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MODEL OF THE ECONOMIC MECHANISM FOR THE DEVELOPMENT OF URBAN UTILITIES

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Management of any socio-economic complex system (such as urban housing and communal services) can be implemented on the basis of conceptual approaches: mechanistic and organistic. The first approach is characterized by a high degree of structured processes and management procedures, in contrast to the second one. Mechanistic approach was dominated in the “pre-perestroika” period, based on a centralized management model of housing and communal services of administrative-territorial units. The centralization in the allocation of resources played a key role in urban utility management [1].

For many decades, Kazakhstan has been characterized by a model of centralized management of housing and communal services, which provides the development of an action plan and the development of management teams based on informative and administrative information from various elements of the system.

Conceptual changes in the sense of organizing sectorial management of the housing and communal services followed reforms in the state economy. In connection with them, one can observe how the organistic concept replaced the mechanistic concept. At the same time, the entire city housing and communal services are represented as a set of subsystems that are diverse in form and financially independent from each other. These characteristic features of the organistic concept of management take place not only in the organizational and legal space, but also in the material, financial, and informational areas [2].

In connection with the dependence on the development of control actions, there is a need for an effective monitoring system, information on the status of each subsystem of housing and communal services, i.e. the implementation of a network model of urban housing and communal services. All business entities that are elements of the urban housing and communal services, as well as local governments, should not only function in a single information space but also have a common information base founded on a single institutional base.

The efficiency of urban housing and communal services in connection with its systemic characteristics significantly depends on the effective interaction of business entities in this area, territorial government bodies and the population because the functioning of the housing and communal services are aimed at satisfying population needs. In this case, it is necessary to take into account the diverse motivation of subjects of economic relations in the process of realization of housing and communal services. At the city level, many business entities that implement this type of service are management companies, enterprises providing resources, utility services, population, etc.

In some countries (Ireland and others), private property in the management of water supply and sanitation facilities is absent. Government solves the complex of tasks for the implementation of these functions [3, 4].

In Germany and the Nordic countries, a limited share in companies servicing water facilities belongs to private business (in Germany - no more than 25% of the shares of facilities). At the same time, there is another form of implementing the functions of water supply and disposal - a concession. Water supply facilities are transferred for a limited time to concession to the most efficient operators. The infrastructure of these facilities remains the property of the state. All issues on improving the functioning of the water management complex are specified in agreements between the lessee and the state. Of course, there are countries (for example, Great Britain) in which the facilities of the water supply system are fully privately owned [5, 6].

The diagram illustrated in Figure 1 can be detailed taking into account the forms of ownership of business entities: resource supply organizations, specialized enterprises, etc. It is known that foreign models of housing and communal services management organization provide the regulation of the problem spectrum of the housing and utilities sector with the direct participation of state and local governments.

