CHANGE/COMMENTS LOG

S/N	Reviewer	Reviewer's Comments/Suggestions	Section	Response/Location
R1.1	Reviewer 1	Please ensure all references are dated to provide clarity and context.	All	All references have been checked and amended throughout the paper.
R1.2	Reviewer 1	The authors could specify intangible assets and set several examples to enhance understanding.	Section 1	Definition and examples of intangible assets given in Section 1
R1.3	Reviewer 1	There are several grammatical mistakes, please carefully check and revise the manuscript for clarity and correctness. For instance, change "Thus, justifying the need for this paper" to "This justifies the need for this paper."	All	All identified grammatical errors have been corrected throughout the document
R1.4	Reviewer 1	The methodology section should detail whether it includes interviews with managers or the implementation of the proposed method in specific projects and organizations. It should also specify the number of cases included and how the proposed framework was validated. Currently, the absence of a methodology section significantly affects the validity of the findings.		This is in Section 2
R2.1	Reviewer 2	Comment 1 - It is recommended that this paragraph could be more effectively presented with a summary table of the listed countries/regions and publications.	Section 2.0 Paragraph 2	The referenced texts have been deleted
R2.2	Reviewer 2	Comment 2 - The reviewer believes that it is unnecessary to list these publications in paragraph 2 if the only purpose is to demonstrate the global popularity of CoPM.	Section 2.0 Paragraph 2	
R2.3	Reviewer 2	Comment 3 - "These perspectives, financial and non-financial KPIs, include organisational capability and capacity (management, administrative, and technical) - innovation, equipment, proprietary technologies and tools, training, development, learning, and growth; financial; internal project, and business, processes - systems, structures, procedures, controls; and customers satisfaction (clients, end-users, employees, contractors, suppliers, host communities) - motivation, loyalty, support (Maya, 2016)." Please improve the readability of this statement.	Section 2.1	The referenced texts have been updated in Section 3.2.1
R2.4	Reviewer 2	Comment 4 - "The combined use of both strategy map and BSC help construction organisations to..." . help -> helps	Section 2.1	Grammatical error has been corrected in Section 3.2.1
R2.5	Reviewer 2	Comment 5 - "But this a challenge that is	Section 2.1	Error has been corrected in

		common to the use of most balanced frameworks" -> "But this is a challenge that..."		Section 4
R2.6	Reviewer 2	Comment 6 - "...hence, BSC will continue to be used in construction industry, and other business applications" - It is fine to say that BSC's benefits overweigh its shortcomings, which is well supported by the literature review and discussion, but the rest of this statement sounds rather judgmental.	Section 2.1	The referenced texts have been deleted in Section 4
R2.7	Reviewer 2	Comment 7: How is this paragraph linked to the discussions above and below?	Section 2.2	Logical link with preceding and succeeding paragraphs have been provided in Section 3.2.2
R2.8	Reviewer 2	The study shows that competitive advantage in construction organisations can be achieved through the application of continuous CoPM by using BSC and strategy map across the lifecycle of construction projects." Does this conclusion refer to the presented study? If so, it should be moved to conclusion section rather than findings and discussions.	Section 3	The referenced texts have been moved to Section 6: Conclusion
R2.9	Reviewer 2	There should be a description of the research methods applied in this study.		This is in Section 2
R2.10	Reviewer 2	The reviewer recommends the authors further proofread the manuscript.	All	This has been carried out

Using Continuous Construction Performance Measurement as a Strategic Tool for Organisational Competitiveness

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Abstract

The current organisational over-reliance on the use of metrics and indicators that are based only on tangible assets, and financial capital, for the measurement of construction performance has proven to be inadequate for the highly complex and dynamic construction industry environments. This paper, based on the critical review of selected construction performance measurement (CoPM) and competitive strategy literatures from 2015-2024, advocates the use of integration of Balanced Scorecard (BSC) and Construction Value Chain to create an in-depth understanding of the need to use a balanced tool in the measurement of performance of construction projects. Using a systematic literature review (SLR) based on the Context-Intervention-Mechanism-Outcome (CIMO) logic framework, the paper focuses on how continuous CoPM, that produces continuous performance improvement, can be used as a strategic tool that leverages on the balanced utilisation of tangible and intangible organisational assets in project implementation. This is done in order to drive the achievement of long-term financial goals and attain competitive advantage. BSC, based on Plan-Do-Check-Act (PDCA) framework, uses balanced strategic goals and KPIs for CoPM of projects. It is believed that the iterative use of BSC for CoPM across the value chain of each construction project will lead to continuous performance improvement for the organisation. This, in turn, will create strategic value for construction organisations with construction excellence at the centre; and ultimately lead to long-term profitability, and market competitiveness of construction organisations. The main outcome of this study is the development of a performance measurement tool that integrates BSC and construction value chain; and this tool supports CoPM at the project phase-level. This extended application of BSC developed by this research is recommended to be used by top-level managers and project managers for the continuous CoPM of construction projects and competitive advantage of the organisation.

