INVOLVEMENT OF SUSTAINABILITY ISSUES IN VALUE MANAGEMENT: REQUISITE FACTORS

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ABSTRACT: For construction to play its part in making society more sustainable, the project practitioners and the decision makers must confront with social, economic and environmental issues throughout the project life. Raising sustainability awareness early in the project process is highly encouraged to optimize the influential potential in determining the course of the project. As one of the widely accepted techniques for value improvement, value management (VM) possesses many fine qualities fitting to becoming a powerful mode to enhance the incorporation of sustainability issues within project plans, designs and decisions. This paper begins by exploring the capabilities of VM as a mode towards enhancing sustainability integration at the early stages of the construction process. From the field study conducted to investigate the practices of VM in the UK in relation to sustainability consideration, it was revealed that despite of its inherent capabilities, VM practitioners have not fully grasped sustainability issues and they received modest appreciation. Following this finding and several other discussions with experts of the industry, this paper shall present the requisite factors which are deemed important to enable better involvement of sustainability issues in VM in the future.

Keywords: Sustainability, Sustainability Issues, Value Management, Project Improvement.

1. INTRODUCTION

The rise of sustainability phenomena in this modern construction world instigated the search for opportune ways which will enable this concept be infused into present working environments. The production of sustainable buildings depends on the application and commitment on sustainability issues within project process, where the decisions, designs and plans for the projects are made. Sustainability issues should be considered throughout all stages of decision-making to ensure that decisions made are to the best interest of the clients without detriment to the society and the environment they live in (Parry and Wood, 2000). Raising sustainability awareness early in the project process is highly encouraged to influence the course of the project. Presently, engaging sustainability issues in construction projects faces several challenges that impeding effective application. These challenges include a lack of knowledge (Bordass, 2000), lack of guidance (Van Bueren and Priemus, 2002) lack of client commitment (Reed and Gordon, 2000), negative perception about cost (Bartlett and Howard, 2000), treatment as a discrete problem (Barrett et al, 1998) and limited evidence of success (Cole, 2000). As one of the well-known techniques conducted to assist in decision makings, value management (VM) holds a strategic position to incorporate sustainability issues into construction projects. The issues of sustainability are no strangers to value experts as they regularly appeared in VM studies as one of the key elements to fulfil clients' needs. As discussed by Zainul Abidin and Pasquire (2003), VM has the potential to reduce the hurdles of effective integration due to its special characteristics and strategic timing.

This paper begins by exploring the capabilities of VM as a mode towards enhancing sustainability integration at the early stages of the construction process. Then, it presents the application of sustainability issues in VM process based on the understanding of the generic flow of VM workshops. To understand the practical adoption and appreciation on sustainability issues within present practices of VM, two field studies has been conducted. Based on the findings of these two studies, several factors which are important to ensure effective integration throughout VM process have come to light. These factors, which are called requisite factors, are useful especially in planning strategies or guidelines to improve the involvement of sustainability issues in VM in the future.

2. VALUE MANAGEMENT QUALITIES FOR DELIVERING SUSTAINABILITY

Yeomans (2002) argued that VM is the most robust mechanism to deliver a balance triumvirate of society, environmental and economics. He highlighted several points which support his arguments such as the integrated decision making process inherent in the VM process, the potential of VM in distilling objectives towards the desired outcomes and the powerful facilitation. Schneider (1999) recommended the incorporation of sustainability into value methodology as an effort to move into a more resource-efficient construction. These positive remarks on VM to support sustainability came from the realisation of the apparent strengths of VM to raise sustainability in the project process. These strengths, which derived from the key attributes of VM, are discussed under 5 headings: the role of VM participants, knowledge dissemination opportunity, strategic time, effective process and effective tools and techniques.

