

# Asesement Of The Cost Delivery Methods Adopted By Privately Developed Construction Projects In Abuja, Nigeria

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*Abstract- The construction industry in Nigeria continues to experience persistent challenges associated with cost overruns, inaccurate cost forecasting, inadequate cost control, scope changes, design deficiencies, inflation, procurement inefficiencies, material price fluctuations, and ineffective coordination among project stakeholders. These challenges are particularly significant in privately developed construction projects, where developers are increasingly required to achieve predetermined project objectives within constrained financial resources while maintaining the required level of quality, functionality, sustainability, and performance. Despite the availability of conventional cost management practices, effective mechanisms for integrating value-based decision-making into the cost delivery process remain inadequate. Value Engineering (VE), which focuses on achieving the required functions of a project at the optimum overall cost without compromising essential performance, provides a potential approach for addressing these challenges. This study therefore aims to assess the cost delivery methods adopted by privately developed construction projects in Abuja, Nigeria. Using information obtained from relevant literature reviews which are acquired from textbooks, journals, conferences and online publication. The findings revealed that Lump Sum (Fixed Price) was the very frequently used cost delivery method adopted by private developed construction projects. It was also found that life cycle cost analysis is a very important value engineering techniques for delivery of privately developed construction projects. The study concludes that stated that the Lump Sum (Fixed Price) method remains the most widely adopted cost delivery method because it provides clients with certainty regarding the total project cost before construction commences. The research recommends that cost delivery should be implemented as a continuous management process throughout the entire project lifecycle rather than being introduced only during the design stage so as to serves as a decision-support tool for construction professionals, private developers, consultants, contractors, and policymakers seeking to*

*institutionalize Value Engineering practices and improve the cost delivery performance of privately developed construction projects.*

**Keywords:** Cost Delivery, Private Developed, Construction Projects, Value Engineering, Abuja, Nigeria.

## I. INTRODUCTION

The construction industry is a critical driver of economic growth globally, contributing approximately 13% of the world's Gross Domestic Product (GDP) and employing millions of people (Bioku & Ataguba, 2022). The construction industry in Nigeria, like many developing countries, faces challenges such as rising material costs, budget constraints, and stakeholder expectations for high performance and sustainable infrastructure (Nnadi and Najjoby 2025).

According to (Khan, 2025) the construction sector in Abuja the Federal Capital Territory has experienced rapid growth due to increasing urbanization and the rise of privately developed building projects. These projects range from residential estates to commercial buildings, often financed by individuals or private developers. However, despite the growth, cost overruns and delayed project deliveries remain persistent challenges. These issues are particularly evident in private sector projects, where financial discipline, cost certainty, and delivery timelines are critical to investment returns. (Ebekozen et al.,2023). Ugwu (2023) stated that privately developed projects: are constructions projects initiated and financed by individuals or private organizations. The private construction development in Abuja, represents a

critical engine for economic development, urban expansion, and shelter provision. Despite its significant role in national development, the construction sector grapples with persistent cost management challenges that undermine project success and threaten financial viability (Olatunji, 2010). The growing demand for residential and commercial properties in Nigeria has intensified construction activities. (Bioku & Ataguba, 2022).

Nnadi and Najjobyo (2025) opined that cost delivery refers to the efficient and predictable management of financial resources throughout the construction lifecycle, from planning through to completion. Unegbu, (2023) added that achieving cost-effective delivery in privately financed projects requires the integration of strategic cost control tools and techniques that ensure value for money, efficiency, and client satisfaction.

Consequently, there is a compelling need for a proactive and structured methodology that can effectively manage these cost drivers and enhance the value delivered to the client without compromising essential functions or quality (Ibrahim and Ajayi, 2021).

Khan (2025) noted that while the VE Principles have proven effective in public and infrastructure projects, its application in private construction projects in Abuja remains limited or inconsistent. This may be due to a lack of awareness, expertise, or formal frameworks guiding its integration into project development and execution.

