

## VE IN CONSTRUCTION: A SURVEY OF CLIENTS' ATTITUDES IN HONG KONG

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### ABSTRACT

This paper describes the general context and structure of the construction industry in Hong Kong. The results of a questionnaire survey conducted in 1992 regarding clients' attitudes towards the application of Value Engineering (VE) in Hong Kong are presented. Constraints to the applications of VE in Hong Kong's construction industry are discussed in detail. In addition, progress on a current research project entitled "Applications of Value Management (VM) in the Construction Industry in Hong Kong" is briefly described.

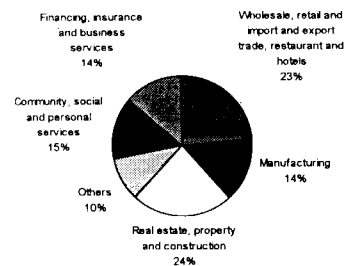
### INTRODUCTION

Hong Kong is at the center of the Asia-Pacific Rim, one of the fastest growing regions in the world. It is also one of the four small "dragons" in the South East Asia. The Territory also forms the main gateway to China, especially the southern regions. Foreign companies who are interested in China or South East Asia trade have set up regional offices in Hong Kong and this has boosted demand for high quality offices in prime locations.

The construction industry, including both building and civil engineering work, employs about 7% of the approximate three million working population, of which more than 80% are manual workers (1995). The clerical, managerial, administrative and professional

workforce constitute the rest. The real estate, property and construction sector contributes 23.5% to the Gross Domestic Product (GDP) in 1992 (Rowlinson and Walker, 1995). From figure 1, it can be seen that construction and real estate have played a significant role in Hong Kong's economy.

**Figure 1 - Contribution to Hong Kong's GDP by Re-Ordered Economic Sectors (1992)**



Source: Rowlinson, S.M. and Walker, A. (1995)

The Gross Value of Construction Work performed by main contractors was HK\$63.4 billion (US\$8.1 billion) in 1994 (Professional Services Unit, 1995). This figure does not take into account new construction work at minor new work, renovation and maintenance at existing buildings and structures and work performed by special trade contractors such as concretors, scaffolders, carpenters, plumbers and gas workers.

At present, demand in the construction industry is very strong. Work on a number of major infrastructural projects is in full swing. In particular, work on the Airport Core Programme (ACP) is entering its peak level of activity.

**STRUCTURE OF THE CONSTRUCTION INDUSTRY**

Different clients will have different expectations for their projects. If quality, cost and speed of construction are ranked by clients in different countries, the ranking will vary according to the type of project, culture and tradition, the ratio of public and private sector work, the way in which construction work is funded and who is the end-user of the facility.

**Table 1 - Ranking of Project Objectives by Clients**

Countries	Ranking of Project Objectives (in descending order)
<b>Hong Kong</b>	Cost Speed of construction Quality
<b>Japan</b>	Quality Speed of construction Cost
<b>United Kingdom</b>	Cost Quality Speed of construction
<b>United States</b>	Speed of construction Cost Quality

Source: Walker, A. and Flanagan, R. (1987)

Table 1 lists a highly generalized picture about clients' priorities and expectations in four different countries including Hong Kong, Japan, UK and US. It is interesting to note that clients in Hong Kong value cost higher than speed of construction and quality. However, in reality, clients in Hong Kong will also treat speed of construction as one of their prime concerns when they invest in real estate or properties. This is because high land cost and finance cost constitute a significant proportion of the total development cost. The longer the construction duration, the higher the financing cost will incur.

The Airport Core Programme (ACP) is one of the world's largest infrastructure programmes. The 10 interlinked projects are concentrated on the construction of a new airport at Chek Lap Kok to replace the existing Kai Tak airport. This project will form the basis of the

territory's economic expansion well into the next century. The ACP provides opportunities for private sector participation which include lots of large scale real estate development associated with the airport and the airport railway. In addition, the replacement of the existing airport will inject substantial urban re-development around the airport plus new town development surrounding the new airport. This programme has already attracted large numbers of overseas contractors to form joint-venture companies with local construction firms bringing in new technology and management techniques that will benefit the local industry in the long term. One related example is the application of VE at the feasibility stage of the programme and its subsequent application at the design stage in various facilities in order to provide cost-effective design solutions and strong financial control.