Keywords: Continuous Construction Performance Measurement, Balanced Scorecard (BSC) framework, Key Performance Indicators (KPIs), Continuous Performance Improvement, Strategy Map.

1. INTRODUCTION

The construction industry is one of the largest in the world with significant direct and indirect impacts on global economy, society, and environment. Acting as a catalyst to trigger economic growth, it contributes 13% to world GDP (World Economic Forum, 2024; Meng & Fenn, 2019), with an annual spend of $10 trillion; and an additional $1.6 trillion that could be created with improved productivity ((McKinsey Global Institute, 2017). The construction industry contributed £117 billion to the UK economy in 2018 accounting for 7% of the UK GDP (CIOB, 2024). Also, it contributes 9% of local workforce impacting employment, productivity, and business growth (RICS, 2022). Despite these statistics, the construction industry has comparatively poor performances due largely to inherent fragmentation that is compounded by increasing project risks and complexities, sizes, and other implementation challenges (Soomro, 2021). These poor performances impact productivity, profitability, and market competitiveness of construction projects and businesses (McKinsey Global Institute, 2017).

To improve this poor performance, there is the need to carryout peformance meaasurment of projects with the objective of identifying and mitigating causes of poor performance. However, traditional construction performance measurement (CoPM) metrics and indicators are based on tangible assets (e.g. property, plant, equipment, tools, etc); and they have lagging and short-term attributes that have limited importance to the long-term survival of the organisation (Osunsanwo & Dada, 2020; Koprivica, et al., 2021). Also, the use of these metrics for CoPM do not account for intangible assets of the project and organisation (e.g. human capital; databases and information systems; technologies; responsive, high-quality processes; social capital; research & development (R&D); customers relationships and brand; innovation capabilities; and culture) (Goldstein, 2022). Tangible assets of construction projects and organisations are physical, and mostly fixed in nature (KPMG, 2020). On the other hand, intangible assets are non-monetary, non-physical but identifiable substances of the company (Dingli, 2021); and they are very important for long-term profitability of the organisation and competitive advantage (Milala, et al., 2021) .

Over-reliance on only tangible assets in CoPM has proven to be inadequate for long-term survival of current construction organisations with their ever-increasing complex and dynamic ecosystems. This conventional approach could mislead construction organisations to overinvest in short-term tangible assets and underinvest in long-term intangible assets thus losing value creating opportunities, and the long-term competitiveness of the organisation (Koprivica, et al., 2021; Shibani & Gherbal, 2018). This action by strategic managers sometimes gets cascaded to the project level of the organisation producing further poor performances.

Performance measurement of the utilisation of both tangible and intangible assets should be accurate and integrated, thus leading to competitiveness (Meng & Fenn, 2019). Although, it is understood that organisational competitive advantage could be achieved via strategies such as resource-based view (RBV), market-based view, knowledge-based view and Porter's five forces theory (Wang, 2014; Kabeyi, 2018); but one strategy that is currently under-researched is the use of continuous CoPM that will lead to continuous performance improvement and market leadership for the organisation. This is because the market competitiveness of an organisation relates to its ability to develop internal capabilities, using tangible and intangible assets, to create value (Dobrovič, et al., 2018). And this should be linked to the achievement of continuous performance improvement with higher effectiveness and efficiency than competition (Neely, 1998 cited in Oyewobi, et al., 2015).

