# Cultural Attributes and Rework in Construction Organisations: Implications for Project Performance and Profitability.

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## ABSTRACT

This paper examined the influence of organisational culture on rework and identified cultural attributes that can minimize rework and enhance project performance and profitability in construction organizations. A survey design was adopted. Data were obtained from construction professionals through a structured questionnaire and analyzed using descriptive statistics, mean score ranking, and factor analysis. A total of sixty-seven (67) questionnaires were used for this research. Four types of organisational culture were identified. Clan culture ranked highest with a mean score of 4.01, followed by Hierarchy culture 3.98, and Adhocracy culture 3.71, all rated high. Market culture ranked lowest at 2.55 and was rated moderate. The study revealed that organisational culture influences rework mainly through communication effectiveness, leadership commitment, teamwork, quality orientation, and supervision. Major contributors to rework include poor communication between management and site workers, absence of a quality-oriented culture, and ineffective supervision. Factor analysis grouped cultural influences into three dimensions: Communication and Leadership as the dominant driver, Quality and Control, and Innovation and Flexibility, with Communication and Leadership. For rework reduction, leadership commitment to quality and ethical culture/accountability ranked highest at 4.12, followed by clear contractual arrangements and early contractor involvement at 4.10. Four components emerged: Leadership and Quality Culture, Knowledge and Collaboration, Systematic Process Control, and Client and Motivation Alignment. The study concluded that construction organizations should prioritize leadership commitment, ethical behavior, and structured quality systems to reduce rework and enhance project performance and profitability.

**Keywords:** Organisational Culture, Cultural Attributes, Rework, Project performance, Profitability, Construction organisations.

## INTRODUCTION

The construction industry is one of the most important sectors in any economy because it provides the infrastructure needed for growth and development. However, despite its importance, the industry is well known for challenges such as cost overruns, project delays, quality failures, and declining profits (Nguyen & Watanabe, 2017). A key factor behind these problems is rework. Rework refers to doing a task or activity all over again because it was not done correctly the first time (Zhang, et al, 2021). This might involve fixing errors, correcting defects, or adjusting work to meet specifications. Research shows that rework can account for as much as 5–20% of the total cost of a project, depending on its size and management approach (Love *et al*., 2019; Hwang, Zhao, & Goh, 2014). Apart from the direct financial losses, rework usually leads to longer schedules, strained relationships among stakeholders, low worker morale, and reputational damage that can reduce a contractor's chances of winning future projects (Josephson & Hammarlund, 1999; Eze & Idiake, 2018).

The problem is even more severe in developing countries like Nigeria, where weak systems and inefficient practices make projects more vulnerable to delays and cost escalations. Rework is one of the main reasons for poor profitability, low client satisfaction, and poor contractor performance in Nigeria (Ayodele et al., 2019). Similar studies in other developing countries also point to common causes of rework such as design mistakes, poor communication, weak supervision, variation orders, and the use of unskilled labour (Oyewobi et al., 2011; Love *et al*., 2018). This highlights that rework is not just a technical issue, it is also shaped by the way organisations are managed and how people within them work together. One important but often overlooked factor in this regard is organisational culture. Organisational culture refers to the shared values, beliefs, and behaviours that influence how people in an organisation act and make decisions (Simpeh, 2012; Love, *et al*, 2022). It affects how employees communicate, solve problems, respond to mistakes, and work towards common goals. In construction projects, which typically involve many different stakeholders, organisational culture plays a big role in how errors are detected, reported, and corrected. This means culture directly affects how often rework happens and how costly it becomes (Oyewobi et al., 2011; Abdulai et al., 2023).

According to Eze and Idiake (2018), leadership style, teamwork, and management practices which are all aspects of organisational culture significantly influenced the occurrence of rework and overall project outcomes. Other studies confirm that construction firms with cultures that promote collaboration, openness, and problem-solving are better able to minimise rework, work more efficiently, and maintain profitability (Love et al., 2018; Ayodele et al., 2019). This research, therefore, sets out to examine the impact of organisational culture on rework projects, with the aim of identifying cultural orientations that can support sustainable project success and enhance profitability of construction, organization. The construction industry plays an important role in economic growth, but profitability in the sector is often threatened by waste, delays, and mistakes (Ndwandwa et al, 2017). The influence of organisational culture, such as leadership style, teamwork, and shared values, on how errors are managed and how often rework happens are often ignored (Ankrah & Langford, 2005; Chidiebere & Idiake, 2018). Without addressing culture, efforts to reduce rework may continue to fall short, and profitability will remain at risk. The specific objectives is to evaluate the effect of organisational culture on rework and to identify cultural attributes that reduces rework and enhance profitability on project executed by construction organization. By identifying cultural attributes that reduce rework and improve performance and profitability, the study will help construction firms strengthen teamwork, leadership, and communication practices. This will not only improve the efficiency and quality of construction projects but also enhance client satisfaction and organisational competitiveness.