**VE DEVELOPMENT IN HONG KONG**

Although VE is still in its infancy stage in Hong Kong, there are already indicators that VE is used in both private and public sectors. Table 2 gives a list of typical VE'ed construction projects in Hong Kong. However, the list is not meant to be exhaustive and represents only projects that I have personal knowledge of. It can be noted from job advertisements in local newspapers that VE personnel are recruited for both construction and non-construction organizations.

The notable examples in adopting VE techniques in Hong Kong's construction industry are the Architectural Services Department (ASD) of the Hong Kong Government, AA [formerly the Provisional Airport Authority], Kowloon Canton Railway Corporation (KCRC) and Mass Transit Railway Corporation (MTRC). Some of these organizations have in-house VE personnel and others employed external consultants to conduct VE studies for them. In the case of external consultants, this is usually offered as part of the project management or construction management package in their professional services. I also found that VE consultants were brought in from the US and Australia to carry out VE studies.

Recently, a leading multi-national construction engineering firm in the US has decided to second their VE manager to their regional office in Hong Kong for VE studies on some major development projects.

It is encouraging to see that VE has been applied to construction projects across the board in both public and private sectors. As is the case in the US, VE has had

widespread acceptance in public projects (Barrie and Paulson, 1992).

However, one thing is different from the US in that among those public works, the majority of these are in the quasi-government category. This includes the AA, KCRC, MTRC and Hospital Authority. Besides being driven by profit, these organizations strive to achieve better performance and attract more customers.

**Table 2 - List of Value-Engineered Construction Projects in Hong Kong**

<i>Year</i>	<i>Title of Project</i>
1988	VE Training Workshop (3 days) by S. Kirk and A. Dell'Isola
1988	United Christian Hospital
1989	Hong Kong Cable TV Network
1992	New Airport Passenger Terminal - Schematic Design
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

CLIENTS' ATTITUDES TOWARDS VE

The key being addressed was not to examine how the performance of VE could be improved; but to examine why it has received little attention and in what way could the situation be improved.

A thorough literature search revealed that, there is virtually no information on how VE, Value Analysis (VA) or Value Management (VM) is applied in the local context. It was considered that the best way to obtain information about clients' attitudes was to conduct a questionnaire survey with follow up interviews.

The objectives of the survey were to assess:

- a. the knowledge of VE amongst clients;

- b. the current usage of VE by clients;
- c. the clients' willingness to learn more about VE.

Three broad types of clients were identified and chosen as the target group for this survey. It was considered that different types of client may have different objectives and have a 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 property for profit maximization by means of selling or leasing of the properties.
- 3. *Hybrid*: this represents clients who are in both category 1 & 2.

In 1992, 135 questionnaires were sent out, a total number of 56 valid questionnaires were returned. This represents an overall response rate of 41.5%.

KNOWLEDGE AND USAGE OF VE AMONG CLIENTS

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

Clients were asked whether they had heard about the term VE, VA or VM prior to receiving the questionnaire. Of the replies, 37.5% of the respondents had heard of VE.

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

One of the questions was directed at the respondents involvement in genuine VE 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.

Sixty-three % of the clients who have commissioned VE studies claimed that their studies were productive, i.e. savings made were greater than the costs for carrying out the study and its implementation. The remainder believed the studies were "effective". All clients who have used VE were in favor of it and would like to see the technique being used more often in the future.

Clients who had not employed VE nominated the reasons as listed in Table 3.

**Table 3 - Reasons for Not Employing VE**

<i>Reasons</i>	<i>% of Total</i>
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 VE. The following reasons were typical of those given:

- 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 VE; no suitable time to do the study;
- project is not complex enough 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;
- VE 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 VE technique, it can be concluded from the above responses that time and cost of the study are the two major concerns restraining the use of VE by clients.

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

CLIENTS' INTEREST IN VE

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 was charged 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 VE and its application in the construction industry, 80% gave a positive response. The majority of clients believed that they could learn about this technique through publications, courses, seminars, conferences and workshops.

### CONSTRAINTS ON APPLICATION OF VE IN HONG KONG'S CONSTRUCTION INDUSTRY

#### **Clients' Attitudes**

An important subset of VE 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 in Hong Kong, a lot of buildings are built in a very short time and are sold even before the buildings are completed. Clients are reluctant to increase initial costs to marginally reduce future running costs. It is especially true for projects with a tight budget.

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

#### **Time Pressure**

In Hong Kong, due to high land costs (see figure 2) and interest rates, developers have to sustain a heavy financial burden during their investment in land and property. Land cost and finance cost are not within the control of developers and they consume a large proportion of their total development cost. They are entirely dependent on market forces, government policy and exchange rates.