This study utilises Systematic Literature Review (SLR) based on the guidelines of Context-Intervention-Mechanism-Outcome (CIMO) logic framework to analyse and synthesise selected literature (Denyer, et al., 2008 cited in Costa, et al., 2018). Finding wide applications in organisation, business, and management studies (Kearney, et al., 2023; Gupta, et al., 2024), CIMO supports the creation of further insights into construction project performance measurement and improvement. It also supports the development of the integration of a balanced performance measurement framework

such as the balanced scorecard (BSC) with the construction project value chain. This integrated methodology is proposed to be used as a strategic tool for increasing market leadership of construction organisations.

2. METHODOLOGY

This study utilises the CIMO logic framework and a design science research approach that allows the creation of new insights from SLR. Three indexed databases (i.e. Scopus, Google Scholar, and EBSCO) were explored for relevant literature on CoPM, BSC, and Competitive Strategy. Suitable keywords were used in searching databases for recent literatures between 2015-2024. Such keywords include performance measurement, value chain theory, tangible assets, intangible assets, continuous construction performance measurement, balanced scorecard (BSC) framework, key performance indicators (KPIs), continuous performance improvement, strategy map. 83 papers on extant construction performance measurement practices and use of balance scorecard by practitioners were found. Based on the relevance to the subject, 25 of these empirical papers were selected for analysis, synthesized, and development of design preposition for industry application

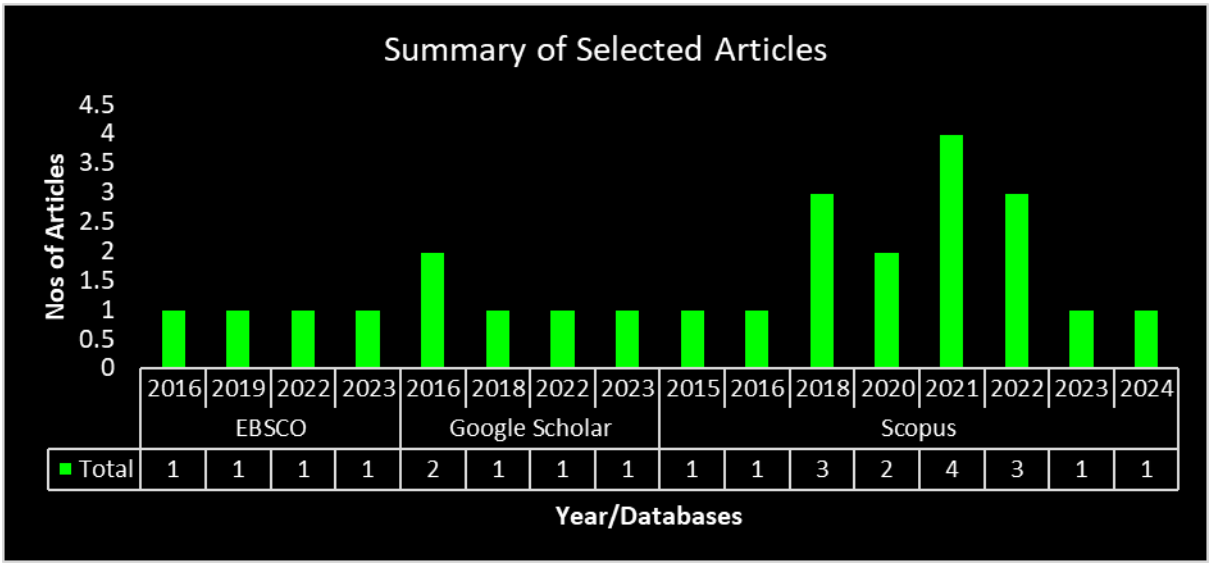

Fig 1: Selected Articles Showing Distribution of Years

Application of the CIMO structure commences with the development of the Context for the study – the poor performance in construction projects, and the several inadequacies in the use of traditional CoPM practices. This is followed by the introduction of an intervention – the continuous use of performance measurement tool, such as balanced scorecard (BSC), that is based on metrics and KPIs that have short-term and long-term impacts on the organisation. The generative Mechanism provides insights on how the proposed Intervention produces the desire Outcome – continuous performance improvement of projects and market leadership of the organisation.

The use of CIMO framework introduces an evidence-based approach for identifying, selecting, and analysing the appropriate papers to be included in the study. This demonstrates a robust, consistent, and transparent approach that reduces biases in literature selection, while increasing reliability and validity of analysis and findings. Established gaps in the analysis of the seminal papers led to the development of a design proposition to support the construction industry towards continuous performance improvement of projects.