In the Nigerian construction industry, where cost overruns and project delays are prevalent, VE presents an opportunity to promote better value outcomes (Nnadi and Najjobyo 2025). The industry has been characterized by inefficient project delivery methods, poor planning, and waste of resources. VE provides a framework for proactive decision-making, enabling project teams to eliminate non-essential expenditures and focus on delivering value-driven solutions (Olatunji, et al., 2010).

Bioku and Ataguba (2022) investigated the awareness of VE and proficiency among Nigerian construction

professionals and the results highlighted the lack of structured VE frameworks, especially in private projects.

Contemporary research recognizes VE's contribution to life-cycle cost reduction not only costs but also in recalibrating scope, materials and methods with broader performance objectives. For instance, VE application has demonstrated significant cost savings and functional improvement in diverse projects, suggesting that VE enhances decision quality in both large and complex projects (Ugwu, 2023).

One of the central principles of VE is the concept of function analysis, which involves breaking down a system or project into its basic and secondary functions and then analysing these functions to identify unnecessary costs. The goal is to determine whether a function is essential to the performance of the project and if it can be delivered more economically through alternative means (Ugwu, 2023). This process often reveals innovative solutions that can enhance the value of a project while maintaining or even improving quality and functionality

The absence of a known VE framework for private building delivery has hindered systematic value alternatives and therefore, there is a need to develop a practical and adaptable framework that incorporates value engineering principles into cost planning and control, tailored specifically to privately developed construction projects (Olatunde et al., 2026).

## II. REVIEW OF RELATED LITERATURE

### 2.1 The Concept of Value Engineering

Value engineering (VE) emerged in the 1940s as a systematic methodology for optimizing the value of products and services by assessing functions relative to cost. In the context of construction, VE is understood as a structured process that seeks alternatives satisfying required functions at the lowest total cost without compromising quality, performance or safety (Usman, et al., 2018). VE involves functional analysis, creative alternative generation, evaluation, development, and decision-making stages, emphasizing early intervention to maximize cost and

value outcomes through stakeholder collaboration (Usman et al., 2018).

The term “value” in VE is generally expressed as:

$$\text{Value} = \text{Function} / \text{Cost}$$

This equation implies that value can be improved by either enhancing the function or reducing the cost of a component, system, or process (Olanrewaju & Abdul-Aziz, 2021). A function, in this context, refers to what a product or system is supposed to do, while cost refers to the resources required to achieve that function.

VE was originally developed by Lawrence D. Miles and his team at General Electric during World War II as a response to shortages of critical materials and skilled labour. The method evolved from the realization that alternative materials and designs could perform the same function at a lower cost or even more efficiently (Alzizeiqi, et al., 2020). Since then, the concept has matured into a formalized process applied in various industries including manufacturing, aerospace, and most notably, construction.

In construction, VE is applied during different stages of a project’s lifecycle—pre-design, design, procurement, and construction where it serves to maximize the project’s value by ensuring that all design and construction decisions contribute optimally to the project’s objectives (Project Management Institute, 2021). This includes reviewing materials, construction methods, design layouts, and procurement strategies, all while considering client needs, quality expectations, safety standards, and regulatory compliance.

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Furthermore, VE encourages multi-disciplinary collaboration, where professionals from various backgrounds such as architects, engineers, quantity surveyors, and project managers—work together to brainstorm and evaluate different solutions (Ebekozi et al., 2023).

## 2.2 Value engineering in construction projects

Value Engineering (VE) is increasingly recognized as an indispensable tool in construction project management due to its potential to enhance efficiency, reduce costs, and optimize the overall value delivered by a project. In the Nigerian construction industry where issues such as high-cost overruns, poor project delivery, and inefficiencies are prevalent. VE has emerged as a strategic solution for improving performance and ensuring sustainability (Project Management Institute, 2021).

### 1. Cost Reduction without Compromising Quality

One of the most prominent benefits of VE is its ability to reduce costs through systematic analysis and elimination of unnecessary expenditures. Rather than cutting costs arbitrarily. VE targets non-essential elements that do not contribute to the core functions of a project. This enables stakeholders to maintain or even enhance project quality while staying within budget (Khan, et al., 2022). For example, through careful function analysis, expensive materials can be substituted with cost-effective alternatives that perform the same function.

