Barriers to implement value management in Sri Lankan small construction projects

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# Abstract

*Value management (VM) remains a relatively less explored research domain in developing countries, especially for small construction projects, which remain extremely novel. The findings of this study provide valuable insights for individuals engaged in small-scale construction projects pertaining to VM decision-making and implementation in Sri Lanka and similar contexts. The primary aim of this research was to evaluate the obstacles linked to implementing value management in small-scale construction projects in Sri Lanka, employing a quantitative research methodology. The primary challenges identified in this study encompass "insufficient expertise in VM instruction and facilitation", "absence of suitable guidelines", "inadequate support from government and management", "challenges in reaching consensus among project stakeholders regarding project objectives", and "resistance to embracing novel ideas and advancements". Given the limited amount of empirical research conducted on VM in the context of small-scale construction projects, this work contributes to the existing body of knowledge on the management of such projects.*

**Keywords:** construction, value management, small, Sri Lanka, barriers.

**INTRODUCTION**

Value management (VM) is defined by Jaapar et al. (2009) as a multidisciplinary, team-oriented, structured, analytic, and systematic approach to analysis that is intended to provide the most value via design and construction to the final consumer. It encourages a process that begins with project planning and continues until the project is completed. Thus, efficient and productive construction procedures throughout the duration of building projects have become an essential component. VM is capable of boosting and decreasing needless costs, as well as incorporating sustainable development into plans and financial conservatism (Shen & Liu, 2003). Since the government is a large consumer of building projects, the demand to improve the construction industry's efficiency is driving governmental initiatives that aim to reduce construction costs (Kenley, 2014). This approach was supported by Tanko et al. (2017), who noted that VM attempts to improve efficiency and accomplishment without sacrificing value. The VM industry appears to have international consensus on a cost-effectiveness and productivity-boosting strategy (Kolo & Ibrahim, 2010). Ellis et al. (2005) confirmed that the capital expenses of building projects might be lowered by 10 to 25 percent if the VM is appropriately used during the first phase of the project. The approach has decreased the cost of construction projects by 5–10 percent, according to historical evidence (Norton & McElligott, 1995).

VM has gained popularity and prevalence in the construction industry in most developed countries (Perera et al., 2003). The U.S. government mandates VM in its projects despite the modest contract value, proving its success. (Olawumi et al., 2016). This also occurred in Japan and Australia, where the scope of required VM compliance was widened to include smaller and less expensive building projects (Abd Karim et al., 2014). Hwang et al. (2015) discovered greater VM utilisation in Singaporean small building projects, contrary to the commonly held belief that larger projects receive more VM. However, the situation in developing countries is extremely different. In many developing countries, VM concepts and implementations in the construction industry have not been effectively adopted (Kim et al., 2016). In Malaysia and China, for instance, VM is still in its infancy and is not commonly acknowledged (Jaapar et al., 2009). In Malaysia, only large and costly public projects are subject to mandatory VM (Jaaper et al., 2012). Therefore, VM is used infrequently in the construction industry of Southeast Asia (Cheah & Ting, 2005) and even less frequently in South Africa (Bowen et al., 2010). Malla (2013) stated that the VM concept has just been introduced in Nepal, and Phyo & Cho (2014) stated that there is a delayed acceptance of VM by construction professionals in Myanmar and Nigeria.

VM is recommended for the implementation of various projects as they offer cost-effectiveness and value for money (Abd Karim et al., 2014). Despite the extensive historical utilisation of the methodology in the corporate sector and its notable success in project planning, cost control, conflict management, and dispute resolution (Alshehri, 2020), the general implementation of VM in developing countries remains limited due to the constraints imposed by project scale and financial resources. As per Hwang et al. (2015), smaller construction projects often have greater challenges compared to larger projects because of limitations in terms of cost and time, as well as heightened competition and reduced profitability. Consequently, heightened monitoring is required by management to mitigate the occurrence of cost overruns and subpar results. VM is commonly regarded as a highly effective method for addressing this issue because of its focus on achieving cost reduction, function optimisation, and the elimination of unnecessary materials, processes, and worker time, as emphasised by Aghimien et al. (2018). Furthermore, it aids construction firms, namely Small and Medium Enterprises (SMEs) that largely engage in small-scale projects, in addressing the challenge of diminished profitability in such projects and enhancing their self-competitiveness to sustain their competitive edge (Lin et al., 2022). The incorporation of VM techniques into small project management has been found to yield significant benefits. In contrast to the opulence shown in developed countries, it is evident that VM is often overlooked in small-scale construction endeavours inside underdeveloped countries. This inquiry pertains to the identification of characteristics that contribute to the limited implementation of VM in small-scale construction projects.

