Human-Centered Design and User Experience, Vol. 114, 2023, 762-772
doi: http://doi.org/10.54941/ahfe1004461

Benefits of Implementing Value Management Practices on the Performance of Construction Projects

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ABSTRACT

The construction sector contributes significantly to the economy, and its activities are essential to achieving a nation's societal strategic priorities of fostering housing, infrastructure, and improved livelihood. However, compared to expectations, the current construction projects are undergoing significant changes. The complexity and difficulty of completing construction projects timely continue to be a major problem and delivering construction projects is more difficult in recent times due to increased design iterations, cost, and time overrun, and enormous wastes, among others. Therefore, defining value in terms of social, economic, and environmental issues, even when the clients' criteria are met becomes a major challenge. Consequent to this, the establishment of value management (VM) practices was advocated to ensure the successful completion and delivery of construction projects. However, there is limited research on implementing value management practices for the completion of construction projects especially in developing nations and the concept of doing so isn't yet comprehended. Therefore, this study examined the benefits of applying VM techniques to the successful delivery of construction projects. Based on current research trends, a systematic literature study was done, looking at articles from the year 2010 to 2023. The insights derived from this study contributed to a comprehensive understanding of the benefits of adopting VM practices and facilitated the identification of knowledge gaps within the value management study. It also provided a roadmap for researchers, clients, project stakeholders, and policymakers to identify the benefit of this research implications as they establish and enhance value requirements on construction projects.

Keywords: Construction Projects, Performance, Value Management, Project Delivery

INTRODUCTION

The importance of construction projects in the construction industry has been studied by various researchers. Construction projects are structures that improve the environment, economy, and health while also outperforming traditional constructions in terms of design, construction, and operation Zhao and Moh (2016) referred to a construction project as a structure that incorporates environmental protection principles throughout the whole project execution process. With this reference, it can be claimed that green construction focuses on increasing the project's investment value and life-cycle value (Oguntona et al., 2019). In the meantime, present-day construction projects are substantially different than it was a few decades earlier. Construction projects are adversely affected by factors like greater project complexity, ineffectiveness in the construction phase, cost and time overruns, delays in the delivery, inadequate project planning, threats, schedule delays of building materials, and incoherence, which may prevent a comprehensive comprehension of the primary value chain from beginning to end for full

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management of all construction projects (Lin et al., 2011). As sustainable building projects are developed, more emphasis has been paid to strategies to increase the financial performance of construction projects and the life-cycle project value (Powmya & Abidin, 2014). When the clients' objectives are accomplished, there is value; however, defining value in terms of social, economic, and environmental issues is challenging for the project stakeholders (Olanipekun et al., 2018). If this is to be fully handled, a dramatic shift in the way construction projects are delivered is required, while the use of a variety of technologies to assist in managing and delivering construction project projects sustainably is of utmost importance (Liyanage & Rupasinghe, 2020). As a result, there has been advocacy to incorporate value management (VM) for the effective execution of sustainability of construction projects (Aghimien & Oke, 2015; Kim et al., 2016; Kineber et al., 2022; Ojo et al., 2021; Othman et al., 2021; Perera et al., 2011). The goal of VM is to ensure that clients of construction projects may constantly use investment principles and accomplish both their investment goals and the full life-cycle worth after the project (Othman et al., 2021). According to Kineber, Othman, Oke, Chileshe, and Buniya (2021), VM can enable the construction industry the ability to be more sustainable by encouraging measures that reduce construction costs. This is also in line with the assertion of Zainul-Abidin (2008) that the roles of VM include enhancing sustainability and performance while reducing waste in the execution of building projects. The adoption of the VM technique has proved to be beneficial in achieving building development goals, such as improving project design, construction, and cost-effectiveness (Iyiola & Mewomo (2022a) Hwang et al., 2015). However, the concept of VM practices is still at the inception stage, especially in developing countries, and is still confronted with numerous challenges and barriers (Iyiola & Mewomo, 2022b). The extent of understanding of VM and its capacity to offer sustainable buildings among construction professionals might be one of the reasons behind this. As a result, the benefit of VM practices on the performance of green construction projects is highlighted in this study.

