

EDITORIAL

Value Management: recent developments and way forward

Abstract

Purpose: This paper reviews the development of value management (VM) over the last few decades and proposes ways for future development.

Methodology/approach: A qualitative research methodology was adopted which involved a comprehensive review of relevant literature leading to a better understanding of the history and development of VM. A way forward is suggested for the future development of VM.

Findings: The research revealed that sustainable development is an area which has great potential for the application of a VM methodology in the construction industry in order to ensure sustainable design and development is leveraged during the life span of construction projects.

Originality/value: The research work described in this paper encourages researchers and practitioners to integrate VM and sustainable development. It enables the VM community to have a better understanding of applying VM techniques to address ‘green building’ issues and the potential of applying VM to promote sustainability in buildings.

Keywords: Value Management, Sustainable Development

Paper type: Editorial

Introduction

Value Management (VM) is an organised function-oriented systematic team approach directed at analysing the functions and costs of a system, supply, equipment, service or facility, for the purpose of enhancing its value, through achieving the required functions specified by the clients at the lowest possible overall cost, consistent with requirements for performance (Shen, 1993). An essential element of a VM methodology is that it enables major stakeholders to formally participate in the briefing and design process, to clarify their needs, to have better understanding of the project as well as the interests of other stakeholders,

to build consensus, and to create ownership and commitment to the solutions which emerge from the workshops (Lam, 1995, Kelly and Duerk, 2002, Yu, 2007; Yu, 2005a, b; 2006a, b; 2007 and 2008). The VM process encourages an improved understanding of the objectives and perspectives of various stakeholders, and the effective accomplishment of these objectives (Kirk and Spreckelmeyer, 1988; Shen 1993). It also acts as a common language among stakeholders to work collaboratively to identify opportunities available for development and to highlight potential problems at the very beginning of the project (Gray *et al.*, 1994; Lawson, 2006).

This paper presents the recent development of theories and practices of the VM methodology in the world, focussing on its application specifically in the construction industry, and suggests possible ways forward for future development.

VM Development in the World

VM in United States

VM evolved from Value Analysis (VA) and was first introduced by Mr. Lawrence Miles of the General Electric Company (GEC) in the 1940s. At that time, the manufacturing industry in the United States was running at maximum capacity, which resulted in the shortages of raw materials. GEC was forced to use alternatives, and Miles found that many of the substitutes delivered same or even better performance at a lower cost. As the potential benefits were significant, Miles later developed a formal procedure called Value Analysis, and applied this method within GEC.

The concept widely spread into the engineering and manufacturing process. In 1954, the US Department of Defense adopted VA when the Navy's Bureau of Ships set up a formal

programme “Value Engineering (VE)” for cost improvement during design. Since then, the term Value Engineering came into common use in North America. After the establishment of the Society of American Value Engineers (SAVE) in 1959, VE spread to many federal, state and local government agencies in the US, following the cost reduction programme of Secretary McNamara in 1964.

VE was first applied to the construction industry by Mr. Dell’Isola, when he introduced VE to the Navy’s Facilities Engineering Command. The application of this technique in the construction industry expanded quickly as it became a mandatory requirement in many public projects in the USA. While the scope expanded and the approaches to VE were developed continually, a number of terminologies such as value control, value planning and value management also evolved. The term Value Management was first used by the General Services Administration in 1974 to reflect that value techniques were not confined to technical issues but had evolved into more management activities and company policies (Macedo *et al.*, 1978). VM has now become a blanket term covering all relevant terms previously used such as value control, value planning, value engineering or value analysis.

VM in Australia

VE came to Australia in mid to late 1960s through the activities of multinational companies such as Hawker Siddeley and the marketing activities of US value engineering practices such as Value Analysis Inc. In this country, it was widely recognised that VM activity was more management than engineering in orientation, as reflected in the name of the value society - Institute of Value Management Australia (IVMA). VM in the manufacturing and defense sector has maintained activity, but the IVMA went into decline, and by the mid 1980s there was little activity (Male *et al.*, 1998).

