ELECTRONIC VALUE MANAGEMENT (eVM)

Value Management for the 21st Century!?

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Abstract

This paper outlines the concept of Electronic Value Management (eVM) which was originally conceptualised in 1999 as part of a University of Leeds PhD proposal. The paper will summarise the background to Value Management as well a highlighting issues and limitations around the current prevailing use of VM in the UK. The building blocks of eVM will be outlined as well as the advantages and disadvantages of using eVM on projects based on its use on an Institute of Value Management (IVM) case study and the authors personal experience of VM. Finally, areas for improvement and further research will be highlighted.

The paper has been put together to challenge the current applications of VM and to spark debate about methods for improving the way in which VM is being delivered. This is especially relevant in a marketplace which is becoming increasingly competitive, fast changing, cost conscious and time critical.

Introduction

The intention of this paper is to stimulate debate about the dominating ideas around the process and application of Value Management (VM), and to propose a new way forward that takes into account the challenges that face industry today. The paper seeks to broaden the scope of VM to open up new markets by making use of the technology that is available to us now, that limited its application in the 1940's when the methodology was first introduced. The paper also seeks to make VM more financially accessible and viable to such countries and organisations that lack the knowledge and resources, for example small and medium enterprises, to implement VM and realise its potential benefits.

A Brief History of Value Management & It's Application in the UK

Larry Miles is considered the father of the Value Method, or Value Engineering (VE), a problem solving method developed at General Electric in the late 1940s which was initially defined as Value Analysis. Larry Miles also developed the powerful new concept of Function Analysis, which is considered the key element of the value process that sets is aside from other management techniques. Function Analysis is, essentially, a method for understanding the intent of something to be 'done' in relation to its individual tasks and the whole system, in other words, establishing the 'purpose' of something[1].

In 1954 the US Department of Defence's Bureau of Ships became the first US Government organisation to implement a formal programme of Value Analysis. It was at this time that the term Value Engineering came into being for the administrative reason that engineers were considered the personnel most appropriate for this programme. The formation of the Society of American Value Engineers in 1959 established the methodology and the name.

The spread of VE, in the manufacturing and construction sectors, to the UK was largely through organisations with North American head offices and research activities of UK academics[2]. The term Value Management was adopted in the UK to reflect the fact that the value process was now also applied during the strategic phases of projects.

However, unlike the USA where the value process is usually applied by a completely independent project team with no prior connection to the project, current practice in the UK is to utilise the existing multi-disciplinary project team when applying Value Management.

The dominating ideas around VM in the UK today are that:

a. The VM process is workshop based, physically bringing together the existing multi-disciplinary project team for a set period of time.
b. An experienced Value Management Facilitator will manage the process.
c. The established Job Plan will be followed including some form of 'Function Analysis' usually in the form of a FAST diagram.
d. A pre-set program of VM 'Interventions' will normally be followed.
e. A report will be submitted to the VM 'team' by the Facilitator outlining decisions made.
f. The focus will be on maximising function/value and removing unnecessary cost/function.

Current VM Climate

In the UK anecdotal evidence suggests that Value Management is struggling in an ambivalent and apathetic environment. It is also fair to say that the Value Management process along with the way in which it is implemented has changed little over the past few decades. Traditional VM is also fiercely protected by Value Institutes and the consultants that carry it out, hence, there has arguably been little innovation within the field in recent years.

In a world where time is money, people are under overwhelming pressure, the working day is getting longer, and deadlines shorter, VM is now looked upon by many former advocates as a luxury which they can no longer afford. The days of bringing together 10 to 20 people in the same location, at the same time for 2 to 3 days, with all the inherent expense, is becoming less and less tolerated, or even achievable. Many organisations, who would traditionally spend 2 or 3 days on Value Management, are now allocating half a day, if any. Project Managers with their impossible deadlines, increasing workload and multiple projects simply have not got the time to even consider putting together a series of VM workshops.