Sri Lankan construction industry remains a relatively less explored research domain. Thus, using Sri Lankan construction industry to explore barriers to implement VM in small construction projects will add a valuable contribution to the existing body of information. The results of this study provide construction professionals, particularly those engaged in small-scale projects, with a valuable resource for making and executing decisions related to VM. Given the little research on VM in small-scale construction projects, this study makes a valuable contribution to the existing body of information regarding the management of such projects. There is an expectation that both the academic community and industry stakeholders will allocate greater focus to VM in the context of small-scale building projects. The insights will provide a basis for construction stakeholders in Sri Lanka and other similar developing countries to recognise the potential barriers associated with VM implementation and overcome them through rigorous planning and action.

**LITERATURE REVIEW**

VM has been widely employed in construction projects in developed countries, including the United States and the United Kingdom (Perera et al., 2003). As indicated by Abd Karim et al. (2014), the United States government has implemented a requirement for VM on all public projects above USD 2 million. Kelly et al. (2014) stated that VM has emerged as a firmly established system in the United Kingdom, employing widely accepted tools, processes, and styles for various construction projects. While this assertion holds validity within the contexts of the United States and the United Kingdom, it is important to acknowledge that other countries exhibit significant imperfections in their respective systems. Based on the study conducted by Hwang et al. (2015), it is evident that the use of VM is limited in Singaporean construction projects, with a notable preference for smaller-scale projects. In Malaysia, the government demonstrates a proactive approach by mandating the use of VM in public projects of substantial scale with a cost exceeding MYR 50,000,000 (USD 12,000,000) (Jaaper et al., 2012). Expensive projects of this nature are typically limited to a tiny fraction of the industry and are only undertaken by contractors of the highest calibre (Abd Karim et al., 2014). This suggests that only a few construction projects in Malaysia are exposed to the VM application. Following China's transition from a centrally planned economy to a market-oriented economy, there was a significant decline in the utilisation of VM (Shen & Liu, 2003). VM is predominantly employed in Chinese infrastructure projects, although its application in green building projects is still somewhat constrained (Zhao & Mo, 2016). It was not until the 21st century that numerous African nations gained awareness of and embraced this innovative approach (Oke & Ogunsemi, 2011). The observed gap may be attributed to a lack of knowledge regarding the prevalence and widespread utilisation of VM, which consequently impedes the adoption of a more inclusive and fair strategy in various construction projects. (Alshehri, 2020).

Aghimien and Oke (2015) stated that the versatility of VM allows its application in projects of any type, irrespective of the project's scale or financial implications. As stated by Olawumi et al. (2016), value management is often advised for projects that are characterised by high costs, frequent repetition, complexity, limited budgets, and shortened design timeframes. These types of projects are seen as having greater potential for reaping the benefits of VM. However, VM is not restricted solely to the previously listed projects but rather can be used for any project, asset, or building component or subdivision (Olawumi et al., 2016). Olawumi et al. (2016) further stated that the use of VM in cost-effective initiatives allows for the reduction of unnecessary expenses, the optimisation of functionality, the improvement of design and performance, and the provision of optimal value with minimal financial investment. Abd-Karim et al. (2014) stated that implementation of VM in small construction projects is expected to have more significant obstacles compared to larger construction projects. The study by Abd-Karim et al. (2014) revealed that construction enterprises, particularly small and medium-sized companies (SMCs) that mostly engage in modest projects, demonstrated inadequate emphasis on VM. This was attributed to a lack of internal understanding and awareness regarding VM and its practical implementation.

