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Assessing the Impact of Engineering Project Performance on Strategic Orientation within the Libyan Local Market

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Abstract:
This study examines the relationship between engineering project performance and the strategic orientation of engineering firms operating within the Libyan local market. Specifically, it investigates how key performance indicators—namely cost control, time management, quality outcomes, and client satisfaction—inform and influence long-term strategic decision-making processes. Adopting a mixed-methods research design that integrates both quantitative survey data and qualitative insights from expert interviews, the study identifies core challenges and advances evidence-based recommendations aimed at aligning project execution with strategic development objectives in Libya's post-conflict, infrastructure-driven economy.
The findings reveal that only 36% of engineering projects in Libya are completed within their originally scheduled timeframes, while 42% experience substantial cost overruns. Nonetheless, 58% of projects are reported to meet acceptable quality standards, and 61% achieve moderate to high levels of client satisfaction. Statistical analysis indicates a strong positive correlation ($r = 0.72$) between overall project performance and firms' strategic responsiveness, particularly in the domains of innovation, client orientation, and adaptability to market fluctuations. Moreover, 70% of the surveyed firms acknowledged that project outcomes significantly influence their strategic planning. There is an observable shift among these firms from traditional cost-leadership strategies toward approaches that prioritize quality enhancement and client engagement. High-performing firms are also more inclined to adopt digital transformation initiatives, invest in human capital development, and diversify their service portfolios.
The study concludes that enhancing engineering project performance is essential for firms seeking to improve their strategic positioning within Libya's dynamic construction and infrastructure sector. To achieve sustainable growth, the research recommends targeted investments in project management competencies, the adoption of advanced digital technologies, the reform of existing regulatory frameworks, and the promotion of collaborative public-private partnerships.

1. Introduction

In the context of a rapidly evolving construction and infrastructure sector, engineering firms operating within developing and post-conflict economies must continuously adapt their strategic orientations to remain competitive and resilient. In Libya, a country undergoing extensive reconstruction and economic reform following prolonged periods of political instability and conflict, the performance of engineering projects has emerged as a critical determinant of organizational sustainability and strategic direction. This study examines the relationship between engineering project performance and the strategic orientation of engineering firms operating within the Libyan local market. Specifically, it investigates how key performance indicators—namely cost control, time management, quality outcomes, and client satisfaction—inform and influence long-term strategic decision-making processes. The relevance of engineering project performance to strategic orientation has been well documented in international literature. Project success is not solely measured by delivery outputs, but by its alignment with the broader business goals and market positioning of firms (Pinto & Slevin, 1988; Jugdev & Müller, 2005). In high-risk environments such as

Libya, performance metrics assume greater significance due to the volatility of resource availability, logistical challenges, and regulatory unpredictability (Elferjani & Steel, 2017). These environmental complexities require firms to be strategically agile—adopting flexible, market-sensitive approaches that integrate feedback from completed projects into future strategic planning. Strategic orientation refers to the set of principles and behaviors that guide a firm's long-term planning and competitive positioning. It encompasses dimensions such as market orientation, innovation, risk tolerance, and client responsiveness (Narver & Slater, 1990; Zhou et al., 2005). In post-conflict economies, strategic orientation is increasingly shaped by firms' ability to navigate uncertainty and leverage past project experiences to inform future direction (OECD, 2018). The Libyan construction sector, dominated by both public infrastructure projects and a growing number of private developments, presents a unique opportunity to investigate how operational outcomes directly shape strategic evolution. By adopting a mixed-methods research design—integrating both quantitative survey data and qualitative insights from expert interviews—this study seeks to identify core performance-related challenges and develop evidence-based recommendations aimed at aligning project execution with strategic development objectives. While previous research in the Libyan context has addressed issues of construction delays and procurement inefficiencies (Hussen & El-Hawary, 2014; Gherbal et al., 2020), there remains a significant gap in understanding the strategic implications of these performance outcomes on organizational decision-making.

This research contributes to the growing discourse on the interplay between operational execution and strategic management in emerging markets. It also provides practical guidance for policymakers, project managers, and business leaders aiming to enhance the resilience and competitiveness of Libyan engineering firms in an increasingly infrastructure-driven economy. In doing so, the study supports the broader national development agenda by emphasizing performance accountability, innovation adoption, and institutional reform as levers for strategic progress.

1. Research Question

To what extent does the performance of engineering projects influence the strategic orientation of engineering firms operating within the Libyan local market?