VM desperately needs to be aligned with the changing demands of industry that simply does not have the luxury of time, money and flexibility. To survive and grow, VM needs to embrace new ways of thinking as well as the latest technology available. The benefits of VM are as valid today as they were 50 years ago, however, the manner in which those benefits are attained need to change to reflect 21st century working practices. In other words, the VM methodology that in itself promotes innovation and change must itself change to align with the latest thinking and client requirements!

These various constraints are expanded upon in the sections below.

Financial Constraints

The financial considerations of applying VM versus the potential benefits arising from the methodology has always been a factor when taking into account the viability of applying VM. It is an established fact that collecting information is a costly business in itself. The question to most organisations will therefore be – 'how likely am I to recover the cost of acquiring this information'? In order to mitigate this potential risk, many Organisations will set limits whereby VM will be applied to projects based on a pre-determined project value, complexity or perceived importance. This concept is illustrated in the diagram below where applying VM will be financially viable in the shaded area of the graph.

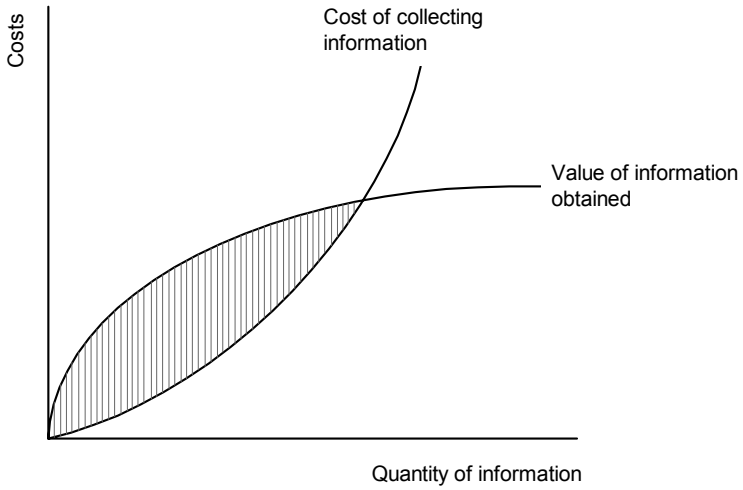

Figure 1: Cost vs Value of Information[3].

Time Constraints

The demands on managers seem to be provoking sometimes a formal and sometimes a sub-conscious trade-off in terms of the management methodologies that will be applied to projects. Many management methodologies exist, all fighting for a place in the various time constrained project phases. For example:

- Risk Management
- Asset Management
- Lean Manufacturing/Construction
- Project Review
- Design Review
- Value Management
- TQM
- Etc…

This trade-off involves analysing the absolute benefits of these management methodologies to ensure that only those which assure success in terms of regulatory requirement or value enhancement are applied. VM now competes with many other management methodologies that promise to deliver maximum value for minimum cost.

The prescribed 'value opportunity points' for applying Value Management will traditionally expect up to 7 interventions per project[4]. Each requiring substantial time commitments and each potentially slowing down the project delivery process through an increase in time to arrange workshops, facilitators, workshop attendance and, to issue and agree reports.

Reliance on Team Participation & Geographical Limitations

Unlike techniques such as Risk Management, VM has always traditionally relied on physical team participation, whether that team is the existing project team, or a team independent of the project.

Advances in technology, such as video-conferencing, has seen the creation of 'virtual teams' which are not bound by conventional ideas around the need for teams to share physical space. These teams create a flexible working environment where decisions are made without the need for arranging physical meetings. Current VM practice largely does not take these new ways of working into account and demands the type of physical 'meeting' that the virtual team has, to some extent, broken away from.