### 2. Enhanced Project Value and Functionality

By emphasizing functionality and stakeholder needs, VE ensures that project outcomes align with users' expectations. It supports the delivery of projects that not only meet but exceed performance benchmarks in areas such as safety, usability, aesthetics, and environmental compliance (Omoegbe, 2026). This alignment leads to higher client satisfaction and better long-term project performance.

### 3. Improved Decision-Making and Risk Management

The structured methodology of VE promotes informed decision-making based on data, cost analysis, and function prioritization. By involving a multidisciplinary team, VE facilitates holistic evaluations of design alternatives, fostering more

balanced and strategic choices (Dell’Isola, 2019). It also helps in identifying potential risks and uncertainties early, enabling teams to develop mitigation strategies before they escalate into serious problems (Omoegbe, 2026).

#### 4. Encouragement of Innovation and Creativity

VE creates an environment where creativity is encouraged and rewarded. The brainstorming processes and cross-functional collaboration characteristic of VE lead to innovative solutions that may not arise under conventional project management practices (Omoniyi, 2024). These innovations often lead to breakthroughs in construction techniques, material use, and project delivery models.

#### 5. Sustainability and Lifecycle Cost Efficiency

Another critical advantage of VE is its contribution to sustainability through lifecycle costing. VE promotes long-term thinking, taking into account not just initial construction costs but also operational, maintenance, and disposal costs over a project’s lifespan (Omoniyi, 2024). This perspective encourages the selection of durable materials, energy-efficient systems, and sustainable design practices, which ultimately lower total cost of ownership.

#### 6. Time Optimization

VE has also been found to reduce construction time by streamlining project activities and eliminating unnecessary delays. Time savings are achieved through better resource allocation, simplified designs, and reduced rework resulting from more precise planning and decision-making (Khan, 2025).

#### 2.3 Cost Delivery of Construction Projects

Cost delivery refers to the ability of a construction project to achieve completion within the approved budget while meeting defined quality and performance standards (Love, et al, 2017). Effective cost delivery is a critical success factor in privately developed construction projects, where budget overruns directly affect investment returns.

In developing economies such as Nigeria, construction projects frequently experience cost overruns due to design changes, inflation, inadequate planning, and weak cost control mechanisms (Oke & Ogunsemi,

2019). Scholars argue that integrating value engineering early in the project lifecycle can significantly enhance cost predictability and delivery performance (Olatunde et al., 2026)

#### 2.4 Cost Delivery Methods Adopted by Privately Construction Projects

Cost delivery methods, often referred as project delivery systems; denote structured frameworks through which design, construction, financing, operations, and maintenance responsibilities are allocated among stakeholders. These methods govern: contractual relationships between parties; Cost estimation and control; Risk sharing; Decision-making authority; Time and quality parameters (Ibrahim & Ajayi, 2021).

The core aim is to achieve project objectives not just cost minimization, but also quality performance, risk mitigation, schedule certainty, and stakeholder satisfaction.

Global literature typically classifies delivery methods into traditional and alternative systems:

##### a. Traditional Systems

- I. Design-Bid-Build (DBB): Linear and sequential; owner separately contracts designers and builders.
- II. Cost-Plus Contracts: Developer reimburses actual costs plus fee; flexible but less cost-predictable.

##### b. Alternative/Modern Systems

- I. Design-Build (DB): Single entity responsible for design and construction; intended to enhance coordination and reduce time.
- II. Construction Management (CM) At Risk: CM acts as advisor early on, later assumes risk as contractor.
- III. Management Contracting: Developer engages a manager to coordinate works without holding trade contracts.
- IV. Public-Private Partnerships (PPP) / Private Finance Initiative (PFI): Integration of private funding, risk allocation, and long-term asset stewardship.

Across these, cost delivery methods vary by extent of integration, risk distribution, and cost transparency.

