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VALUE ENGINEERING IN HONG KONG'S CONSTRUCTION INDUSTRY: CLIENTS' PERSPECTIVES

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Abstract

As value engineering is recognised and adopted to a greater extent in other countries, the author is interested in investigating why it receives such a low level of acceptance in Hong Kong's construction industry. The primary objective of this paper is to examine the clients' perspectives towards its application. To achieve this objective, clients' perceptions were solicited through a questionnaire survey. Besides, other issues that may have affected the growth of value engineering are also discussed.

Keywords: Clients' perceptions, clients' perspectives, construction industry, cost reduction, Hong Kong, value engineering.

Vrijednosno inženjerstvo u građevinarstvu Hong Konga: pogledi korisnika

Sažetak

Pošto je vrijednosno inženjerstvo u većoj mjeri prepoznato i prihvaćeno u drugim zemljama, autora zanima zašto je ono toliko malo prihvaćeno u građevinarstvu Hong Konga. Glavni je cilj rada istražiti poglede korisnika prema primjeni vrijednosnog inženjerstva. Radi postizanja tog cilja sakupljena su razmišljanja korisnika pomoću

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anketnog upitnika. U radu se razmatraju i druga pitanja koja mogu utjecati na razvoj vrijednosnog inženjerstva.

Ključne riječi: razmišljanja korisnika, pogledi korisnika, građevinarstvo, smanjenje troškova, Hong Kong, vrijednosno inženjerstvo

1 Introduction

As the cost of money becomes more significant, different cost control techniques and means to achieve better value for money are becoming increasingly important. Value engineering is one of the ways to improve design efficiency and seek the best balance between cost, reliability and performance of a building.

Value engineering was introduced into the construction industry in the US in the early 1960's. It is now commonly adopted in the United States, Japan, Australia and in Europe in both civil and building projects. Its application in Hong Kong has been limited. Value engineering has proven to be an effective tool in eliminating unnecessary costs and achieving better value for money for clients. Why then is value engineering so rarely used in Hong Kong?

2 Value engineering philosophy

The authoritative source of the definition of Value Engineering is the Society of American Value Engineers (SAVE). It gives the following definition:

Value engineering (synonymous with the terms value management and value analysis) is a function-oriented, systematic team approach to provide value in a product, system or service. Often, this improvement is focused on cost reduction, however, other improvements such as customer-perceived quality and performance are also paramount in the value equation. [1]

Referring to the SAVE's definition of value engineering, it can be seen that the process is aimed at removing unnecessary costs. No matter how capable the design team, there will invariably be some unnecessary costs hidden in the design.

“There is always a better way of obtaining equivalent quality at lower cost.” [2]

A typical objective of value engineering applied to the building industry is to assess total costs within the product's life cycle [3] and to achieve better value over this life cycle instead of simply securing the project at the lowest initial cost [4]. As Ashworth [5] points out: “Cheapness is in itself no virtue. It is worthwhile to pay a little more, if as a result the gain in value exceeds the extra cost”.

3 Current development in Hong Kong

Though value engineering is still in its infancy stage in Hong Kong, there are already signs showing that value engineering is used in both private and public sectors. It can be noted from job advertisements in local newspapers that value engineering personnel were recruited for both construction and non-construction organisations. The notable examples

in adopting value engineering process in Hong Kong are the Architectural Services Department (ASD) of the Hong Kong Government, Provisional Airport Authority (PAA), Kowloon Canton Railway Corporation (KCRC) and Mass Transit Railway Corporation (MTRC). Some of these organisations have in-house value engineering personnel and the others employed external consultants to conduct the value engineering studies for them. The latter one is usually offered as part of the project management or construction management package in their professional services. The author found that value engineering consultants were brought in from the US and Australia to carry out the value engineering studies.

It is encouraging to see that value engineering has been applied to construction projects across the board in both public and private sectors. Similar to the situation in the US, value engineering has had widespread acceptance in public projects [6].

However, one thing different from the US is that among those public works, the majority of them are in the quasi-government category. This includes the Provisional Airport Authority (PAA), Kowloon Canton Railway Corporation (KCRC), Mass Transit Railway Corporation (MTRC) and Hospital Authority (HA). Besides being driven by profit, these organisations are striving to achieve better performance and attract more customers. With this positive attitude, it is not surprising to see that some of the abovementioned organisations have adopted the “partnering” approach to rectify the adverse nature of relationships which are often present among design team members, contractors and clients.

