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CLASSES OF CONSTRUCTION COST ESTIMATES

BY

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Abstract. There are many ways of classifying construction cost estimates. The most significant of these are the degree of project definition. The degree of project definition is based upon the percentage of completed architectural and engineering designs. It defines available input information to the estimator. Related to input informations, a prudent owner or contractor must associate the "expected accuracy range" The estimate accuracy is an indication of the degree to which the future final (true) cost of construction varies from the estimate prepared earlier. Accuracy is usually expressed as a positive or negative percentage range surrounding an estimated future cost. In this way it defined "classes of construction cost estimates". This paper represents a proposition to a possible classification of classes of estimates.

Key words: cost estimate; classes of estimates; cost engineering; cost construction life cycle; cost management.

1. Introduction

The main purpose of the activity cost estimate is to provide as accurate predictions and the actual development costs of a construction project adequately to the various stages of its implementation. During the life cycle of construction, cost engineering practitioner should be able to do a series of estimates, from the early stages of the project until the project statement. The quality of these estimates, meaning consistency between estimated and actual values, is directly proportional to the volume of information and certainty of their engineering costs that the practitioner has at its disposal. In practice, a perfect estimate of costs is not possible, any estimate no matter how good it is, contains a number of risk factors translated into a difference between estimated and actual costs during the construction project execution. The degree of approximation of the size of costs is measured by the difference between the cost of return (cost achieved) and the corresponding estimated phase of the

project construction. Fig. 1 presents the variation degree of approximation of costs during the completion of a project.

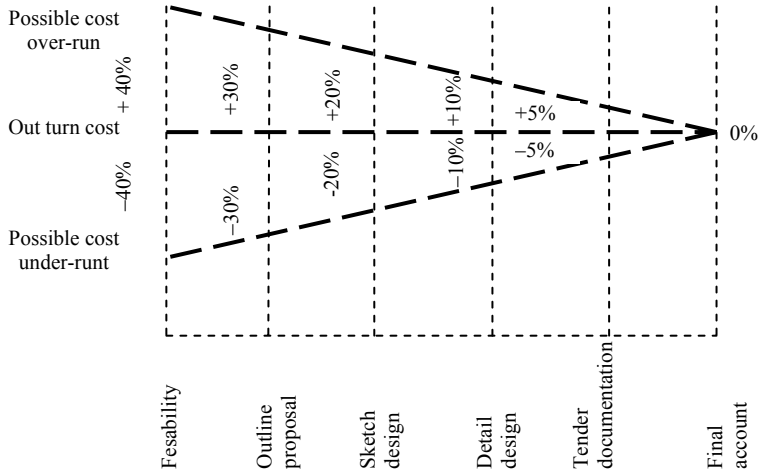

Fig. 1 – Degree of uncertainty for a construction project.

2. Classes of Construction Cost Estimates

In literature, depending on the precision of the estimate, it is defined several classes of estimation (see Table 1) depending on the stage of project development.

Table 1
Estimates Classes

Phase of the project	Project identification			Project definition	
Step	Project development	Feasibility study	Project development	Concept selection	Project definition.
Estimate class	A	B	C	D	E
Estimate name	Evaluation estimate	Feasibility estimate	Development estimate	Concept estimate	Control estimate
Purpose	Evaluate potential of project	Check technical and economic feasibility	Define development alternatives, recommend solutions	Select optimal development concept	Basis for project execution control
Typical uncertainity	40%	30%	20%	15%	10%
Report	Evaluation report	Feasibility study report	Development plan	Concept study report	Project management plan

The factors influencing the size of a construction project costs can be analysed according to when they intervene in time to achieve it.

2.1. Factors Influencing the Size of Costs During the Identification and Establishment of Design Basis

There is not two construction project identical, even to the existence of similarities between them, the cost will always be different. The costs of a project depend on the those of obtaining land, the materials, equipment and tools used by labour costs specific regions where the project is made. These costs vary depending on a number of factors, synthetically presented in Fig. 2.

