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Value Perspective of Project Stakeholders

Z Cekic, N Surlan, T Kosic

Department of Construction Management, Union Nikola Tesla University, Cara Dusana 62-64, Belgrade 11000, Serbia

E-mail: zoran.d.cekic@gmail.com

Abstract. When starting a construction project, one assumes, mostly through experience, what is the value the project will bring to investors, consultants, contractors and other stakeholders. However, the value of the project greatly depends on the perspective of the observer and which stakeholder is considering it. So, how is value perceived on the construction project? The purpose of this research is to obtain construction project value parameters utilizing the Delphi technique.

1. Introduction

"Concept of value historically has been presented within an economic perspective in terms of the ratio of costs to benefits ... however, other authors have presented value in terms of use qualities, esteem features linked to ownership characteristics; exchange properties; cost characteristics, normally the sum of labour, material and other costs." [1]. The concept of Value is based on the relationship between satisfying needs and expectations and the resources required to achieve them [2-11]. If end result of the project is to be considered as a success, investors as the project instigators have to bear in mind the value that the end user will experience. "Three basic elements provide a measure of value to the user: function, quality, and cost. These elements can be interpreted by the following relationship: Value = (Function + Quality)/Cost. Therefore, we can say that Value equals the most cost-effective way to reliably accomplish a function that will meet the user's needs, desires, and expectations." [6]. There are four basic elements that provide a measure of value to the user. To use project management terms, these are performance, time, cost, and risk." [12-17]. The question is: are these the only parameters that impact the value of the project?

2. Value parameters

Whole life Value principles should be considered when analysing the project value parameters. Traditional approach to project value ended with construction phase and start of operation [2]. The property owners/users have embraced the WLV as the cost generated throughout operation of the property grossly outweighs the planning and construction costs. Different expectations from different organizations throughout a project's life and the lack of data, monitoring targets, and long-term interest for many key players are obstacles to be overcome if WLC is to be implemented.

The client's value system is at the heart of the goal definition and comprises the following seven elements which may be explored and ranked using the pairs comparison technique: Time, Capital cost (CAPEX), Operating cost, Environment, Exchange or resale, Aesthetic/ esteem, Fitness for purpose [1]. Also, Construction Best Practice Panel (CBPP) for benchmarking are: Construction cost,

Construction time, Predicted design cost, Predicted design time, Defects Client satisfaction product, Client satisfaction service, Profitability, Productivity and Safety [8]. Value drivers are: Maximize business effectiveness, Ensure effective project management and delivery, Achieve the required financial performance, Minimize building operation and maintenance costs, and environmental impact, Impact positively on the locality and Comply with third party requirements [10]. Additionally to difficulties in defining and analysing value parameters in a sophisticated marked such as USA, UK or other West European countries, the option of entry into emerging markets such as Western Balkans (South Eastern Europe) is considered.

Same would apply for any markets that are handicapped by lack of reliable data, established procedures, construction industry data bases and KPI`s. As a first stage in defining value parameters in unknown and possibly high-risk markets is the transfer of existing local experience into useable form. This is achieved through Delphi technique where country expects identified that can transfer understanding of local marked related values, traditions, present conditions and expected futures. This will then be used as a base for potential investor consideration and definition of value parameters in country specific local terms and eventually be used as support system for decision-making in early stages of the project. The value parameters and utility factors from the Delphi survey will be used in further study and model formation for support system for decision making in early project stages.

3. Research methodology

The Delphi method is a structured communication technique, originally developed as a systematic, interactive forecasting method, which relies on a panel of experts [9]. The Delphi technique is recently being applied in many complex industries in which a consensus is required to be achieved. An example of this is the development of residential areas [7] and theory and design application [5]. The process is completed after a pre-defined stop criterion (e.g. achievement of consensus, number of rounds) and the mean scores of the final rounds are determined as the results [12]. Delphi is based on the principle that forecasts (or decisions) from a structured group of individuals are more accurate than those from unstructured groups [13].

The success of Delphi method depends foremost on selection of the participants. Emulating the expected scenario where potential investor considers undertaking projects in the unknown market, various types of construction industry participants were considered. Also, in investigating local market conditions in Western Balkans it was determined that there were very few permanent investors with repeat business in construction. Market primarily had one-off clients who constructed building for their own use and would be interested in refurbishment or expansion in matter of years, or clients who invested in construction primarily for sale. Some of the investors could not be located in country as they moved to other markets.