Table 1: Summary of Major Academic Literature Reviewed

S/N	Authors	Title	Methodology	Name of the Journal	Subject	Database
1	Abu Oda, MMA; Tayeh, BA; Alhammadi, SA; Abu Aisheh, YI et al., (2022)	Key indicators for evaluating the performance of construction companies from the perspective of owners and consultants	Questionnaire	Results in Engineering	CoPM	Scopus
2	Arteeva, V; Skhvediani, A (2022)	Reviewing The Indicators for Assessing Construction Company Reviewing the Indicators for Assessing Construction Company and Project Performance	Systematic Review	Journal of Infrastructure Development	CoPM	EBSCO
3	Dobrovič J., Urbański M., Gallo P., Benková E., Čabinová V. et al., (2018)	Balanced scorecard concept as a tool of Strategic management and its usage in the Construction industry	Questionnaire	Polish journal of management studies	BSC	Scopus
4	Ingle, PV; Mahesh, G; Deepak, MD et al., (2021)	Identifying the performance areas affecting the project performance for Indian construction projects	Questionnaire	Journal of Engineering Design and Technology	CoPM	Scopus
5	Ingle, PV; Mahesh, G; Deepak, MD et al., (2024)	Developing a project performance assessment model for benchmarking the project success of Indian construction projects	Semi-Structured Interview	Benchmarking: An International Journal	CoPM	Scopus
6	Khutso, ML; Nkomo, MW (2023)	Investigating Challenges Facing the Performance of South African Construction Industry: An Exploratory Study	Literature Review	International Journal of Industrial Engineering and Operations Management	CoPM	Google Scholar
7	Maya RA (2016)	Performance Management for Syrian Construction Projects	Case Study	International Journal of Construction Engineering and Management	BSC	EBSCO
8	Mbugua, M; Ajwang, P;	Identification and Ranking of Key Performance	Questionnaire	Engineering,	CoPM	Scopus

	Winja, MMO et al., (2021)	Indicators in Building Construction Projects in Kenya		Technology & Applied Science Research (ETASR)		
9	Ofori-Kuragu, JK; Baiden, BK; Badu, E et al., (2016)	Performance measurement tools for Ghanaian contractors	Focus Group Questionnaire	International Journal of Construction Management,	CoPM	Scopus
10	Osunsanwo, HF; Dada, JO (2020)	Evaluating quantity surveying firms' performance: An application of balanced scorecard technique	Questionnaire	International Journal of Productivity and Performance Management	BSC	
11	Tofan, AS; Breesam, HK (2018)	Identify the Appropriate Key Performance Indicators for Evaluating the Performance of Construction Companies in Iraq	Questionnaire	International Journal of Engineering and Technology	BSC	Scopus
12	Zamin, S (2021)	Identification of crucial performance measurement factors affecting construction projects in Iraq during the implementation phase	Structured Interview Questionnaire	Cogent Engineering	CoPM	Scopus
13	Oyewobi, LO; Windapo, AO; Rotimi, JOB et al., (2015)	Measuring strategic performance in construction companies: a proposed integrated model	Literature Review	Journal of Facilities Management	BSC	
14	Kabeyi, MJB (2018)	Michael porter's five competitive forces and generetic strategies, market segmentation strategy and case study of competition in global smartphone manufacturing industry	Literature Review	International Journal of Applied Research	Competitive Strategy	Google Scholar
15	Hristov, I; Chirico (2016)	The Limits of the Balanced Scorecard	SLR	Open Journal of Social Sciences	BSC	Google Scholar