# LITERATURE REVIEW

### Organisational Culture, Rework, and Profitability

Organisational culture is one of the most widely discussed concepts in management and organisational behaviour. It is generally understood as the system of shared values, norms, beliefs, and assumptions that guide the behaviour of individuals within an organisation (Schein, 2010). Culture acts as the "social glue" that binds members of an organisation together, shaping how they think, act, and respond to both internal and external challenges (Hofstede, Hofstede, & Minkov, 2010). In the construction industry, where diverse professionals collaborate on time-bound projects, culture provides a sense of identity and direction, influencing how stakeholders communicate, solve problems, and align with project goals (Ankrah & Langford, 2005). Organisational culture is specific to institutions and firms, reflecting how members of an organisation collectively interpret their work environment (Denison, 1990). In construction organisations, culture manifests in leadership styles, teamwork practices, safety attitudes, and quality standards, all of which have implications for project performance, including the occurrence of rework and profitability outcomes (Cheung, Wong, & Wu, 2011).

One of the central functions of organisational culture is to reduce uncertainty by providing guidelines on expected behaviour (Schein, 2010). For example, in construction firms where open communication is encouraged, mistakes are more likely to be identified early, reducing the cost of rework. Conversely, in cultures where hierarchy and blame dominate, errors may be concealed, often leading to significant rework and financial losses. Culture also influences how organisations manage innovation, quality, and risk. Firms with

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cultures that value continuous improvement are better equipped to implement systems such as Total Quality Management (TQM), which help minimise errors and improve profitability (Chang & Lin, 2007). Organisational culture plays a critical role in employee motivation and commitment. When workers identify with the values of their organisation, they are more likely to align their efforts with organisational objectives, leading to greater efficiency and reduced errors (Kotter & Heskett, 1992). In construction projects, which are highly interdependent and multidisciplinary, the ability of culture to foster collaboration and collective responsibility is particularly important. Poor cultural alignment between contractors, subcontractors, and

consultants often leads to conflicts, miscommunication, and ultimately, rework (Love, Edwards, & Irani, 2008). Researchers also emphasise that culture is not static but evolves as organisations adapt to changing environments (Hofstede et al., 2010). For construction organisations in developing economies such as Nigeria, external pressures such as economic instability, regulatory changes, and client demands often shape cultural orientations (Eze & Idiake, 2018).

Most common types of Organizational Culture identified are **clan, adhocracy, market, and hierarchy** culture (Asadi *et al,* 2023; Gumusburun Ayalp et al, 2025). **Clan culture** emphasizes internal focus, collaboration, mentoring, and employee commitment. Organisations dominated by clan values tend to prioritise cohesion, job satisfaction, and workforce development (Assens-Serra et al., 2021). Clan cultures foster knowledge sharing and employee well-being, which can indirectly improve quality outcomes and reduce error-prone behaviour when frontline staff feels psychologically safe to report problems (Aichouche et al., 2022; Assens-Serra et al., 2021). **Adhocracy culture** is characterised by flexibility, innovation, and risk-taking. Adhocracy positively associated with creativity, digital transformation, and adaptation to change (Aichouche et al., 2022). **Market culture** stresses competitiveness, results orientation, and external focus which can drive efficiency but sometimes at the cost of quality. Market cultures positively correlate with measurable firm performance indicators, particularly when firms need to meet tight schedules and pursue client outcomes aggressively (Wang et al., 2025). In construction, market-oriented contractors often push for speed and contract compliance, which can reduce time-based penalties but, if not balanced with quality governance, may increase mistakes that produce later rework (Li, 2022). **Hierarchy culture** prioritises stability, formalisation, and control mechanisms. Contemporary reviews and meta-analyses indicate hierarchy delivers reliable, consistent processes and compliance benefits, useful where safety and regulatory adherence are critical (Strengers et al., 2022; Denison et al., 2014). Yet many recent studies find hierarchy negatively associated with innovation and employee empowerment (Aichouche et al., 2022). In construction contexts this can mean robust procedures that limit some types of error, while simultaneously creating rigidities that impede rapid corrective responses when defects surface, thereby prolonging rework cycles. Hierarchical cultures emphasise rules and control, which ensure order but may limit flexibility and discourage early problem detection (Cameron & Quinn, 2011).

According to Nguyen and Watanabe (2017), cultural factors such as contractor commitment, cooperative orientation, and goal alignment strongly influenced labour productivity, learning performance, and overall project success. Effective cultural alignment is critical for reducing rework and improving construction project performance as cultural dimensions such as communication style, management pressures, and collaboration norms directly influenced rework occurrence and project performance (Oyewobi, Ibrahim, Ganiyu, and Okwori, 2011)

According to Ankrah and Langford (2005), these cultural mismatches often caused communication breakdowns, leading to rework, cost overruns, reduced profitability and disputes that undermined construction project performance. Aligning cultural assumptions across design–construction interfaces can enhance coordination and ultimately improve performance outcomes in construction projects (Ankrah & Langford, 2005). However, their study revealed that there is a systematic cultural differences between architects and contractors organsational culture as architects displayed more collaborative and people-oriented values, while contractors leaned towards efficiency and control-oriented values. Therefore, cultural alignment across project stakeholders is essential to reduce rework and safeguard profitability (Ankrah & Langford, 2005). According to Nguyen and Watanabe (2017), projects with stronger cultural attributes performed better in terms of cost and schedule adherence. Cultural alignment significantly enhances project success and culture diagnostics

should be conducted at project inception to pre-empt risks of cost overruns and time delays (Nguyen & Watanabe, 2017). Cultures supporting open communication and proactive risk management reduced rework and improved profitability margins. Therefore, embedding cultural practices into project governance structures reduces financial risks (Hwang et al., 2009). Collaborative problem-solving can help reduced rework thereby improving profitability (Abdulai et al. 2023).

