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Economic justification for building value engineering systems in the management of enterprises - participants in construction projects

Engineering - a set of methods and techniques that the company, enterprise, firm uses to design its own activities. In the traditional sense, these are engineering and consulting services related to the preparation of the production process, or services to ensure the normal course of the production process and product sales. Engineering services are usually provided by specialized engineering consulting (engineering) firms. Sometimes they are provided by construction and manufacturing companies.

All different types of engineering services can be divided into two groups:

- 1) services related to the preparation of the production process (pre-project, project, post-project and special services);
- 2) services to ensure the efficiency of existing production and sales of manufactured products (work aimed at optimizing operating processes, improving the operation of production lines, involvement in information systems, improving logistics, management and marketing, recruitment and training, as well as advice on financial policy).

Engineering as a multi-purpose tool of cooperation, creates opportunities for interaction at different stages of construction, preparation and operation of production facilities. From this we can conclude about the existence of the engineering cycle.

The engineering cycle includes: study of a certain market situation; design and development of working technical documents; support and provision of post-project services, recommendations for production maintenance of the project.

Engineering is carried out on a commercial basis, and since a significant number of companies specializing in engineering services operate on the world market, the cost of services is quite transparently determined by socially necessary

costs. Due to the fact that engineering involves a large number of different services that fall into the category of engineering, engineering firms specialize in areas. In international practice, there are the following types of engineering firms:

- engineering consulting - provide services without subsequent supply of equipment;

- civil engineering - can provide the full list of services related to the creation of industrial and other facilities on a turnkey basis;

- advisory - provide business management services related to computer technology, production, sales, finance;

- engineering and research - focus on the development of technological processes and technologies for the production of new materials.

In large-scale construction, complex engineering is used - a set of services and supplies required for the construction of an industrial enterprise or infrastructure facility.

Complex engineering involves:

- consulting (clean) engineering - design of the object, development of construction plans and control over the works;

- technological engineering - providing the customer with technologies required for the construction of the facility and its operation (transfer of industrial experience and knowledge, provision of technology and patents);

- construction or general engineering - design, supply of equipment, installation.

Engineering services can have different degrees of depth of development: basic engineering is the preparation of preliminary research and marketing assessments (creation of master plans, assessment of the total cost of projects, etc.); detailed engineering is the development of detailed technical documentation, working drawings, comprehensive work plans of the enterprise.

The rapid development of engineering in modern conditions is due to the following factors:

- significant shifts in the structure of international trade in the direction of increasing trade in complex types of equipment that require special knowledge to

solve illogical and organizational problems, from the design of the enterprise to its commissioning;

- high demand for technical services from countries that have embarked on the path of independent economic development and do not have the necessary experience and staff for such construction.

Engineering as a special type of entrepreneurship has specific features:

1. Engineering is one of the forms of production services, which is embodied not in the material form of the product, but in its useful effect. This effect may have a material carrier (design and technical documentation, graphics, etc.) or not have it (training, management, etc.);

2. It is ultimately associated with the preparation and provision of the process of production and sale of intermediate and final consumption of material goods and services;

3. Engineering is the object of sale, ie has a commercial characteristic;

4. In contrast to franchising and know-how, it deals with reproduced services, ie services whose value is determined by the socially necessary time spent on their production, and therefore has many sellers for their implementation.

The task of engineering is to get customers the best result from investing through:

- systematic, interdisciplinary approach to project implementation;
- variety of technical and economic developments, their financial evaluation of the choice of the best option for the customer;

- development of projects taking into account the possibility of using advanced construction and production technologies, equipment, structures and materials from various alternative sources that best meet the specific conditions and special requirements of customers;

- use of modern methods of organization and management of all stages of project implementation.