16	Kunkcu, H; Koc, K; Dagou, HH; Gurgun, A (2022)	Using key performance indicators in Construction project literature	SLR	International Structural Engineering and Construction Society	CoPM	Scopus
17	Tripathi, KK; Jha, KN (2018)	An Empirical Study on Performance Measurement Factors for Construction Organizations	Questionnaire	KSCE Journal of Civil Engineering	CoPM	Scopus
18	Meng, K; Fenn, P (2019)	Performance measurement for construction projects	Questionnaire	International Scientific Conference on Project Management	CoPM	EBSCO
19	Tarek, E; Motawa, I; Elmasoudi, I (2022	Relative Importance Index for the Key Performance Indicators for the construction industry in Egypt	Questionnaire	International Journal of Structural and Civil Engineering Research	CoPM	Google Scholar
20	Gunduz, M; Al-Naimi, NH	Construction projects delay mitigation using integrated balanced scorecard and quality function deployment	SLR	Engineering, Construction and Architectural Management	BSC	Scopus
21	Gopinath, S; Kantilal, BS; Sreelakshmi, S; Roshan, M (2016)	Performance measurement of residential Projects in India: a balanced scorecard Approach	Questionnaire	International Journal of Civil Engineering and Technology (IJCIET)	BSC	Google Scholar
22	Rani, A; Singh, R; Taneja, S; Prasad, AB; Dhiman, S (2021)	A Review on Key Performance Indicators for Measuring Real Estate Project Success	SLR	International Journal of Sustainable Development and Planning (IJSDP)	BSC	Scopus
23	Thuong, CV; Singh, H (2023)	The Impact of a Balanced Scorecard on Enterprise Performance in Ho Chi Minh City, Vietnam	Questionnaire	International Journal of Organizational Leadership	BSC	EBSCO

24	Mellado, F; Lou, ECW; Becerra, CLC (2020)	Synthesizing performance in the construction industry: An analysis of performance indicators to promote project improvement	Mixed Method	Engineering, Construction and Architectural Management	CoPM	Scopus
25	Zhang, Y; Pan, W; Pan, M (2021)	Key Performance Indicators of Offsite Construction Supply Chains: A Review	SLR	International Association for Automation and Robotics in Construction	CoPM	Scopus

3. FINDINGS

3.1. Context: Shortcomings of Traditional Construction Performance Measurement (CoPM) Approaches

Stakeholders have identified CoPM as key to performance improvement (Beatham, et al., 2004 cited in Ofori-Kuragu, et al., 2016; Mbugua, et al., 2021), but the use of established performance measurement tools is a challenge (Ofori-Kuragu, et al., 2016). Traditional CoPM makes use of financial indicators such as cost, schedule, and quality (Tofan & Breesam, 2018), however, these are considered to be inadequate because they are short-term and with a historic inability to provide current and future directions for the organisations (Zamim, 2021; Wang, et al., 2023). Also, they are unable to predict the causality of poor performances (Maya, 2016). They fail to link financial and non-financial metrics while offering little consideration for intangible assets (Kaplan & Norton, 2001 cited in Oyewobi, et al., 2015). Overall, these financial indicators provide misleading information about continuous improvement, corporate health, business sustainability and innovation, thus leading to the need to have a balanced set of indicators that will cover critical areas of the project and business. These shortcomings might have prompted researchers like Toor & Ogunlana (2009 cited in Sibiya, et al., 2015) to advise the use of KPIs in performance measurement that cover both tangible and intangible assets of the business with short-term and long-term implications. The use of such balanced indicators could provide organisational management with useful information previously unknown about the business.

Additionally, another important but less popular dimension to the use of traditional CoPM approaches is that they are transactional in characteristics. They find wide application in construction organisations with highly centralized management structures (Koprivica, et al., 2021); with theory X management style, and transactional company leadership (Mishra, 2022). In such environments, there is difficulty for strategic leaders to communicate organisational strategies to project teams; and project teams tend to operate in “silos”, isolated from strategic objectives.

Finally, evidence has shown that researchers have focused more on CoPM from the organisational and industry perspectives (Oyewobi, et al., 2015; Dobrovič, et al., 2018). However, the discussion on CoPM at the project level requires more scholarly attention, specifically as only the summation of successful implementation of a portfolio of programmes and projects can lead to organisational success. Therefore, this paper has undertaken to study CoPM across the project value chain, also called lifecycle, by mapping organisational strategic goals to the construction project value chain. This will support project managers and senior management in better management of CoPM when using balanced tools like BSC.

3.2. Intervention: Improving Construction Performance Using Balanced Performance Measurement Framework

3.2.1. Balanced Scorecard (BSC) Framework

Balanced Scorecard (BSC) is a powerful strategy-based performance measurement tool that is systematic in application while producing continuous process improvement (Koprivica, et al., 2021). It is made up of four interrelated perspectives (Maya, 2016) as shown in Table 1. These four perspectives, reflecting the balanced utilization of tangible and intangible assets of construction projects, combine to provide a balanced future view for the organisation (Goldstein, 2022).