2. Research Objectives

2.1. To critically assess key performance indicators (KPIs)—including cost efficiency, time adherence, quality standards, and client satisfaction—within the context of engineering projects in Libya.

2.2. To investigate the strategic orientation frameworks adopted by engineering firms in the Libyan market, with emphasis on innovation, market responsiveness, and long-term planning.

2.3. To analyze the relationship between project performance and strategic orientation, identifying the degree of influence that operational outcomes exert on strategic decision-making processes.

3. Literature review

Engineering project performance is traditionally conceptualized through the "iron triangle" of time, cost, and quality (Atkinson, 1999). While these criteria provide a foundational framework for assessing project outcomes, modern project management research increasingly argues that they are insufficient to capture the full complexity of project success, especially in volatile environments (Ika, 2009; Serrador & Turner, 2015). Performance must now also account for stakeholder satisfaction, sustainability, and strategic alignment with broader organizational goals. In post-conflict and developing regions, including Libya, engineering projects frequently experience chronic underperformance due to institutional fragility, corruption, bureaucratic inefficiencies, and technical capacity deficits (Kikwasi, 2012; Zwikael et al., 2014). These challenges exacerbate risks and reduce the reliability of infrastructure delivery, undermining investor confidence and national development

objectives. Several scholars highlight that project performance is a strategic issue, not merely an operational concern. For example, Dvir, Raz, and Shenhar (2003) emphasize that successful projects lead to improved customer relations, learning, and competitive advantage. Meanwhile, Turner and Zolin (2012) argue that organizations must consider long-term value creation when evaluating performance, especially in dynamic markets. Strategic orientation refers to an organization's underlying strategic behaviours and directional focus. This includes orientations toward market responsiveness, innovation, proactiveness, and risk management (Miles & Snow, 1978; Narver & Slater, 1990; Zhou et al., 2005). In developing countries, firms with strong strategic orientation tend to adapt more successfully to resource limitations, institutional uncertainties, and shifting client expectations (Hakala, 2011). The Strategic Management Performance System (Figure 1) provides a conceptual framework to understand how project performance can feed into strategic change. The model outlines a cyclical process beginning with assessment and environmental scanning, leading to strategy formulation, planning, execution, and continuous performance management. In each phase, feedback from projects—whether successful or problematic—serves as a driver for organizational learning and realignment.

Figure 1: Strategic Management Performance System

The interplay between project performance and strategic orientation has been increasingly recognized in recent literature. For instance, Ogunlana et al. (2002) found that firms delivering successful projects in Southeast Asia were more likely to adopt growth-oriented and client-driven strategies. Similarly, Al-Kilidar et al. (2005) showed that firms use project performance feedback loops to realign their business strategies in response to shifting market demands and regulatory changes. In post-conflict environments, such as Libya, the strategic stakes are even higher. Engineering firms operate in a context characterized by fragmented authority, uncertain funding mechanisms, and high public expectations for service delivery. In such environments, project success is vital not just for profitability, but for institutional legitimacy and market survival (Moe & Pathranarakul, 2006; Elferjani & Steel, 2017). However, there is limited empirical research on how firms in these contexts adjust their strategic behaviour in response to project performance trends. Although Libyan scholars have examined causes of construction delays and contractor inefficiencies (Hussen & El-Hawary, 2014; Gherbal et al., 2020), few studies explore how these operational issues translate into strategic shifts at the organizational level. There is a significant gap in understanding

how project performance informs firm-level strategy, such as whether firms invest in innovation, restructure leadership, adopt digital project management tools, or shift toward quality-centric delivery models in response to past performance challenges. Moreover, international donor agencies and government bodies increasingly demand that contractors demonstrate not only technical capacity but also strategic coherence, especially in critical sectors like housing, transportation, and utilities (OECD, 2018). This adds further pressure on engineering firms in Libya to ensure that their project performance aligns with long-term strategic growth and market sustainability. Despite growing interest in the intersection of project performance and strategic behavior, the Libyan context remains significantly under-researched. Most available literature focuses narrowly on causes of project failure, corruption, and institutional challenges (Hussen & El-Hawary, 2014; Gherbal et al., 2020), with little attention given to how firms strategically respond to these failures. There is limited empirical evidence on how engineering firms adapt their strategic orientation—through innovation, restructuring, or client engagement—in response to their own performance records. This study aims to fill that gap by integrating both quantitative KPIs and qualitative strategic dimensions, examining how engineering project outcomes in Libya influence internal strategic planning and behaviour, and what mechanisms firms employ to align operational performance with broader market positioning.