Use of Facilitators

The facilitator has always been a key element of the Value Management workshop. Unlike the application of Risk Management, for example, there is little software in existence that can take the place of the VM facilitator, and a significant competence is required to deliver VM benefits. Organisations who embrace VM will need to consider the options, including the risks and costs associated with either:

a. Providing additional training to project managers in order that they can undertake VM facilitation as part of their remit.
b. Employing full-time Value Management facilitators within a dedicated department.
c. Use of external VM facilitators on a consultancy basis.

The requirement for facilitators brings a unique set of constraints to an organisation in terms of:

- **Cost** - a 1 day workshop will demand, on average, around 40 hrs of facilitator input.
- **Availability** - if dedicated in-house capability is not available, then external resources must be procured.
- **Training & Competence** - in-house facilitators need intensive training and experience to reach an appropriate level of competence.

Team Working

If VM relies on the physical VM 'team' to add value, then it must deal with all the inherent issues that come with 'team working'. Where the design of the 'project team' traditionally acknowledges and respects hierarchy and position, the 'VM team' does not. The VM team removes any pre-existing hierarchy in terms of decision-making and influence, thus creating a team with equal status and authority. This can create a situation that is at odds with prescribed ways of working within the traditional project team resulting in tensions and a failure to agree.

Reporting & Auditability

The VM process will see the production of large amounts of data. The time taken to provide reports has already been highlighted. Other issues exist in terms of the quality of information provided and the auditability of that information. Traditional methods of facilitation promote the use of flip charts, post-its and wall charts. There is an element of 'interpretation of information' required by the Facilitator who needs to make sense of what was agreed, or stated, or written down during a workshop. This may have an impact later in the project. It is difficult to ensure that *all* discussion has been captured, and that *all* decisions were recorded.

To make the VM process more flexible, cost, time and resource effective these constraints need to be addressed. Outlined in the next section is a VM method utilising IT to overcome many of the barriers presented above.

The Concept of Electronic Value Management (eVM)

Electronic Value Management takes advantage of developments in IT to create a new Value Management delivery process that is significantly different from the traditional physical team workshop environment. eVM uses the concepts of Delphi, Virtual (or Far-Flung) teams together with the more traditional VM concepts of structured problem solving, analysis of purpose (e.g. Function Analysis) and the utilisation of an experienced VM facilitator to manage the whole process.

The eVM process can be summarised as:

1. Team working over the internet utilising the latest technology.
2. Utilising structured problem solving following the traditional VM stages of:
   - Information gathering.
   - Diagnosing and analysing purpose through, for example, Function Analysis or Objectives Hierarchies.
   - Innovation i.e. generating options and solutions to meet functions/objectives.
   - Evaluation of options.
   - Development of solutions.
3. Conducting the structured problem solving stages asynchronously by setting team members tasks which will be fed back to the eVM Co-Ordinator who will analyse and prepare the data before it is fed back to the eVM team members in the next iteration for further input.

Some of these concepts are expanded upon in the subsequent sections.

The Delphi Methodology

The Delphi method is a systematic interactive method based on independent inputs of selected experts. Delphi method uses a panel of experts who answer a series of questions which are usually formulated as hypotheses. Each round of questioning is followed with feedback on the preceding round of replies, often presented anonymously. The experts are, therefore, encouraged to revise their earlier answers in light of the replies of other members of the group. During the process the range of the answers should decrease with the group converging towards the most appropriate answer[5].

The following key characteristics of the Delphi method help the participants to focus on the issues at hand and separate Delphi from other methodologies[5]:

1. Structuring of information flow.
2. Regular feedback.
3. Anonymity of the participants.

Participants of the eVM will maintain anonymity during the process of submitting information for each phase of the workshop. Their identity is not revealed even after the completion of the interim 'phase' reports, and the final report. This prevents domination by some members of others during the process. This also allows all eVM team members to freely express their opinions, and encourages an open and frank exchange of ideas.

Virtual & Far Flung Teams

Virtual teams are groups of geographically dispersed individuals working on interdependent tasks and sharing joint responsibility for team outcomes. These individuals collaborate using a mix of face-to-face and electronic media mechanisms. Generally such teams have been comprised of individuals belonging to the same company and situated within the same region or continent working on routine tasks[6].