2.1 The Role of VM Participants

VM participants are divided according to their roles and responsibilities in the VM practices. Each VM study consists of 3 types of participants, namely decision makers (clients or clients' representatives), facilitators and team members (BS EN 12973, 2000). Based on the understanding of the terminologies provided under BS EN 1325-1 (1997), decision makers are those people who give direction of the VM study and decide on which proposals of the VM that will be implemented. VM facilitators are the people who have the knowledge, experience and personality to organise, lead and co-ordinate a study in a professional and successful way. The VM team members consist of a multi-disciplinary group of people, selected for their competence, expertise and responsibility in various aspects of the project to work together to produce the best possible proposals for the project. The role played by each participant can contribute positively towards sustainability improvement. Clients are required to define clearly their goals and objectives. A study by Leung and Liu (1998) confirmed that project goals affect the VM participants' behaviour and the final outcome. By including sustainability as part of the project objectives, the whole process of VM will be directed towards it. The facilitators, who are the intermediate persons between clients and team members, hold a strategic position to improve the awareness of sustainability. They need to take lead in this area (Dallas, 1999). The interaction between clients and VM facilitators at the pre-workshop stage raises the opportunity to encourage clients to commit to sustainability. Then the facilitator can relay clients' needs to all team members and ensure that the demand is uphold throughout the decision-making. Finally, the skill-mixed team members provide the benefits of team working and integration. They will work in unity to achieve what has been targeted.

2.2 Knowledge Dissemination Opportunity

The lack of knowledge on sustainability is inhibiting its integration into construction. Fong (2003) highlighted the strength of VM as an effective knowledge creation and transfer tool. This means that VM is also capable of spreading sustainability knowledge among project practitioners. By gathering the participants in one place at the same time, the process of giving and absorbing information is faster and more effective. The knowledge and importance of sustainability can be planted in the participants' mind, which can later be diffused further in future projects or workshops. Sustainability concepts can be diffused either by appointing sustainability / environmental experts; or through guidance by the facilitator; or through information shared by other members. In any case, forwarding this knowledge to the VM team allows the members to spread the concept outside the project into their companies, other VM studies and future projects.

2.3 Strategic Time

Sustainability aspects should be considered early in the project process and then reconsidered at critical points in the decision making process. VM is undertaken at early stages of the project process to ensure the maximum impact in influencing the project's critical decisions. In the UK, VM workshops are commonly conducted at pre-brief, briefing, outline and the final sketch design and pre-construction stage. Barton et. al. (1999) stressed that sustainability values should be incorporated as early as possible and suggested that VM provides a way of doing this. Hayles (2004) discussed that the issues of sustainability raised in the VM workshops will result in the inclusion of those issues in the decision made. Bringing sustainability into VM at the conceptual stage would encourage the inclusion of sustainability objectives in the overall project mission. At the design stage, this effort would lead to the development of sustainable design and at the pre-construction stage, this would stimulate the construction to proceed in a sustainable manner. Sustainability thinking and plan should blend into the project process. However, without proper monitoring, it can fritter away as projects become more complex. The series of workshops can act like checking points to ensure that sustainability agenda does not dissipate as the project progresses further.

2.4 Effective Process

VM consists of a systematic job plan, which would guide the team through problem seeking and solving in a coordinated manner. This job plan would ensure that sustainability issues would be part of the efforts generated to produce the proposal of VM. Phillips (1999) stated that the VM process can be adapted to align stakeholder views and to develop jointly acceptable strategies for moving towards agreed, long term, sustainable solutions. Sustainability should not be treated as a discrete agenda. It should be part of the project objectives, which could then be incorporated into the function analysis diagram. The ideas will be evaluated against the defined functions and then developed into greater detail. At the end, the proposal produced from the workshop would include features that protect the environment, social interest and long-term economic return.

2.5 Effective Tools and Techniques

There are many tools and techniques being applied in a VM in its quest to improve value. These tools include the FAST diagram, creative thinking technique, life cycle costing and weighted scoring techniques and others. As stated by Hayles (2004), through its tools and techniques, VM offers a means for the client to contribute to a better built environment and the opportunity to stimulate improvements in the construction process. These tools are useful in eliminating unnecessary costs. The view that sustainability adds cost hinders a wider acceptance of this concept. By demonstrating that sustainability can be economically viable, the acceptance to it could be accelerated (Barton et. al., 2000). The capability to eliminate unnecessary cost could be made possible to uphold sustainability needs without raising the total cost. Thus, demonstrating that sustainability can be economically viable, would in return, stimulate acceptance for sustainability.