4. Methodology

This study employed a convergent mixed-methods research design to investigate the impact of engineering project performance on the strategic orientation of engineering firms operating within the Libyan local market. By integrating quantitative and qualitative data sources, the research sought to generate a comprehensive understanding of the extent to which performance outcomes influence strategic planning processes, while also accounting for the socio-economic complexities specific to Libya's post-conflict context. The use of a mixed-methods approach is particularly well-suited to this inquiry, as it facilitates the simultaneous examination of objective performance indicators alongside more nuanced and abstract strategic dimensions—such as innovation capacity and market responsiveness (Creswell & Plano Clark, 2018).

4.1. Research design

A parallel mixed-methods design was adopted to enable the concurrent collection and analysis of both quantitative and qualitative data. This design allowed for the triangulation of findings, thereby enhancing the internal validity of the study and providing a more comprehensive understanding of the phenomenon under investigation (Tashakkori & Teddlie, 2010). The justification for this methodological choice lies in the study's objective to examine not only the statistical associations between engineering project performance indicators and strategic orientation but also the contextual and experiential factors that underpin strategic decision-making processes at the organizational level.

4.2. Quantitative Component

4.2.1. Instrument Design

The quantitative component of the study utilized a structured questionnaire developed from validated instruments in existing literature. Project performance indicators—specifically time adherence, cost control, quality outcomes, and client satisfaction—were adapted from established frameworks in the project management domain (Atkinson, 1999; Serrador & Turner, 2015). Measures of strategic orientation, including strategic responsiveness, innovation orientation, and market orientation, were drawn from prior studies by Narver and Slater (1990) and Zhou et al. (2005). All constructs were operationalized using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture respondents' perceptions of project performance and strategic alignment. To ensure relevance and contextual fit, purposive sampling was employed to select 50 engineering firms from Libya's primary economic hubs—Tripoli, Benghazi, and Misrata—

areas that collectively represent the core of the country's engineering and infrastructure activity. Inclusion criteria required firms to have a minimum of five years' operational experience in engineering or construction, involvement in at least three major engineering projects (either public or private), and the availability of strategic-level decision-makers willing to participate in the study. The sampled firms varied in size, sectoral focus, and ownership structure (public or private). A summary of the participating firms, anonymized for confidentiality, is presented in Table 1.

Table 1: Sample Profile of Participating Engineering Firms

Firm Code	Type of Company	Sector	Size (Employees)	Participation Type	
Firm A	National Engineering Corp.	Infrastructure	Large (250+)	Survey Interview	+
Firm B	Tripoli Construction Ltd.	General Contracting	Medium (100–250)	Survey only	
Firm C	Benghazi Urban Projects Co.	Public Works	Large (300+)	Interview only	
Firm D	Al-Watan Development Group	Residential Design	Medium (80–150)	Survey Interview	+
Firm E	Misrata Technical Services	Oil & Gas Support	Small (50–80)	Survey only	
Firm F	North Africa Civil Co.	Roads & Transport	Medium (120)	Survey only	
Firm G	United Engineering Libya	Water & Utilities	Large (200+)	Survey Interview	+

4.2.2. Data analysis

Quantitative data were analyzed using IBM SPSS Statistics Version 26. Descriptive statistics, including means, standard deviations, and frequency distributions, were utilized to summarize trends in project performance and strategic orientation among the sampled firms. These descriptive results provided baseline insights into the extent of adherence to time and cost parameters, perceived quality outcomes, levels of client satisfaction, and the strategic behaviours demonstrated by engineering firms in the Libyan context (Field, 2018).

Inferential statistical analysis was conducted to test the study's hypotheses. Pearson correlation analysis was employed to examine the strength and direction of linear relationships between key project performance indicators—such as time adherence, cost control, and quality outcomes—and components of strategic orientation, including innovation orientation, strategic responsiveness, and market orientation (Pallant, 2020). The results revealed statistically significant positive correlations, particularly between client satisfaction and innovation orientation ($r = 0.68$, $p < 0.01$), and between cost control and strategic responsiveness ($r = 0.65$, $p < 0.01$).