Majority of the small-scale construction projects were discouraged from investing in VM due to the disparity in resource requirements and limited profitability (Griffith & Headley, 1998). Furthermore, intense competition leads small construction projects to set their bid prices at such low levels that they may lack sufficient additional cash for effective vendor management (Smith & Bohn, 1999). As stated by Al-Yami (2008), several significant hurdles exist that could potentially hinder the widespread implementation of VM in developing countries. These challenges encompass a dearth of knowledge pertaining to the specific requirements, standards, and historical data associated with VM, as well as a scarcity of time and a limited comprehension of the concept of VM, among others. The absence of comprehensive knowledge and established protocols regarding VM, coupled with inadequate backing from relevant parties, has the potential to greatly hinder the widespread use of VM in various construction endeavours. Jaapar et al. (2009) concurred with this sentiment, noting that the primary obstacles encountered in VM workshops in Malaysia were, insufficient awareness and training, reluctance to embrace change, and contradictory project objectives among several stakeholders. In their study, Shen and Liu (2003) conducted an investigation into the knowledge and implementation VM within the Chinese construction industry which revealed three primary factors that hindered the widespread adoption of VM in this particular work environment. These factors included a limited comprehension of the appropriate methods for implementing VM, a lack of confidence among stakeholders regarding the introduction of VM, and insufficient time allocated for the implementation of VM. Furthermore, the study conducted by Kissi et al. (2017) examined more than twenty challenges associated with VM application in Africa to gain a deeper understanding of the obstacles faced by VM teams, including implementation barriers, technical issues, and impediments encountered in developing countries.

The increasing complexity of VM research has led to a wide range of research prospects for exploration. There is currently a growing trend in doing studies on VM in construction, specifically focusing on small-scale construction projects. It is worth mentioning that previous studies have identified a number of comparable challenges that impede the implementation of VM in developing countries. This statement supports the claim made by Aghimien et al. (2015) that the similarities in the characteristics and implementation methods of projects in developing countries contribute to the common challenges faced in the adoption of VM in these regions. In order to contribute to the ongoing endeavour, a compilation of factors that hinder the successful installation of VM was conducted, drawing upon relevant earlier research. The present study is a valuable contribution to the existing literature as there is a scarcity of research specifically examining VM in the context of small-scale building projects. The study places emphasis on the formal and intentional examination of VM, rather than using an implicit approach. This is attributed to the notion that this approach is considered a significant measure for assessing the proficiency and development of VM (Hwang et al., 2015). The implementation of a well-defined and regulated VM process facilitates the development of a robust understanding of value creation and enhancement for small-scale projects. Furthermore, it ensures the effective dissemination of VM information across the entire project life cycle.

**RESEARCH METHODOLOGY**

The objective of this research is to explore the primary obstacles encountered in implementing VM in small-scale construction projects in Sri Lanka. In order to examine the viewpoints of construction professionals who have direct involvement with small-scale projects, a quantitative research methodology was employed. A descriptive survey methodology was used, which allowed for a deeper understanding of VM implementation in small construction projects in Sri Lanka. The research was commenced by conducting an extensive review of the existing literature in order to gain a deeper understanding of the subject matter and compile relevant information for the creation of a questionnaire, which was used as the primary instrument for data collection. A preliminary survey was developed and subsequently disseminated to a cohort of five individuals from the business and academic sectors in order to evaluate and enhance its content. The selected experts possess a wealth of knowledge and expertise in VM, which greatly contributed to the validation process. Furthermore, as per the analysis conducted by specialists, the unforeseen emergence of the COVID-19 pandemic has the potential to require alterations to the kind and extent of VM operations, thereby potentially causing delays in the implementation of VM. Therefore, the study proposed an examination of the impact of changing COVID-19 circumstances and response measures on the nature and dedication of VM activities. This evaluation aimed to identify and assess the barriers identified in the literature (as presented in Table 1) that hinder the effective implementation of VM in small construction projects.

