f_{i1}}{max(a_{11}, \ldots, a_{n1})}, \ldots, & r_{i1} = \dfrac{f_{ik}}{max(a_{1k}, \ldots, a_{nk})}, \\
& \ldots \\
r_{n1} = \dfrac{f_{n1}}{max(a_{11}, \ldots, a_{n1})}, \ldots, & r_{nk} = \dfrac{f_{nk}}{max(a_{1k}, \ldots, a_{nk})}.
\end{cases}
\tag{10}
$$

Table 3. Relative indicators of the rating assessment of factor indicators

No.	Utility company	Indicators by factor		
		F_1	…..	F_k
1	UC_1	r_{11}	……	r_{1k}
…		…..	…...	…..
n	UC_n	r_{n1}	……	r_{nk}

Source: personal contribution of the authors.

To calculate the generalized rating indicators (b_{ik}) in addition to the rating values (a_{ij}) of factor indicators (F_j) their weighting coefficients (p_{ij})

$$
p_{ij} \in [0,1], \sum_{j=1}^{n} p_{ij} = 1):
$$

$$
p_{ij} = \frac{a_{ij}}{max\, a_{ij}}
\tag{11}
$$

Table 4 forms the corresponding data set of the complex evaluation of factor indicators (F_j).

For each of the *i*-th enterprise of housing and communal services using the data from Table 4 are determined and summarized in Table 5 generalized indicators of the rating (b_{ik}).

$$
b_{ik} = \sqrt{p_{i1} a_{i1}^2 + p_{i2} a_{i2}^2 + \ldots + p_{ik} a_{ik}^2}
\tag{12}
$$

Table 4. Rating estimates of factor indicators

Estimates	F_1	F_2	…	F_k
Preliminary estimates	a_{i1}	a_{i2}		a_{ik}
Weighting factors	p_{i1}	p_{i2}		p_{ik}

Source: personal contribution of the authors.

Table 5. Generalized rating indicators

No.	Utility company	Factors			
		F_1	F_2	...	F_k
1	UC_1	b_{11}	b_{12}	....	b_{1k}
...		....	.....	.....	.....
n	UC_n	b_{n1}	b_{n2}	......	b_{nk}

Source: personal contribution of the authors.

The overall rating of the *i*-th housing and communal services provider (Ri) is performed using the data in Table 5 in this sequence.

First step. For each indicator (b_{ik}) in the column (F_j) there is a maximum value, which is the corresponding result of CRP activity:

$$\overline{CRP} = (\max(b_{11}, \ldots, b_{n1}) ; \ldots \max(b_{1k}, \ldots, b_{nk})) \tag{13}$$

Second step. Regarding the CRP indicators are determined and summarized in Table 6 standardized values (x_{ij}) indicators $b_{lk:}$

$$x_{ij} = \frac{b_{ij}}{\max_k b_{nk}} \tag{14}$$

Table 6. Standardized indicators of rating grades

No.	Utility company	Factors			
		F_1	F_2	...	F_k
1	UC_1	x_{11}	x_{12}	....	x_{1k}
...		....	.....	.....	.....
n	UC_n	x_{n1}	x_{n2}	......	x_{nk}

Source: personal contribution of the authors.

Step three. For each *i*-th supplier of housing and communal services the value of the rating score (R_i) is determined:

$$R_i = \sqrt{\sum_{j=1}^{k}(1 - x_{ij})^2} \tag{15}$$

The fourth step. Housing and utilities suppliers are ranked. The supplier with the lowest R_i value has the highest rating.

The given algorithm of the rating assessment of housing and utilities suppliers is used both statistically and dynamically. In the first case the indexes of rating scores are determined as of the end of the period, in the second case they are calculated as ratios (growth rates or rates of growth) by the ratio of absolute values of indexes of rating scores at the end and beginning of the analytic period. In the complex such estimation allows to

control the results of functioning and development of housing and communal services suppliers.

4. CONCLUSIONS

In conclusion, it is worth noting the advantages of the above methodology of monitoring of providers of housing and utility services, because:

- it is based on a comprehensive, multidimensional approach to performance assessment;
- it uses a flexible computational algorithm, which implements the capabilities of the economic-mathematical model based on the equalized comprehensive assessment.
- the results of the corresponding type of economic activity of all providers of housing and communal services within a certain administrative territory are used, which makes monitoring objective.

Thus, we can conclude that targeted incentives for housing and utilities suppliers, aimed at their achievement of conditional benchmark enterprise performance, in conjunction with an improved methodology for monitoring their condition is an innovative approach to state regulation of their activities. However, its implementation requires prompt receipt of relevant information. This necessitates the creation of a certain information-analytical system (IAS) in the relevant institutions of local government and public authorities. Scientific and methodological basis of its formation is the direction of further research.

The article shows that the housing and communal services (HCS) is a system of business processes as a set of interrelated areas of implementation of services and production of works aimed at creating a living environment for consumers. Given that modern public policy is aimed at the transition to align all services of the state around the needs of the people, and the digital transformation activates the use of more effective management models, the article explores the task of transition from the principles of customer centricity to customer centricity, which allows to form a target focus in the activities of organizations and enterprises on a set of actions that ensure increased satisfaction of comfort and strengthen the interaction with consumers.

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