Table 1. List of value-engineered construction projects in Hong Kong

Year of Application	Title of Project
1988	Value Engineering Training Workshop (3 days) by S. Kirk and A. Dell’Isola
1988	United Christian Hospital
1989	Hong Kong Cable TV Network
1993	South China Morning Post Building
1994	North District Hospital Project
1994	Various Provisional Airport Authority Projects
1994	Kowloon Canton Railway Corporation Development Project
1994	Lei Yue Mun Housing Project
1995	Haven of Hope Hospital
1995	Mass Transit Railway Corporation Development Project
1995	Kowloon Canton Railway Corporation Development Project

4 Clients' perceptions towards value engineering

The key issue in studying this area is not to examine how its performance could be improved; but to examine why it has received little attention and in what ways could this situation be improved.

From a literature search, there is limited information of value engineering being applied in the local context. It was considered that the best way to obtain information about clients' perception was to conduct a questionnaire survey with follow up interviews.

The objectives of the survey were to assess:

- a) the knowledge of value engineering among clients;
- b) the current usage of value engineering by clients;
- c) the clients' willingness to learn more about value engineering.

Three broad types of clients were identified and chosen as the objects for this survey. It was considered that different types of clients may have different objectives and have different appreciation of project risks.

1. *Owner-occupiers*: this represents the group of clients who build for their own use whether for public, social, community or profit making purposes.
2. *Developers*: this represents commercial clients who develop properties for profit maximization by means of selling or leasing of the properties.
3. *Hybrid*: this represents clients who are in category 1 & 2.

Of the 135 questionnaires sent out, a total number of 56 valid questionnaires were returned. This represents an overall response rate of 41.5%.

4.1 Knowledge and usage of value engineering

Before asking clients about their knowledge and use of value engineering, a brief definition of value engineering was given in the questionnaire to provide some clarifications of the meaning of value engineering.

Clients were asked whether they had heard about the term value engineering, value analysis or value management prior to receiving the questionnaire. Of the replies, 37.5% of the respondents heard of value engineering.

Of the 37.5% respondents who had heard of value engineering, 71% of them believed they were clear about the concepts of value engineering. The remainder had heard of the term but were not clear until they had read the given definition. Some had considered value engineering was another name for a cost saving exercise, buildability study or one of the techniques of quality control.

One of the questions was directed to the involvement in genuine value engineering studies. Only 14.3% of clients said they had been involved. Of these, the majority of the studies (75%) had been carried out during the sketch design stage. All the other studies were carried out at the final design stage. This is encouraging as the cost saving potential decreases throughout the life of the project [7].

63% of the clients who have commissioned value engineering studies claimed that their studies were productive, i.e. savings made were greater than the costs for carrying out the study and for the implementation. The remainder believed the studies were “effective”. All clients who have used value engineering were in favour of it and would like to see the technique being used more often in the future.

Clients who had not employed value engineering nominated the reasons as listed in Table 2.

Table 2. Reasons for not employing value engineering

Reasons	% of Total
Had not heard of this term before	25%
Lacked knowledge/information of this technique	18%
Architect or quantity surveyor has not recommended or provided such services	26%
Carrying out such a study requires extra costs	6%
Did not consider that future running cost was a prime concern, the maximization of profit was more important	3%
Others	14%
Not answered	8%

Clients who chose “others” nominated their reasons for not employing value engineering. The following reasons were forthcoming:-

- requires extra time for study;
- good planning before construction and good project management were already adopted by the firm for all projects;
- financial feasibility is more important and is always assessed. Development cost can be controlled by many means and it is not necessary to use value engineering;
- no suitable time to do the study;
- project is not so complex and profitable to be able to cover the cost of the study;
- it is not a ‘must’;
- the organization has always aimed at keeping costs as low as possible through soliciting donations;
- schedule is too tight, re-design may delay the project;
- value engineering study should be part of the design process;
- project size is too small to adopt this new method.

Besides some inaccurate perceptions and lack of knowledge about the value engineering technique, it can be concluded from the above responses that the time and cost of understanding the study are the two major concerns restraining the use of value engineering by clients.

When clients were asked about their perception of value engineering when compared with other cost control techniques, 26.3% said value engineering seems to be a good technique to achieve 'value for money'. About 37% of the clients considered value engineering is the same as other cost control techniques but with a different name and that techniques already being applied are good enough. Nearly 32% of the clients gave their own answers with wide ranging reasons for their perceptions about value engineering.

4.2 Clients' interest in value engineering

About 45% of the clients said that they would not pay for the service. 32% of them said they would pay and the rest gave a qualified response in that they will pay for the study if:

- the size of the project warranted it;
- a reasonable fee for carrying out the study;
- there were capable professionals to carry out the study.

The reasons quoted by those who are not willing to pay for the service are:

- benefits cannot be guaranteed;
- should be within the architect and quantity surveyor's scope of services;
- present cost control is good enough;
- it would lengthen the design period;
- too little information about the technique;
- paying for the service will lower the profit.