Table 2: Balanced Scorecard (BSC) Perspectives

S/N	Perspective	Details	Asset Type
1	Financial	Cost, schedule, productivity, quality	Tangible Assets – Property, Plant, Tool, Equipment, Materials
2	Stakeholders' satisfaction	Clients, end-users, employees, contractors, suppliers, host communities - motivation, loyalty, support	Intangible – Relationship, Socio-cultural Capital, Political Levers
3	Internal project, and business, processes	Systems, structures, procedures, controls	Intangible Assets – Business/Project Processes, Databases & Information Systems
4	Capability and capacity	Management, administrative, and technical – knowledge, skill, experience,	Intangible Assets - Human Capital, Training & Innovation, Learning, Technologies, Research & Development (R&D)

The strategy map, a key component of BSC framework, is a cause-and-effect visual representation of organisation and project objectives with logics (Goldstein, 2022). It contains objectives that represent the overall strategy of the project/organisation, while the BSC contains KPIs that reflect the achievement of these objectives. Cokins (2020) and Goldstein (2022) explained further that the strategic objectives in the lower perspectives of the map have causal relationships with strategic objectives in the upper perspectives. Hence, Gomes & Liddle (2006) cited in Osunsanwo & Dada (2020) stated that BSC is developed on the assumption that organisational capability and capacity, at the bottom perspective, will utilise internal processes of the organisation to achieve satisfaction of both employees and clients while creating value and profitability. Using strategy map and BSC helps construction organisations to create, understand, and clearly communicate strategic expectations to project teams, through top-down channels, prior to the project planning phase (Koprivica, et al., 2021).

3.2.2. Construction Project Value Chain

Donovan, et al., (2015) suggested that construction performance, and the accompanying competitive advantage, could be enhanced by the application of a construction value chain during project implementation. Construction value chain utilises a lifecycle philosophy to divide construction project activities into unique phases (Stobierski, 2020). This improves project performance and value by reducing waste through a Lean approach, and the identification of key activities that are necessary for project implementation and success.

For instance, industrial construction projects have lifecycle phases namely front-end loading (FEL); contracting; engineering; procurement; fabrication; hookup, installation, commissioning & Handover to client. This lifecycle philosophy allows each preceding phase to create value for the succeeding phase as the project progresses (Zamora, 2016), with the interfaces between phases marked by at least a milestone. Although the value created increases as the project progresses, all phases are deemed to have significant importance in their contribution to the overall success of the project. Hence, a project

implementation can be considered as a heterogeneous unit with different phases, and measuring performance at the project phase-level increase performance effectiveness and efficiency.

Previous scholars on the use of BSC for CoPM were not specific on the time of carrying out performance measurement during project implementation (Koprivica, et al., 2021; Maya, 2016). However, the long duration of construction projects, and the temporary nature and composition of project teams and supply chains, make it necessary to carry out performance measurement just after a project's major activity according to the value chain. This ensures that relevant KPIs for the activity are effectively and efficiently measured, and recovery initiatives are applied to the remaining part of the project in order to achieve desired performance.

3.2.3. Mechanism: Integration of Balance Scorecard Frame and Construction Value Chain Using Plan-Do-Check-Act (PDAC) Cycle

Figure 1 shows a proposed integrated BSC with value chain, developed from this study, through the integration of BSC and construction value chain. This integrated tool can be used to measure performance at the end every project phase.