In the mid-1980s, Professor Barton, a construction academic at the University of Canberra, undertook a study tour of value engineering practitioners in the USA. He returned to Australia with the message that VE was applicable to Australian construction, although some changes to the US system were necessary to reflect cultural differences. At the same time, the US practice of Smith Hinchman and Grylls was undertaking VE for Leighton Construction. This led to the development of two strands of the same VM message. In parallel with these activities, the New South Wales Government was formulating a strategy for reducing borrowing and securing across-the-board gains in productivity. The strategy in respect of construction was embodied in the Total Asset Management System Manual (NSW Government, 1993), which incorporated a 28-page section on VM. The manual stated that the Ministerial Capital Works Committee would maintain a panel of private sector VM specialists for New South Wales public sector agencies. Members of the panel were required to have successfully undertaken a facilitation course offered by the University of Canberra (Male *et al.*, 1998).

VM in the UK

VE came to the UK in the early to mid 1960s, and was presumed to have taken place through the activities of multinational companies. Similarly to the Australian events, it was recognised that the activity was more management than engineering in orientation, and the Institute of Value Management (IVM) was formed in 1966. VM in manufacturing went largely underground as those companies which maintained activity drew their VM teams within their organisation and concentrated upon identifying a competitive edge.

VM in construction was also slow to take root. Government agencies in the main did not take on board the ideas, nor recognise its benefits. One London quantity surveying practice was offering a value engineering service during the 1980s to a limited number of clients. A few major construction companies were also bringing VE into the UK through their links with North American construction companies. Expansion in construction came from the then newly privatised organisations, such as BNFL, BAA, Railtrack, BA and the water companies, particularly Yorkshire Water and Southern Water. London Underground, representing the transport industry in the public sector, has been actively promoting the use of VM. However, there has been no compulsion by government to require agencies and departments to use VM as in the USA and Australia (Male *et al.*, 1998).

VM in Hong Kong

Value Management was first introduced to Hong Kong in 1988. Although it is still in its early stage of applications, there has been an increasing awareness of its merits and potential benefits in value enhancement and cost savings. In recent years, VM has been increasingly applied to public construction projects. Most of them were initiated by the Architectural Services Department (ArchSD), one of Asia's largest multi-disciplinary professional offices in the public sector, who has played a leading role in promoting and using VM in Hong Kong.

In 1995, The Hong Kong Institute of Value Management was established. Ten International VM Conferences were organised by HKIVM since 1996. In 1998, the Works Bureau and the Planning, Environment and Lands Bureau jointly issued a technical circular which demanded VM studies for major public projects in the subordinate departments (Works Bureau, 1998). The Construction Industry Review Committee (2001) also recommended that VM should be used more widely in construction projects. As a result, VM was increasingly applied to a

large number of public construction projects. Over the past three years, there were on average 25 VM workshops conducted per year for projects undertaken by the works departments. The total value of projects with VM workshops conducted in the last three years amounts to HK\$218 billion.

On the research front, a large number of research projects have been conducted in the field of VM in construction. For example, the research team lead by Professor Geoffrey Shen at the Hong Kong Polytechnic University has successfully won five research grants in a row from the Research Grants Council's Competitive Earmarked Research Grant Scheme in Hong Kong to conduct research relevant to VM. Titles of these projects can be seen in Table 1.

Table 1 - Research Projects in VM Funded by the Research Grants Council in Hong Kong

Project Title	Duration
The effect of using GSS on virtual value management workshops for major construction projects	2009-12
Managing multiple stakeholders in the briefing process of large construction projects	2007-10
A computer-aided toolkit for using the functional performance specification in the briefing process	2006-09
Measuring the processes and outcomes of value management studies in construction	2005-08
The effect of using group decision support systems on the processes and outcomes of VM studies	2004-07
A best practice framework for systematic identification & precise representation of client requirements	2003-06
Successful value management applications in China: a framework for implementing the best practice	1998-01

Further Research

Since the birth of Value Analysis (VA) during last century, all VM tools aim to increase the value of a VA subject, this being defined as the relationship between the satisfaction of needs and the use of resources. VA, which leads to VM, was mistakenly seen as a cost reduction tool by some people previously; it is no longer possible today as any VM study must take into account the different stakeholders' needs and expectations. Technical and economic aspects can no longer be separated from environmental and social ones which mean that sustainability must be considered.