When they were asked whether they were interested in learning more about value engineering and its application in the construction industry, 80% gave a positive response. A majority of clients believed that they could learn about this technique through publications, courses, seminars, conferences and workshops.

5 Clients' perspectives

5.1 Clients' attitudes

An important subset of value engineering is life-cycle costing; this allows for the effect of future costs as well as initial costs. However, due to the short term economic investment environment of Hong Kong, a lot of buildings were built in a very short time period and were sold even before the buildings were completed. Because clients would no longer wish to continue to increase initial costs in order to marginally reduce future running costs. It is especially true for projects with a tight budget. From the clients point of view, cost is much more important than time and quality [8].

In addition, unlike other developed countries, there is no organisation in Hong Kong which undertakes the collection and dissemination of life-cycle cost data. This may become a major deterrent to the proper execution of value engineering.

5.2 Time pressure

In Hong Kong, due to high land costs and interest rates, developers have to take up the heavy financial burden during their investment in land and property. The land cost itself takes up a large proportion of the total development cost. If value engineering is to be applied successfully in Hong Kong, one of the significant factors is to reduce development time which, in turn, will reduce the project financing cost.

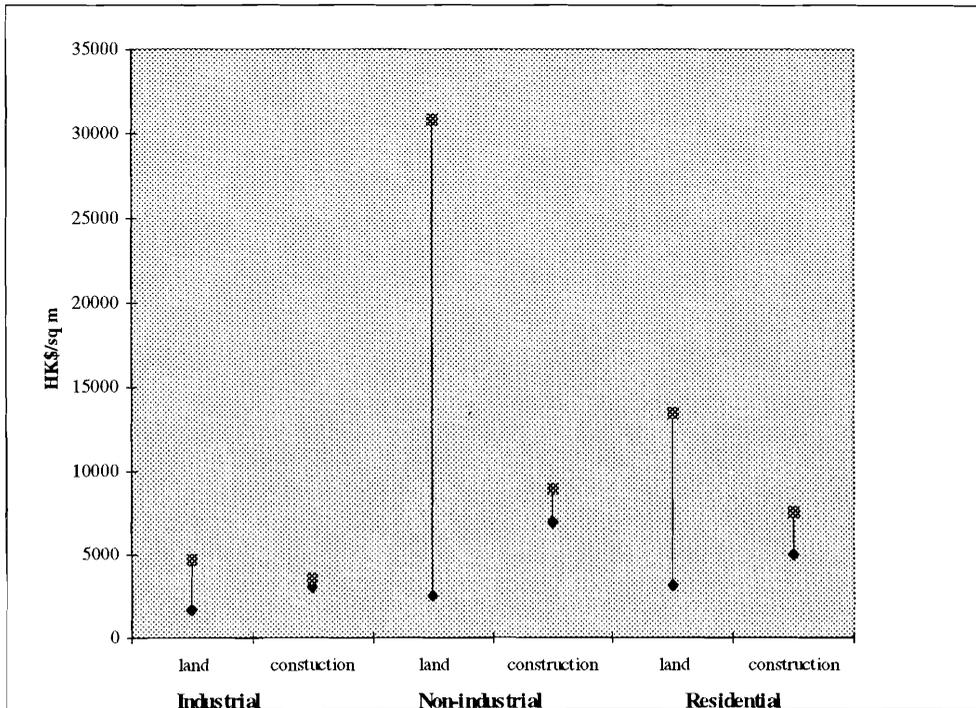


Fig. 1. Land costs vs construction costs in Hong Kong between 1989-90 (Cost data taken from [9])

5.3 Insufficient relevant experience

Although value engineering is not new to Hong Kong, there are only a handful of projects that have adopted this approach. Therefore, local experience on value engineering is very limited. As a result, clients, consultants and contractors have insufficient confidence and understanding regarding what value engineering can offer. In fact, most of the value

engineering studies carried out in Hong Kong relied heavily on value engineering facilitators from the US and Australia.

5.4 Problem in the adoption of team approach

Value engineering emphasizes that a “team approach” to problem solving is the key to its success. Rather than working in a fragmented and diverse environment, value engineering brings together the technical expertise of different parties in the project to share the same vision. The team approach will rely on consensus, mutual trust and cooperation among team members. In Hong Kong, however, this approach is not widespread and appears quite odd to some of the professional firms. Thus, much effort will have to be expended to encourage local professionals to change their confrontational attitudes to the cooperative approach.