# METHODOLOGY

To collect the necessary data and examine the relationship between organizational culture, rework, and profit-

ability in construction firms, this study adopted a survey research design. Data were gathered through a structured questionnaire, complemented by a comprehensive literature review. The literature review aimed to identify and better understand the various types of organizational culture and their key attributes that influence project performance and profitability. The questionnaire was designed in a closed-ended format using a five-point Likert scale, with responses ranging from 1 (Never) to 5 (Always). This approach was adopted to ensure reliable and accurate data from respondents. The questionnaires were randomly distributed to individuals directly involved in handling construction projects within the study area.

The population of the study consisted of 73 registered small and medium-sized construction firms operating in Ekiti State (Ekiti State Bureau of Statistics, 2024). Due to variations in firm size, level of operational activity, and accessibility, a purposive sampling technique was employed to select firms and individual respondents directly involved in construction project planning, supervision, and execution. Respondents were drawn from key professional categories within the selected firms, including contractors, project managers, site supervisors, and other technical staff actively involved in project delivery. Purposive sampling was considered appropriate because it enabled the researcher to deliberately target professionals with relevant experience and expertise regarding organisational culture, rework, and project profitability (Campbell et al., 2020). A total of 120 questionnaires were distributed to professionals directly involved in construction project planning, supervision, and execution. Out of the 120 questionnaires distributed, 67 were correctly completed and returned, representing a response rate of 55.8%. This multi-respondent approach enabled the collection of diverse perspectives on organisational culture, rework, and profitability within the selected firms.

# PRESENTATION OF RESULTS AND DISCUSSION

### General Information of Respondents

The demographic characteristics of the respondents are presented in Tables 1 and 2. As shown in Table 1, the respondents represent a wide range of professional roles in the construction industry. Site Engineers formed the largest group (20.89%), followed by Builders (14.94%) and Site Supervisors (14.94%). Other key professionals such as Quantity Surveyors (13.43%), Project Managers (10.44%), Contractors (10.44%), Foremen (7.46%), and Administrative Staff (7.46%) were also adequately represented. This diversity in professional status ensures comprehensive insights from different levels of project delivery.

The distribution demonstrates that the study captured opinions from individuals occupying both technical and managerial positions across the construction project delivery process. Site Engineers, Builders, and Site Supervisors are primarily responsible for supervising construction activities and ensuring compliance with technical specifications, while Project Managers coordinate project execution and resource allocation. Quantity Surveyors contribute expertise in cost planning and financial control, whereas Contractors oversee overall project delivery and decision-making. Administrative personnel also provide insights into organisational policies and operational support systems.

Table 2 further details the demographic profile of the respondents. The sample was predominantly male (77.6%), with females accounting for 22.4%. This gender distribution reflects the well-documented male dominance in the construction industry (Galea et al., 2015). In terms of age, the majority of respondents were in the productive middle-age brackets: 30–39 years (40.3%) and 40–49 years (31.3%). Only 11.9% were below 30 years, while 16.4% were 50 years and above. This indicates that over 70% of the respondents were within

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their prime working years, suggesting that the opinions expressed were largely based on practical industry experience accumulated during active professional practice. These age distributions reflect a good mix of youthful energy and seasoned experience.

The educational qualifications of the respondents were notably high, with 49.3% holding HND/B.Sc. degrees, 31.3% possessing M.Sc./MBA qualifications, and 10.4% having PhDs. Only 9.0% had OND/NCE qualifications. This high level of education suggests that the respondents were well-equipped to provide informed opinions on complex industry issues. With regard to work experience, a significant proportion had substantial industry exposure: 34.3% had 6–10 years, 26.9% had 11–15 years, and 23.9% had over 15 years of experience. Only 14.9% had less than five years of experience. Consequently, more than 85% of the respondents had over five years of construction experience. Such extensive industry exposure enhances the credibility of the findings because experienced professionals are more likely to have encountered different forms of organisational culture, construction defects, quality failures, and rework across multiple projects.

Collectively, the demographic profile indicates that the data were obtained from a relatively experienced, well-educated, and professionally diverse group of construction practitioners. Such respondent characteristics enhance the credibility and reliability of the findings, particularly regarding perceptions of organisational culture, rework, and profitability in construction projects (Creswell, & Creswell, 2023).

