JOURNAL OF ENGINEERING AND APPLIED SCIENCE, VOL. 67, NO. 2, APR. 2020, PP. 295-313
FACULTY OF ENGINEERING, CAIRO UNIVERSITY

ASSESSMENT OF HIDDEN TRANSACTION COST IN INTEGRATION WITH VALUE ENGINEERING IN HOTELS

M. M. ELBAZ[1], S. M. WAHBA[2], A. M. AMIN[2] AND H. M. ABDELAZIZ[3]

ABSTRACT

Cost is one of the three main elements in the managerial field. Researchers are developing different cost-effectiveness techniques to maximize organizations profit and minimize the unnecessary paid cost. Moreover, most of the cost-effectiveness and reduction techniques are managing the tangible costs only neglecting the intangible costs as emotions cost. Hidden transaction cost in hotels construction in Egypt was studied as an effective cost-saving variable while applying value engineering to achieve the cost-effectiveness during the project life cycle. Relative importance index (RII) analysis was done to rank the hidden transaction cost if considered during the value engineering application. The analysis was done on two groups of variables; the first group is the traditional cost variables. While the second group including the hidden transaction costs. Analysis of the cost variables revealed the actual ranking for the Hidden costs. The results add support to the decision maker to achieve the cost-effectiveness by proposing a cost-effectiveness model.

KEYWORDS: Hidden transaction cost, Value engineering, design phase, cost effectiveness, cost saving

1. INTRODUCTION

Cost plays an essential role in many aspects of a project. In hotels construction, Cost paid to complete the project during its life span and the return on investment are the main approaches controlling the overall managerial process maintaining the needed quality to achieve the owner requirements.

After the world economic crisis in 2007-2008, the owners focused on the cost-effectiveness techniques to increase the profit by reducing the un-necessary cost paid.

---

[1]Assistant Lecturer, Architecture Department, Modern Academy for Engineering and Technology, moutaz.elbaz@ontime-eg.com
[2]Professor, Department of Architecture, Faculty of Engineering, Cairo University
[3] Lecturer, Architecture Department, Modern Academy for Engineering and Technology

Moreover, after the Arab spring uprising, this concept has been consolidated due to the poor return on investment, poor funding and unexpected market movements. Managers and researchers are developing cost-effectiveness and saving techniques across the time to achieve the targeted cost-effectiveness. Commonly used method for cost-effectiveness is value engineering considering the traditional cost variables only (unnecessary attributes, specs, opportunity, life cycle cost, and poor built-ability). Value engineering in hotels is a manegerial technique to increase the value of the property by improving the function, reducting the cost or both. In the lodging field, a critical VE component is procuring substitute materials or design alternates to meet the designer intent. In egypt value engineering application is essential in hotels construction or renovation because of the investors reservations of cash flow. By applying value engineering the investors assure the return on investmnet by reducing the project initial cost from one hand and the overall duration from the other.

However value engineering application Ignoring the intangible costs as the hidden transaction costs which will maximize the cost-effectiveness while considering. In the construction industry, conflicts between the different participants are inevitable due to the conflicting demands or interests [1, 2]. if the parties ignore the hidden transaction costs occurs from the various interests; a massive cost loss will occur.

2. RESEARCH PROBLEM

According to Construction Industry Research and Information Association, all the cost variables value engineering managing are substantial costs. Ignoring any other unclassified costs as the hidden transaction costs. The main problem is the absence of hidden transaction cost variables from the managerial process while applying Value engineering; this aims to reduce the potential of cost-effectiveness while applying value engineering following points are expected to be achieved from the research:

- Appropriate guidelines for cost assessment and reduction methods for designers
- Sorting the different cost variables taking into consideration the hidden transaction cost based on each variable effect on the overall cost-effectiveness, and arrange the result in a hypothetical basic model.

In this research, it has been made an investigation through a survey for experts in hotels construction asking them to put a relative importance weight for the hidden transaction costs during applying value engineering, the authors analyzed the results statistically through SPSS program. The findings will reveal the actual ranking for the hidden transaction cost in integration to the traditional cost variables.

3. OBJECTIVES AND HYPOTHESIS

The research aim is to survey the role of hidden transaction cost in achieving the cost-effectiveness in hotels industry and integrate the hidden transaction cost variables to the traditional value engineering equation to maximize the cost-saving and the investor /owner profit and will attract the external investors to promote the tourism industry in Egypt by identifying and categorize the different cost variables and sorting them by each variable importance, based on the previous research findings, it is expected to find:

1. A correlation between the hidden transaction costs and cost saving in hotels industry especially while considering them in the early project phases
2. It is also anticipated that the hidden transaction costs have the same effect as the traditional cost variables on the cost saving. Additionally, project managers and designers will consider the hidden transaction costs while applying value engineering during the early design phases of the project.

Relative importance index (RII) analysis was used. An analysis of the given rates for each element would reveal the actual ranking for both the hidden transaction costs and traditional costs while applying value engineering.