5.5 Inertia in the change of conventional attitudes

Traditionally, the architect acts as leader to coordinate and manage the design team and contractor. However, under the value engineering approach, the relationships among the parties are changed. Instead of having the old multi-tier status system, the whole design and construction team will work together as a genuine team, this will take some time for the parties to adjust in order to come to a proper team culture.

5.6 Procurement systems

The Shui On Quarterly reported that “structural constraints” existed in Hong Kong’s construction industry, including “the fragmented approach to contracting and the limited application of modern management may have constrained the optimal utilisation of resources and technology available to the industry” [10]. Therefore, a number of unconventional procurement systems have been experimented within Hong Kong. Changing from the traditional procurement systems of designer-led to the contractor-led approach can facilitate greater use of the contractor’s input in terms of buildability which will benefit value engineering greatly. This does not mean that value engineering cannot be applied to traditional procurement systems, instead, all parties - client, design team and contractor - should be enlisted in carrying it out.

If traditional methods are used, perhaps value engineering incentive clauses (VEIC) should be incorporated into the contract to solicit contractors’ efforts in value engineering. However, the culture of sharing cost savings between the clients and contractors need to be established as most of the clients have expressed the view that all cost savings generated from any value engineering change proposals (VECP) should go to the client alone.

5.7 “Super team”

The old tradition of “I won’t tolerate people who can’t design economical facilities” [11] reflects the clients attitude in Hong Kong.

In today's rapidly changing world, the reliance of all designers to work individually, to produce economic designs and to have knowledge in all alternative solutions are not possible, effective and efficient. No professional can hope to master all the current knowledge of his own expertise, needless to say, he may feel more comfortable with existing custom and practice due to various reasons.

One large organisation in Hong Kong implemented value engineering not purely for cost reasons, in fact, their value engineering effort is part of their improvement process to their project management function within their organisation.

5.8 Duration of studies

The duration of a value engineering study has serious repercussion for its acceptance by clients in Hong Kong. Currently, the duration of the studies vary from the 2 days Australian model to the 5 days 40-hour workshop proposed in the US.

From the conversations with some of the senior professionals in the industry, they indicated that due to the time pressure of work, it is very unlikely for any organisation, especially the private ones, to lock up the whole team for 5 days or more for a value engineering study.

5.9 Existence of cost profession in Hong Kong

Though quantity surveying services are usually engaged on most construction projects, those clients who have initiated value engineering studies do not see any conflict of interest between the two services. In fact, a lot of QS practices would like to incorporate value engineering as part of their services rendered to clients. In addition, the QS roles in the past do not concentrate on function analysis. They are more cost-oriented rather than value-oriented.

In addition, similar to the UK, some of the quantity surveyors claim to have carried out value engineering studies frequently. Their approaches are no more than conventional cost reduction. Cost savings can easily be achieved by using cheaper or less material, or removing parts. If this impairs the quality or the reliability of the product then it contradicts a key principle of value engineering.

As Macpherson [12] and Green [13] suggest, value engineering is not simply a cost-cutting tool. Green and Popper [14] point out that value engineering concentrates on achieving value rather than simply focusing on minimising or reducing cost. Value engineering's main objective is to *improve value*, which may or may not *reduce cost*.

6 Benefits through application of value engineering

Through the application of the value engineering process, a better and more efficient design can be identified. In the short term, profits could be increased by ensuring lower production cost. In the long term, profits could be increased through improved performance, reliability and lower maintenance costs.

As Park [15] suggests, companies need to foster innovation, improve quality and reduce costs to stay competitive, not only in world markets but in their own country as well. Applying the value engineering process could well be a good way to improve any company's competitiveness.

7 Recommendations

Though the wide acceptance and application of value engineering in the construction industry does not seem possible in Hong Kong, at least in the near future, this should not deter us from pursuing in the right direction. Actually, the most determining hurdle to acceptance and implementation of value engineering in Hong Kong or elsewhere is ATTITUDE - including that of clients, consultants, contractors and all other people who are directly or indirectly involved in the project.

8 Conclusions

Value engineering is largely a question of changing a person's attitude, perspective and habits. It is not something requiring special knowledge or professional background. Instead, the main issue is: are people willing enough to accept it?

Value engineering is not the best technique for the construction industry in the 90s; it is just one of the techniques producing better results in achieving value for money for clients. The most important issue is whether clients will take the initiative to ensure that they get what they need. The British saying says that "the proof of the pudding is in the eating", this will certainly hold true for clients in Hong Kong through testing and participating in value engineering technique.

Change is inevitable. The issue is how the clients can be persuaded to accept the change. Value engineering is only a matter of changing our confrontational attitude to cooperative one. This attitude is far more important than the introduction of rigid and mechanistic techniques from other countries.

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