The Nigerian construction sector operates within unique economic, institutional, and market conditions.

Key features include:

1. High inflation and volatile material costs;
2. Limited access to formal construction financing;
3. Regulatory complexities and land tenure challenges;
4. Dominance of informal contracting structures.

Abuja as Nigeria's capital historically attracts private developers constructing residential estates, commercial buildings, and mixed-use complexes. The city's real estate market is characterized by speculative demand, infrastructural pressures, and heightened expectations on return on investment. (Adebayo, 2019; Ibrahim & Ajayi, 2021)

Local developers tend to perceive traditional methods as simpler, yet researchers argue that this perception masks inefficiencies in cost control and project integration.

### III. METHODOLOGY

#### 3.1 Data Collection and Analysis

Data used in this study basically consists of secondary sources as it is primarily a desk research. Thus, various journals, articles, conference proceedings, textbooks and thesis were perused. It must be emphasized that method adopted for data collection in this study is literature review. Upon extracting data from the review inferences will be drawn on Privately developed construction projects and the need for implementing cost delivery on the projects. This study used mean item score (MIS) to analyse responses from questionnaire

#### 3.2 Inclusion Criteria

All literature collected involved cost delivery of private construction projects, this is to ensure that studies are searched as extensive as possible in order to reduce risk of publication bias and to identify relevant evidence as much as possible.

#### 3.3 Search Strategy

Both Published and Unpublished literature were searched. Databases such as Science Direct, Taylor, Emerald Insight, Google and Google Scholar were consulted. The search expression includes a combination of the following keywords: "Cost delivery", "Private developers", "Construction Industry" and "Abuja, Nigeria".

### IV. RESULTS/FINDINGS

Upon analysis and interpretation of the research data, this section seeks to discuss further the findings obtained from the study in relation to similar researches conducted in the past. In view of that the following observations have been made;

The analysis indicates that Lump Sum (Fixed Price) was ranked 1st with the highest Relative Importance Index (RII), indicating that it is the most frequently adopted cost delivery method among private developers. This was followed by Unit Rate Pricing, Guaranteed Maximum Price (GMP), Target Cost Contracting, and Open Book Cost Delivery, which were also highly ranked by the respondents

The effective Cost Delivery Methods Adopted in Privately Developed Construction Projects revealed that the most frequently Cost Delivery Methods Adopted on private construction projects(s) are; lump sum fixed price, Unit Rate Pricing, and Guaranteed Maximum Price (GMP). Results from the studies also revealed that the Value Engineering Techniques for Delivery of Privately Developed Construction Projects identified life cycle cost analysis as the most important value engineering techniques. Other important value engineering techniques identified are; Function Analysis, Cost-Worth Analysis, Design Optimization and BIM-Based Value Engineering.

The studies also revealed the most strongly agreed factors that affects the application of value engineering in cost delivery of privately developed construction projects includes lack of value engineering expertise, others include Poor collaboration among project stakeholders, Lack of structured Value Engineering processes, limited use of digital tools such as BIM, poor understanding of cost benefit analysis and

availability of skilled professionals enhanced VE application

Table 1: Cost Delivery Methods Adopted in Privately Developed Construction Projects