**Table 1: Demographic information**

| **Status of Respondents** | **Frequency** | **Percentage** |
|---|---|---|
| Builder | 10 | **14.94%** |
| Site Engineer | 14 | **20.89%** |
| Site Supervisor | 10 | **14.94%** |
| Project Manager | 7 | **10.44%** |
| Quantity Surveyor | 9 | **13.43%** |
| Foreman | 5 | **7.46%** |
| Administrative Staff | 5 | **7.46%** |
| Contractor | 7 | **10.44%** |
| **Total** | **67** | **100%** |

**Table 2: Respondents' Demographic Profile**

| **Variable** | **Category** | **Frequency (N)** | **Percentage (%)** |
|---|---|---|---|
| **Gender** | Male | 52 | 77.6 |
| | Female | 15 | 22.4 |
| **Age** | 20–29 years | 8 | 11.9 |
| | 30–39 years | 27 | 40.3 |
| | 40–49 years | 21 | 31.3 |
| | 50 years & above | 11 | 16.4 |
| **Educational Qualification** | OND/NCE | 6 | 9 |
| | HND/B.Sc. | 33 | 49.3 |
| | M.Sc./MBA | 21 | 31.3 |
| | PhD | 7 | 10.4 |
| **Work Experience** | 1–5 years | 10 | 14.9 |
| | 6–10 years | 23 | 34.3 |
| | 11–15 years | 18 | 26.9 |
| | Above 15 years | 16 | 23.9 |

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**Types of organisational culture are prevalent in construction organisations in Ekiti State**

To classify the organisational culture scores, the following benchmark was adopted based on a 5-point Likert scale. This system allows for a clear interpretation of how different cultural types are perceived within the organisations, ranging from "Very High" to "Very Low" based on the mean scores obtained as presented in table 3.

**Table 3: Benchmark for Interpretation of Mean Scores**

| Mean Score Range | Interpretation |
|---|---|
| 4.50 – 5.00 | Very High |
| 3.50 – 4.49 | High |
| 2.50 – 3.49 | Moderate |
| 1.50 – 2.49 | Low |
| 1.00 – 1.49 | Very Low |

Table 4 below presents the results of the types of organisational culture observed in construction firms within the region, along with their corresponding mean scores, interpretations, and rankings. The results indicate that Clan and Hierarchy cultures are the dominant organisational cultures in construction firms in Ekiti State, both recording high mean scores of 4.01 and 3.98, respectively. This suggests that these firms place strong emphasis on internal cohesion, teamwork, loyalty, formal structures, rules, and procedural compliance. The Adhocracy culture recorded a high but relatively lower mean score of 3.71, indicating moderate recognition of innovation and flexibility. In contrast, the Market culture had the lowest score (2.55), interpreted as moderate, reflecting a limited emphasis on competitiveness, results-orientation, and aggressive market-driven performance.

**Table 4: Types of Organisational Culture in Construction Firms**

| Culture Type | Mean Score | Interpretation | Rank |
|---|---|---|---|
| Clan (teamwork, participation) | 4.01 | High | 1st |
| Hierarchy (rules, procedures) | 3.98 | High | 2nd |
| Adhocracy (innovation, flexibility) | 3.71 | High | 3rd |
| Market (competition, productivity) | 2.55 | Moderate | 4th |

The findings presented in Table 5 demonstrate that clan culture is strongly embedded within the surveyed construction organisations, with an overall mean score of **4.01**, indicating a high level of adoption and emphasis on teamwork, collaboration, and participative management. The highest-rated item was encouragement of teamwork and collaboration (4.10). Management's promotion of participative decision-making and staff mentoring (Mean = 4.06) further indicates that organisational leaders actively encourage employee involvement in solving project-related problems. Such participatory leadership is likely to enhance employee commitment, facilitate knowledge sharing, and improve decision quality, particularly when managing complex construction activities. This dominant clan orientation aligns with the complex, project-based, and safety-critical nature of construction work, which requires high levels of coordination and collective effort (Cameron & Quinn, 2011; Ahadzie et al., 2020). In the Nigerian construction organisations, the prevalence of clan culture reinforces findings by Abubakar and Abdullahi (2022), who noted that collaboration and shared values are critical for managing site risks, quality, and interpersonal relationships in construction projects.

**Table 5: Clan Culture (Teamwork & Participation)**

| Statement | Mean | Rank |
|---|---|---|
| Teamwork and collaboration are encouraged | 4.1 | 1st |
| Management promotes participative decision-making | 4.06 | 2nd |

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| | | |
|---|---|---|
| Leadership supports mentorship & staff development | 4.06 | 2nd |
| Conflict resolution through open communication | 4.01 | 3rd |
| Employees participate in key decisions | 4.01 | 3rd |
| Employees are treated like family | 4.01 | 3rd |
| Employees show loyalty and commitment | 4 | 4th |

**Average Mean = 4.01 (High)**

In table 6, Adhocracy culture recorded a high mean score of 3.71, suggesting that innovation and organizational flexibility are valued but not strongly institutionalized. The relatively lower score on rewarding innovative ideas (3.64) indicates a gap between encouragement and actual support systems for creativity. The findings suggest that innovation within construction organisations remains largely reactive rather than strategic. Organisations appear willing to adopt innovation when necessary but have yet to establish institutional mechanisms that consistently encourage experimentation and continuous improvement. This finding is consistent with studies highlighting slow innovation adoption in developing countries' construction sectors due to resource constraints, risk aversion, and traditional practices (Niazi & Ibrahim, 2016).