4. VALUE ENGINEERING AND TRADITIONAL COST VARIABLES

According to SAVE International the premier international society dedicated to approaching and developing the value methodology which is utilizing a worldwide certification program identified as the industry standard for value methodology application competence, value engineering is defined as a function-oriented, providing an agreed upon value to a system, product or service based on the client or user needs by a systematic team approach. Often this improvement occurred on cost reduction; however, improvements such as customer perceived quality and performance are paramount in the value equation. Simply stated, Value engineering is more than a cost-reduction methodology. It is a systematic approach to identifying and solving problems. The main concept for value engineering reduces the overall project cost in a meanwhile increasing the activity or item value. The main objectives in the VE are optimizing the three factors mentioned in the definition illustrated in Eq.1 [3] :

$$Value = \frac{Function + Quality}{Cost} \quad (1)$$

- Value: is the actual value for an activity or product, when an item has a value higher than one then the object is perceived to be a good value.
- Function: many features are involved in the function of any product. The most commonly cited are safety, quality, and convenience [4].
- Quality: The owner’s or user’s needs, desires, and expectations
- Cost: The real value of an item is not just the amount of immediately paid money. The primary goal of VE is the identification and removal of unnecessary costs. The unnecessary costs identified as the costs that do not contribute to the essential quality, reliability, functions, and maintainability. The added value for these costs is almost zero.

There are unnecessary costs that can be classified according to the area in which it occurs; the costs are unnecessary attributes, redundant specification, poor buildability, unnecessary life-cycle and unnecessary opportunity cost [5]. All the cost variables value engineering managed are tangible cost variables, could be measured and estimated. It was necessary to study the other managerial cost techniques to assure that the hidden transaction cost is not managed by another technique.

4.1 Other Managerial Cost Control Techniques and Related Cost Variables

Due to the restrictions, governments and private organizations are putting to assure the return on investment, and the proper allocation of the paid funds, cost-effectiveness, and saving techniques are essential to be applied during the different project phases. The most common cost control techniques are value management, value analysis, lifecycle cost analysis, cost-benefit analysis, cost-effectiveness analysis, and cost reduction. Value management is dealt with sustaining and improving a desirable balance between the needs and wants of collaborators and the resources needed to satisfy them. Collaborators value judgments vary, and VM reconciles differing priorities to deliver the best value for all stakeholders [6].

While value analysis is a systematic review process that is applied to existing product designs comparing the function of the customer needed product to meet their requirements at the lowest cost matching with the specified performance and reliability needed, these costs include the technology employed, the materials used and the required time to manufacture the product, Cost of manufacture, Cost of assembly, Cost of poor quality and Cost of warranty [7].

As value management and value analysis deal with more general cost variables, life cycle cost (LCC) could be classified as a sub-technique from value engineering managing more detailed cost variables in a wider view of study. Life cycle cost analysis is an economic assessment of an item, area, system, or facility that considers all the significant costs of ownership over its economic life, expressed concerning the equivalent currency of money. LCC can be performed on large and small buildings or isolated building systems such as HVAC, lighting, glazing, etc. [8]. The cost variables in life cycle cost analysis are Initial investment cost, operation costs, maintenance and repair cost and replacement cost [9]. Another cost control technique is cost-benefit analysis; it is mainly used by governments to evaluate the desirability of a public construction project. It provides a review of the cost-effectiveness of different alternatives to see whether the benefits outweigh the costs. The main aim is to gauge the efficiency of the added value relative to the status quo [10]. Cost-benefit analysis is managing the Social cost, Private cost, External cost, investment costs, operating costs and revenue [11, 12].

Another technique, cost-effectiveness analysis, is the decision alternatives in which both their costs and consequences are systematically taken into account. It is a decision-oriented tool, in that it is designed to ascertain which means of attaining particular educational goals are most effective. Cost-effectiveness analysis is managing real costs versus transfers [13], direct and indirect costs, tangible and intangible benefits and costs and financial and social benefits and costs.

The last choice for managers to apply is cost reduction, as it is a cost-cutting technique, which focuses on parts which might result in quality or performance reduction to meet the goal of reducing the budget, by the amount or percentage, set by management [14]. Cost reduction mainly manages fixed cost, direct cost, and indirect cost [15].

5. TRANSACTION COST VARIABLES

Hidden transaction costs are the non-value adding costs; they are defined as a combination of ex-ante and ex-post costs. They are the transaction costs incurred during the different project phases. Hidden transaction costs themselves are not tangible but their effect, as the project delay and emotional cost. In the construction industry, there are various types of transaction costs, which occur during different stages of the project lifecycle. The types of transaction costs in the construction industry have been split up into two categories. The two categories are referred to as pre and post contract transaction costs.

5.1 Pre and Post Contract Transaction Costs

Pre-contract transaction costs are identified as: "The costs incurred before a transaction takes place between two or more parties and essentially include the owner bears the costs associated with initiating the project; these costs before the construction contract is signed". They are broken down into the following categories, initiation costs, preliminary design costs, negotiation and contracting costs and feasibility study costs. Post contract transaction costs are associated with the costs incurred after the contract has been signed and before the entire transaction has been completed, they are associated with the setup and running costs of the contract governance structure in which monitoring is assigned, and disputes are resolved [16].