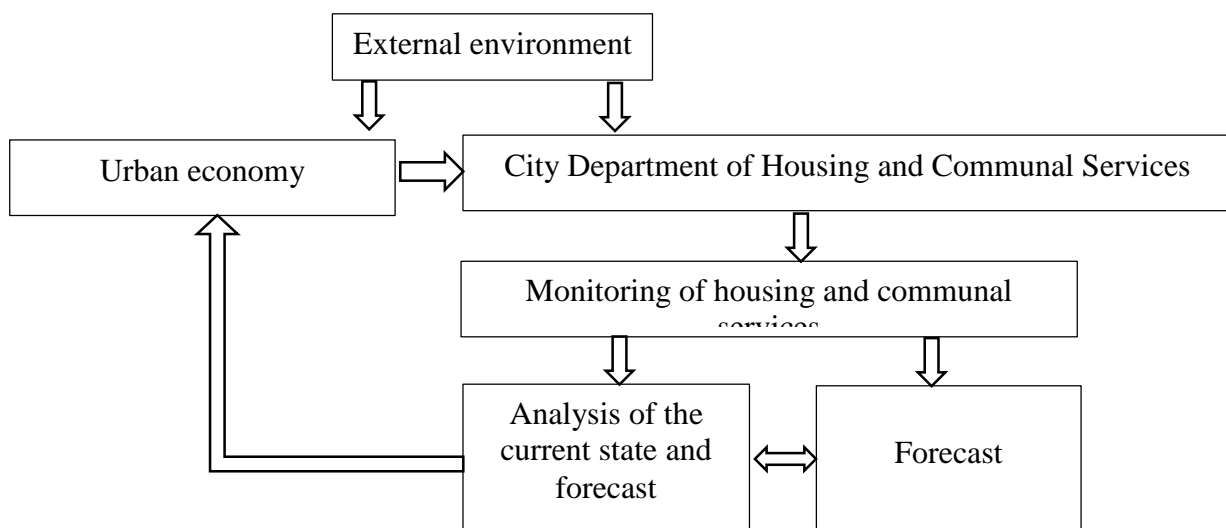


Figure 1. **Scheme of management of urban utilities by deviations**

The state and the city ensure the implementation of the right of the population to quality public services; compliance with the norms and standards of quality of utility

services in relation to contracting and service organizations; formation of a system of norms and standards for public services. This model of relations can be represented by the control system of the object by deviations.

Based on the standard formulation of the content of this type of management, control actions are organized and implemented due to detected deviations in the process of functioning of the system from the developed standards, programs and targets. In this case, the presence of a modern subsystem for monitoring the situation in the system (urban housing and communal services) becomes a mandatory factor in the effectiveness of management. This type of management makes sense only if there is a full regulatory framework, a system of rules and algorithms for the functioning of business entities that ensure the implementation of housing services. As a rule, the stipulated premise is not taken into account when managing this system in full.

In modern Kazakhstan, in contrast to the deviation management model of the housing and utilities sector, the totality of functions provided by the state and city is significantly narrowed. According to the Law of the Republic of Kazakhstan “On Housing Relations”, the population is considered as the main consumer of housing and communal services [7]. At the same time, the activities of commercial, contracting and service organizations by the state or the “akimat” are not always standardized, or not defined at all. In addition, the implementation of warranty functions, quality standards of vital services for the population is not fully implemented. Thus, the modern management concept of housing and communal services is proposed in the form of a system of decentralized regulation of housing and communal services.

It is important to emphasize the organizational and legal independence of business entities in the housing sector and the implementation of their own goals, which may not be openly declared. The implementation of this model requires the mandatory presence of several functional subsystems of housing and communal services (heating networks, electricity networks, water utilities, gas supply, etc.). These subsystems have the same characteristics as decentralized systems: their own information base, structural and functional characteristics.

In this case, it is advisable to highlight the most important properties of housing and communal services - dispersibility and their distribution over time during the operation of housing and communal services. At the same time, the nature of the functioning of urban housing and communal services can be compared with the wave process, the same property applies to individual business entities [8].

The prerequisites for using this toolkit in the first macroeconomic environment of the housing and communal services model are as follows:

1. Urban housing and communal services is a geographically distributed system. Business entities sell services of a certain type, cyclically distributed in time and space.
2. The volume of services rendered is divided into the part remaining with the consumer and the part returned back. At the stage of transfer of services, both from the producer to the consumer, and in the opposite direction, there are losses of the services performed.
3. The total volume of services provided consists of functionally independent volumes of services produced by individual manufacturers. Consumed services are interdependent.

4. Payment for services received from the consumer through financial structures is sent directly to the business entity operating in the housing and communal services [9].

In essence, the process model of the system “production of housing and communal services - consumer” is the first environment of the general model of urban housing and communal services (figure 2).

