Formation of the Sustainable Development Strategy of the Enterprises of Construction Complex and Housing Utility Services

B B Khrustalev¹, N A Shlapakova¹, M G Ganiev¹, Yu B Khrustalev¹,
D B Solovev²,³

¹Penza state university of architecture and construction, 440028, Penza, Germana Titova str., 28
²Far Eastern Federal University, Engineering school, Vladivostok, Russian Federation
³Vladivostok Branch of Russian Customs Academy, Vladivostok, Russian Federation

E-mail: hrustalev_bb@mail.ru

Abstract. In the present paper we discuss the main features of functioning and development tendencies of construction and housing utility services enterprises. The mechanism of development strategy formation of construction complex enterprises and housing utility services and their infrastructures is proposed, taking into account the main features of their functioning and the mutual integration possibilities of functional units. The variants of strategic sustainable development in complicated organizational and economic conditions of formation and development of the construction complex enterprises and the housing and utility sphere in the Russian Federation are considered.

1. Introduction
The current state of the construction complex and housing and utility services with their infrastructures are characterized by extremely low efficiency of all their components, by high barriers, poor manageability, low innovation and investment prospects and as a consequence, by low quality of housing and utility services. The main priorities in the elaboration of the development strategy are increasing of the enterprise potential in the sphere of housing and utility services, isolation of the negative factors influence and increasing of functioning efficiency.

The majority of enterprises of the given sphere operate in the zone of inefficient activity and the general state of the sphere can be characterized as a crisis, while there are more than enough opportunities for overcoming these difficulties.

The sphere of housing and utility services can be functionally divided into four major units: [2]
- utility services complex is a set of enterprises providing public services;
- housing complex is a set of enterprises providing housing services to the population, including services for cleaning the territory and common areas, garbage disposal, lighting of common areas, regular maintenance of chimneys, elevators and utilities, major repairs and maintenance and capital and maintenance;
- monitoring is a set of enterprises that perform managing the housing stock and interacting between the functional units of the sphere;
- market is the sum of all housing and utility services consumers, including dwellers who are not house owners (family members of the owner, tenants, etc.).

2. Materials and methods
At the same time, the specifics of the sphere allow the mutual integration of functional units. 8 different variants of mutual integration of units are possible in different operation conditions (Fig. 1), each of which will be more preferable in certain conditions. [3]
The enterprise development can take place in several directions: vertical (transition to new markets), horizontal (improvement of the product (service)), internal (capacity building, perfection of management relations) and diagonal (simultaneous improvement of the product (service) and transition to new markets by attracting investment) (Fig. 3).

At the same time, it is necessary to provide the availability and the best compliance of the four main integrated units:

1) characteristics of the deliverables (activities, services) ($A_1$);
2) characteristics of the enterprise potential ($A_2$);
3) characteristics of the operating conditions of enterprises in the region ($A_3$);
4) investment prospects of enterprises ($A_4$).

Each of the blocks $A_1, A_2, A_3, A_4$ can be described by a finite number of factors that characterize the change in the condition of the housing and utility system over space and time with its development within the organizational and economic situations.

Thus we see that, there are four main variants for the development of the company:

1) **Investment strategy** is a system of interrelated measures aimed at increasing the investment prospects of the investment activity object and ensuring the required investment inflow. This strategy covers all four functional units of the housing and utility sector.

2) **Innovation strategy** is a set of interrelated measures to increase the potential of the given system through the development and implementation of innovative technologies aimed at improving the enterprise efficiency. This strategy is aimed at changes in the functional units of the housing and utility sector such as «Utility services complex » and «Housing complex».

3) **Intra-company strategy** is a strategy that is directed inside the system and includes sub-strategies for each organization system and its components, in order to form more effective system of organization and management, as well as the interaction of various participants in the given sphere. First of all, this strategy is aimed at the transformation of the functional unit «Monitoring» of the housing and utility services sphere, but it indirectly affects all the units.

4) **Market strategy** is a strategy of interaction between enterprises and the market, aimed at identifying the needs of consumers, entering into new markets and strengthening their positions in the marketplace. This strategy is one of the most difficult for implementing because it involves a large number of unknowns in its structure, but its implementation is vital in modern economic conditions. The implementation of this strategy is primarily aimed at the conversion of the functional units «Monitoring» and «Market» within housing and utility services sector, but there is an impact on the entire sphere as a whole.
Presenting the data of sustainable development on the modified national rhombus, one can identify not only the most and least developed spheres but also to determine the effect of activities aimed at the development of one sphere or another. This effect will be numerically equal to the difference of areas $S_2$ and $S_1$. Where $S_2$ is the area of the rhombus after implementation of the measures, and $S_1$ is the area of the rhombus before implementing the measures.