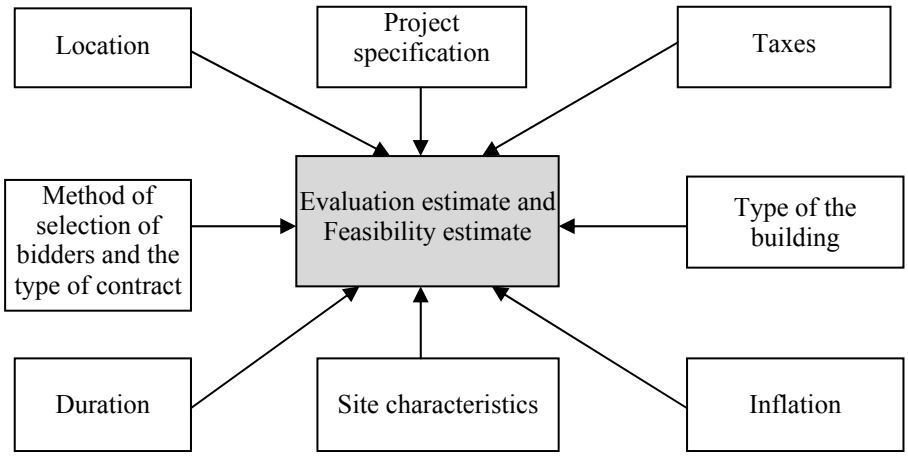

Fig. 2 – Factors influencing the size of costs during the identification and establishment of design basis.

a) *Project specification* defines the physical and quality attributes of a project.

b) *Location*, where the project is made, affects costs by conditions imposed by local authorities (licensing procedures, licensing fees, the process of licensing, protection measures environmental requirements, etc.) and by specific location (supply costs, design standards, cost of transport, employment insurance, etc.).

c) *Method of selection of bidders and the type of contract* chosen by the investor can change the value of the estimated costs. The project costs are different in the case of a unit price contract than in the case of a contract total price. In the case of type “design - implementation" costs are different than in the case of a "traditional" in running a project beneficiary.

d) *Site characteristics*: the conditions of land, groundwater level, access, archaeological conditions, influence size estimated costs.

e) *Type of the building*: if a new building or if using an old structure

reinforcing and reshaping. Most times a new building is cheaper as one old that is restored.

f) *Taxes*: their size depends not only on the region where the project is realized but also on the type of project. Thus it exist projects having the destination or activity within them may be exempted from taxes or pay taxes improved.

g) *Duration of the project*: generally, projects with long lead and to achieve high costs. But there are also situations in which to reduce execution times are required additional costs.

h) *Inflation,* which leads to changes in expenses (often upside) for the period of the project.

2.2. Factors Influencing the Size of Costs in the Course of the Project Implementation

After starting a project, its estimated costs rarely remain unchanged. The design stage, to the extent that sufficient information is available and the project is defined in detail, costs can be estimated correctly and can be considered fixed. But even in these conditions, there are many factors that can lead to increased costs of implementing the project. In Fig. 3 there are given a number of factors leading to changes in estimated costs after the start of project implementation work namely

a) *Changes to execution plans*, which may occur due to various conditions: the willingness of beneficiaries, implementation changed conditions which require redesign elements of construction, etc. These changes involve additional costs of implementation plans to design and sometimes implementation costs supplementary.

b) *Mismanagement of the project* has implications for all stages of the project construction, leading to: lack of planning and organization; poor communication between participants to the project; inability to identify problems and make necessary changes to the project; lack of control on the duration and cost of implementation.

c) *Unforeseen field conditions* that occur at runtime construction and that it was impossible to predict by initial tests on the site. Therefore it is possible to change in all the projects with simultaneous increase in cost and execution time.

d) *Shortage of materials and/or equipment* due to weak development of the region where the project is realized and can not provide the volume of materials/equipment necessary for the work or lack of effective marketing materials, that was not foreseen by designer.

e) *Change in the exchange rate,* which occurs either when the contract currency is other than currency, or when the purchase of materials or equipment is done in other countries.

f) *Improper selection of contractors*, meaning that in general they are

selected as result of the proposed bids and negotiated and not as a result of professional experience and technical ability to achieve the construction works. The result is produced in terms of implementation delays and additional costs due to non-quality.

g) *Issues of funding by the project*, evidenced by lack of funds necessary for the work of the project that lead to growth period and the default implementation costs.

h) *Changing costs to use the land*.