Considering other potential project stakeholders as a source of local market condition and values, professional companies such as project managers, designers and contractors as well as the relevant local authorities were considered. Designers and Contractors as well as local authorities have a limited project involvement in their respective project phases, so Project Managers remained as the best available source of information. Project Managers are usually actively involved in the construction projects throughout their life-cycle, starting with business case, briefing, planning and design, through procurement and construction. In order to check the consistency of the responses and check for “one company one understanding” approach, representatives of 3 more consultancies were included; however these representatives were based in Serbia with extensive regional knowledge. Total of 12 representatives included in the study have extensive working experience in the construction industry and are directly involved in the management of construction projects in region.

4. Research results

It is intended that this Delphi method results will be used in further study of value parameters and their application as support to decision making in early project stages. These results present valuable bases for further application as they have provided region specific background information into market and

construction industry specifics of the Western Balkans region. Once Client (property owner/developer) values are cross-referenced with such provided data, a true measure of value parameters on new and fairly unknown market will be much better applicable than only proceeding with Client values and requirements. All 50 parameters now spread in two groups: Value Drivers – soft parameters with 6 sub-categories and Critical factors – hard parameters with 8 sub-categories (14 groups represents the selection model). Soft parameters are shown at table 1, and hard value parameters are shown at table 2.

Table 1. Soft value parameters.

	Value Drivers - SV parameter	Utility Factors				W	α
		Business (Office)	Residential Apartments	Hotels	Shopping malls	Kendall's W	Asymptotic Significance
1.	Maximize business effectiveness						
1.1	Staff satisfaction	87.50	40.00	78.75	67.50	0.554	0.000
1.2	Operating costs per head	93.75	42.50	70.00	75.00	0.910	0.000
1.3	Productivity per employee	85.00	40.00	68.33	66.67	0.812	0.000
1.4	Number of complaints	73.33	82.50	93.33	63.75	0.590	0.000
1.5	Revenue per unit area	73.33	73.33	94.17	79.58	0.484	0.001
2.	Ensure effective project management and delivery						
2.1	Industry Best Practice	65.83	65.42	91.67	87.08	0.872	0.000
2.2	Project Management Guidelines - Gateway Review	64.17	51.67	85.83	80.83	0.859	0.000
3.	Achieve the financial performance						
3.1	Capital Cost	87.92	97.50	67.92	86.25	0.709	0.000
3.2	Payback	73.33	86.25	69.17	80.42	0.461	0.001
3.3	Whole-life Cost	85.00	72.92	81.67	70.83	0.240	0.035
3.4	Building operating and maintenance cost	80.83	55.00	91.67	77.50	0.779	0.000
4.	Minimize building operation and maintenance costs, and environmental impact						
4.1	Annual cost of heating, cooling and lighting	85.83	61.25	92.50	79.17	0.628	0.000
4.2	Annual cost of cleaning and maintenance	75.83	50.83	80.83	78.75	0.555	0.000
4.3	Frequency of periodic maintenance	71.67	49.17	88.75	82.08	0.897	0.000
5.	Impact positively on the location of the facility						
5.1	Company image	72.50	50.83	90.00	69.17	0.767	0.000
5.2	Views of local planning authority	60.83	84.17	75.00	70.00	0.447	0.001
5.3	Public or private survey results	72.92	50.83	79.17	67.50	0.587	0.000
6.	Comply with third party requirements						
6.1	Planning approval	70.83	83.75	88.33	82.50	0.398	0.002
6.2	Public survey	54.17	69.17	78.33	78.75	0.604	0.000

Out of total suggested 282 parameters in 14 categories, 251 separate parameters were initially registered. These parameters have been grouped by similar meanings and combined. Altogether 251 criteria divided in 14 groups were identified. Answers were generally balanced between Serbia (6 experts) and rest of the region (6 experts).

Table 2. Hard value parameters.

