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Young Scientists' Researches

Selection of the proper constructive solution for building elements based on value analysis and engineering

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Summary

The construction under its different shapes is one of the most important products of human activity by the degree of intelligence and knowledge imposed by conception, design and execution, by its extensive service length, by particularities that differentiate it from other products and least but not last by its purpose, implicitly its use value. A product having such characteristics attracts costs accordingly, and these costs cover the corresponding activities for the interval of conception and design, proper execution, maintenance and exploitation, putting to another purpose and after-use. A major concern of the human being was always in achieving some products with maximum use value and involving minimal expenses. No methods used until present day, no research made on national or international level did not exhausted the possibilities of cost reduction in construction achievement in the context of constant changing in customer requirements, performance demand, quality standards' satisfaction.

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Value analysis and engineering for construction elements is another lever, that is less studied and founded and that the author proposes in dwelling house construction achievement for a minimum value-value use report.

PAPER CONTENT

The paper is structured on six chapters, after the model presented in figure 1.1:

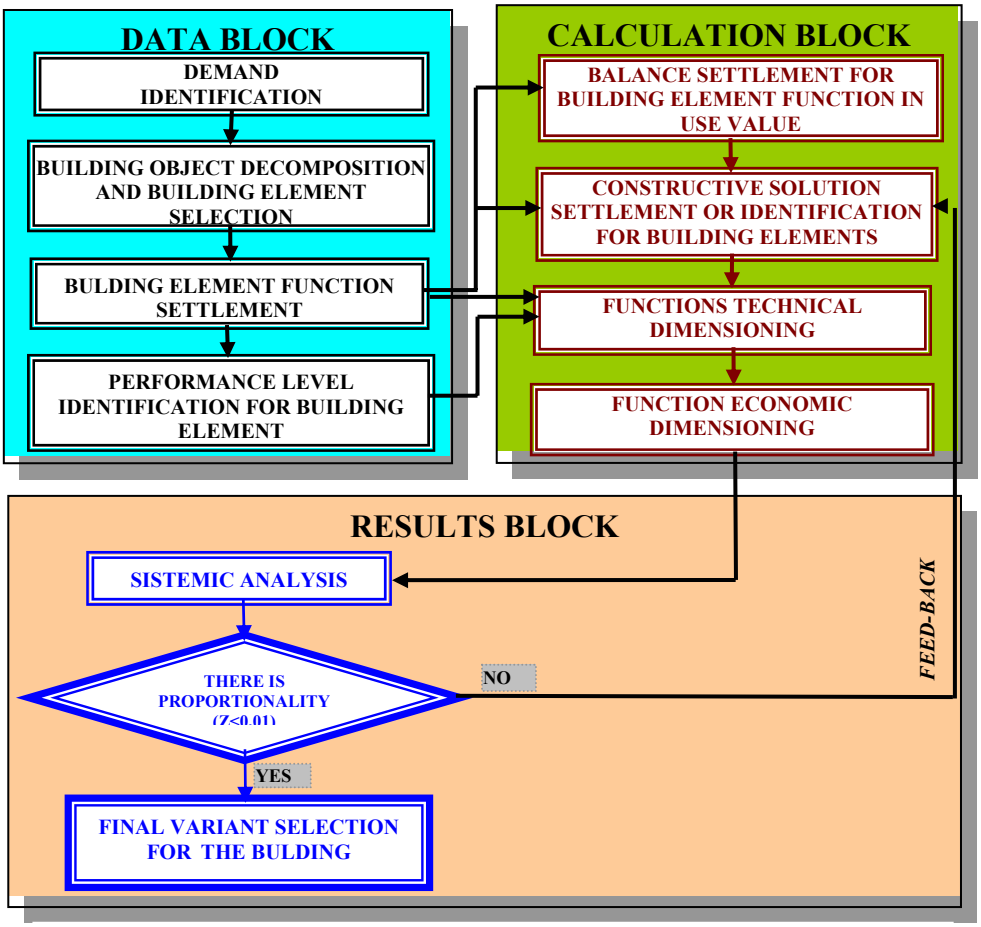

Figure 1.1. General diagram of the model applied for AIV

Chapter 1 – Presents a short history of appearance and development of the value Analysis and Engineering on international and national level and also its connection with other subjects. We present also in this chapter a general diagram based on which we structured the doctor's degree paper (figure 1.1). Finally we get

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to the conclusion that *at present this method is little used in constructions on national level, but the competitive market will impose its use.*

Chapter 2 – Defines the system concept and presents the general model of a system. We defined the system, we classified the systems and we made a systemic approach of the building object. We get to the conclusion that the "building object" system is decomposed in more or less complex subsystems function of the pursued purpose. The criteria found at the base of the decomposition is generally the *functional criteria*, each subsystem being characterized by specific functions that refer to the main role that this has inside the "construction object" system. The systematic approach of the building creates at the same time the opportunity of using some modern investigation techniques and methods in this area.

Chapter 3 – theoretically treats the concept of value Analysis and Engineering defining concepts and terms that will be used in the doctor's degree thesis. Is defined the value Analysis and Engineering and is described the connection between a product's value and utility, reaching the conclusion that the product is determined by necessities. We defined the function concept and the principle standing at the base of this research method, and at the end of the chapter we presented the methods and techniques specific for value Analysis and Engineering.

Chapter 4 – presents the problem of the construction performance concept being analyzed the basic and performance demands, and also the performance criteria that a building must fulfill. There are identified advantages and disadvantages of building performance concept use and there are obtained a series of conclusions.

The second part of this chapter presents the quality concept problematic in constructions reviewing the evolution of quality concept, quality insurance system organization modality and the elements that are part of quality insurance in constructions. At the end of the chapter there are presented the three levels of quality achievement, namely: quality design, quality insurance and quality control presenting the quality control and insurance system (S.C.A.Q.).

Chapter 5 – establishes and proposes a selection methodology of the optimal constructive solutions for the building system based on value Analysis and Engineering. We decomposed the "building" system in subsystems of inferior rank, respectively building elements. While the building elements are varied, this study was particularly made for the closing elements in civil engineering, respectively exterior walls.

There were presented a series of constructive solutions for the exterior walls based on the users' demands mentioned in anterior chapter and Law 10/1995 – Construction Quality Law, established the exterior walls' functions. We established the balance of these functions in the utility value by drawing up a poll chart. We made the technical and economical dimensioning of the functions, and finally,

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through the systemic analysis we identified the constructive solutions accepted by the value Analysis and Engineering method.

Chapter 6 – synthesis of the main results and original contributions of the author established in the doctor's degree thesis performance. The references include 128 titles, from which 29 are of the thesis' author.

Keywords: system, subsystem, function, functionality, building object, building element, demand, quality requirements, performance criteria, performance levels, technical dimension, economical dimension, use value, value engineering and analysis.

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