RESEARCH METHODS

Based on the methodology, a systematic literature review for this study was conducted. To identify knowledge gaps and suggest areas for more research, systematic literature reviews evaluate, interpret, and synthesize all existing research pertinent to a given research subject. A pool of similar papers was generated using a two-stage process. Using the pre-established search strings and keywords, a list of construction management journals was initially examined. Only 10 of the 35 construction management journals listed, according to the stage's results, were pertinent to the goal of this paper. The second stage involved a desktop study that evaluated papers using a few search engines, such as Google Scholar, Web of Science, and Scopus. A second collection of publications was generated by using keyword searches in databases like Google Scholar and Scopus. From the reviewed articles' citations and reference lists, additional literature publications were found. The specified search terms and phrases shown in Table 1 show the foundation for the database retrieval. This research produced a cluster of 106 papers, each of which has a source listed under the heading "Initial Number of Papers." The identification of 73 studies for in-depth study followed the removal of duplicate research. Additional research was done on the 73 papers to determine

whether the articles met the inclusion and exclusion criteria as well as quality standards. A more thorough review of the paper reduced the number of pertinent publications to 32 papers, which were then analyzed. The phrase "Final number of papers" refers to the total number of screened publications in this section.

Table 1. Top search strings and keywords

Country	Documents
1	"VM" OR "Value management" OR "Construction projects" AND "benefit" OR "performance"
2	"VM" OR "Value management" OR "Value Analysis" AND "adoption" OR "implementation"

THE VALUE MANAGEMENT PROCESS

VM helps to improve efficiency and performance without compromising product value or overall performance, as well as maximize functional value and decrease project life cycle costs by minimizing needless costs (Kineber, Othman, Oke, Chileshe, & Zayed, 2021; Ncube & Rwelamila, 2017). VM task plan provides direction for properly managing issues that may develop throughout a building's existence. The task plan commonly known as the VM job plan according to Kineber et al. (2022) is categorized into different phases ranging from five to eight phases. The six stages of VM practices as categorized by Madushika et al. (2020) were the information phase, function analysis, creativity phase, evaluation, development phase, and presentation phase. This assertion was also supported by the studies of Tanko et al. (2017). The schedule and location are set at the pre-study/workshop stage, and basic project documentation and background documents (such as technical, and expert statements, records, and pertinent problems) are sent out to ensure that the desired stakeholders can participate. Participants are given a process briefing to ensure that they have a good knowledge of the projects. A procedure brief is given to team members to ensure participants are well-informed about the initiatives. The majority of the value study's information phase is addressed in this preparatory step. A work plan created during the workshop or study phase offers a systematic and structured method for designing and comparing solutions that will enable the project to be finished with the most worth (such as enormous productivity, economic growth, quality, and the least amount of delay).

APPLICATION OF VM IN THE CONSTRUCTION INDUSTRY

Although VM originated in the manufacturing sector, it has also been adopted in building firms due to the changes in the competitive environment of the construction industry (Ojo et al., 2021), the concept has existed for over a century, and its application has remained confined (Alshehri, 2020). The ability and implementation of VM to offer sustainability in building projects in industrialized countries have been the subject of numerous research. Its successful implementation in US public construction projects was noted by Luvara and Mwemezi (2017). Additionally, government parastatals in most developed nations, including the USA, the UK, Hong Kong, China, and Australia, have implemented VM to enhance infrastructure works and maximize investment returns (Kissi et al.,

2015). Recent research by Hwang et al. (2015) demonstrated the value of VM in helping construction industry personnel share risks and make decisions. The fundamental objective of VM is to provide all necessary services to the industry at the most affordable cost while enhancing project design and upholding the industry's defined standards for product performance and quality.

BENEFITS OF IMPLEMENTING VALUE MANAGEMENT

The significant benefits of implementing VM practices in building projects have also been drawn from the literature.

Financial and Economic Benefits

Aigbavboa et al. (2016) found that in South African construction, VM maximizes value for money while simultaneously focusing on the project's goals and working toward a more efficient design. VM detects excessive expenses in a construction project and evaluates alternate options without jeopardizing productivity efficiency, aesthetics, or security, benefiting the project's timeline and overall existence (Jaapar et al., 2009). Aigbavboa et al. (2016) noted that, as a cost management tool, VM is critical in the construction sector because it emphasizes all the concepts that would ensure that projects are executed at the lowest feasible cost while ensuring functionality. The adoption of VM on building projects, according to Olawumi et al. (2016) can assist in detecting excessive expenses. In the process, waste on the job site, duplication of effort, and wasteful spending are reduced through value analysis, which includes providing alternative ideas, reducing, or deleting superfluous products, and utilizing creative ideas. According to Olawumi et al. (2016), VM aids in comprehending what value means to the project's owners and users, as well as providing a functional method and strategic planning for assessing value by considering monetary and non-monetary advantages, i.e., a good approach to evaluate value for money. The relevance of VM in building project performance prompted several countries to guarantee that VM was adapted to fit their construction procedures. Othman et al. (2021) mentioned that using VM in building projects would increase performance, design, constructability, functionality, and quality while lowering costs. As a result, VM may be considered a dependable instrument for developing sustainable goods.