5.2 Hidden Transaction Costs

As high quality is a must in the project and functions are variously based on the selected item, and the job plan, cost based on the previous theories represents the initial cost and the life cycle cost of the project [17]. Dispute are inescapable because of the interests divergent, demands, or goals of different participants in the construction industry [18, 19]. The costs mentioned above mean not only the money paid out in the settlement but also the transaction costs incurred during the project lifetime [20], which could be considerably high. The latter contains the running costs of the governance structure to which monitoring is assigned and to which disputes are referred and settled"[21]. Transaction costs are classified as direct costs, indirect costs, and hidden costs [22, 23]. Table 1 illustrating the hidden transaction cost variables which are negligible during applying value engineering.

Table 1. Hidden transaction cost variables.

Hidden Transaction Cost	Time loss cost (time loss from project delay)
	Delay recovery of money cost (delay return on investment)
	Project delay (increasing the overall duration than planned)
	Quality loss of follow up work (executed work below standards)
	Reputation damage (owner or contractor reputation loss)
	Lack of future Cooperation (miss coordination)
	Effect on other cooperation
	Trust damage cost (lack of trust between different parties)
	Reduction in working the efficiency of the project (hiring a non-professional members)
	Emotional cost (emotions interfering decision making)
	Expenditure spent on favorable measures. (hiring an unqualified family member)
	difficulty in executing judgment (dispute resolution delay)

6. MATERIAL AND METHODS

For reaching a value engineering application methodology for hotels construction during the design phase, determining the different cost variables "including the hidden transaction cost" is a must. To achieve the primary goal, a data collection/analysis procedure consisting of three stepswas followed. The first step was to obtain a comprehensive list of preliminary cost variables. A qualitative research in the form of semi-structured interviews was then conducted to improve the framework proposed in step one before starting phase 2. This is followed by a qualitative approach using an analytical method to analyze the survey results to determine the importance level of the cost variables. Followed by a convenient conclusion and discussion for the scientific contribution that can assist the project managers in optimizing the overall project cost. Figure 1 represents the research methodology different stages.

6.1 Participants

To maintain the research sample representativeness, participants were approached by several manners, as poster advertisements in a number of local universities, emailing lists and semi-structured interviews with a hard copy of the questionnaire to fill manually. The survey targeted the Professors in the academic architectural field, Project managers with sufficient experience in hotels construction, owning company engineer for hotel buildings, Operator engineer, Value engineering experts and finally Architects in design /contracting offices and companies.

Respondents selected based on the below criteria:

a) Time Limit: The respondents have to work in the field not less than five years.
b) Targeted respondents: The respondents must be a Project manager, designer or operator engineer in tourism field especially five stars hotels.
c) Educational/experience level: have a master degree, Ph.D. or at least ten years experience in a related work.
d) Responses from 72 persons were received; incomplete responses were ignored. The finals sample consists of 66 participants. 58% of them with experience more than 10 in hotels construction while 33% with experience from 5:10 years and only 8% with 1:5 years experience. 86.1% of the respondents have an idea about value engineering while 13.9% responses between may be or have no idea. Figure 2 represents the level of experience for each participant.