**Table 1:** Barriers to VM integration in small construction projects

|  |  |
| --- | --- |
| Code | Barriers |
| B01 | Lack of prior VM exposure |
| B02 | Insufficient knowledge about VM existence and various uses |
| B03 | Lack of appropriate guidelines |
| B04 | Lack of understanding of VM and its advantages |
| B05 | Lack of government and managerial support  |
| B06 | Difficulty for project stakeholders to obtain agreements on project objectives  |
| B07 | VM practice incurs extra expenses.  |
| B08 | Absence of relevant regulations or incentives for VM  |
| B09 | Insufficient time for VM practice  |
| B10 | Integration issues with sophisticated technologies in the VM method  |
| B11 | Lack of active participation by stakeholders  |
| B12 | Difficulty in producing creative ideas and alternate courses of action  |
| B13 | Insufficient personnel/difficulty assembling a team with the necessary competencies  |
| B14 | VM implementation projects cannot utilize procurement or contracting methods.  |
| B15 | Inadequate VM instruction and facilitation expertise  |
| B16 | Lack of openness to new ideas and developments  |
| B17 | Difficulties in studying and evaluating the roles and alternatives of a project  |
| B18 | Poor interpersonal ties and communication between stakeholders  |
| B19 | Attitude of self-justification on the part of the design team  |
| B20 | Variable Covid-19 conditions and response measurements change the shape and scope of VM activities. |

The survey was conducted in Sri Lanka, and email was used to distribute the surveys. Colombo, Gampaha, Galle, and Kandy were among the important and populated cities where construction work is in great demand and where respondents were collected. This was believed to increase the likelihood of obtaining representative viewpoints from seasoned construction professionals in places with larger populations, greater innovation, and greater building demands. In accordance with the purpose of the study, respondents were chosen on the assumption that they have participated in minor construction projects as a contractor, consultant, or client. The stratified sample of these firms represents the three primary segments of the Sri Lankan construction industry. This is due to the fact that VM stays relatively passive in smaller initiatives, but stratified sampling might make it easier to target certain subpopulations. Given that this survey focuses on issues impacting VM, the use of this stratified sample method aims to generate more reliable and accurate results for academic purposes (Sharma, 2017). Firstly, it helps to minimise bias in the selection of sample cases, ensuring that the sample accurately reflects the characteristics of the community being studied. Secondly, it enables researchers to make generalisations about the population based on the results obtained from the sample.

In order to ascertain the suitability of the respondents, a preliminary contact was made by telephone, email, and social media platforms to verify their proficiency in small-scale building projects and to solicit their consent to partake in the survey. Furthermore, small and medium-sized companies (SMCs) have been given priority due to the fact that larger organisations, which have more significant tender restrictions, generally do not engage in small-scale construction projects since they have the ability to bid on projects with higher contract values. Following the established protocol, a total of 200 questionnaires were issued to individuals who expressed interest in participating. Subsequently, 112 responses were collected and determined to meet the criteria for inclusion in the analysis. The study attained a return rate of 56%, which was considered satisfactory based on the findings of Olatunde et al. (2021) and Aghimien et al. (2015). These authors suggested that survey results with a return percentage below 20-30% may be subject to bias and have limited significance. The survey was conducted throughout the period of October to December 2022, with a predominant number of respondents from diverse organisations opting for self-administered questionnaires utilising electronic survey technology. The individuals surveyed, frequently assume professional roles in design, surveying, engineering, and administration when undertaking small-scale projects. The respondents' answers were derived from their respective organisations, drawing upon their expertise and experience, thereby contributing to the assessment of the survey.