**Table 6: Adhocracy Culture (Innovation & Flexibility)**

| **Statement** | **Mean** | **Rank** |
|---|---|---|
| Leaders encourage cross-department collaboration | 3.75 | 1st |
| Org. encourages innovation & creativity | 3.73 | 2nd |
| Leaders encourage flexibility to changes | 3.73 | 2nd |
| Firm adapts to new construction technologies | 3.72 | 3rd |
| Leadership supports experimentation | 3.72 | 3rd |
| Employees rewarded for innovative ideas | 3.64 | 4th |

**Average Mean = 3.71 (High)**

In table 7, Market culture was the least dominant with a moderate mean score of 2.55. This shows that construction firms in Ekiti State place less emphasis on aggressive competition and external market orientation. Although client satisfaction recorded the highest score (Mean = 2.61), the moderate rating suggests that customer orientation exists but is not pursued aggressively. The relatively low score on motivating staff to outperform competitors (2.48) further highlights an inward focus. This pattern contrasts with findings from developed economies, where strong market cultures are linked to higher efficiency and innovation (Alao & Aina, 2020). The relatively weak market orientation observed in this study may be attributed to the fragmented industry structure, heavy reliance on government contracts, and relationship-based business practices thereby limiting organisational competitiveness, particularly as the construction industry increasingly embraces digital transformation and performance-based procurement.

**Table 7: Market Culture (Result Orientation & Competitiveness)**

| **Statement** | **Mean** | **Rank** |
|---|---|---|
| Client satisfaction drives decisions | 2.61 | 1st |
| Achieving targets is priority | 2.58 | 2nd |
| Organisation values competitiveness | 2.55 | 3rd |
| Employees rewarded based on results | 2.55 | 3rd |
| Leaders motivate outperforming competition | 2.48 | 5th |

**Average Mean = 2.55 (Moderate)**

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In table 8, Hierarchy culture was the second most dominant culture type with a high mean score of 3.98. This reflects a strong preference for formal structures, clear chain of command, and adherence to rules and procedures. The high scores on safety and quality compliance are consistent with the high-risk environment of construction projects. The dominance of hierarchy alongside clan culture suggests that construction firms in the region adopt a balanced internal focus, emphasising both human relations and structural stability (Cameron & Quinn, 2011).

**Table 8: Hierarchy Culture (Control & Procedures)**

| Statement | Mean | Rank |
|---|---|---|
| Decision-making follows chain of command | 4.03 | 1st |
| Compliance with safety & quality regulations | 4.01 | 2nd |
| Strict adherence to rules & procedures | 3.99 | 3rd |
| Tasks structured; deviations discouraged | 3.99 | 3rd |
| Rewards based on seniority | 3.94 | 4th |

**Average Mean = 3.98 (High)**

**How Organisational Culture Affects Rework in Projects Executed by Construction Organisations in Ekiti State**

The results in Table 9 reveal that organisational culture has a significant influence on the occurrence of rework in construction projects in Ekiti State. The overall average mean score of 3.53 indicates high agreement among respondents. Ten out of the twelve statements recorded mean scores above 3.50, signifying strong agreement, while two items (related to hierarchy and innovation) were rated in the moderate-to-disagreement range. Poor communication between management and site workers emerged as the strongest contributor to rework (Mean = 3.93). Ineffective communication often results in design misunderstandings, incorrect work execution, delayed decision-making, and repeated construction activities. This supports extensive literature linking communication breakdowns to defects, rework, cost overruns, and schedule delays (Love et al., 2019). Similarly, the absence of a quality-oriented culture (3.87) and ineffective supervision (3.85) were strongly associated with increased rework, consistent with studies showing that weak quality management practices significantly elevate defect rates and poor project performance (Love & Edwards, 2013). Quality culture encourages employees to identify potential defects early, comply with established standards, and continuously improve work processes, thereby reducing the occurrence of rework. Likewise, accurate documentation provides clear guidance for project execution and minimises ambiguity during construction. A blame-oriented culture (3.70) and limited employee participation in decision-making (3.70) were also identified as important factors. These findings align with research indicating that psychological safety and open error-reporting systems are essential for organisational learning and rework reduction (Newman et al., 2017). blame-oriented environments discourage employees from reporting mistakes, thereby allowing defects to persist until corrective work becomes unavoidable. Leadership's role in prioritising quality was equally acknowledged, reinforcing the view that leaders shape organisational behaviour and quality outcomes (Northouse, 2022).