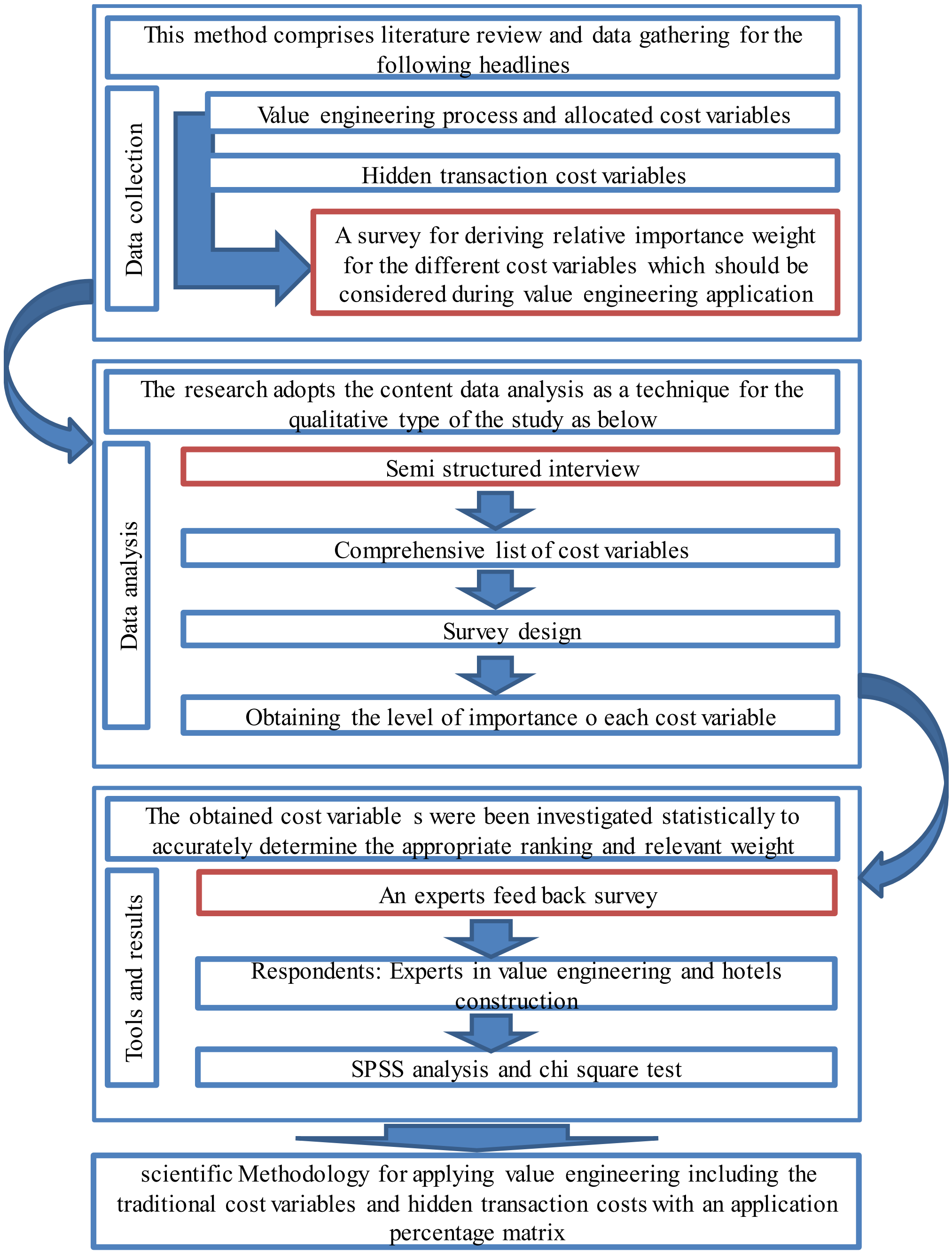

Fig. 1. Research methodology.

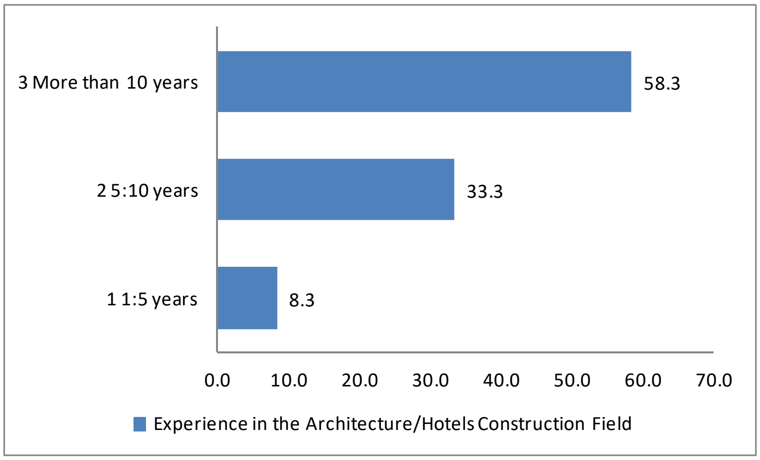

Fig. 2. Participants years of experience.

The occupancies numbers and percentages are as following: number of project managers and value experts (others) is 29 with percentage of 40.3%, while the number of hotel owner engineers is 7 with percentage of 9.7%. Director of engineering number is 10 with percentage of 13.9% electric and mechanical engineers' number is 1 with percentage of 1.4% for each. Number of architects is 21 with percentage of 29.2% and finally the number of contractors is 3 with percentage of 4.2%, as shown in Fig. 3.

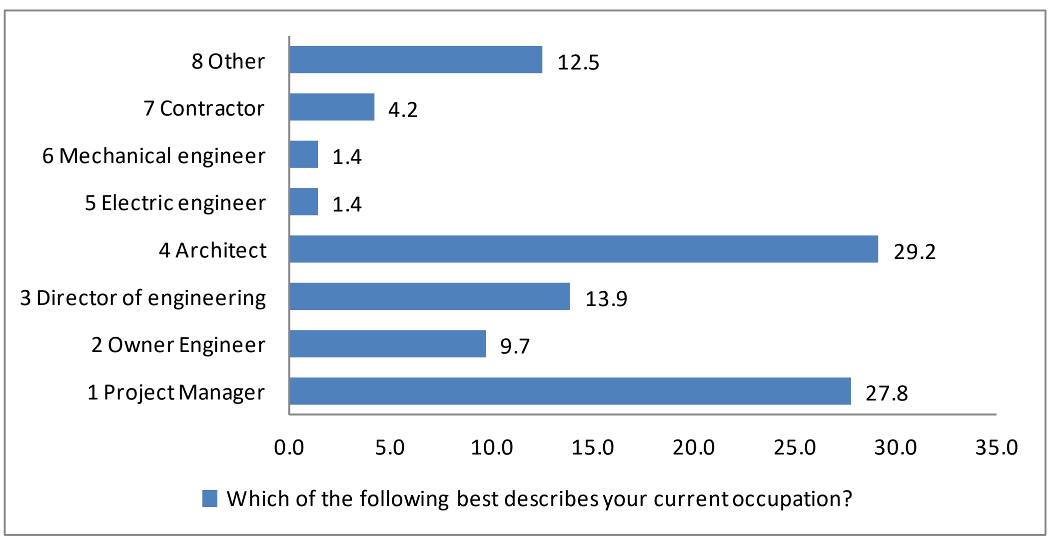

Fig. 3. Participants occupancies percentage.