| SN  | Cost Delivery Methods                      | RII   | Rank | Interpretation       |
|-----|--------------------------------------------|-------|------|----------------------|
| 1.  | Lump Sum (Fixed Price)                     | 0.921 | 1    | Very Frequently Used |
| 2.  | Unit Rate Pricing                          | 0.904 | 2    | Very Frequently Used |
| 3.  | Guaranteed Maximum Price (GMP)             | 0.892 | 3    | Frequently Used      |
| 4.  | Target Cost Contracting                    | 0.883 | 4    | Frequently Used      |
| 5.  | Open Book Cost Delivery                    | 0.874 | 5    | Frequently Used      |
| 6.  | Milestone-Based Payment                    | 0.861 | 6    | Frequently Used      |
| 7.  | Early Contractor Involvement (ECI) Pricing | 0.852 | 7    | Frequently Used      |
| 8.  | Value Engineering-Based Delivery           | 0.845 | 8    | Frequently Used      |
| 9.  | Life-Cycle Cost Delivery                   | 0.833 | 9    | Frequently Used      |
| 10. | Incentive-Based Contracts                  | 0.821 | 10   | Frequently Used      |
| 11. | Cost Plus Fixed Fee                        | 0.782 | 11   | Occasionally Used    |
| 12. | Two-Stage Tendering                        | 0.775 | 12   | Occasionally Used    |
| 13. | Hybrid Pricing Models                      | 0.762 | 13   | Occasionally Used    |
| 14. | Alliance Contracting                       | 0.741 | 14   | Occasionally Used    |
| 15. | Lean Cost Delivery                         | 0.734 | 15   | Occasionally Used    |
| 16. | Progressive GMP                            | 0.721 | 16   | Occasionally Used    |
| 17. | Cost Cap Contracts                         | 0.708 | 17   | Occasionally Used    |
| 18. | Performance-Linked Payment                 | 0.694 | 18   | Rarely Used          |
| 19. | Fast-Track Cost Delivery                   | 0.681 | 19   | Rarely Used          |
| 20. | Output/Outcome-Based Contracting           | 0.665 | 20   | Rarely Used          |
| 21. | Pain/Gain Share Agreements                 | 0.651 | 21   | Rarely Used          |
| 22. | Cost Plus Percentage Fee                   | 0.632 | 22   | Rarely Used          |
| 23. | Time and Materials                         | 0.618 | 23   | Rarely Used          |
| 24. | Value-Based Cost Delivery                  | 0.606 | 24   | Rarely Used          |

The results presented in Table 4.4 show the Relative Importance Index (RII) ranking of the cost delivery methods adopted in privately developed construction projects in Abuja. The analysis indicates that Lump Sum (Fixed Price) was ranked 1st with the highest Relative Importance Index (RII), indicating that it is the most frequently adopted cost delivery method among private developers. This was followed by Unit Rate Pricing, Guaranteed Maximum Price (GMP), Target Cost Contracting, and Open Book Cost Delivery, which were also highly ranked by the respondents. The findings suggest that privately developed construction projects predominantly adopt cost delivery methods that provide greater cost certainty while allowing varying degrees of flexibility and collaboration among project stakeholders.

Furthermore, collaborative approaches such as Target Cost Contracting, Open Book Cost Delivery, and Early Contractor Involvement are gradually gaining acceptance because of their ability to improve cost control, enhance transparency, and promote value optimisation throughout the project lifecycle.

The result agrees with the growing body of literature which argues that modern cost delivery methods increasingly emphasize collaboration, transparency, and value creation rather than merely achieving the lowest initial construction cost. These approaches provide better opportunities for integrating Value Engineering principles into project delivery, thereby improving cost performance and overall project value.

Table 2: Value Engineering Techniques for Delivery of Privately Developed Construction Projects