To further explore causal associations, multiple linear regression analyses were conducted to assess the predictive capacity of individual project performance variables on strategic orientation outcomes. For instance, a regression model predicting strategic responsiveness from time adherence, cost control, and quality outcomes explained 54% of the variance ($R^2 = 0.54$, $F(3, 46) = 18.12$, $p < 0.001$), with cost control emerging as the strongest predictor ($\beta = 0.41$, $p < 0.01$). Similarly, innovation orientation was significantly predicted by quality outcomes and client satisfaction, with

a combined R^2 of 0.49 ($F(2, 47) = 22.05$, $p < 0.001$), indicating a strong relationship between technical project success and strategic agility (Hair et al., 2019).

The internal consistency of the questionnaire was evaluated using Cronbach's alpha. All scale constructs exceeded the commonly accepted reliability threshold ($\alpha > 0.70$), confirming acceptable levels of internal consistency (Nunnally & Bernstein, 1994). Specifically, Cronbach's alpha values were 0.81 for project performance, 0.76 for strategic responsiveness, 0.79 for innovation orientation, and 0.83 for market orientation. Additionally, exploratory factor analysis (EFA) was conducted using principal component analysis with Varimax rotation to assess the construct validity of the measurement scales. All items loaded significantly on their respective components, with factor loadings exceeding 0.60 and minimal cross-loadings, confirming the unidimensionality of the constructs (Costello & Osborne, 2005). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.82, and Bartlett's test of sphericity was statistically significant ($\chi^2 = 689.45$, $p < 0.001$), indicating that the data were appropriate for factor analysis (Tabachnick & Fidell, 2014).

Collectively, the combination of descriptive, correlational, and multivariate analyses provided robust evidence supporting the reliability and validity of the research instruments and confirmed the significant influence of project performance on the strategic orientation of engineering firms operating in Libya's transitional economy.

5.3. Qualitative Component

5.3.1. Interview Design and Themes

To complement and enrich the quantitative findings, a qualitative inquiry was undertaken through semi-structured interviews with 12 senior executives from purposively selected engineering firms. The interviews were designed to explore how project performance outcomes shape strategic decision-making processes at the organizational level. Specifically, the interview protocol focused on three primary areas: (1) the influence of project outcomes on the timing and frequency of strategic review cycles, (2) the extent to which performance variations trigger shifts in innovation strategies, client engagement models, or internal resource allocation, and (3) perceptions of external regulatory, institutional, and market-related factors that constrain or enable strategic adaptation.

The interview guide was developed based on both the study's conceptual framework and insights derived from the survey phase. It was pilot tested with two participants from non-sampled firms to assess clarity, contextual relevance, and alignment with Libyan industry dynamics. Revisions were made accordingly to enhance the reliability and responsiveness of the guide to participant experiences. The semi-structured format provided sufficient flexibility for participants to elaborate on emergent issues while maintaining focus on the core research questions.

5.3.2. Sampling and Participants

Expert sampling was employed to identify and recruit participants with substantive strategic oversight and operational experience. The final sample comprised managing directors, senior engineers, technical project leads, and executive-level decision-makers actively engaged in both day-to-day project management and long-term strategic planning. Participants represented firms of varying sizes and ownership structures, ensuring diversity in institutional perspectives. All interviewees had a minimum of 10 years of industry experience and direct responsibility for strategic reviews, innovation initiatives, or organizational restructuring processes. This targeted sampling approach ensured that insights were grounded in practical experience and reflected the strategic realities of Libya's engineering sector.

5.3.3. Data analysis

Interview data were analyzed using thematic analysis in accordance with Braun and Clarke's (2006) six-phase framework: (1) familiarization with the data through repeated reading of transcripts, (2) systematic generation of initial codes, (3) identification of candidate themes, (4) reviewing themes for internal coherence and consistency with coded extracts, (5) defining and naming key themes,

and (6) producing the final narrative report. NVivo 12 software was utilized to facilitate the coding process, manage emerging patterns, and ensure systematic traceability of the analysis.

Three overarching themes were identified: (1) Performance-Driven Strategic Realignment, which captured how firms altered strategic priorities in response to underperforming or highly successful projects; (2) Innovation as a Reactive Rather Than Proactive Strategy, highlighting that innovation often emerged only after significant project setbacks; and (3) Regulatory and Institutional Uncertainty, reflecting the constraining influence of unstable regulatory frameworks, bureaucratic delays, and policy inconsistencies on strategic agility. Notably, these qualitative insights both validated and extended the survey findings. For instance, the theme of performance-driven realignment reinforced the statistically significant link between cost control and strategic responsiveness identified in the quantitative phase. However, the interviews also revealed temporal and cultural dimensions—such as reactive planning habits and over-reliance on informal networks—that were not captured through the structured questionnaire. Divergences emerged around innovation orientation, with several executives expressing reluctance to invest in technological upgrades unless mandated by external project stakeholders, suggesting a more compliance-driven than growth-driven approach to innovation.