The final sample consists of 66 participants after ignoring the responses with no idea about value engineering or has experience less than five years. The sample fulfilled a number of criteria including familiarity with value engineering application; cost variables value engineering managed and hotel construction process from the early design phases to the extensive renovation.

6.2 Procedures

A questionnaire was distributed among the selected respondents. The questionnaire form had two pages. The first page describes the purpose of the study and gathering data about the respondent background, occupation, position in hotels construction, years of experience and the knowledge about value engineering. The next page including one question in a matrix format asking for arranging the different cost variables according to their importance while applying value engineering, the question contains 22 cost variable represents the traditional cost variables and the hidden transaction costs and asked the respondents to rate each variable on a 5 values scale extremely important, important, moderate, less important and completely not important. This question aims to determine if the hidden transaction cost is as much practical as the traditional cost variables while applying value engineering. Initially, all the cost variables related to the different cost control and reduction techniques were studied and shortlisted into 20 elements represents the cost variables associated with value engineering and its sub-techniques as life cycle cost analysis, and the hidden transaction cost components. Ignoring the cost variables applies in another phase of the project, refers to other projects like infrastructure or regional projects and implemented by others than the individual owners like governments or non- profit organizations.

7. RESULTS

With the data acquired from the questionnaire, the standard deviation and mean was calculated in order to calculate the relative importance ranking for each element to represent its importance, if two or more variables happened to have the same mean, the one with the lower standard deviation is conceded red to be more critical.

7.1 Reliability of Measurements

To evaluate the reliability of the measurement for each variable, a reliability analysis test, which checks the significance of the results was run by SPSS software. The reliability test used Chi-square test as a valid test to evaluate the results for two different groups of variables, the average value for the Asymptotic Significance coefficient was 0.2644 which is greater than 0.05. Thus, the reliability of measurements seems adequate. For testing purposes, the cost variables were divided into two sets, the first set represents the traditional cost variables which could be classified under the direct and indirect cost, and the second set represents the hidden transaction cost variables.

7.2 Traditional Cost Variables

The first group of variables contains the traditional cost variables value engineering deals with Table 2 represents the first group of cost variables which is the conventional group.

Table 2. Relative importance index (RII) descriptive Statistics
For the Managerial Cost variables.

	N	Sum	IID	Mean	Std. Deviation
[Initial cost]	62	288	92.9%	4.65	0.546
[Life cycle cost]	62	277	89.4%	4.47	0.593
[Unnecessary attributes]	62	259	83.5%	4.18	0.779
[Unnecessary specs]	62	258	83.2%	4.16	0.772
[Unnecessary life cycle cost]	62	240	77.4%	3.87	0.778
[Unnecessary opportunity cost]	62	229	73.9%	3.69	0.781
[Operation Cost]	62	222	71.6%	3.58	1.181
[Maintenance cost]	62	223	71.9%	3.60	1.207
[Replacement cost]	62	214	69.0%	3.45	1.169

Theoretically, the main cost variables VE deals with is Initial cost, Unnecessary attributes and specs, unnecessary life cycle and opportunity cost. Moreover, the life cycle cost, R and M cost and operation cost are considered while applying life cycle cost analysis that was shown clearly in the above analysis as the initial cost importance percentage is 92.9% while life-cycle cost took the second place with 89.4% importance. Unnecessary attributes, spec and life cycle cost ranking is from third to fifth places with a percentage of 83.5%, 83.2%, and 77.4%. Unnecessary opportunity cost importance percentage is 73.9%, while operation, maintenance, and replacement cost took the last three ranks from the list, those cost variables mainly managed by life cycle cost analysis technique which is sub-technique of value engineering. Unnecessary elements weighted from 83.5 to 73.9% then the life cycle elements percentages from 71.6 to 69%. While integrating the Hidden transaction cost, it was found that the hidden transaction costs not only merged with the traditional costs but also took a ranking percentage higher than some of the conventional elements.

7.3 Hidden Transaction Cost Ranking Integrated with Traditional Costs

In order to rank the hidden transaction costs according to their importance and influence in cost-effectiveness, this part represents the overall ranking for all the cost variables in the questionnaire showing the position of the hidden transaction costs in between the traditional costs. The initial cost importance percentage is 92.9%, but quality loss of follow up work took the first rank with 94%, and project delay took the second place with 93% which means that Hidden transaction cost variables are more important than the traditional variables in some cases. Table 3 presents the ranking of the different cost variables from 1 to 22 including both HTC and traditional cost variables.

Table 3. Relative importance index (RII) descriptive statistics for the managerial cost variables.