The interest and demand for sustainability in the construction industry has been growing for the past two decades. The vision of sustainability should be planted as early as possible in the briefing and design stages of a project, as decisions must be made at these stages to have significant impact. Sustainability should also be also integrated into all activities within the project development process with close interaction between clients and stakeholders. Currently, progress towards sustainable buildings is hampered by many barriers, such as passive reaction by clients and service providers, the belief that ‘trade-offs’ are required among the principles of sustainability, lack of guidance, a negative perception of green buildings in terms of cost, belief that sustainability is a discrete problem with limited evidence of success for overcoming it.

Value Management has the potential to promote sustainable design and development during the life span of construction projects. VM is a proactive, creative, problem-solving and problem-seeking task, which maximises the functional value of a project by managing its development from concept to use. VM can raise awareness of construction personnel on sustainability issues at appropriate times. VM can also eliminate unnecessary costs, and allow sustainability to be integrated into projects, whilst adhering to budgets. The systematic job plan can guide the participants to consider sustainability issues throughout the building’s life cycle effectively.

There are many publications on the subject of green buildings and VM separately. However, papers that highlight the contributions of VM towards the design of green buildings are limited. Several papers were presented in conferences held by IVM Australia in 2002 and Hong Kong in 2008 that link VM with sustainability. These papers discussed the importance

of sustainability for improving value (Barton 2002; Barton *et al.*, 2002; Schneider, 1999) and the potential of applying VM to promote sustainability (Yeomans, 2002; Barton *et al.*, 1999; Philips, 1999). In addition, there are papers that propose integration of VM and sustainability to enhance the reputation of VM (Fong, 2003; Schneider, 1999). Recent research has identified “perceived additional cost” as one of the barriers to the implementation of green specifications for construction projects (Lam *et al.*, 2009) and that other factors such as the availability of guides are important drivers (Lam *et al.*, 2010).

However, the absence of research-based literature and the superficial discussion in this area in extant literature indicate that the use of VM to promote sustainability in building construction has not been given much attention by either researchers or the VM community locally, nationally and internationally. The lack of information in this area is unsettling. It leads to the perception that the VM community and researchers are unaware of the importance of integrating green building issues into VM, and the potential of VM to promote sustainability in buildings. To address this problem, it is proposed to integrate sustainability with VM; and to develop practical guidelines which enable evaluation of the considerations given to green building issues during VM workshops.

VM has been identified as having the potential for achieving sustainable building projects owing to its utilisation of diverse knowledge source, professional disciplines and stakeholders, facilitating environment, strategic timing and effective processes (Abidin and Pasquire, 2005). As a value enhancement technique, VM should indeed be applied to address the many differing issues of sustainability, as they affect the quality of the outcome. The term sustainability may not be used frequently in VM workshops, but issues such as energy efficiency, minimisation of waste, healthy indoor environment, air and water quality are basic

considerations of participants of VM studies. The features of VM workshops such as the multi-disciplinary nature of participants, knowledge dissemination opportunity, strategic time, effective process and effective tools and techniques could guide participants to consider issues of sustainability. The VM approach could also open up the decision-making process considerably by involving representatives of all the key parties to sustainable development issues. This requires the representatives of all major groups to identify objectives and alternatives of green buildings (Fong and Ku, 1999).

The “Sustainable Building Collaborative” states that sustainable construction maximises energy efficiency; minimises waste; maximises the use of recycled and salvaged materials; minimises and optimises the use of natural resources and other raw materials; minimises health risks to those who manufacture building products, construct the building and occupy or operate the building; and provides the greatest quality for the lowest price. VM facilitators are no strangers to these characteristics of sustainable development issues (Schneider, 1999). They appear regularly in VM studies as criteria or components of a FAST (Function Analysis System Technique) diagram for the basic functions of a building. VM for green building design could provide a profound renewal of the VM ideas, techniques and practices. It seems that the distance between VM and sustainable development requirement is not so wide, and that the VM methodology can easily be adapted to an enlarged perspective, to provide new fields for creative and efficient work (Michel, 1999).