Table 2. Financial and economic benefits variables

Financial/economic benefits	Authors
Cost Management	(Jaapar et al., 2009), Aigbavboa et al. (2016), Olawumi et al. (2016). Aigbavboa et al. (2016), Oke and Aigbavboa (2017), Madushika et al. (2020), Othman et al. (2021), Liyanage and Rupasinghe (2020)
Optimise value for money	
Reduce project cost	
Return on investment	
Achieve value for money	
Getting rid of superfluous items	
Use of locally sourced materials	
Reduce life cycle costs	
Project delivery in a cost-effective way	

Planning and Design Benefits

To suit the needs of their clients, VM ensures that all project stakeholders are aware of the project brief (Oke & Aghimien, 2018). The VM framework offers a decision-making process so that involved parties can evaluate and analyze data. A VM task plan is a method that enables team members and stakeholders to consider each methodology individually before making decisions. It varies depending on the project's timeline and study scope (Madushika et al., 2020). According to Oke and Aigbavboa (2017), VM improves construction value, improves design efficiency and quality, maximizes value for money, and helps designers make better choices. According to Olawumi et al. (2016), VM is critical for the early detection of problems in a project, with the large increase in the value obtained greatly outweighing the time and effort required. The author said that when utilized at the idea development and first design stages, a large positive impact would be obtained, with the capacity to meaningfully affect final project results rapidly declining as the project continues through the design development stage. It also reduces the cost spent on a building project by identifying extra expenses, increasing customer engagement, providing a system for the project stakeholders to work collaboratively, advancing design decisions by highlighting various design options for selection, increasing design efficiency, and providing a credible review of the project. VM enables improved design and performance in a collaborative environment, and it also serves as the foundation for enhancing the work plan, which reflects the sponsors' goals and expectations represented as a function (Kissi et al., 2015).

Table 3. Planning and design benefits variables

Planning and design benefits	Authors
Effective design	Oke and Aigbavboa (2017), Kissi et al. (2015), Madushika et al. (2020), Ncube and Rwelamila (2017), Oguntona et al. (2019), Zhao and Moh (2016), Perera et al. (2011).
Support information of project brief	
Highlight design options for selection	
Advanced design decision	
Improved design efficiency	
Eliminating unnecessary designs	
Developing innovative design solutions	

Social Benefits

VM boosts team morale by improving team and client interactions; owing to interdisciplinary and multitasking teamwork, more productivity may be attained (Othman et al., 2021). VM also confronts some of the project stakeholders existing beliefs and private agendas to increase customer engagement throughout the development stages of the project, as well as shared ownership of ideas and adherence to successful implementation (Luvara & Mwemezi, 2017), VM offers the system for the team to collaborate and take advantage of collaborative relationships; shared agreement and ensures that cooperation among relevant parties is improved; the professional team's ability to collaborate effectively and sustain a sense of teamwork guarantees that the client's other goals are achieved (e.g., a project that is delivered on time, meets the business plan, etc.), duties and functions are well defined. It enables better communication so that all stakeholders

are aware of the limits, restrictions, and requirements for making suitable trade-offs, as well as a way of maximizing the balance between the demands and aspirations of multiple stakeholders (Luvara & Mwemezi, 2017). Aghimien and Oke (2015) stated that collaboration in the form of cross-joint effort is of extreme significance to optimizing the productivity and execution of building projects in construction firms through VM. (Sabiu & Agarwal, 2016) said that VM offers a space for team members to communicate and work together.

Table 4. Social benefits variables

Social benefit variables	Author
Cooperation among project participants	Hwang et al. (2015), Oke et al. (2015), Kim et al. (2016); Sabiu and Agarwal (2016), Luvara and Mwemezi (2017), Alshehri (2020), Othman et al. (2020), Ojo et al. (2021), Sabiu and Agarwal (2016), Olawumi et al. (2016)
Give responsibility precise terms	
Collaboration between team members	
Give the participants a framework they need to benefit from collaborating	
Consensus between stakeholders is enhanced	
Improves working relationship	
Enhance communication and efficiency through multi-task teamwork	