Item	Sum	IID, %	Mean	Std. Deviation	Rank
Quality loss of follow up work	290	94	4.68	0.594	1
Initial cost	288	92.9	4.65	0.546	3
Project delay	288	93	4.65	0.630	2
Reputation damage	283	91	4.56	0.668	4
Lack of future Cooperation	279	90	4.50	0.647	5
Life cycle cost	277	89.4	4.47	0.593	6
Trust damage cost	271	87	4.37	0.707	7
Delay recovery of money cost	270	87	4.35	0.515	8
Time loss cost	266	86	4.29	0.637	9
Effect on other cooperation	264	85	4.26	0.676	10
Reduction the project efficiency working	263	85	4.24	0.670	11
Unnecessary attributes	259	83.5	4.18	0.779	12

Table 3. Relative importance index (RII) descriptive statistics for the managerial cost variables (Cont.).

Unnecessary specs	258	83.2	4.16	0.772	13
Unnecessary life cycle cost	240	77.4	3.87	0.778	14
Expenditure spent on favorable measures	233	75	3.76	0.783	15
Unnecessary opportunity cost	229	73.9	3.69	0.781	16
Maintenance cost	223	71.9	3.60	1.207	17
Operation Cost	222	71.6	3.58	1.181	18
Replacement cost	214	69.0	3.45	1.169	19
Emotional cost	213	69	3.44	0.842	20
Difficulty in executing judgment	201	65	3.24	0.783	21
Other managerial costs	155	50	2.50	0.901	22

This result could be illustrated in value effectiveness hypothetical model considering the different cost element allocated to the various architectural parameters in the hotel property; this model will help in reducing the value engineering process by focusing on the most effective cost elements allocated to the different architectural parameters. The model consists of 3 main elements, the first one is the architectural parameters, the second is the cost elements, and the third is the relation linked between them. This model could be developed by studying the different architectural elements in the hotel building and analyzing them to sort the different elements from a cost-saving point of view and allocate them in a proper sorting in the proposed model in further researches. Moreover, the different architectural elements in the model are sorted with the expected cost saving while applying value engineering. The first part of the model illustrating the best time to apply VE there are four relations between VE applicartion and the different project phases, during planning, schematic design, design development and tendering a net saving will occures by applying value engineering. If value engineering is applied in further phases a net loss will occurred. Then the middle part is showing the allocation of the cost variables on the arch. Elements following the relative importance index extracted from the SPSS analyses ends with the application criteria. The links between the architectural elements and the cost variables represents the allocation of cost variables on the different architectural parameters based on the application sequence in the end of the model. The application sequence represents the proposed sequence of selecting the different architectural elements with the cost variables allocated into them while applying value engineering based on the level of cost saving occurs on them. A7 have the maximum opportunity for cost saving and I1 have the minimum opportunity. Figure 5 illustrating the proposed value effectiveness model.

8. DISCUSSION

A central question motivating this research was will the hidden transaction costs increase the cost-effectiveness while considered during value engineering application or not? The answer to this question appears to be yes, hidden transaction costs are effective and will increase the cost saving with a tangible amount if considered. Our findings can be demonstrated through a methodology and framework of application that helps the decision maker to take the appropriate decision regarding cost-effectiveness in hotels construction, which presents the arrangement of cost variables allocated to the different architectural elements in the project including the hidden transaction cost variables during the early project phases especially the design phase. From the previous study, it was found that:

a) Quality loss of follow up work which is a hidden transaction cost took 94% importance percentage while Initial cost importance percentage is 93%. This means that hidden transaction cost has the same importance as the necessary cost variables VE manage.
b) Hidden transaction cost variables as project delay and reputation damage could be transferred from intangible cost variables to a tangible cost which will be considered during VE application.
c) Due to the studied contract terms, conditions and clear judgment procedures, difficulty in executing judgment came at the end of the ranking.
d) Maintenance and operation cost came at the end of the classification too as the amount of money allocated to them came from the revenue gained from the hotel not from the same pocket as the initial cost.