Additional research studies reveal that sustainability issues have sometimes been incorporated within VM workshops. However, “there are gaps in practice that are believed to be caused by the barriers raised by the lack of understanding of and confidence about this agenda” (Abidin and Pasquire, 2007). Sustainability consideration has been given less

attention than would be expected. Their importance often depends on client requirements. On the other hand, many VM practitioners claim to have a good knowledge of sustainability, and are aware of its importance. However, few practitioners have actually absorbed this knowledge into the VM process. This leads to the need for an aid in channelling their knowledge and addressing green issues more effectively and efficiently. If awareness and understanding of the sustainability concept are addressed in the pre-workshop phase of a VM study, improvement to building sustainability as well as the VM process can be achieved. Green building issues should be discussed during the VM process (and not be treated as a separate agenda). The issues need to be raised early in the process, and client support and commitment is critical to the project success. Formal guidance is necessary to indicate where improvement initiatives need to be focused and addressed. Therefore, the authors proposed to conduct research which will help to formulate strategies for the better integration of VM and green building design and construction, which it is envisaged will increase the likelihood of high performance buildings with value for money in the future.

Conclusion

The interest and demand for sustainability in the construction industry has been growing for the past two decades. The vision of sustainability should be planted as early as possible in the briefing and design stages of a project, as decisions must be made at these stages to have significant impact. Sustainability should also be integrated into activities within the project development process, with close interaction between clients and stakeholders. This paper suggests that value management has the potential to promote sustainable design and development during the life span of construction projects. However, the paucity of literature indicates an absence of past relevant research on the usage and contribution of VM towards sustainable buildings. To improve the situation, this paper sheds light on how the VM

processes can be applied to address sustainability issues and promote green design and development of construction projects. Further empirical research will lead to new knowledge and improved understanding of how stakeholders can integrate VM processes with green building design and sustainability issues during the asset life cycle of these projects.

References

Abidin, N.Z. and Pasquire, C.L. (2005). “Delivering sustainability through value management: Concept and performance overview, Engineering”, *Construction and Architectural Management*, 12(2), 168-180.

Abidin, N.Z. and Pasquire, C.L. (2007). “Revolutionize Value Management: A Mode towards Sustainability”, *International Journal of Project Management*, April, 25 (3), 275-282.

Barton, R. (2002). “Integrating values”, paper presented at the International Conference of the Institute of Value Management, Balancing the Scorecard, Hobart.

Barton, R., Jone, D. and Andersen, H. (1999). “Incorporating the values of ecologically sustainable development into project definitions using soft value management”, *Proceedings of Hong Kong Institute of Value Management International Conference 1999 – Managing Sustainable Values*, Hong Kong Conventional and Exhibition Centre, 6-7 May, Hong Kong.

Barton, R., Jones, D. and Gilbert, D. (2002). “Initiating sustainable projects”, paper presented at the *international Symposium, Shaping the Sustainable Millennium*, Queensland University of Technology, Brisbane.

Construction Industry Review Committee (2001) *Construct for Excellence – Report of the Construction Industry Review Committee*, Printing Department, Hong Kong Special Administrative Region Government.

Fong, S.W. (2003). “Value management – going all out for knowledge creation”, *The Value Manager*, 9(1), available at: <http://www.hkivm.com.hk/publication03/TVM2003.1.pdf>

Fong, P.S.W. and Ku, D.C.C. (1999). “Creating sustainable stakeholder values using value management”, *Proceedings of Hong Kong Institute of Value Management International Conference 1999 – Managing Sustainable Values*, Hong Kong Conventional and Exhibition Centre, 6-7 May, Hong Kong.

Gray C., Hughes W. and Bennett J. (1994). *The Successful Management of Design, A Handbook of Building Design Management*, Centre for Strategic Studies in Construction, University of Reading, UK.

Kelly, J. and Duerk, D. (2002). Construction Project Briefing/Architectural Programming, in *Best Value in Construction*, Kelly, J, Morledge, R. and Wilkinson, S. (eds.) Blackwell Science Ltd., 38-58.