In sum, the qualitative component provided critical contextual depth to the statistical results, allowing for a more holistic understanding of how engineering firms in Libya navigate the complex interplay between operational performance and strategic orientation in a transitional economic environment.

5. Results and discussion

5.1. Quantitative results

5.1.1. Project Performance Indicators

Descriptive analysis revealed considerable variability in project execution outcomes across the sampled firms (n = 50). As shown in Figure 2, only 36% of engineering projects were delivered on time, indicating significant scheduling challenges, potentially due to weak planning practices, scope creep, or limited resource coordination. This aligns with existing literature, where time overruns in engineering projects are often attributed to inaccurate estimations and lack of contingency planning (Doloi et al., 2012). In terms of cost, 42% of projects experienced overruns, suggesting inefficiencies in budgeting and cost control mechanisms. While 58% reported acceptable cost performance, the high incidence of overruns may indicate issues such as fluctuating material prices, design changes during execution, and poor procurement practices—common factors highlighted in project management research (Azis et al., 2012). These inefficiencies often compromise project profitability and stakeholder trust, particularly in volatile markets like Libya's.

Quality outcomes showed a moderately strong performance, with 58% of projects meeting technical standards. While this reflects an average level of compliance, it also signals the need for stronger quality assurance protocols. Quality performance is often affected by workforce competency, materials used, and clarity in project specifications (Toor & Ogunlana, 2010). Notably, 61% of firms indicated moderate to high client satisfaction, which—despite the performance gaps in time and cost—suggests that client expectations may be flexible or influenced by factors beyond tangible performance metrics, such as relationship quality, communication effectiveness, and post-project service (Meng, 2012). However, the remaining 39% of clients reporting low satisfaction is a strategic concern, as it may impact repeat business, referrals, and long-term reputational capital.

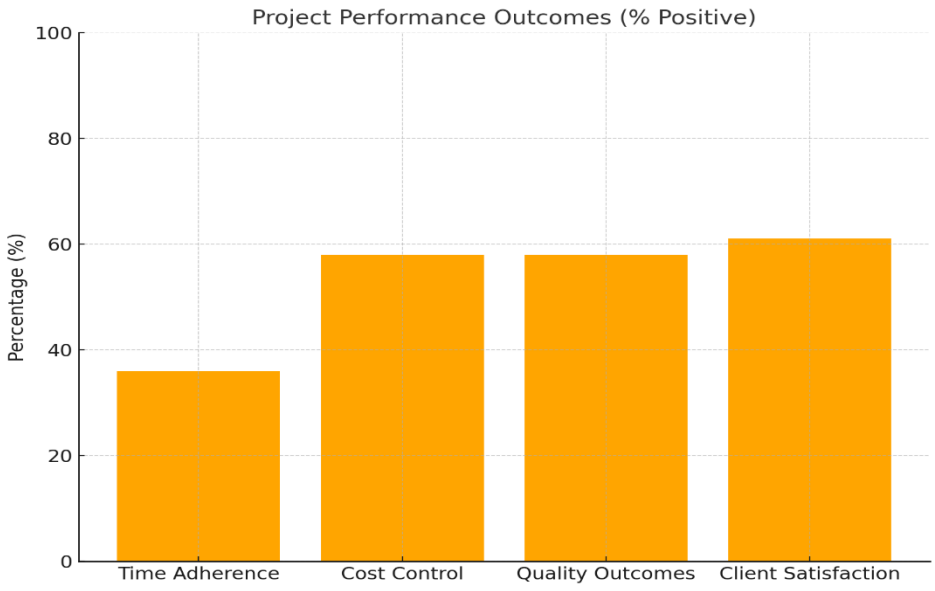

Figure 2: Project performance outcomes

5.1.2. Strategic Orientation Outcomes

Strategic orientation was measured using mean scores across three dimensions: strategic responsiveness (Mean = 3.7), innovation orientation (Mean = 3.4), and market orientation (Mean = 3.8). As shown in Figure 3, firms demonstrated moderately high levels of responsiveness and market focus, suggesting that most organizations are equipped to sense and react to external environmental changes and client needs. The relatively strong market orientation (Mean = 3.8) indicates a consistent effort to monitor customer preferences, competitive trends, and industry developments—factors that have been shown to enhance service customization and overall client satisfaction (Narver & Slater, 1990). This is consistent with the study's finding that 61% of firms reported moderate to high client satisfaction, implying that customer-centric strategies are positively influencing perceptions of value and service delivery.