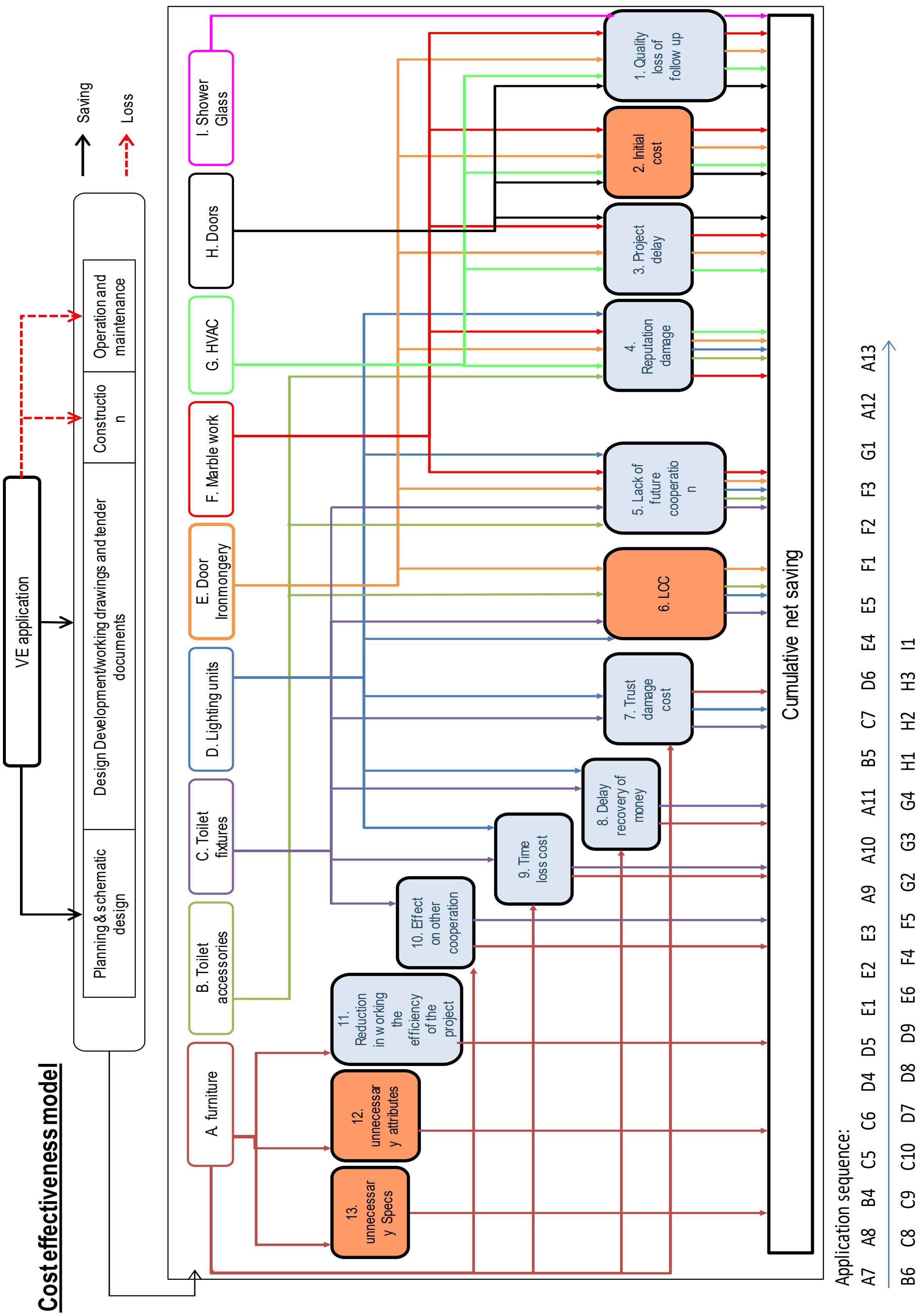

Fig. 5. Proposed value effectiveness model.

9. CONCLUSION

To achieve the cost-effectiveness in hotels construction,there are certain phases to be followed ,the main phase is to apply some managerial cost control processes during the project different phases from pre-contract phase to dismantling the building.

This phase is divided into sub-phases, the first one is to select the most effective cost control technique. The most common cost effectiveness technique is value engineering which deals with the cost, quality and time as well. The main cost variables value engineering managing categorized into two main categories Direct cost and Indirect cost. The second sub-phase is to determine the best time for value engineering application, according to the previous study, it was found that a net saving happened when applying VE in the early project phases which are starting from preliminary design to tendering.

However,the final phase to achieve the better cost saving for the project, hidden transaction cost as a third group of cost variables should be considered during VE application. Hidden transaction cost variables which affect the overall cost directly could be summarized as quality loss of follow up work, project delay, reputation damage, lack of future cooperation, trust damage cost, delay recovery of money cost and time loss cost. By considering the above variables while applying value engineering to the different architectural elements, the cost saving will be maximized compared with the conservation occurred from applying VE considering the traditional cost variables only. The previous phases are illustrated in a proposed cost effectiveness model to help the engineers and project managers to achieve the required cost effectiveness and reduce the VE application and the overall project duration as well. The other main phases are to monitor and track the results compared with the targeted budget to assure the cost saving during the different project construction phases.

DECLARATION OF CONFLICT OF INTERESTS

The authors have declared no conflict of interests.