Kirk, S.J. and Spreckelmeyer, K.F. (1988). *Creative Design Decisions*, Van Nostrand Reinhold Company, New York.

Lawson, B.R. (1997). *How Designers Think – The Design Process Demystified*, Architectural Press, Oxford.

Lam, P.T.I. (1995). Application of Value Engineering in the Construction Industry, *The Asia Pacific Building and Construction Management Journal*, **1**, 18-24

Lam, P.T.I., Chan, E.H.W., Chau, C.K., C.S. Poon, and Chun, K.P. (2009). Integrating Green Specifications in Construction and Overcoming Barriers in their Use, *Journal of Professional Issues in Engineering Education and Practice*, ASCE, **135**(4), 142-152

Lam, P.T.I., Chan, E.H.W., Chau, C.K., C.S. Poon, and Chun, K.P. (2010). Factors Affecting the Implementation of Green Specifications in Construction, *Journal of Environmental Management*, **91**(3), 654-661.

Male, S., Kelly, J., Fernie, S., Gronqvist, M. and Bowles, G. (1998). *The Value Management Benchmark: Research Results of an International Benchmarking Study*, Thomas Telford, London.

Michel, J. (1999). “Sustainable value management versus managing sustainable value”, *Proceedings of Hong Kong Institute of Value Management International Conference 1999 – Managing Sustainable Values*, Hong Kong Conventional and Exhibition Centre, 6-7 May, Hong Kong.

NSW Government (1993). *Capital Project Procurement Manual*, New South Wales Government, Australia.

Phillips, M.R. (1999). "Toward sustainability and consensus through value management: case study", *Managing Sustainable Values, Proceedings of the International Conference of the Institute of Value Management*, 6-7 May, Hong Kong.

Schneider, M. (1999). "Value management and sustainability: an opportunity to revolutionize the construction industry", *Managing Sustainable Values, Proceedings of the International Conference of the Institute of Value Management*, 6-7 May, Hong Kong.

Shen, Q.P. (1993). *A Knowledge-Based Structure for Implementing Value Management in the Design of Office Buildings*, PhD thesis, University of Salford, published by the British Library, Document Supply Centre, UK.

Works Bureau (1998). Technical Circular No. 16/98, Planning, Environment, & Lands Bureau Technical Circular No. 9/98, *Implementation of Value Management in public works projects*, September, HKSAR.

Yeomans, P. (1999). "Value management saving the planet: potent paragon or pompous pipedream?" *Managing Sustainable Values, Proceedings of the International Conference of the Institute of Value Management*, 6-7 May, Hong Kong.

Yu, A.T.W., Shen, Q.P. and Chan, E.H.W. (2005a). An analytical review of the briefing practice in Hong Kong's construction industry, *The International Journal of Construction Management*, 5(1), 77-89.

Yu, A.T.W., Shen, Q.P., Kelly, J. and Hunter, K. (2005b). Application of Value Management in Project Briefing, *Facilities*, 23(7/8), 330-342.

Yu, A.T.W., Shen, Q.P., Kelly, J. and Hunter, K. (2006a). *A Concise Guide to Value Briefing*, The Hong Kong Polytechnic University, ISBN: 962-367-509-7.

Yu, A.T.W., Shen, Q.P., Kelly, J. and Hunter, K. (2006b). *A How-To Guide to Value Briefing*, The Hong Kong Polytechnic University, ISBN: 962-367-510-0.

Yu, A.T.W. (2007). *A Value Management Framework for Systematic Identification and Precise Representation of Client Requirements in the Briefing Process*, A thesis submitted to The Hong Kong Polytechnic University for the degree of doctor of philosophy, Hong Kong.

Yu, A.T.W., Shen, Q.P., Kelly, J. and Hunter, K. (2007). "An Empirical Study of the Variables Affecting Construction Project Briefing/Architectural Programming", *International Journal of Project Management*, 25(1), 198-212.

Yu, A.T.W., Shen, Q.P., Kelly, J. and Hunter, K. (2008). "A Comparative Study of the Variables in Construction Project Briefing/ Architectural Programming", *Journal of Construction, Engineering and Management*, ASCE, 134(2), 122-138.