At the same time, if only one conversion is carried out per unit of time, the calculation can be simplified to calculating the difference of areas of the corresponding triangles.

Thus, the possible effect depends not only on the degree progress of the variable parameter (delta) but also on the degree of advancement of the other two underlying parameters. With a knowledge of the conversion price, one can choose the most optimal way of development, which would allow to get the maximum effect at the lowest cost.

**Figure 2.** The example of presentation of the enterprise development degree in the following spheres on the modified national rhombus.

| Product Market | Mono-product | Assortment (product group) | Pioneer product | Startup business |
|----------------|--------------|----------------------------|-----------------|-----------------|
| Local market   |              | innovative                 |                 |                 |
| Regional market|              |                            |                 |                 |
| Government market|            | investment                 |                 |                 |
| International market|        | market                     |                 |                 |

**Figure 3.** Steiner matrix.

The initial position of the company is of great importance while choosing the direction of strategic development. To do this, we take the relative indicator of the strategic development - $Y_{dev.,str}$, which is calculated by the formula: [1]
where $S_i$ is the real area of the modified national rhombus formed by all levels of strategic development of the enterprise;

$S_{gen}$ – effective (maximum) area formed by all levels of enterprise strategic development;

$Y_{dev.str.}$ - relative level of strategic development.

Further choice of the most optimal way of enterprise development is based on the prevailing conditions of the external and internal environment. The alternative choice is carried out by comparing the alternatives at the integral value of efficiency, taking into account the time of implementation, cost, the integral barrier to implementing, the integral risk indicator.

The logic of the variant selection is based on the fact that for transition of the system from one condition to another, the enterprise needs to spend a number of resources: time, capital, etc. However, there are a number of barriers to the implementation of this transition. After evaluating the transition variants and selecting those for which the cost of resources is minimal, and the barriers are surmountable (in accordance with the company capabilities), we get a discrete number of strategic development variants.

All the indicators are relative and are given in a unit fraction.

At the same time, if the market was not taken into account at the $i$-th step, (the degree of market prominence), then at step $i+1$ it will decrease and the risk will increase.

At each stage, we have the opportunity to turn into 7 different conditions (3 horizontal (that is, they are carried out at one step of development (in parallel)) and 4 vertical (that is, they are carried out at a new step of development (implementing sequentially)), each of which will be characterized by the corresponding values of the following indicators: total implementation time, year; integral implementation costs (million rubles); integral implementation barrier; integral implementation risk indicator.

Each state of $G1$ is characterized by a complex of indicators that change during the transition. Thus, firstly, these indicators give us information about whether the organization is able to make this transition (or some preliminary actions are required), and secondly, a subsequent comparison of the system status indicator $G2$ will reveal whether this transition is appropriate. Thus, we can carry out transitions, while it is possible and expedient. Finally we will turn into the state of $G_{max}$.

Thus, we have the opportunity to compare different variants of the enterprise development not only at every step but we can also see the efficiency of the whole chain of development stage through integrative indicator $E_{sv}$ which is calculated according to the formula:

$$E_{sv} = \sum_{i=1}^{n} \frac{2 \sqrt[4]{P_{1i} \times P_{2i} \times P_{3i} \times P_{4i}}}{\sqrt{R_{1i} \times T_{1i}}}$$

Where $n$ is the maximum number of stages of development strategy implementation

In the end we get a preliminary scheme of the enterprise development, giving us the idea of what strategy (market, intra-company, innovative, investment) should be applied at a particular stage (Fig.4).

So far, it is possible to differentiate the five most typical situations of formation and housing and utility services development, each of which will be characterized by certain conditions and there will be the most rational development strategy for all types.
3. Variant 1. Regions with existing multi-storey housing development with heterogeneous consumers, without the possibility of restructuring

This variant is the most prevalent under Russian conditions and at the same time the most problematic, whereas the development of housing and utility services is significantly hampered under these conditions by the presence of a large number of constraining factors. Under such circumstances, the implementation of the development strategy is necessary to begin with an intra-company strategy, and then combined innovation and investment strategy should be the next (which corresponds to the diagonal development according to the Steiner matrix).