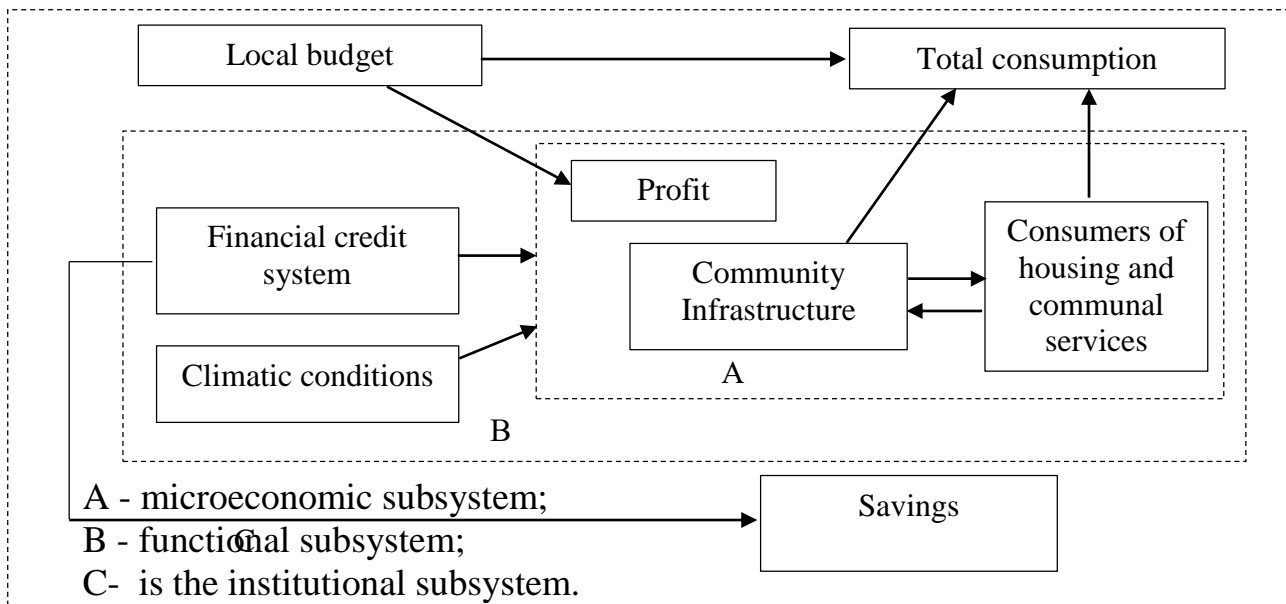


Figure 2. **Model of the economic mechanism for the development of urban utilities**

It should be noted that for the development of regulatory control actions, there is a clear lack of capabilities of this toolkit since it is limited by a set of management tasks that can be analyzed and solved using the above approach.

The tasks of the urban housing and communal services regulation solved with the help of wave theory tools are the following:

- optimization of the production of urban housing services;
- determination of the loss of services provided at different stages of their production and transfer;
- and analysis of the performance of business entities operating in the field of housing and communal services [10].

For a more complete analysis of the development of housing and communal services and the development of regulatory solutions, it is useful to form a number of regression models that describe the various processes of implementation and production of urban housing services.

The unitary process boundaries of economic entities are integrated into the (second) functional environment since they are all interconnected and function effectively only with the corresponding functioning of other business entities in the urban housing complex. Thus, heat supply facilities cannot function without energy supply organizations and gas supply enterprises, which, in turn, need heat, etc. From

this point of view, it is important for the management process to identify the factor interdependence of the effectiveness of the functioning processes of the urban housing and communal services and individual process boundaries. This problem is partially solved using regression analysis tools.

Analysis of the structural and functional links between the elements of the economic mechanism model for the development of urban housing and communal services allows us to calculate the regression dependencies of housing and communal services related to the (second) functional environment.

Figure 3 shows the economic model for the development of modern urban housing and communal services. A profit block is taken out as a target block. It is obvious that for different business entities operating in the housing sector, the rate of this profit will be different. To a large extent, its size will depend on the share of the city's property in the objects of urban housing and communal services. The satisfaction of the population and the community as a whole with the functioning of housing and communal services will depend on how much the city can provide or lobby for its priorities in the process of managing its development.