The capabilities of VM in improving sustainability consideration are summarised as below.

1. Skill-mix participants provide an opportunity to disseminate and broaden sustainability knowledge;
2. Team working and coordination in VM practices would increase the chances of sustainability being considered effectively in VM;

3. Structured job plans can systematically guide a sustainability agenda in detail;
4. The use of function analysis to identify sustainable issues as project function;
5. Availability of tools and techniques within VM to assist in the decision making process and to ensure the concern on sustainability is relayed from one stage to another;
6. Strategic time of VM ensures sustainability issues are not sidelined before critical decisions are made;
7. The series of workshop would enable continuous attention on sustainability performance;
8. Action plans following the accepted proposal ensure sustainability plans or design being implemented;
9. VM proposals, which are both cost efficient and fulfil sustainability needs, could provide evidence to persuade clients towards this approach in the future;
10. The tools and techniques are reliable to eliminate any unnecessary cost; and
11. Availability of facilitators to guide sustainability into the process and bring awareness to the members.

3. THE APPLICATION OF SUSTAINABILITY ISSUES IN VM PROCESS

VM participants have opportunities to ensure that construction projects create minimal damage to the environment and society as they are sought before vital decisions that would affect the whole course of the project are being made. They could take a pro-active role, within their sphere of influence, in providing a more sustainable built environment and producing a balanced solution for clients. It is important however, to acknowledge the existence of certain boundaries, which limit the influence that VM can have on the vision of sustainability such as time constraint and preset scope and interest of study, which vary according to projects and timing of VM practices. Any strategies or actions taken to uphold this idea of integration must account for these boundaries.

The idea behind integrating VM with sustainability is to put this concern at the forefront of VM thinking and along its activities. The application of sustainability issues in VM is discussed in three levels of VM workshop: pre-workshop stage, workshop stage and post-workshop stage as shown in Figure 1. At pre-workshop, the importance of sustainability issues to the project needs to be made explicit to attract clients' interest and stimulate demand for it. Once clients express commitment for sustainability, they would be included in the statement of needs to secure the inclusion of these issues in the rest of the VM activities. Having identified sustainability as part of project's objectives, they would be presented to all team members and included during functional analysis stage. Ideas generated during creativity phase are evaluated against the defined functions and objectives.

The proposals are then developed and presented to the decision makers, highlighting the estimated cost savings and the features that protect the environment, social interest and long term economic return. Post-workshop stage is where the outcome from the workshop shall be implemented. The clients would decide to accept, partially accept or reject the proposal produced from the workshop. If accepted, plans and strategies will be formulated to implement the proposal.