REFERENCES

1. Cheung, S.O. and Suen, H.C.H., “A Multi-Attribute Utility Model for Dispute Resolution Strategy Selection”, Construction Management and Economics, Vol. 20, No. 7, pp. 557-568, 2002.
2. Ho, S.P., and Liu, L.Y., “The Analytical Model for Analyzing Constr. Claims and Opportunistic Bidding”, Journal of Construction Engineering and Management, Vol. 130, No. 1, pp. 94-104, 2004.
3. Bomarius, F., and Iida, H., “Product Focused Software Process Improvement: 5th International Conference”, PROFES 2004, Kansai Science City, Japan, April 5-8, Proceedings, Vol. 5, pp. 1-16, Springer Publications, 2004.
4. Connaughton, J., and Green, S., “Value Management in Construction: A Client's Guide”, Construction Industry Research and Information Association, P 37, London, 1997.
5. Mukhopadhyaya, k. A., “VE Mastermind, from Concept to VE Certification”, India, New Delhi, Chairman Enterprises, pp. 40-41, 2009.
6. Ghazali, M. R. M., and Anuar, H. S. “Value Management: Implementation of Asset Life Cycle in one of Oil and Gas Service Company”, International Journal of Advanced Engineering Research and Science (IJAERS), Vol. 4, No. 10, pp. 68-69, 2017.
7. Nick, R., “Value Engineering and Value Analysis”, Lean Enterprise Research Centre Cardiff, United Kingdom, 2007.
8. Dell'lsola A, “Life Cycle Costing for Facilities”, USA, Construction Publisher, and Consultant, p. 12, 2003.
9. Alaska Department of Education and Early Development, “Life Cycle Cost Analysis Handbook”, Education Support Services / Facilities, 1st Edition, 1999.
10. Hanley, N. and Spash, C. L., “Cost-Benefit Analysis, and the Environment”, Edward Elgar Publishing Limited. UK, 1993.
11. Ison, S., and Wall S., “Economics”, 4th Edition, Harlow, England; New York: FT Prentice Hall, 2007.
12. Flyvbjerg, B., Mette, S.H., and Søren L.B., “Underestimating Costs in Public Works Projects: Error or Lie?”, Journal of the American Planning Association, Vol. 68, No. 3, pp. 279-295, 2002.
13. Belfield, C. R., Nores, M., Barnett, S., and Schweinhart, L. “The High/Scope Perry Preschool Program: Cost-Benefit Analysis Using Data from the Age 40 Follow-up”, Journal of Human Resources, Vol. 41, No. 1, pp. 162-190, 2006.
14. Lawal. B., “Effect of Cost Control and Cost Reduction Techniques in Organizational Performance”, International Business and Management, Vol. 14, No. 3, pp. 19-26, 2017.
15. Asaolu, T.O., and Nassar, M.L., “Essential of Management Accounting and Financial Management”, (2nd ed.). Ile-Ife, Nigeria: Cedar Productions Ltd, 2007.
16. Williamson OE., “The Economic Institutions of Capitalism: Firms. Relational Contracting”, Free Press, New York, Markets, 1995.

17. Chong, H.Y., and Zin, R.M., "Selection of Dispute Resolution Methods: Factor Analysis Approach", Engineering, Construction and Architectural Management, Vol. 19, No. 4, pp. 428-443, 2012.
18. Cheung, S.O., and Suen, H.C.H., "A Multi-Attribute Utility Model for Dispute Resolution Strategy Selection", Construction Management and Economics, Vol. 20, No. 7, pp. 557-568, 2002.
19. Ho, S.P., and Liu, L.Y., "The Analytical Model for Analyzing Construction Claims and Opportunistic Bidding", Journal of Construction Engineering and Management, Vol. 130, No.1, pp. 94-104, 2004.
20. Gebken II, R.J., Gibson, G.E., and Groton, J.P., "Dispute Resolution Transactional Cost Quantification: What Does Resolving a Construction Dispute Cost?", Construction Research Congress, USA, 2005.
21. Li, H., Arditi, D., and Wang, Z., "Transaction-Related Issues and Construction Project Performance", Construction Management and Economics, Vol. 30, No. 2, pp. 151-164, 2012.
22. Gebken II, R.J., and Gibson, G.E.,. "Quantification of Costs for Dispute Resolution Procedures in the Construction Industry", Journal of Professional Issues in Engineering Education and Practice, Vol. 132, No. 3, pp. 264-271, 2006.
23. Moustafa, W. F. O., "Design of Sustainable Buildings through Value Engineering", Journal of Engineering and Applied Science, Vol. 59, No. 5, pp. 377–393, 2012

تحديد مدى تأثير تكلفة المعاملات الخفية مع دمجها مع عناصر التكلفة التقليدية عند تطبيق هندسة القيمة فى الفنادق

تعد التكلفة احدى العناصر الاساسيه الثلاث (التكلفة والوقت والجودة) فى مجال ادارة المشروعات. هذا وبالرغم مما يقوم به الباحثون بتطوير اساليب وتقنيات رفع كفائة التكلفة المختلفة لتعظيم ربح المؤسسة وتقليل التكلفة الغير مستغلة، الا انه يمكن ملاحظة ان معظم اساليب خفض التكلفة المعروفة تقوم بالعمل على التكاليف الملوسة فقط مع اهمال التكلفة الغير ملموسه، يدرس البحث تكلفة المعاملات الخفية كعامل مؤثر على التكلفة الفعلية عند تطبيق هندسة القيمة فى انشاء الفنادق لتحقيق كفاءة التكلفة، عن طريق التحليل بواسطة مؤشر الاهمية النسبية لتصنيف عناصر تكلفة المعاملات الخفية اذا تم اخذها فى الاعتبار عند تطبيق هندسة القيمة وتمت الدراسة على مجموعتين من العناصر, الاولى تشمل عناصر التكلفة التقليدية والثانية تشمل عناصر تكلفة المعاملات الخفية وبتحليل عناصر التكلفة المختلفة يمكن الاستدلال على تصنيف ورتب عناصر تكلفة المعاملات الخفية وهذا قد يساعد متخذى القرار فى تحقيق كفائه التكلفة عن طريق صياغة النتيجة فى شكل نموذج مبدئى لخفض التكلفة .