This variant is the fastest at implementation, characterized by relatively low values of the integral barrier, integral costs and risk. Thus, this variant of development will allow: firstly, to respond promptly to the crisis thereby minimizing the negative effect due to restructuring the internal structures and also, to create a reserve for further development by improving the management system; at the second stage, this variant will allow to enter a new market in a period of economic instability, and at the third stage, it is necessary to attract investment in the company and develop innovations thereby increasing its potential and creating opportunities for further development. Within the framework of implementation of this development strategy in the region, the variant of integration of functional units of housing and utility services B4 should be formed.

4. Variant 2. New neighborhood unit with heterogeneous consumers

During the construction of new neighborhood units, it is possible to form more effective housing and utility structures with the potential for further growth. With the constant growth of cities this is one of the priority areas of activities. However, the implementation of such projects is limited by the low potential of the system at the initial stages, which should be taken into account in the development strategy formation.

The market strategy aimed at the formation and market development is implemented at the first stage. There is a capacity building of the system and attracting investments for its further development at the second stage. It is also necessary to establish the possibilities to the constant implementation of innovative technologies in the sphere of housing and utility complex at this stage in the future that will give the opportunity to develop it continuously and maintain a high level of innovation and investment attractiveness. At the last stage, there is the implementation of the intra-company strategy aimed at the development of control systems in the sphere, their modernization in accordance with the new conditions of functioning and introduced innovative technologies. Within the framework of implementation of this development strategy, it is necessary to form the variant of integrating the functional units of the sphere B7 in the sector of housing and communal services.
5. Variant 3. New business class neighborhood unit with homogeneous consumers
This variant is quite prevalent in many developed countries, but it is not so frequent in Russia, they are mainly found in large economically developed regions, such as Moscow and St. Petersburg. This variant is the most attractive from the perspective of investment opportunities because initially it has a very high potential.

At the first stage, there is the implementation of the investment strategy aimed at attracting investment for the formation of housing and utility services in the region, thereby increasing its cost. At the second stage, there is the implementation of the market and innovation strategy aimed at the development of innovative technologies used in this system that contribute to the market share expansion and the development of market relations. At the third stage, an intra-company strategy is implemented, within the framework of which the effective forms of management aimed at maintaining and successful development of the system are formed. Within this variant, the large professional management structures are more effective, thus, while implementing of this version of the strategy, it is necessary to form the variant for the integration of functional units in the sphere of housing and utility services B7.

6. Variant 4. Private housing sector with heterogeneous consumers
Although the volume of the given sector of house property is reduced every year, it still remains a highly prevalent variant in the Russian Federation. This variant is the most difficult for development of the sphere, due to a great diversity in needs and the absence of consistency of the object arrangement, in terms of both capacity and geographically and of low innovation and investment attractiveness. All of this greatly complicates the application of the united development strategy and the absence of any regulatory bodies make it almost impossible.

At the first stage, a market strategy is implemented, which aimed at market development and formation of the system of regulable relations in the region. At the second stage, an intra-company strategy is implemented to form the management system for housing and utility services in the region. At the third stage, there is a simultaneous implementation of the investment and innovation strategy to attract investment resources and there is the implementation of plans for the developing of innovation projects, which should increase the quality of housing and utility services, the level of customer satisfaction and ensure the growth of the potential of the sphere and, as a consequence, the growth of innovation and investment prospects. Within the framework of implementation of this strategy, the best variant for the integration of functional units of housing and utility services will be B1 with a possible transition to the B8 variant.

7. Variant 5. Elite cottage settlement
This variant of functioning of the sphere has become more and more widespread in recent years. Despite the fact that the development of the sphere under the conditions of this variant is the most simple and effective, there are also negative phenomena and it is necessary to have an appropriate development strategy to overcome all these negative effects. For example, while the quality of the services provided is of primary importance to consumers in this sector, it is inappropriate to hold up prices for them as this will significantly reduce the number of consumers.

8. Conclusion
At the first stage, an investment strategy is carried out and since the investment prospects of such projects are high, it is possible to attract a sufficient number of investment resources to the sphere, which should be directed to the development and implementation of innovative technologies at the second stage. At the third stage, it is necessary to realize an intra-company strategy in a parallel way, for improving controllability of the system under the new conditions of functioning and within the new market strategy for further market development and more effective contact with ultimate consumers. Within the framework of implementation of this strategy, it is necessary to form the variant for the integration of the housing and utility services sphere B8.
The effective development of the sector of housing and utility services is possible only with the comprehensive implementation of the sustainable development strategy, which is most optimal within the framework of the formation and implementation of a unified development program in the region.

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