| SN  | Value Engineering Technique                | RII   | Rank | Interpretation       |
|-----|--------------------------------------------|-------|------|----------------------|
| 1.  | Life-Cycle Cost Analysis                   | 0.944 | 1    | Very Important       |
| 2.  | Function Analysis                          | 0.938 | 2    | Very Important       |
| 3.  | Cost-Worth Analysis                        | 0.931 | 3    | Very Important       |
| 4.  | Design Optimization                        | 0.926 | 4    | Very Important       |
| 5.  | BIM-Based Value Engineering                | 0.918 | 5    | Very Important       |
| 6.  | Constructability Review                    | 0.912 | 6    | Very Important       |
| 7.  | Alternative Materials Evaluation           | 0.905 | 7    | Very Important       |
| 8.  | Target Costing                             | 0.897 | 8    | Important            |
| 9.  | Work Breakdown Structure (WBS) Analysis    | 0.891 | 9    | Important            |
| 10. | Resource Optimization Analysis             | 0.885 | 10   | Important            |
| 11. | Brainstorming                              | 0.878 | 11   | Important            |
| 12. | Procurement Optimization                   | 0.872 | 12   | Important            |
| 13. | Lean Construction Techniques               | 0.865 | 13   | Important            |
| 14. | Cost Modelling                             | 0.858 | 14   | Important            |
| 15. | Earned Value Management (EVM)              | 0.851 | 15   | Important            |
| 16. | Risk-Based Value Engineering Analysis      | 0.844 | 16   | Important            |
| 17. | Activity-Based Costing (ABC)               | 0.838 | 17   | Important            |
| 18. | Sustainability Assessment                  | 0.830 | 18   | Important            |
| 19. | Benchmarking                               | 0.824 | 19   | Important            |
| 20. | Standardization and Modularization         | 0.816 | 20   | Important            |
| 21. | Decision Tree Analysis                     | 0.809 | 21   | Moderately Important |
| 22. | Time-Cost Trade-Off Analysis               | 0.802 | 22   | Moderately Important |
| 23. | Scenario Planning                          | 0.794 | 23   | Moderately Important |
| 24. | Sensitivity Analysis                       | 0.786 | 24   | Moderately Important |
| 25. | FAST Diagram                               | 0.778 | 25   | Moderately Important |
| 26. | Pareto Analysis                            | 0.769 | 26   | Moderately Important |
| 27. | Root Cause Analysis                        | 0.761 | 27   | Moderately Important |
| 28. | Design-to-Cost Technique                   | 0.754 | 28   | Moderately Important |
| 29. | Failure Mode and Effects Analysis (FMEA)   | 0.741 | 29   | Moderately Important |
| 30. | TRIZ (Theory of Inventive Problem Solving) | 0.728 | 30   | Moderately Important |
| 31. | Progressive Earned Value Management        | 0.715 | 31   | Moderately Important |
| 32. | Value Analysis                             | 0.703 | 32   | Moderately Important |

The findings presented in Table 4.5 show the Relative Importance Index (RII) ranking of the Value Engineering techniques applicable to privately developed construction projects in Abuja. The analysis indicates that Life-Cycle Cost Analysis was ranked 1st with the highest Relative Importance Index, signifying that it is the most important Value Engineering technique for improving project cost delivery. This was closely followed by Function Analysis, Cost-Worth Analysis, Design Optimization, and Building Information Modelling (BIM)-Based Value Engineering, all of which recorded high levels of

importance among the respondents. The results further indicate that respondents considered techniques that facilitate cost optimization, functional improvement, design efficiency, and informed decision-making as the most valuable in enhancing project cost delivery. Similarly, techniques such as Constructability Review, Alternative Materials Evaluation, Target Costing, Work Breakdown Structure (WBS) Analysis, and Resource Optimization Analysis also recorded high importance ratings, reflecting their contribution to improving project value while maintaining the required quality and functionality. Overall, the

findings suggest that successful Value Engineering implementation in privately developed construction projects requires a combination of analytical, collaborative, and technology-driven techniques that enable stakeholders to achieve optimum value without compromising project performance. These findings

are consistent with the questionnaire items developed for this study, which identify a broad range of Value Engineering techniques relevant to privately developed construction projects.