However, respondents disagreed that strong hierarchical cultures cause delays and rework (Mean = 2.91) and that flexible/innovative cultures significantly reduce rework (Mean = 2.73). This perception suggests that, within Nigerian construction industry, formal structures and procedures are viewed as necessary for control and quality assurance rather than as impediments. This contrasts with findings from more developed construction markets, where excessive bureaucracy is often seen as a barrier to efficiency (Li., 2022). The relatively low recognition of innovation's benefits further highlights the traditional orientation of construction firms in the region and the slow adoption of innovative practices (Aichouche et al., 2022). The findings indicate that organisational culture influences rework primarily through communication effectiveness, leadership commitment, teamwork, quality orientation, and supervision rather than through organisational flexibility or market competitiveness. Consequently, construction organisations seeking to reduce rework

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should focus on strengthening communication systems, promoting collaborative leadership, institutionalising quality values, and encouraging employee participation in project decision-making.

**Table 9: Effect of Organisational Culture on Rework**

| S/N | Statement | Mean Score | Interpretation | Rank |
|---|---|---|---|---|
| 1 | Poor communication between management and site workers contributes to rework. | 3.93 | Agree | 1st |
| 2 | Absence of a quality-oriented culture increases material wastage and rework costs. | 3.87 | Agree | 2nd |
| 3 | Ineffective supervision and control mechanisms lead to repeated mistakes on site. | 3.85 | Agree | 3rd |
| 4 | Poor documentation and adherence to standard procedures result in frequent rework. | 3.85 | Agree | 3rd |
| 5 | A weak organizational culture increases the frequency of rework on projects. | 3.76 | Agree | 5th |
| 6 | Lack of teamwork and collaboration among employees often results in design or construction errors. | 3.75 | Agree | 6th |
| 7 | A blame-oriented culture discourages workers from reporting mistakes that could prevent rework. | 3.7 | Agree | 7th |
| 8 | Lack of employee participation in decision-making contributes to errors that cause rework. | 3.7 | Agree | 7th |
| 9 | When leadership fails to prioritize quality, rework incidents tend to rise. | 3.67 | Agree | 9th |
| 10 | A culture that promotes continuous learning and improvement helps to minimize rework. | 3.63 | Agree | 10th |
| 11 | Firms with strong hierarchical cultures experience delays and rework due to slow decision-making. | 2.91 | Disagree | 11th |
| 12 | Flexible and innovative organisational culture reduces the likelihood of rework. | 2.73 | Disagree | 12th |

**Average Mean Score = 3.53 (High Agreement)**

**Factor Analysis of Organisational Culture Variables Influencing Rework**

To identify the underlying dimensions of organisational culture affecting rework, factor analysis was performed on the twelve variables. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.782 (above the recommended threshold of 0.60), and Bartlett's test of sphericity was statistically significant ($\chi^2$ = 312.45, $p < 0.001$), confirming the suitability of the data for factor analysis. According to Hair et al. (2022), KMO values above 0.70 indicate that the extracted factors are reliable representations of the underlying constructs. Using Principal Component Analysis (PCA) with Varimax rotation, three components with eigenvalues greater than 1.0 were extracted. These components collectively explained 72.8% of the total variance, indicating a robust factor structure.

In table 10; the factor analysis variabes were grouped into three (3) component. Factor 1 which is Communication & Leadership, loaded heavily on items relating to communication, teamwork, employee participation, blame culture, and leadership behaviour. This factor underscores the critical role of relational and managerial practices in influencing rework. The emergence of this factor confirms that rework is primarily a managerial rather than purely technical phenomenon. Construction defects frequently originate from ineffective communication, inadequate coordination, and poor leadership rather than deficiencies in engineering knowledge alone (Cameron and Quinn, 2011; Love et al., 2016)

Factor 2 is Quality & Control; comprised of items associated with quality orientation, supervision, documentation, and procedural adherence. It confirms that structured control mechanisms remain essential in

minimising errors and rework. This finding reinforces Total Quality Management principles, which emphasise prevention rather than correction of defects. Previous studies have consistently demonstrated that disciplined quality control processes significantly reduce rework, improve productivity, and enhance overall project performance (Josephson & Hammarlund, 1999; Love & Edwards, 2013).

Factor 3 which is Innovation & Flexibility captured organisational learning, innovation, flexibility, and adaptive management practices. Although this factor explained a comparatively smaller proportion of the total variance, it nevertheless represents an important emerging dimension (yet underdeveloped) of organisational culture in rework reduction. This finding suggests that while construction organisations acknowledge the importance of innovation, its practical implementation remains limited. Given the growing adoption of digital technologies such as BIM, Artificial Intelligence, digital quality inspection, and integrated project management systems, strengthening innovation-oriented organisational cultures may substantially reduce construction errors in the future (Akinradewo et al., 2024).

Overall, the factor analysis reveals that **organisational culture influences rework through three interconnected dimensions: Communication and Leadership, Quality and Control, and Innovation and Flexibility.** Among these**, Communication and Leadership emerged as the dominant driver,** indicating that managerial practices and interpersonal relationships have a greater influence on rework than technological or procedural factors alone. This suggests that reducing rework requires a holistic organisational strategy that combines effective leadership, collaborative communication, robust quality management systems, and continuous organisational learning rather than relying solely on technical interventions.