		Utility Factors				W	α
	Critical factors - HV parameters	Business (Office)	Residential Apartments	Hotels	Shopping malls	Kendall's W	Asymptotic Significance
1.	Scope						
1.1	Clarity of contract	74.17	77.92	91.67	76.67	0.402	0.002
1.2	Effective preplanning	69.17	71.67	95.83	88.33	0.688	0.000
1.3	Project levels of decision making	74.17	55.83	89.17	93.33	0.803	0.000
1.4	Understanding of project requirements	80.83	63.33	97.08	94.58	0.928	0.000
2.	Time						
2.1	Project time constraints	70.83	83.33	84.58	94.17	0.652	0.000
2.2	Constraint by government regulations	61.67	78.33	79.17	85.83	0.688	0.000
2.3	Rapid decision making	68.33	80.00	88.33	81.67	0.656	0.000
2.4	Overrun duration	61.67	71.67	87.50	77.50	0.703	0.000
2.5	Adequacy of time	60.00	68.33	85.83	74.17	0.678	0.000
3.	Cost						
3.1	Rapid decision making	65.83	81.25	80.83	92.92	0.621	0.000
3.2	Cash flow certainty	75.00	95.00	85.42	83.33	0.422	0.002
3.3	Precise project budget estimate	94.17	76.67	82.08	91.67	0.361	0.005
3.4	Over budget possibility	80.00	56.67	79.17	83.33	0.531	0.000
4.	Quality						
4.1	Material quality	80.00	66.67	91.67	75.00	0.580	0.000
4.2	Construction quality plan	65.00	75.00	93.33	85.00	0.666	0.000
4.3	Contracted work quality	71.67	80.83	95.83	90.42	0.810	0.000
5.	Contract-admin						
5.1	Mutual-trusting relationships	60.00	70.00	85.00	75.42	0.672	0.000
6.	Human resource						
6.1	Team communication	76.67	67.08	95.83	92.50	0.937	0.000
6.2	Leadership-team management	64.58	77.50	92.50	79.17	0.787	0.000
6.3	Motivation for project	66.67	54.58	84.17	84.17	0.797	0.000
6.4	Monitoring and feedback	58.33	68.33	92.50	77.50	0.805	0.000
6.5	Skilled personnel	70.00	62.50	91.67	89.17	0.695	0.000
7.	Risk						
7.1	Risk identification	82.08	61.67	96.67	88.33	0.816	0.000
7.2	Risk response	74.17	67.50	96.67	92.08	0.840	0.000
7.3	Coordination with subcontractors	64.58	75.00	94.17	81.67	0.750	0.000
7.4	Risk management techniques	68.33	57.50	84.17	77.50	0.576	0.000
7.5	Financial stability of client	70.00	85.83	76.67	85.00	0.450	0.001
8.	Health and safety						
8.1	Management of work safety	80.00	85.00	95.00	87.50	0.409	0.002
8.2	Hazard identification	72.50	80.00	88.33	81.67	0.310	0.011
8.3	Health and safety records	58.75	73.33	65.42	69.17	0.384	0.003
8.4	Management responsibility	65.83	78.33	74.17	72.50	0.326	0.008

5. Discussion

The purpose of the research was explained to experts in personal communication, and they were informed that there would be four rounds of questionnaires. In the first round of Delphi, experts were asked to provide a list of value parameters (value divers and critical factors) that they considered to have the greatest influence in the building construction project in Western Balkans from the perspective of the Client investing in the development for operation and use.

Larger discrepancies over ±100% were noted on Soft Value Parameters in Maximize business effectiveness (Staff satisfaction, Productivity per employee, Number of complaints), Ensure effective project management and delivery (Construction Industry Standard KPIs) and Impact positively on the location of the facility (Company image, Design awards, Public or private survey results, Views of local planning authority). For Hard Value Parameters these were Time (Adequacy of time), Cost (Rapid decision making, Adequate tender sum), Quality (Design quality plan), HR (Skilled personnel), Risk (Risk management techniques, Risk response) and SHE (Health and safety records) and they have shown similar discrepancies.

It is interesting that three of the parameters were excluded in that next stage (Design awards, Adequate tender sum, Design quality plan) while Construction Industry Standard KPIs was excluded in the last stage of Delphi technique further reducing regional discrepancies in the final parameter selection to 4.78%. With this data, we can conclude that there is no major difference in the region on how the value parameters are understood as relevant based on the location of practice of the experts. The experts were asked to indicate the relative importance in the contribution to the value of the building construction project in West Balkans of these 27 (over 50% experts nomination) plus additional 58 (10% to 50% expert nomination) parameters that had been identified in round one of the Delphi survey. In conclusion, list of 52 parameters have been summarized, sorted in two major groups (soft value parameters-value drivers and hard value parameters-critical factors) and 14 (6+8) sub-categories and carried into Delphi third round.

From the Delphi round two questionnaires, we have found that the parameters obtained were sufficiently consistent. For the round three questionnaires, 52 parameters, which were agreed by 60% or more experts has been examined in Round three of Delphi method. In the Fourth and final round of Delphi method Scoring table showing the "average" of the utility factors provided by the 12 experts and individual scoring was provided to all 12 participants.

To obtain a measure of consistency, a statistical test was applied involving the calculation of a coefficient of concordance (W) for the utility factors provided by the experts. Kendall's W (also known as Kendall's coefficient of concordance) is a non-parametric statistic. Out of initial 282 value parameters, 50 parameters spread through 14 categories have been determined to be relevant through four Delphi rounds by the group of 12 experts with extensive construction industry and local market conditions in Western Balkans.

6. Conclusion

This paper details the process and results of investigating value parameters on the construction projects in Western Balkan region. Adopted procedure was Delphi method which has proven to be appropriate for obtaining the utility factors for the value parameters in construction projects as a statistically significant consensus has been reached. Application of Delphi method proved as a good choice in the environment where there are very few reliable sources of industry relevance.

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