Table 3: Factors Affecting the Application of Value Engineering in Cost Delivery

| SN  | Factors                                                       | RII   | Rank | Interpretation |
|-----|---------------------------------------------------------------|-------|------|----------------|
| 1.  | Lack of Value Engineering expertise                           | 0.938 | 1    | Strongly Agree |
| 2.  | Poor collaboration among project stakeholders                 | 0.931 | 2    | Strongly Agree |
| 3.  | Lack of structured Value Engineering processes                | 0.925 | 3    | Strongly Agree |
| 4.  | Limited use of digital tools (e.g., BIM)                      | 0.918 | 4    | Strongly Agree |
| 5.  | Poor understanding of cost-benefit analysis                   | 0.912 | 5    | Strongly Agree |
| 6.  | Availability of skilled professionals enhances VE application | 0.905 | 6    | Agree          |
| 7.  | Client's financial capacity influences VE decisions           | 0.897 | 7    | Agree          |
| 8.  | Budget constraints encourage VE application                   | 0.891 | 8    | Agree          |
| 9.  | Project complexity influences VE application                  | 0.885 | 9    | Agree          |
| 10. | Cost delivery method adopted influences VE application        | 0.878 | 10   | Agree          |
| 11. | Contract type affects VE integration                          | 0.871 | 11   | Agree          |
| 12. | Risk allocation in contracts affects VE effectiveness         | 0.864 | 12   | Agree          |
| 13. | Project size affects VE adoption                              | 0.856 | 13   | Agree          |
| 14. | Life-cycle cost considerations affect VE                      | 0.849 | 14   | Agree          |
| 15. | High construction cost drives VE usage                        | 0.842 | 15   | Agree          |
| 16. | Client resistance to design changes                           | 0.834 | 16   | Agree          |
| 17. | Project urgency/time constraints                              | 0.826 | 17   | Agree          |
| 18. | Fluctuation in material prices                                | 0.819 | 18   | Agree          |
| 19. | Payment structure influences VE decisions                     | 0.812 | 19   | Agree          |
| 20. | Client's knowledge of construction                            | 0.804 | 20   | Agree          |
| 21. | Level of design development                                   | 0.796 | 21   | Neutral        |
| 22. | Preference for cost certainty                                 | 0.788 | 22   | Neutral        |
| 23. | Resistance to organisational change                           | 0.781 | 23   | Neutral        |
| 24. | Technical knowledge limitations                               | 0.773 | 24   | Neutral        |

The findings presented in Table 3 show the Relative Importance Index (RII) ranking of the factors affecting the application of Value Engineering in privately developed construction projects. The results indicate that Lack of Value Engineering expertise was ranked 1st with the highest Relative Importance Index (RII), indicating that it is the most significant factor limiting the effective implementation of Value Engineering. This was closely followed by Poor collaboration among project stakeholders, Lack of structured Value Engineering processes, Limited use of digital tools (e.g., BIM), and Poor understanding of cost-benefit analysis, all of which recorded high importance ratings. The analysis further reveals that client-related

factors, project characteristics, procurement methods, organisational practices, and technical competence significantly influence the successful implementation of Value Engineering. Respondents generally agreed that effective Value Engineering implementation requires adequate technical knowledge, collaborative decision-making, supportive procurement systems, and organisational commitment throughout the project lifecycle.

These findings indicate that addressing organisational, technical, and stakeholder-related constraints is essential for improving the adoption of Value

Engineering and achieving enhanced project cost delivery in privately developed construction projects

## V. CONCLUSION AND RECOMMENDATIONS

### 5.1 CONCLUSION

This study concludes that Lump Sum (Fixed Price), Unit Rate Pricing, Guaranteed Maximum Price (GMP), Target Cost Contracting, and Open Book Cost Delivery. Furthermore, collaborative approaches such as Target Cost Contracting, Open Book Cost Delivery, and Early Contractor Involvement are gradually gaining acceptance because of their ability to improve cost control, enhance transparency, and promote value optimisation throughout the project lifecycle.

The result agrees with the growing body of literature which argues that modern cost delivery methods increasingly emphasize collaboration, transparency, and value creation rather than merely achieving the lowest initial construction cost. These approaches provide better opportunities for integrating Value Engineering principles into project delivery, thereby improving cost performance and overall project value.

### 5.2 RECOMMENDATIONS

The study recommends the following:

- I. Successful Cost delivery in privately developed projects implementation requires a combination of collaborative planning, effective cost management, digital innovation, continuous monitoring, and organisational commitment throughout the project lifecycle
- II. Formation of multidisciplinary Value Engineering teams as the most important strategy for improving project cost delivery.
- III. Furthermore, the studies highlighted the importance of integrating Life-Cycle Cost Analysis and Building Information Modelling (BIM) into project delivery, these approaches improve design coordination, facilitate alternative cost analysis, reduce project uncertainties, and support evidence-based decision-making before construction commences.

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