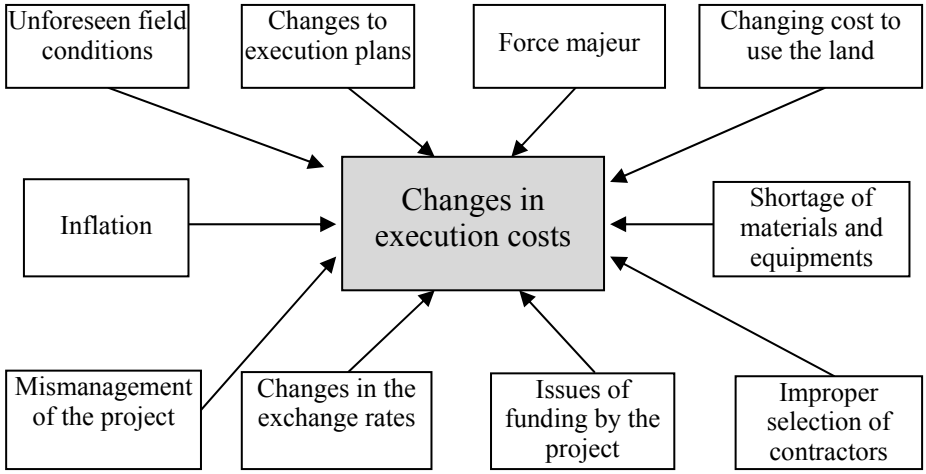

Fig. 3 – Factors influencing the size of costs in the course of the project implementation.

In addition to these main factors, other causes may occur leading to increased costs of implementation work, of which we mention: cost estimates wrong, unfortunate involvement of local or national authorities.

3. Conclusions

Estimate updating is important in order to have the best possible cost target for each single contract and to provide a forecast of the final cost of the project. The uncertainty will be gradually reduced for each estimates update. During the project identification phase, each estimate will serve as a decision basis for proceeding to the next step or phase. During the feasibility study, a number of alternatives are considered. This is done without including much engineering work. During project development, the best solution is selected. During the project definition phase the control estimate is developed. The selected concept is optimized and the master control estimate defined. An important task in the project definition step is to reduce the uncertainty. To

some extent this is in contrast with the purpose in the project identification phase, where each estimate served as a basis for decision to continue or not.

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CLASE DE ESTIMARE A COSTULUI LUCRĂRILOR DE CONSTRUCŢII

(Rezumat)

Există numeroase modalităţi de clasificare a estimărilor costurilor de construcţii. Cele mai importante dintre acestea sunt funcţii de gradul de definiţie a proiectului. Gradul de definiţie a proiectului se bazează pe gradul de detaliere a proiectului de arhitectură, rezistenţă, utilităţi etc., definindu-se informaţiile de care dispune estimatorul pentru efectuarea evaluărilor. Funcţie de aceste informaţii iniţiale rezultă un grad de precizie al evaluării. Precizia este, de obicei, exprimată ca un interval (procent pozitiv sau negativ) în jurul unui cost estimat viitor. În acest fel, se definesc "clase de estimare a costului lucrărilor de construcţii".

Lucrarea reprezintă o propunere cu privire la o posibila clasificare a costurilor în clase de estimare, definindu-se în acest fel gradul de precizie (aproximare) a costurilor funcţie de momentul evaluării, la care trebuie să se aştepte, beneficiarii, proiectanţii, contractorii, managerii de proiect etc.