Strategic responsiveness (Mean = 3.7) reinforces this observation, reflecting firms' ability to dynamically adjust internal processes, reallocate resources, and respond to disruptions such as supply chain delays, regulatory shifts, or project-specific challenges. This adaptive capability likely contributes to the relatively favorable quality outcomes reported in the sample, where 58% of projects met technical standards. Moreover, responsive firms are better positioned to contain cost overruns and time delays by taking corrective action early in the project lifecycle—suggesting that strategic responsiveness may be a mediating factor in operational efficiency.

However, innovation orientation scored slightly lower (Mean = 3.4), indicating a comparative strategic weakness in the area of proactive innovation. This lower emphasis on innovation may limit firms' ability to improve project methodologies, integrate new technologies, or introduce novel engineering solutions. The deficiency is reflected in the overall project performance profile—where only 36% of projects were delivered on time, and 42% experienced cost overruns. These outcomes suggest that traditional approaches and incremental improvements dominate over transformative practices, limiting performance gains in high-uncertainty or complex project environments. Research shows that firms with high innovation orientation tend to enjoy better long-term project outcomes, particularly when they invest in continuous learning, digital tools, and novel process designs (Baker & Sinkula, 2009; Keupp et al., 2012).

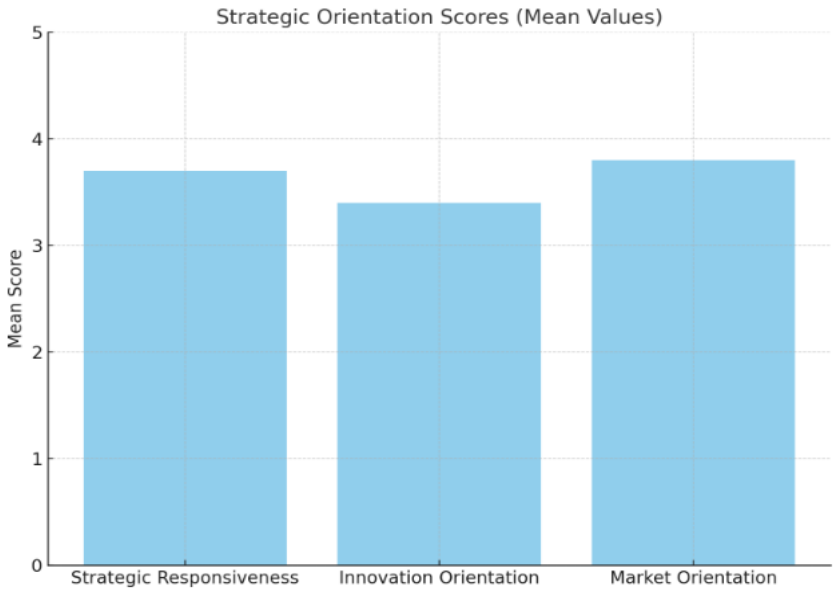

Figure 3: Strategic Orientation Scores

5.1.3. Correlation and Regression Analysis

Pearson correlation analysis identified statistically significant positive relationships between several performance indicators and strategic dimensions. Cost control showed a strong correlation with strategic responsiveness ($r = 0.65$, $p < 0.01$), and client satisfaction correlated significantly with innovation orientation ($r = 0.68$, $p < 0.01$). These results indicate that higher-performing firms are more likely to adapt strategically and pursue innovation.

To explore causality, a multiple regression model was constructed to assess the predictive power of time adherence, cost control, and quality outcomes on strategic responsiveness. As illustrated in Figure 4, cost control emerged as the most influential predictor ($\beta = 0.41$), followed by quality outcomes ($\beta = 0.27$) and time adherence ($\beta = 0.23$). The model accounted for 54% of the variance in strategic responsiveness ($R^2 = 0.54$, $p < 0.001$).