Far-flung virtual teams, or far-flung teams, or FFTs for short, take the concept of virtual teams to the next level – they are teams of individuals spread *across* the globe, working *collaboratively* to innovate, with minimal or *no face-to-face* interaction. Thus, FFTs are characterised by added complexity over commonly deployed virtual teams[6]:

- They are 'communications challenged' since they conduct almost all of their core work virtually through electronic mediums.
- They are 'culturally challenged' since the members have diverse areas of expertise, belong to different countries, are based in multiple countries, and hence may speak different languages.
- They are 'task challenged' as the need to pool together disparate participants create uncertainties in both the processes for accomplishing team objectives as well as the nature of the actual outcomes anticipated.

The eVM process utilises virtual teams which are brought together using the latest technology under the guidance of an eVM Co-Ordinator. The technology used and the manner in which the process is managed is carefully orchestrated to address the challenges highlighted above.

Facilitator Input

The required skills base of the eVM co-ordinator is different to that of the traditional VM facilitator allowing a greater flexibility, thus not necessarily relying on the qualified and experienced facilitator. Any member of the project team, or organisation can be trained to act as eVM Co-Ordinator.

Table 1: VM Facilitator vs eVM Co-Ordinator Skill Sets.

Required Skills	**Traditional VM Facilitator**	**eVM Co-ordinator**
Communication & negotiation skills.	Essential	Desirable
Moderate IT skills.	Desirable	Essential
Chairmanship/ leadership skills.	Essential	Desirable
Time keeping skills.	Essential	Essential
Organisational skills.	Essential	Essential
Ability to maintain neutrality.	Essential	Essential
Be empathetic – show understanding of the parties' situations, needs, and feelings.	Essential	Desirable
Listen, paraphrase, clarify, and reflect team member comments.	Essential	Desirable
Be authentic – without defensiveness or hidden agenda.	Essential	Desirable
Encourage interaction.	Essential	Essential
Confront and challenge – but only after empathy and respect have been established.	Essential	Desirable

Team Building

Traditional VM relies on an element of Team Building to ensure a successful outcome. eVM relies on data and decision-making and removes the challenges encountered by traditional facilitators placed on them by 'face-to–face situations'.

Team Input

eVM relies on the virtual team and does not depend on a physical meeting of those members. IT provides the communication vehicle for the team which allows a greater degree of flexibility. The team no longer commits to 1 to 3 days of workshop time, but rather the occasional half hour to an hour over an agreed period of time. All that is required from team members is access to the internet and e-mail during this period.

Information Gathering, Decision-making and Structuring

Unlike the traditional VM where information, ideas and decisions are generated within the physical team, eVM adopts the Delphi Methodology of information gathering, assuring anonymity at all stages of the VM process.

Where debate/discussion *is* needed, a discussion forum, or web-based conferencing offers an environment where opinions and clarification can be offered throughout the process and at every opportunity. Examples of available technology supporting this requirement include:

Discussion Boards	http://excoboard.com/exco/index.php?boardid=19718
Webex	http://www.webex.co.uk/
Skype	http://www.skype.com
Conferenceplus	http://www.conferenceplus.com/conferenceplus/TrialHome.aspx

Reporting

Whereas traditional VM relies on a VM report which is generally produced up to 1 week after completion of the workshop, eVM reports information at every stage of the Job Plan. There is no need to 'type up flip charts' as these do not exist. The issuing of 'draft' reports, followed by 'final' reports become redundant, as eVM ensures that all information is confirmed and agreed at every stage of the process.

To put the above into context a brief example of eVM in action along with potential benefits and constraints is given in the section below.

eVM Case Study

A recent workshop delivered for the Institute of Value Management, saw the Institutes very first Electronic Value Management process. The eVM workshop was aimed at improving and developing the Institutes Certification and Training System. The exercise was facilitated using basic technology available to most (e-mail), and without the use of specifically designed software. A Discussion Board was set up to aid the eVM team in terms of communication and debate.