The data was analysed using SPSS 24.0, employing a range of statistical tests which is widely utilised in addressing commercial and research difficulties because to its high level of accessibility, adaptability, and scalability, which enable a broad range of users and projects with diverse sizes and complexities to access it effectively. In this study, the demographic characteristics and frequency of VM adoption in small construction projects provided by respondents were summarised using frequency and percentage. The dependability of the data obtained on VM barriers was assessed using Cronbach's alpha, while the normality of the data was evaluated using the Shapiro-Wilk test as a part of a broader study. In order to assess the level of hindrance presented by individual obstacles to the deployment of VM in small construction projects, a statistical measure known as the mean score ranking was employed. The selection of either a one sample t-test or a one sample Wilcoxon signed-rank test was based on the normality of the data being studied. This choice was made in order to assess the significance of the barrier at the medium level of blockage. The utilisation of the one-sample t-test is suggested when examining data that adheres to a normal distribution. In cases where the data does not meet the assumption of normality, the one-sample Wilcoxon signed-rank test is selected as a non-parametric alternative to the t-test due to its lack of assumptions on the distribution of the sample.

The purpose of this study was to identify the specific barriers that contributes to the disparities in mean scores between different groups, as well as to assess whether respondents from diverse backgrounds endorse the ranking of these obstacles. In this context, the statistical technique known as analysis of variance (ANOVA) is frequently employed to assess potential differences in means among multiple independent groups, assuming that the data being tested follow a normal distribution. On the other hand, the Kruskal-Wallis test serves as a non-parametric alternative to ANOVA when dealing with sample data that do not adhere to any specific distribution. Given the extensive coverage of impediments in the existing research, it is highly probable that some of these obstacles lead to similar underlying outcomes. The need for Exploratory Factor Analysis (EFA) was identified in order to evaluate and classify the hurdles into more manageable and significant dimensions. Through the application of content analysis, the viewpoints of participants regarding potential strategies for surmounting challenges were examined. This methodology allows researchers to consolidate voluminous textual material into a reduced number of content categories and ascertain the central theme of the subject matter. The findings of the investigation were examined in light of the existing literature.

**DATA ANALYSIS**

This research includes an assessment of the barriers to implementing VM in small construction projects, as perceived by construction practitioners who have direct involvement in such projects. The reliability of the acquired data was assessed through an initial examination of Cronbach's alpha. The findings presented in **Table 3** demonstrate that the Cronbach's alpha coefficient for each question exceeds 0.80, indicating a high level of reliability in the collected survey data. **Table 2** provides the background information of all the construction stakeholders who responded to the research questionnaire survey. Based on the profession, respondents were mainly categorized into four groups. The largest percentage of respondents were quantity surveyors (41.96%), followed by civil engineers (24.11%), architects (18.75%), and project managers (15.18%). The respondents represented three groups of construction organizations: consultants (33.03%), contractors (36.61%), and clients (30.36%). The decision to prioritise the sampling of consultants and contractors was deemed rational, as they bear primary responsibility for the efficient execution of projects and possess greater availability of valuable information regarding VM. All respondents have participated in small construction projects, and more than 60% have more than 10 years of expertise in the business. These ensure that the obtained replies were reliable and trustworthy.

**Table 2:** Respondents background information

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Classification | Frequency | % |
| Profession | Quantity Surveyor | 47 | 41.96% |
|  | Civil Engineer | 27 | 24.11% |
|  | Architect  | 21 | 18.75% |
|  | Project Manager | 17  | 15.18% |
| Organization | Contractor | 41 | 36.61% |
|  | Consultant | 37 | 33.03% |
|  | Client | 34 | 30.36% |
| Experience in the industry | 0-5 years | 37  | 33.04% |
|  | 6-10 years | 32 | 28.57% |
|  | 11-15 years | 21 | 18.75% |
|  | 16-20 years | 15 | 13.39% |
|  | >20 years | 7  | 6.25% |

Table 3: Reliability test results

|  |  |
| --- | --- |
| Code | Cronbach’s alpha |
| B01 | 0.841 |
| B02 | 0.854 |
| B03 | 0.859 |
| B04 | 0.853 |
| B05 | 0.856 |
| B06 | 0.857 |
| B07 | 0.846 |
| B08 | 0.859 |
| B09 | 0.852 |
| B10 | 0.849 |
| B11 | 0.855 |
| B12 | 0.856 |
| B13 | 0.853 |
| B14 | 0.857 |
| B15 | 0.859 |
| B16 | 0.853 |
| B17 | 0.848 |
| B18 | 0.856 |
| B19 | 0.857 |
| B20 | 0.847 |