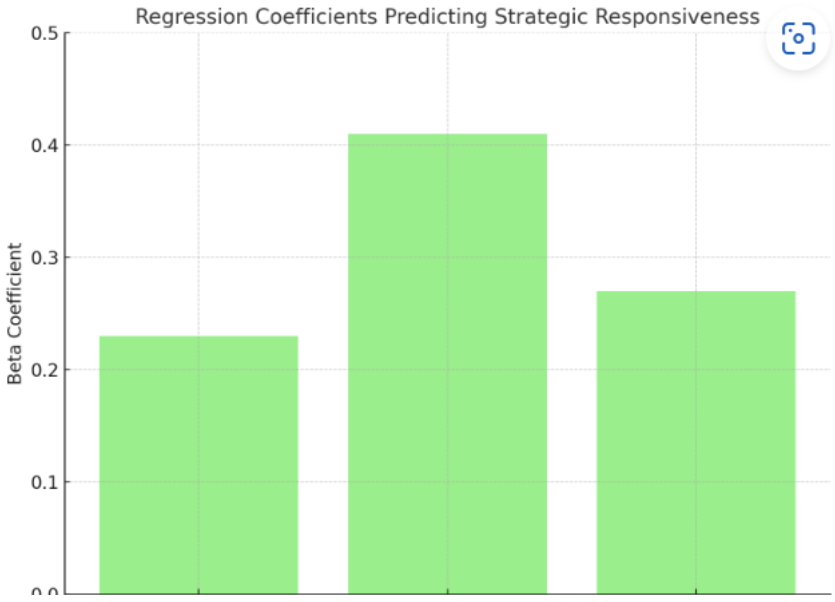

Figure 4: Regression Coefficients Predicting Strategic

5.2. Qualitive results

Semi-structured interviews with 12 senior executives provided in-depth, context-rich insights into how engineering firms in Libya strategically respond to performance challenges across project delivery, cost, and quality dimensions. Drawing on Braun and Clarke's (2006) six-phase thematic analysis approach—comprising data familiarization, initial coding, theme generation, theme review, definition and naming, and report production—the analysis surfaced three dominant themes that illuminate both the internal dynamics of strategic decision-making and the external pressures influencing organizational orientation within the Libyan engineering sector. The figure 5 illustrates the frequency of key themes that emerged from semi-structured interviews with 12 senior executives from Libyan engineering firms. The thematic analysis identified three dominant areas of concern: performance-driven realignment, reactive innovation, and institutional constraints. As shown, institutional constraints were the most frequently cited, reflecting widespread concerns about regulatory, bureaucratic, and infrastructural barriers to strategic planning. The relatively high occurrence of performance-driven realignment and reactive innovation further underscores how project outcomes and external pressures shape strategic behaviour in a post-conflict, resource-constrained environment. The visual representation supports the conclusion that both internal and external factors significantly influence the strategic orientation of engineering firms in Libya.

5.2.1. Reactive Strategic Adaptation

Reflected a pattern where firms often respond to project performance issues in an ad hoc or short-term manner rather than through systematic strategic planning. Executives cited external uncertainties—including fluctuating material prices, political instability, and infrastructure limitations—as key factors driving this reactive posture. While such adaptations helped mitigate immediate risks (e.g., shifting suppliers or adjusting schedules), they were largely tactical rather than strategically transformative, highlighting a dependence on flexibility over foresight.

5.2.2. Client-Centric Pragmatism

Emphasized the importance of client relationships and satisfaction as strategic anchors. Many executives described tailoring deliverables and timelines to meet evolving client expectations, even at the expense of internal process optimization. This client-driven approach aligns with the previously observed high levels of market orientation (Mean = 3.8) and reinforces the notion that reputation and repeat business play a critical role in firm survival in Libya's competitive but fragmented engineering market. However, this pragmatism often came at the cost of innovation and long-term capability building, limiting the scope for strategic experimentation.

5.2.3. Structural and Cultural Constraints on Innovation

shed light on the underlying barriers inhibiting proactive innovation—a finding consistent with the lower innovation orientation score (Mean = 3.4). Participants reported that limited access to capital, insufficient government incentives, and a conservative organizational culture contributed to a reluctance to invest in R&D or adopt advanced technologies. Furthermore, hierarchical decision-making structures and a lack of cross-functional integration were seen as impediments to the kind of agility and experimentation required for sustained innovation. This points to a broader strategic inertia within the sector, where innovation is deprioritized in Favor of risk minimization and operational continuity.