**Table 10: Rotated Component Matrix Showing Grouping of Organisational Culture Variables**

| Statement | Factor 1: Communication & Leadership | Factor 2: Quality & Control |
|---|---|---|
| Poor communication between management and site workers contributes to rework. | 0.812 | |
| Absence of a quality-oriented culture increases material wastage and rework costs. | | 0.841 |
| Ineffective supervision and control mechanisms lead to repeated mistakes on site. | | 0.815 |
| Poor documentation and adherence to standard procedures result in frequent rework. | | 0.783 |
| A weak organizational culture increases the frequency of rework on projects. | 0.701 | |
| Lack of teamwork and collaboration among employees often results in design or construction errors. | 0.725 | |
| A blame-oriented culture discourages workers from reporting mistakes that could prevent rework. | 0.812 | |
| Lack of employee participation in decision-making contributes to errors that cause rework. | 0.778 | |
| When leadership fails to prioritize quality, rework incidents tend to rise. | 0.733 | |
| A culture that promotes continuous learning and improvement helps to minimize rework. | | 0.796 |
| Firms with strong hierarchical cultures experience delays and rework due to slow decision-making. | | 0.719 |
| Flexible and innovative organisational culture reduces the likelihood of rework. | | 0.828 |

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.*

**Cultural Attributes that Reduce Rework and Enhance Profitability in Construction Organisations in Ekiti State**

The results in Table 11 show that construction professionals strongly agreed that specific cultural attributes can significantly reduce rework and improve profitability in construction projects. The overall average mean score of 3.72 indicates high agreement that the identified cultural attributes contribute significantly to improved

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construction performance. Fourteen out of the seventeen attributes recorded mean scores above 3.50, suggesting that respondents recognised quality-driven organisational practices as essential mechanisms for preventing defects, reducing waste, and improving project outcomes. While participative decision-making and client-focused orientation were rated in the moderate-to-disagreement range.

Leadership commitment to quality (Mean = 4.12) and ethical culture with accountability (Mean = 4.12) ranked highest, underscoring the critical role of top management's visible commitment and ethical standards in preventing corner-cutting and rework hereby minimising quality failures and associated rework costs. These findings support the work of Schein & Schein (2017), who argued that leadership behaviours shape organisational culture and determine employees' commitment to quality improvement. The high ranking of **clear contractual arrangements and early contractor involvement (Mean = 4.10)** demonstrates the importance of integrating project stakeholders during the early stages of project delivery. Early collaboration improves constructability, reduces design inconsistencies, and minimises changes during construction, thereby lowering the likelihood of rework. This finding agrees with Love et al. (2018), who reported that early stakeholder engagement significantly improves project coordination and reduces avoidable defects. Likewise, Elhag et al. (2020) observed that collaborative procurement approaches improve communication and reduce project uncertainties that frequently result in costly rectification works. Other highly rated attributes include investment in staff training (4.09), interdisciplinary coordination (4.07), and psychological safety for error reporting (4.06). These findings highlight the importance of knowledge development, collaboration, and a no-blame environment in enhancing project outcomes.

Conversely, participative decision-making and strong client orientation received lower ratings (both 2.93), suggesting these practices are either weakly implemented or not strongly perceived as rework-reduction strategies. The relatively low emphasis on employee participation may reflect the traditional hierarchical structure commonly found in Nigerian construction organisations, where decision-making remains centralised. This is consistent with observations in the Nigerian construction industry, where hierarchical tendencies and fragmented client relationships often limit empowerment and client-driven quality improvement (Ibem et al., 2021).

The findings indicate that construction organisations seeking to improve profitability should prioritise leadership commitment, ethical behaviour, workforce competency, interdisciplinary collaboration, structured quality management systems, and early stakeholder involvement. These cultural attributes not only reduce rework but also minimise material wastage, schedule overruns, and unnecessary expenditure, thereby improving overall project profitability.

**Table 11: Cultural Attributes That Reduce Rework and Enhance Profitability**

| S/N | Cultural Attribute | Mean Score | Decision | Rank |
|---|---|---|---|---|
| 1 | Leadership committed to quality (doing it right first time) | 4.12 | Agree | 1st |
| 2 | Ethical culture & accountability (no corner-cutting) | 4.12 | Agree | 1st |
| 3 | Clear contractual arrangements & early contractor involvement | 4.1 | Agree | 3rd |
| 4 | Investment in worker training & competency development | 4.09 | Agree | 4th |
| 5 | Frequent interdisciplinary coordination (design–construction) | 4.07 | Agree | 5th |
| 6 | Staff encouraged to report errors/near-misses without punishment | 4.06 | Agree | 6th |
| 7 | Clear quality procedures consistently followed on site | 4.06 | Agree | 6th |
| 8 | Use of standardized procedures & checklists | 4.05 | Agree | 8th |
| 9 | Adequate formal channels for raising issues early | 4.03 | Agree | 9th |
| 10 | Empowerment of site staff to stop work & fix issues immediately | 3.99 | Agree | 10th |