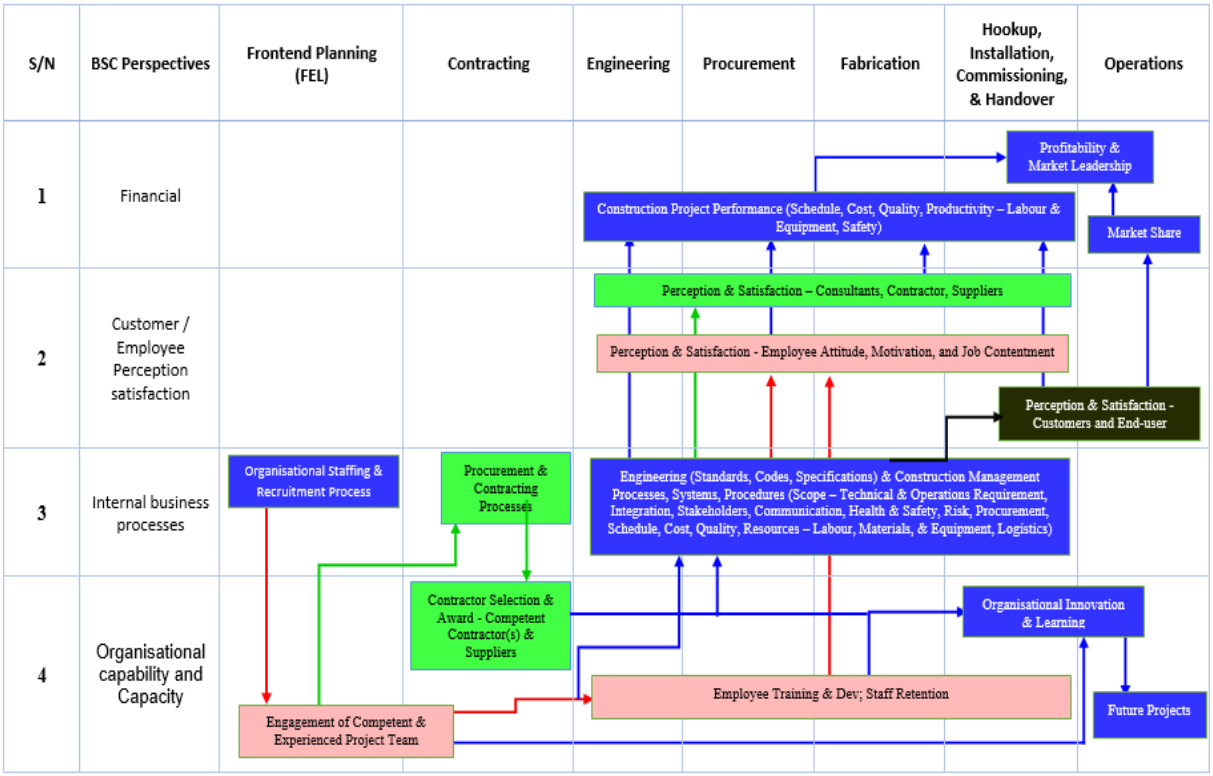

Fig 1: Strategy Map of Industrial Construction Project

Legend	
	Company/Project-Centric
	Consultants, Contractor, Suppliers
	Clients, Customers, User-Users
	Employees, Project Team

During the frontend loading (FEL) phase of the project, the achievement of two strategic goals is planned. These are organisational staffing & recruitment process, and engagement of competent and experienced project team. Contrary to the findings of other researchers on the application of BSC for construction companies (Koprivica, et al., 2021; Osunsanwo & Dada, 2020), this paper establishes that for a construction project, the performance measurement and improvement ladder commences with Organisation Staffing and Recruitment Process within internal business perspective. This drives the recruitment of experienced and competent project team, especially the appointment of a project manager, under the Organisational capability and Capacity perspective.

The experienced project team use the Procurement and Contracting Process of the organisation to carryout bidding, selection, and award of contracts to suitably qualified consultants, contractors, manufacturers, suppliers and other service providers. The experience and suitability of the contractors and supply chain stakeholders cannot be undermined or overstated. Competence in contracting, such as the possession of prequalified contractors and suppliers lists, creates competitive advantage in project performance (schedule saving, understanding of work scope – technical and operational requirements, high quality of deliverables and commissioned assets).

The project team, and selected contractor(s) and supply chain stakeholders utilise the engineering, procurement and construction (EPC) management processes to execute the project. For simplicity, the processes for the EPC phases have been combined in Table 1 but the different project phases – engineering, procurement, and construction – have different processes, systems, and procedures that project teams and organisations use to achieve competitive advantage. For instance, the determination of engineering productivity during the engineering and design phase requires a different effort to construction productivity (labour, equipment, and materials) that occurs during the construction phase.

Additionally, during the EPC phase, members of the project team undergo structured employee training and development programme that is aimed at creating positive perception of the organisation amongst employees, leading to employee satisfaction and loyalty. Also, during the EPC phase, the achievement of organisational innovation and learning takes place. This is driven by experienced project team, experienced contractors and supply chain stakeholders, and employee training and development programme output.