Project Development Benefits

According to Jaapar et al. (2009), the goal of VM is to improve the functional performance of building projects while also addressing resources other than cost. It also brings the project's objectives into greater perspective, reveals project challenges, impediments, and hazards, and gives an authoritative evaluation of the project. Oke and Aigbavboa (2017) also mentioned that VM implementation early in the construction procedure can be used to save funds, resolve issues, and make funds, as well as conduct routine site reviews, achieve project objectives, choose the most appropriate alternatives, minimize expenses, plan at the tender stage, and harmonize resource efficiency and effectiveness. According to Luvara and Mwemezi (2017). VM offers the greatest return for each function, resulting in a decrease in project discontinuation. According to Aghimien and Oke (2015), the benefits of adopting VM for a sustainable built environment include the ability to identify possible issues quickly, the removal of unneeded designs, the reduction of waste, and the assurance that the project is carried out most cost-effectively. Similar concerns were backed by Kineber, Bin Othman, et al. (2021) that VM provides a comprehensive assessment of the project's objectives from the perspective of the client. Oke et al. (2015) endorsed this claim by stating that VM improves value for money, clarifies construction goals, works toward more effective design, works on similar or more beneficial components, and identifies extra expenses through superfluous design, material, labor, and equipment.

Table 5. Project development benefits

Project development benefits	Authors
Creates a better focus on the project goal	Jaapar et al. (2009), Oke and Aigbavboa (2017); Oke et al. (2015),
VM discovers project issues, constraints, and risks involved	

The client's involvement is enhanced	Luvara and Mwemezi (2017), Kineber, Bin Othman, et al. (2021), Hwang et al. (2015), Alshehri (2020), Lin et al. (2011), Zhao and Moh (2016), Tanko et al. (2017)
Enhance clear definition of roles	
Provides an unbiased assessment of the project	
Enhance risk management measures	
Early identification of a problem in the project	
Promotion of innovative service delivery process	
Time savings through a focus on effort	

Environmental Benefits of VM

Additionally, it gives project participants the chance to improve the built environment and, as a result, promote specialized development (Aigbavboa et al., 2016). Environmental considerations can be included through a variety of methods, including sustainable materials, design strategies, and energy-efficient technologies (Edwards et al., 2019). To provide the best value for the stakeholders throughout the project, the work plan focuses on option evaluation and the design process after identifying and developing a balancing of goals among stakeholders. The overall quality and long-term viability of construction projects are improved by undertaken VM (Kissi et al., 2015). Additionally, it has benefits like a shorter time to market, higher quality, lower environmental impact, and lower lifespan costs. According to Bennett and Mayouf (2021), VM will identify potential issues before they become big ones, get rid of pointless ideas, reduce waste, and make sure the project is finished as cheaply as possible.

Table 5. Environmental benefits

Environmental benefits	Authors
Selecting sustainable materials	Kim et al. (2016); Sabiu and Agarwal (2016), Luvara and Mwemezi (2017), Alshehri (2020), Madushika et al. (2020), Othman et al. (2021), Liyanage and Rupasinghe (2020).
Sustainable designs	
Improves energy efficiency	
Waste minimization and management	
Reduce project abandonment	

DISCUSSION OF FINDINGS

The literature showed that VM adoption continues to be haphazard due to inadequate VM implementation in most underdeveloped countries and some adoption hurdles like lack of awareness, poor communication, and interaction, lack of VM experts, understanding about VM, poor planning and schedule, among others which are affecting the sustainability of construction projects according to (Kim et al., 2016). The paper revealed that these barriers can be mitigated by considering the benefits that will be acquired when an effective VM is implemented. These benefits are financial/economic benefits; planning and design benefits; social benefits; project development benefits; and environmental benefits. These benefits will enhance sustainability and improve the performance of construction projects. The worldwide construction sector currently prioritizes

sustainable development that strikes a balance between social, economic, and environmental agendas (Jaapar et al., 2009). The process of selecting a good site location, sustainable materials, determining excellent design features, and ensuring sustainable construction practices is an essential attribute of VM and it helps to minimize environmental and social damage Additionally, the attributes of VM encourage strong involvement, information exchange, and efficiency by facilitating the collaborative efforts of professionals with a variety of skills and competencies. A few advantages of VM include better business decisions, increased productivity, better products and services, enhanced communication processes, cooperation, stakeholder involvement, and actions that can be supported by all participants. There are various advantages to VM, but they can only be realized if it is embraced, proper individuals are involved, and the study's recommendations are followed. Given this, clients and other construction professionals should embrace these commitments.

CONCLUSION

This study concludes that applying VM practices in construction projects will considerably increase the likelihood of achieving sustainability in building projects. The research is projected to alleviate the long-standing problem of low knowledge of the functions of VM among construction stakeholders as it will also serve as a foundation for promoting VM practices to achieve project sustainability. It is paramount to implement novel concepts and solutions that work for the construction sector to optimize the usage of VM for improved project performance. Furthermore, because all construction professionals are prospective VM team members, great communication skills are required, and more data collection is required to better understand efficient ways of implementing VM. It is also vital to have legislation that can be approved, put into effect, and oversee VM activities.

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