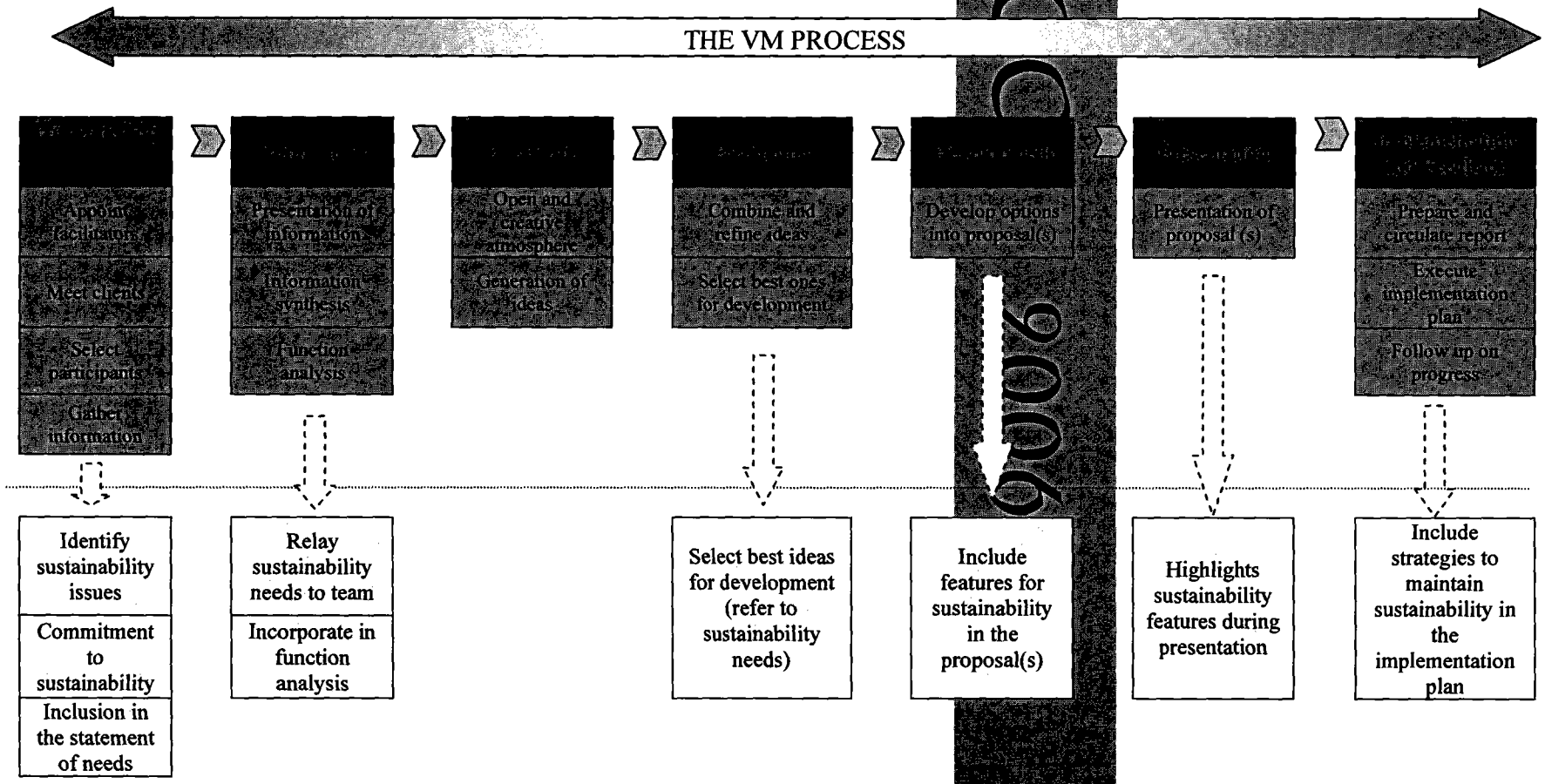

Figure 1. Application of Sustainability Thinking and Issues in VM pr[illegible] from Male et.al., 1998)

The emphasis that participants in the workshop placed on sustainability aspects will determine the sustainability 'content' within the workshop. Sustainability should not be seen as an 'add on' to VM requirements but truly integrated into all facets of planning and design. It is important to capture the essence of sustainability vision and be aligned to it as early as possible in a project process. The consideration of sustainability in VM is expected to align with the generic process of VM, as it only affects the scope and focus of study

4. INVOLVEMENT OF SUSTAINABILITY ISSUES IN VM: FIELDWORKS

Two field studies have been conducted to investigate the attention and attitude of VM practices concerning the issues of sustainability. The first field work is a survey, which aimed to investigate the integration of sustainability issues within VM practices and the perception of VM practitioners with this subject. The second study involved discussions by 11 certified value managers. These field studies, which have been conducted in the United Kingdom, produced valuable insights into the involvement of sustainability issues in present practices of VM. The discussions on these studies are extensive, however, in this paper the discussion will focus on the findings that lead to the identification of crucial factors that would affect the extent of sustainability issues being considered in VM.