The EPC management processes collectively have an important impact on the project because it is a key determinant of project performance and success. These processes drive the perception and satisfaction of major stakeholders and also project performances. The perception and satisfaction factor has been divided into three mutually exclusive parts i.e. clients, customers, end-users; project team, employees; consultants, contractors, and supply chain stakeholders. Organisations should work towards having a positive perception among these three stakeholders, and ensure that they are kept satisfied. This ensures that long-term financial performance indicators are achieved.

Using the proposed framework, senior managers and project managers are advised to measure related KPIs just after the occurrence of corresponding tasks and phases. This will enable project teams, and organisations, to implement necessary corrective actions and initiatives to mitigate the root cause(s) of any observed poor performances. Also, lessons learned from a project could be applied to future organisational projects while developing both internal processes, capability and capacity.

3.2.4. Outcome: Long-term Profitability and Market Leadership

It is the position of this paper that the continuous application of the proposed integration of BSC and construction value chain for performance measurement, using the PDCA framework, will ultimately produce more accurate positive project performances. This is due to two reasons namely: the iterative use of PDCA framework, driven by senior management, is known to have produced continuous improvement in different processes and disciplines (Isniah, et al., 2020; Patel & Deshpande, 2017).

Secondly, the effective use of BSC places a balanced focus on tangible and intangible assets. This will enable strategic managers to give the right attention to the development of intangible assets, thus leading to organisational growth and competitive advantage.

4. STUDY JUSTIFICATION AND LIMITATIONS

There are several other performance measurement frameworks in application such as Performance Prism, European Foundation Quality Management (EFQM), Malcolm Baldridge for Performance Excellence (MBNQ), Capability Maturity Matrices, Performance Pyramid, Six Sigma, Result and Determinant Matrix (Hussain, et al., 2022; Meng & Fenn, 2019; Osunsanwo & Dada, 2020; Oyewobi, et al., 2015). But the popularity of BSC is due to its robustness as a tool for strategy creation, implementation, and performance measurement; and this is demonstrated in its wide application in several industries (Osunsanwo & Dada, 2020). Additionally, the integration of BSC with construction value chain increases CoPM effectiveness and efficiency. However, some critics of BSC argued that the difficulty in the choice of KPIs for projects and organisations is a challenge in the use of the tool (Gopinath, et al., 2016). This challenge is common with the use of balanced frameworks, however, keeping a focus on strategic statements and goals when choosing KPIs can help overcome these drawbacks. Additionally, the empirical work of (Hristov & Chirico, 2016) focused on the inability of BSC to show the contribution of motivated employees and other satisfied stakeholders to the performance of the organisation. Despite the above, the benefits of BSC outweigh its shortcomings.

5. CONCLUSION

The study shows that competitive advantage in construction organisations can be achieved through the application of continuous CoPM by using BSC and strategy map across the construction project value chain through the PDCA cycle. It then proposes a shift in current CoPM practices by using CIMO framework to develop the integration BSC and construction project value chain as a performance measurement balanced tool. This promotes strategic value of project and organisational assets through structured identification and measurement of performance drivers.

It is the position of this paper that the iterative use of BSC, based on PDCA framework, on a portfolio of programme and projects that can lead to continuous performance improvement and competitive advantage. The use of BSC places the right attention on the utilisation of both tangible and intangible assets of the organisation made available to the project teams, by mapping strategic goals across project lifecycle.

The outcome of this study is being recommended to top-level managers of construction organisations who have the responsibility of communicating same to project managers (Saalmuller, 2022). This paper contributes to the literatures on CoPM by introducing the use of BSC on construction projects value chain. This provides valuable insight to the project team on mapping of strategic goals to project lifecycle phases, and the likely timing of their occurrences and measurements. Also, it provides insights of the existence of three strategic goals that have been overlooked by other studies, namely: Organisational Staffing & Recruitment Process, Procurement & Contracting Processes, and Selection & Award of Contracts to Experienced Contractors & Supply Chain Stakeholders.

Finally, the paper has provided areas of further research for CoPM scholars such as the interfaces between organisational management/leadership styles, and impact of intangible assets on construction performance.

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