Construction costs, on the other hand are dependent on various resources, whether it is in the consultant's organization or in the contractor's organization, the key to completing a project, on time, within budget and of the right quality, is management. If VE 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.

If the application of VE causes delays to the design or the VE recommendations involve, to some extent, major or minor re-design works, and eventually the revised design needs to go through the planning and other authorities for re-approval, it will have an

undesirable effect to the development programme and costs.

**Figure 2 - Land Costs vs Construction Costs in Hong Kong between 1989-90 (Cost data taken from Walker and Flanagan, 1991)**

#### **Insufficient Relevant Experience**

Although VE is not new to Hong Kong, there are only a handful of projects that have adopted this approach. Therefore, local experience on VE is very limited. As a result, clients, consultants and contractors have insufficient confidence and understanding regarding what VE can offer. In fact, most of the VE studies carried out in Hong Kong relied heavily on VE facilitators from the US and Australia.

#### **Problems in Adopting Team Approach**

VE emphasizes that a "team approach" to problem solving is the key to its success. Rather than working in a fragmented and diverse environment, VE brings together the technical expertise of different parties in the project to share the same vision. The team approach relies 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.

#### **Inertia in Changing Conventional Attitudes**

Traditionally, the architect acts as leader in coordinating and managing the design team and the contractor. However, under the VE approach, the relationships among the parties are changed. Instead of

having the old multi-tiered status system, the whole design and construction team works together as a genuine team, this will take some time for the parties to adjust to come to a proper team culture.

### **Procurement Systems**

It is unrealistic to expect that the construction industry in Hong Kong will survive into the 21st century without major reforms in the way in which complex projects are managed.

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 utilization of resources and technology available to the industry" (1981). Therefore, a number of unconventional procurement systems have been experimented with in 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 VE greatly. This does not mean that VE 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 VE incentive clauses should be incorporated into the contract to encourage contractors' efforts in VE. However, the culture of sharing cost savings between the clients and contractors needs to be established. Most of the clients have expressed the view that all cost savings generated from any VE change proposals should go to them alone.

### **"Super Team"**

The old tradition of "I won't tolerate people who can't design economical facilities" (Barrie and Paulson, 1992) reflects majority of the clients' attitude in Hong Kong.

In today's rapidly changing world, the expectation that all designers will work individually, to produce economic designs and will have knowledge of all alternative solutions is not possible, effective and efficient. Professionals cannot hope to master all the knowledge base of the multi-disciplinary team. Needless to say, an individual may feel more comfortable with existing custom and practice due to various reasons.

### **Duration of Studies**

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

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

### **Existence of the Cost Profession in Hong Kong**

Though quantity surveying services are usually engaged on most construction projects, those clients who have initiated VE studies do not see any conflict of interest between the two services. In fact, a lot of QS practices would like to incorporate VE 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, as is the case in the UK, some of the quantity surveyors claim to have carried out numerous VE studies. The approaches adopted are however 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 one of the key principles of VE.

### VALUE MANAGEMENT RESEARCH IN HONG KONG

A Hong Kong Polytechnic University (PolyU) funded research project entitled "Applications of Value Management in the Construction Industry in Hong Kong" led by me is currently underway. The objectives of the project are:

- to investigate the awareness of VM among various construction disciplines;
- to determine the level of client experience of VM and assess the perception of client need;
- to investigate how successful VM studies were conducted and what lessons can be learned from the failed ones,

- based on the above findings, a set of detailed guidelines will be prepared for construction professionals. It will also be used as teaching materials for the VM module of the MSc/PgD degree in Construction and Real Estate offered by the Department of Building and Real Estate of the PolyU.

On completion, this project will provide a clearer picture regarding the current application of VM among various construction professionals in Hong Kong. The project is targeted to be completed by September 1996.

### CONCLUSIONS & RECOMMENDATIONS

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

VE is not the only management 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 that "the proof of the pudding is in the eating" will certainly hold true for clients in Hong Kong through testing and participating in VE technique.

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

Although the wide acceptance and application of VE in the construction industry does not seem possible in Hong Kong, at least in the near future, this should not deter us from pursuing this goal. The biggest hurdle to acceptance and implementation of VE in Hong Kong or elsewhere is ATTITUDE - including that of clients, consultants, contractors and all other stakeholders who are directly or indirectly involved in the project.

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