4.1 Study 1: Performance Overview

Study 1 aimed to investigate the absorption of sustainability issues within VM practices and the perception of VM practitioners with this subject. A total of 360 questionnaires were distributed to various VM practitioners. The questionnaires consist of a mixture of open, closed and scaled type questions. A few fellow doctoral students were approached to provide peer examination (Creswell, 2003) on the questionnaire before it was sent out to the respondents. The type of sampling used is called 'criterion-based selection' (LeCompte and Preissle 1993). This is a strategy in which particular settings, persons or events are selected deliberately in order to provide the information needed to answer the research questions (Maxwell, 1996). The responses were targeted from all three roles of VM practitioners: decision makers (clients or their representatives), facilitators and team members (multidisciplinary participants). A total of 120 (33%) questionnaires were returned, where 26 (22%) were responses gathered from VM facilitators, 35 (29%) from VM decision makers and 59 (49%) from VM team members. Key findings from this study are:

a) VM practitioners have not fully grasped sustainability issues and they received modest appreciation and
b) There are gaps in practice caused by the several practical and behavioural barriers.

4.2 Study 2: Application Discussion

A series of interviews have been conducted to investigate whether present VM practices able to fulfil and integrate sustainability needs. A total of 37 value managers were approached to request for participation in this study. The list of value managers were obtained from the Institute of Value Management, United Kingdom. A total of 11 certified value managers agreed to participate in this research. Data gathered was analysed qualitatively as they were in the form of opinions and comments from the preset open-ended questions. Contextualising strategy was used to connect statements, opinion and comments to provide a coherent picture. The key finding of this study was that application of sustainability issues into VM depended on several factors such as clients' interest, facilitators' and team members' knowledge and priority differences.

5. REQUISITE FACTORS

There are a number of conditions, issues or factors that have been stressed repetitively from both studies, which are deemed important by the practitioners of VM to ensure effective integration of sustainability issues within their workshops. These factors are discussed under seven headings, known as the 7Cs: clarifications, commitment, cautious, conversion, condense, continuity and control. These factors are extensive but by no mean exhaustive. They would be useful in guiding the formulation of plans and strategies to improve the integration of sustainability in the future practices of VM.

5.1 Clarification

One of the critical success factors for VM studies is having clear objectives before the workshop takes place (Shen and Liu, 2003). This statement is supported by the comments from the respondents of the field studies. It is a mutually agreed that VM participants will comply with clients' demands. Thus, making overt clients' needs or expectations on sustainability-related issues to the team is vital to ensure those issues be incorporated into VM. Clients need to clarify what they want, which will then be refined by the facilitators. Moving forwards, the facilitators will clarify these needs to team members. At the end of the workshop, the team and the facilitators need to illustrate clearly (clarify) that client's demands have been met by presenting evidence which includes calculations, projected benefits, risk assessment etc.

5.2 Commitment

The respondents believe that support and commitment of the clients and participants of VM is the most important factor to ensure a success of a VM study. Commitment towards sustainability rests in the hands of all people involved in the VM studies. For clients, apart from expressing their needs, they should show commitment by avoiding pressures on the team with regard to cost and time, which would affect the overall performance. However, commonly, each client has different value drivers and usually, sustainability priorities were not perceived as one of the main drivers. From the value managers' perspectives, their clients were uninterested in sustainability due to three key reasons: (1) lack of knowledge and understanding on sustainability; (2) time and cost constraints; and (3) they fail to recognise that their project drivers required the consideration of sustainability issues. Making clients understand about sustainability is crucial to secure commitment for it. For facilitators and team members, commitments can be shown by the 'joined-up' thinking and working in unity to achieve what have been targeted. VM facilitators hold a strategic position to promote sustainability issues to the clients and to relay these issues to the team members. However, from the field studies, the commitment for sustainability from the facilitators and the team members is influenced by the clients' commitment for it. The facilitators were worried that promoting sustainability to clients who are not committed to it could stimulate bias to value drivers and risk facing professional liabilities. Commitment is also vital after the workshop. A careful and extensive action plan needs to be devised and implemented.

5.3 Cautious

The integration of sustainability issues into VM needs to be handled without causing conflict with the client's other interests. More attention is required if the workshop is dealing with client with less knowledge on sustainability. Sustainability issues should be discussed by relating them to the other value drivers so that the clients would see how these issues would be prudent in achieving their main drivers. It is believed that the clients would be interested in sustainability when there was a real incentive for it. If not, they would focus more on cost reduction.