This eVM involved the traditional Value Management Job plan, the phases being:

Information Phase

- Issues Analysis (for further information please see Kelly, Male & Graham[2]).

Diagnosing Purpose Phase

- Objectives Hierarchy (for further information please see Connaughton & Green[7]).

Innovation Phase

- Brainstorming of options.

Evaluation Phase

- Scored Evaluation of options.

Development Phase

- Agreeing next steps and development of agreed options.

Reporting Phase

- Presentation of decisions to the project sponsor (the IVM).

Output from each phase of the process was reported back to the eVM team upon completion, as well as the Project Sponsor (IVM). All debate accompanying decisions was placed on a shared discussion board by the delegates themselves, which was to form an auditable record of all discussion and decision-making throughout the process.

Only one physical meeting took place during the eVM (during the Development Phase). Up until this point, the communication had been entirely IT based. The cost benefits in terms of accommodation, subsistence and travel time alone benefited the Institute significantly.

The Advantages and Disadvantages of eVM

Some potential advantages of this process included:

- Very short time to set up.
- No pre-booking of accommodation/refreshments required thus reducing costs.
- No pre-booking of delegate time required in terms of full/specific days.
- No pre-booking of facilitator time required in terms of full/specific days.
- Delegates are less likely to act negatively towards any existing team hierarchy by not contributing/or over contributing.
- Anonymity promotes greater creativity and less restriction.
- More data is produced, on average, due to more thinking time being available.
- Quality of data is better as time is available to find and check data.
- Easy to bring in experts.
- Not restricted by Geographical constraints.
- Not restricted by other commitments (these can now overlap).
- IT software may reduce the need to employ professional VM facilitators.
- Information/ideas can be provided anonymously if preferred.
- Fewer auditability issues as delegates own words/language is used.
- Report is available immediately.
- Information can be refined/added to more easily.
- It is flexible in terms of time.
- Complicated FAST Diagrams can now be constructed by the eVM Co-Ordinator requiring only modification and agreement by team.
- Organisations selling VM products are able to take advantage of International markets.

Some potential disadvantages of eVM include:

- Written words can be misunderstood and time taken to clarify meaning can cause delays.
- People tend to be more honest and open when not face to face and so potentially the possibility of conflict is increased.
- Whereas Delphi helps prevent some team members from dominating others, the discussion board then reduces the effectiveness of Delphi as information and opinion is no longer anonymous (although this can be overcome).
- The eVM Co-ordinator may need to regularly prompt team members for input.
- A degree of IT competence is required of the eVM Co-Ordinator and all team members involved in the eVM process.
- The lack of specifically designed software make the eVM slower than traditional workshops, this could, in some instances, restrict its use to projects that do not have challenging time constraints.

Areas for Improvement and Further Research

Areas for improvement and further research include, but are not limited to:

- Develop dedicated software and websites to make the eVM process more user friendly.
  - Such a website will have to be secure and encrypted to ensure confidentiality.
- Increase automation in terms of:
  - Tools and techniques.
  - Verifying and validating user input.
  - Report generation.
  - Turnaround of data i.e. reducing administration for the eVM co-ordinator.
- Investigate the continuous application of VM throughout the life-cycle of a project e.g. continuous updates of the Issues Analysis, Function Analysis and Risk register databases as the project progresses and changes over time.

Conclusion

For Value Management to survive in a world of time constraints, limited finances and geographically dispersed teams it must embrace the technology that allows it to be a flexible, quick, easy and cost effective methodology. There is little doubt that eVM, without the constraints of physical facilitators and workshops is an interesting and viable way forward.

The availability of specific eVM software, currently being developed, should ultimately aid in the development, uptake and popularity of this new approach to Value Management.

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