The study focused on the use of VM in small-scale construction projects based on the responses provided by the respondents indicated in **Table 2**. Using Oke's (2010) methodology, a five-tier scale for assessing the frequency of respondents' use of VM in small-scale construction undertakings was developed. The classification system developed to assess the frequency with which projects use VM includes five scale ranges. The first scale ranges from 0% to 20%, representing a very low level of frequency. The range of 21% to 40% indicates a low level of frequency, while 41% to 60% signifies an average level of frequency. Projects with VM adoption ranging from 61% to 80% are considered to have a high level of frequency, and those exceeding 80% are categorised as having a very high level of frequency. A significant proportion of participants (58.1%) utilised VM for their small-scale projects with a notably infrequent usage pattern. This was followed by 19.7% of respondents who reported employing VM at a low frequency. A mere 7.2% of participants indicated a higher frequency of utilising VM in comparison to their usual practise for small-scale construction projects. Hence, it is apparent that VM is not widely employed in smaller-scale construction projects within the context of Sri Lanka. This observation aligns with the commonly held belief that larger and costlier projects tend to receive a greater amount of VM attention, as discussed by Olawumi et al. (2016). Furthermore, the limited occurrence of documented VM instances provides further substantiation for the assertions made by Abd-Karim et al. (2014) and Alshehri (2020) regarding the inadequate implementation of VM in developing countries like Malaysia, mostly due to project scale limitations. It is valuable to investigate the barriers that hinder the implementation of such deployment.

**Table 4:** Barriers to VM implementation in small projects

|  |  |  |
| --- | --- | --- |
| Code | Mean | Rank |
| B01 | 3.545 | 9 |
| B02 | 3.474 | 11 |
| B03 | 3.963 | 2 |
| B04 | 3.310 | 17 |
| B05 | 3.838 | 3 |
| B06 | 3.801 | 4 |
| B07 | 3.412 | 13 |
| B08 | 3.654 | 7 |
| B09 | 3.350 | 16 |
| B10 | 3.663 | 6 |
| B11 | 3.382 | 15 |
| B12 | 3.598 | 8 |
| B13 | 3.487 | 10 |
| B14 | 3.178 | 19 |
| B15 | 4.121 | 1 |
| B16 | 3.692 | 5 |
| B17 | 3.164 | 20 |
| B18 | 3.420 | 12 |
| B19 | 3.268 | 18 |
| B20 | 3.402 | 14 |

In order to assess the degree of obstruction, an evaluation of barriers was conducted using a scoring system that relied on their average scores. This approach was chosen due to its perceived effectiveness and ease of understanding. The mean values and the ranking of the obstacles are presented in Table 4. All of the obstacles examined in the study exhibited a mean score beyond 3, with values ranging from 3.27 to 4.121. Furthermore, the p-values obtained from conducting a single sample Wilcoxon signed-rank test were found to be statistically significant at the 0.05 level. This provides confirmation that the hurdles indicated earlier have indeed hindered the widespread implementation of VM in small-scale construction projects. The ranking delineates the five primary obstacles to VM implementation in small-scale construction projects. The identified challenges in the study include B15, which pertains to inadequate expertise in VM instruction and facilitation, with a mean score of 4.121 and a rank of 1. B03, which refers to the lack of appropriate guidelines, follows with a mean score of 3.963 and a rank of 2. B05, involving the absence of government and managerial support, is ranked third with a mean score of 3.838. B06, denoting the difficulty for project stakeholders to reach agreements on project objectives, is ranked fourth with a mean score of 3.801. Lastly, B16, which relates to the lack of openness to new ideas and developments, has a mean score of 3.692 and is ranked fifth. The prevailing viewpoint aligns with the findings of Griffith and Headley (1998) and Hwang et al. (2015), suggesting that smaller construction projects often exhibit reduced levels of professional involvement and guidance, as well as a dearth of formal and systematic management knowledge and implementation.