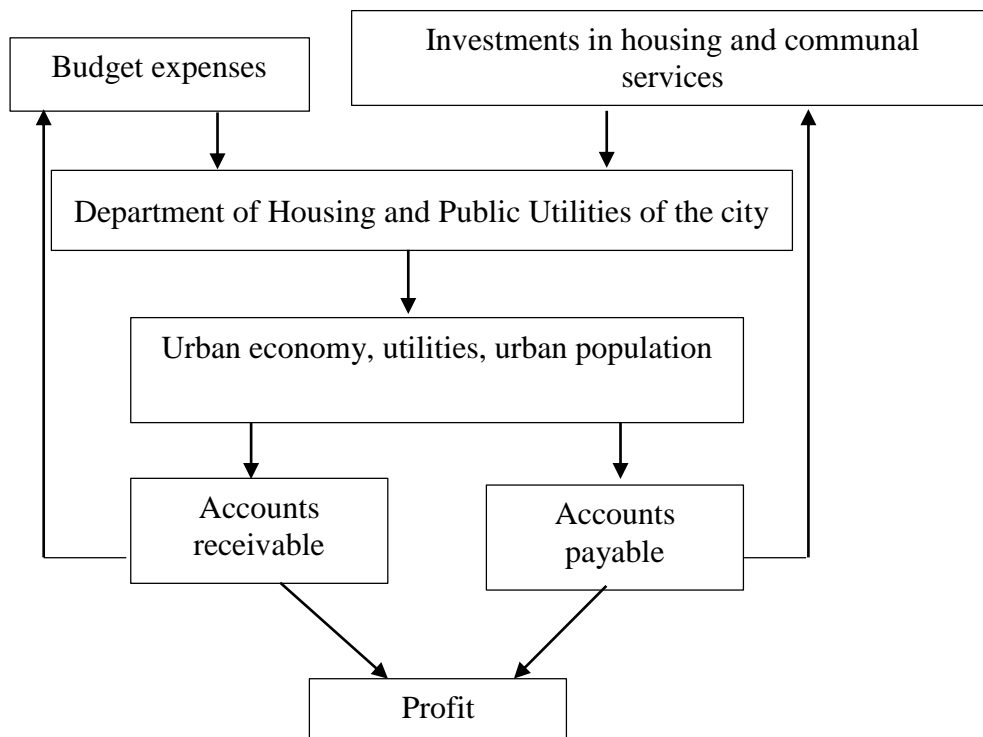


Figure 3. **Economic model of urban housing development**

Obviously, this will change the disposition of the city budget. In one case, it will be assigned to the city management system, in another it will be distributed among enterprises operating in the housing and communal services sector.

The conditions for the formation of such a model are as follows:

1. Business entities have a certain autonomy. In this case, both a full-fledged market model with a goal function of maximizing profits and a public-private form of urban housing and communal services with a more complex structure of the goal function can be implemented.

The main elements of the model are those that can be characterized by quantitative data in accordance with the available statistical base for housing and public utilities in the city of Atyrau, the Republic of Kazakhstan [11–15].

The main financial indicators reflecting the main trends in the housing and communal services of the city for the formation of regression models were:

- investment in housing and communal services;
- expenses of the consolidated budget;
- accounts payable;
- accounts receivable;
- profit;
- fixed assets;
- the volume of housing and communal payments from the population.

The presented statistical data made it possible to form a series of regression models that allow obtaining an objective assessment of the trends in the main financial indicators of urban housing and communal services development (table 1).

Table – 1

Regression models of urban housing and communal services of the city of Atyrau, the Republic of Kazakhstan

Functional Dependence		Functional dependence
y	x	
The volume of housing and communal payments	A period of time	$y = 1E-198e^{0,2304x}$
Profit	The volume of housing and communal payments	$y = 11938x^{-1,2974}$
Profit	A period of time	$y = 1,0018x^2 - 10,878x + 30,13$
Consolidated budget expenses	A period of time	$y = 100,09x - 200023$
Profit	Consolidated budget expenses	$y = 2E-05x^2 - 0,0472x + 28,255$

This set of models can be obtained for various areas of the industry and for various business entities. The last dependence is of natural interest. In accordance with its parameters, the lower the profit made by business entities, the greater the budget expenditures for the provision of housing and communal infrastructure. This dependence does not contradict the other dependence “Profit - The volume of housing and communal payments”. Obviously, profits cannot have such a rate of decline. The indicator of low profitability of organizations operating in the field under study can indicate both low efficiency and the presence of certain corruption phenomena. An interbranch mesoeconomic model can essentially describe the state of the third dependence - the institutional sphere of the urban housing and communal services development model. The analysis of this model allows us to study the structural and economic relations of various sectors of urban housing and communal services.

At the same time, final consumption, gross capital formation, foreign economic relations, etc. are analyzed. The model of the economic mechanism for the development of urban housing and communal services allows you to explore various aspects of its modernization with all the complexity of the relationship using various economic and statistical tools.

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