5.4 Condense

A VM workshop usually takes up a few days. Sometimes, due to client's pressure, it could be reduced to half a day only. As time is critical in VM, it was argued that addressing the vast issues of sustainability is difficult. Suggesting changes to time frame to accommodate sustainability consideration seemed irrational, as this time frame has been widely accepted in the industry. Hence, considering sustainability issues can only be made possible if those important and related issues at the time of VM study were identified beforehand and condensed to suit the time limitation. Identification of sustainability issues prior to a workshop is possible through proper guideline and framework.

5.5 Control

To ensure that sustainability issues do not dissipate as VM progresses, the incorporation of a sustainability agenda needs to be controlled and maintained throughout the VM process. These issues should be discussed in conjunction with the clients' value drivers. Issues that have gained client's interests would be treated as part of client's needs and then brought into the VM workshop to be incorporated into the function analysis. It is a common practice to have the team members discussing about the clients' needs and interest. Changes to improve value drivers at this point are usually allowable. It is important to ensure that sustainability priorities are not sidelined after this discussion. Inclusion of these issues in the function analysis diagram would ensure these issues received continuous attention throughout the workshop phase. Then, ideas would be generated and the best ones would be selected for further development. When presenting the proposal, it was expected that the features of sustainability would be highlighted along with other important aspects such as cost estimation, time estimation and others. Logically, monitoring the inclusion of sustainability rests on the shoulder of the VM facilitators who facilitate the whole VM process. Nevertheless, participation from the clients and team members is vital to ensure that sustainability is incorporated in the VM proposals.

5.6 Continuity

Sustainability achievement will not be a success if it only dwells within the VM workshop and is not implemented afterwards. This factor highlights the need for continuity in work. Once the proposal is accepted, an action plan will be prepared, which should include a certain plan and strategy to uphold sustainability. This ensures that sustainability consideration is implemented. A good proposal is only rewarding when it has been effectively implemented.

5.7 Conversion

Clients would be interested in environmental protection or social well being if they gained something out of it. Hence, to persuade clients towards sustainability, the benefits need to be converted into monetary or economic terms, i.e. profitability, cost efficiency, business enhancement, productivity, image etc. The decisions to protect the environment and social needs would improve the clients' economic situation and bring long-term merits to their business. The team needs to highlight these benefits while presenting the proposals.

6. RECOMMENDATION

The field studies conducted enabled deeper understanding about the involvement of sustainability issues within VM practices. To improve the use of VM as an effective mode to deliver sustainability, it is recommended to overcome problems of integration that has been identified from the field studies such as:

a) studying the economic benefit of sustainability to stimulate clients interest on this aspect of construction;
b) formulating guideline to assist the VM practitioners in managing sustainability issues;
c) improving the knowledge of VM practitioners on sustainability; and
d) suggesting suitable ways to assist in identifying relevant sustainability issue prior to workshops.

7. CONCLUSION

VM participants have opportunities to ensure that construction projects create minimal damage to the environment and society as they are sought before vital decisions that would affect the whole course of the project are being made. They could take a pro-active role, within their sphere of influence, in providing a more sustainable built environment and producing a balanced solution for clients. The potential of VM to assist the absorption of sustainability in the conceptual and design stage of project process is owing to its utilisation of diverse knowledge resources, professional disciplines and stakeholders, facilitated environment, strategic timing and effective processes. Two field studies have been conducted to investigate the attention and attitude of VM practices concerning the issues of sustainability. From these studies, several factors which are important to ensure effective integration of sustainability in VM have come to light. These factors are discussed under seven headings, known as the 7Cs: clarifications, commitment, cautious, conversion, condense, continuity and control. Sustainability is a vision for tomorrow and a successful integration would boost VM position as value enhancing technique within the competitive nature of the industry's service provisions. These 7Cs would be useful to guide the formulation of strategies and plan for better absorption of sustainability within the future practice of VM.

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