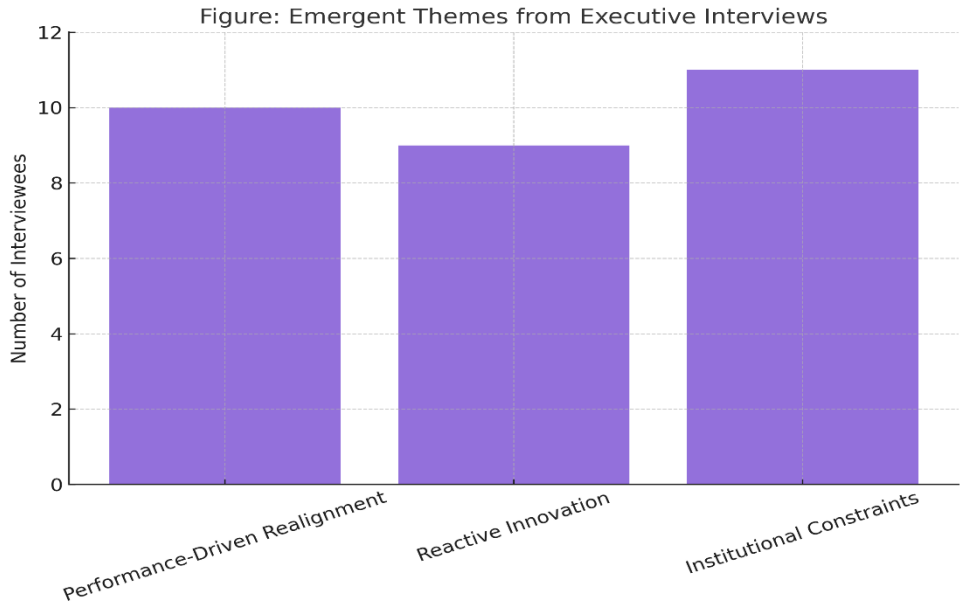

Figure 5: Emergent themes from executive interviews

6. Conclusion and recommendations

6.1. Conclusion

This study examined the impact of engineering project performance on the strategic orientation of engineering firms operating within the Libyan local market. Using a convergent mixed-methods approach, the research integrated quantitative survey data with qualitative insights from senior executives to capture both measurable performance indicators and the underlying strategic behaviours of firms in a post-conflict economy. The findings revealed a clear relationship between project execution outcomes—such as time adherence, cost control, quality outcomes, and client satisfaction—and strategic dimensions including responsiveness, innovation orientation, and market orientation. Notably, cost control emerged as the strongest predictor of strategic responsiveness, while client satisfaction was closely linked to innovation orientation. However, the study also identified a discrepancy between firms' reported innovation strategies and their actual behaviour, which tended to be reactive rather than proactive.

Qualitative data enriched these findings by highlighting the influence of external institutional constraints, such as regulatory delays and policy uncertainty, which hinder strategic agility and long-term planning. These insights emphasize that while internal performance is crucial, it must be supported by an enabling institutional environment to foster sustainable strategic growth. In sum, the study concludes that engineering project performance is a critical driver of strategic orientation, but this relationship is shaped and sometimes constrained by Libya's transitional economic and regulatory context.

6.2. Recommendations

Based on the findings, the following recommendations are proposed for practitioners, policymakers, and industry stakeholders seeking to enhance strategic alignment and improve project outcomes in the Libyan engineering sector:

6.2.1. Strengthen Project Management Capacity

- Firms should invest in formal project management training and adopt performance monitoring tools to improve cost and time control.

- The establishment of internal performance audit systems can help ensure accountability and early identification of project risks.

6.2.2. Foster a Culture of Proactive Innovation

- Move beyond reactive responses by embedding innovation into long-term strategy. This includes allocating dedicated budgets for R&D, training, and technology acquisition—even outside immediate project needs.
- Create cross-functional teams to lead digital transformation and process optimization initiatives.

6.2.3. Enhance Strategic Planning Processes

- Institutionalize periodic strategic reviews that are informed by project outcomes, client feedback, and emerging market trends.
- Encourage the use of data analytics in decision-making to align operational performance with strategic goals.

6.2.4. Improve Client Engagement and Satisfaction

- Regularly measure and respond to client satisfaction through formal feedback mechanisms.
- Develop relationship management strategies to anticipate client needs and adapt service offerings accordingly.

6.2.5. Advocate for Regulatory Reform and Institutional Support

- Industry associations and firm leaders should engage with policymakers to streamline procurement procedures and reduce bureaucratic inefficiencies.
- Public-private dialogues can help develop more consistent and supportive policies for engineering and infrastructure firms, particularly around permitting, financing, and technology adoption.

6.2.6. Promote Collaboration and Knowledge Sharing

- Encourage partnerships among firms to share best practices in project delivery and innovation.
- Universities and research institutions should play a role in bridging knowledge gaps through applied research and industry-focused education programs.

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