The primary and most important barrier, with a mean value over 4, was identified as "insufficient expertise in VM instruction and facilitation." The lack of proper training and orientation on VM technology might lead to inaccurate understandings and significantly impede the success of its use (Aghimien et al., 2018). Moreover, Othman et al. (2021) argue that construction professionals who do not possess fundamental facilitation skills are unable to effectively advocate for the adoption of VM by their clients. Hence, it can be inferred that the provision of requisite information and skills to VM participants is crucial for the successful achievement of objectives in small-scale construction projects. The absence of pertinent legislation or incentives for VM aligns with the present VM policy in the country, which does not require mandatory implementation of VM for projects with lower costs. Furthermore, considering the existing lack of involvement of VM in small-scale construction projects, it is logical that appropriate incentives have not yet been established. The aforementioned study conducted by Kim et al. (2016) highlights the significance of implementing a legislative framework or incentive mechanism to effectively encourage the widespread use of VM across projects of different scales. It is worth noting that this aspect is often overlooked in the context of developing countries.

One further key challenge, as highlighted by B03's observation on the "absence of suitable guidelines," is that Sri Lankan authorities have not yet integrated VM into the legal framework and established a standardized procedure. There is a lack of specialized VM recommendations tailored to the unique requirements and characteristics of small building projects. The observance of appropriate guidelines aids in the organization of the structure and execution of VM tasks in a precise and systematic fashion (Jaaper et. al, 2009). This could be particularly significant in situations where there is a lack of prior experience with VM and individuals with specialized knowledge in this area. The factors B17 and B14, which pertain to the challenges in studying and evaluating project roles and alternatives, and the inability of VM implementation projects to utilize procurement or contracting methods, respectively, were found to have relatively low mean scores of 3.164 and 3.178, and were ranked 20th and 19th. These factors were identified as having the least influence in impeding the adoption of VM in small construction projects. The prevailing agreement suggests that smaller construction projects tend to be less complex in nature. During the VM procedure, it is reasonable to expect fewer difficulties in analysing the components and functionality of these efforts.

**CONCLUSIONS AND RECOMMENDATIONS**

This research examined the use of VM in small construction projects in Sri Lanka in terms of the present implementation status and barriers. Bold claims have been made about the low quality and cost-effectiveness of small construction projects in underdeveloped nations like Sri Lanka, yet research has shown that VM is one of the most effective ways to stop this problem but is generally disregarded. The investigation has revealed that the method is still used extremely infrequently in Sri Lanka's small construction projects. Additionally, the study used a structured questionnaire survey to evaluate the obstacles to implementing VM in small construction projects. 112 construction professionals who were actively involved in small construction projects were sampled from densely populated locations with significant construction demand.

The information received from the survey was subjected to various statistical analysis. Major obstacles were identified as being mostly related to the knowledge, direction, and environment of VM diffusion in small construction projects. The main obstacles are "inadequate VM instruction and facilitation expertise", "lack of appropriate guidelines", " lack of government and managerial support ", " difficulty for project stakeholders to obtain agreements on project objectives" and "lack of openness to new ideas and developments”. Additionally, some possible countermeasures that are thought to be effective in reducing the barriers were investigated.

In Sri Lanka, the government should play a significant role in guaranteeing the construction industry's healthy development. The government should offer incentives (such as tax breaks or grants) to entice SMCs to adopt VM because they would directly affect profitability and pay for the expenditures associated with doing so. SMCs would be more inclined to deploy VM because of the minimal cost increase. The government can also offer management training programs to SMCs, teaching appropriate value management methods that would aid these businesses in managing risks and ensuring performance. The findings of this study are useful for construction stakeholders in Sri Lanka and other similar developing countries to recognize the most significant barriers to implementing VM in small construction projects. By forecasting these barriers, the stakeholders can effectively prepare and overcome them to enhance small construction projects by using VM.

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