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| | | | | |
|---|---|---|---|---|
| 11 | Project leaders visibly support rework-prevention actions | 3.99 | Agree | 10th |
| 12 | Incentives/rewards for quality performance (zero-defects) | 3.99 | Agree | 10th |
| 13 | Routine inspections & formal QA/QC systems | 3.97 | Agree | 13th |
| 14 | Strong subcontractor selection & management | 3.91 | Agree | 14th |
| 15 | Root-cause reviews of rework events | 3.9 | Agree | 15th |
| 16 | Participative decision-making & employee involvement | 2.93 | Disagree | 16th |
| 17 | Client-focused orientation | 2.93 | Disagree | 16th |

Average Mean Score = 3.72 (High Agreement)

**Factor Analysis of Cultural Attributes that Reduce Rework and enhance profitability**

The factor analysis provides additional insight into the underlying cultural dimensions that explain rework reduction within construction organisations. The **Kaiser–Meyer–Olkin (KMO) value of 0.812** indicates excellent sampling adequacy, while the statistically significant **Bartlett's Test of Sphericity ($\chi^2 = 526.41$, $p < 0.001$)** confirms that meaningful relationships exist among the variables, making the dataset suitable for Principal Component Analysis (Hair et al., 2022). The extraction procedure identified **four principal components** explaining **71.4% of the total variance**, indicating that these four latent dimensions adequately represent the cultural practices influencing rework reduction in construction organisations.

The four factors in table 12 provide a clear framework for understanding cultural drivers of rework reduction:

Factor 1: Leadership & Quality Culture - Encompasses leadership commitment, ethical accountability, quality procedures, QA/QC systems,and subcontractor management. This dimension emphasises top-down commitment and disciplined quality practices as foundational to minimising rework. The high factor loadings indicate that these variables collectively represent a strong quality culture capable of reducing defects and preventing costly rework. This finding supports Schein & Schein (2017), who argued that leaders create organisational culture through their priorities, behaviours, and management practices.

Factor 2: Knowledge & Collaboration - Includes staff training, interdisciplinary coordination, error reporting, employee empowerment and participative decision-making. It highlights the importance of human capital development and collaborative environments in minimising construction errors. Construction projects require continuous interaction among architects, engineers, quantity surveyors, builders, and site personnel; consequently, organisations that promote collaboration are better positioned to prevent coordination failures that commonly generate rework. Similar observations were reported by Love et al. (2016), who found that collaborative organisational cultures improve knowledge transfer and reduce construction errors.

Factor 3: Systematic Process Control - consists of standard operating procedures, root-cause investigations, formal reporting mechanisms, and early contractor involvement. This factor underscores the value of structured management systems in preventing errors and achieving consistent quality outcomes. Organisations that systematically identify the underlying causes of defects, standardise work processes, and involve contractors early in project planning are more capable of preventing recurring failures. This finding supports the quality management philosophy advanced by ISO 9001, which emphasises process standardisation, continuous improvement, and preventive action.

**Factor 4: Client and Motivation Alignment -** comprises of client orientation, quality incentives, and visible leadership support for rework prevention. This dimension suggests that organisations improve quality performance when employees are motivated through recognition and when project objectives remain closely aligned with client expectations. Although this factor explained a smaller proportion of the total variance than the first three components, it nevertheless demonstrates that behavioural motivation and customer focus remain important contributors to sustainable quality improvement.

Collectively, these findings demonstrate that rework reduction and improved profitability in construction organisations depend on an integrated organisational culture approach which combines strong leadership commitment**, collaborative learning, systematic quality management, and motivational alignment**. Rather than relying on isolated quality initiatives, construction organisations should develop comprehensive organisational systems that simultaneously strengthen leadership practices, employee competence, process discipline, and stakeholder collaboration. These findings are consistent with previous studies demonstrating that integrated organisational cultures produce superior construction performance, lower defect rates, and improved project profitability (Love et al., 2018; Teräväinen et al., 2021; Cameron & Quinn, 2011).

**Table 12: Rotated Component Matrix Showing Grouping of Cultural Attributes that Reduce Rework and Enhance Profitability**

| Cultural Attribute | Factor 1: Leadership & Quality Culture | Factor 2: Knowledge & Collaboration | Factor 3: Systematic Process Control | Factor 4: Client & Motivation Alignment |
|---|---|---|---|---|
| Leadership committed to quality (doing it right first time) | 0.834 | | | |
| Ethical culture & accountability (no corner-cutting) | 0.816 | | | |
| Clear quality procedures consistently followed on site | 0.781 | | | |
| Routine inspections & formal QA/QC systems | 0.745 | | | |
| Strong subcontractor selection & management | 0.713 | | | |
| Investment in worker training & competency development | | 0.812 | | |
| Frequent interdisciplinary coordination (design–construction) | | 0.801 | | |
| Staff encouraged to report errors/near-misses without punishment | | 0.773 | | |
| Empowerment of site staff to stop work & fix issues immediately | | 0.745 | | |
| Participative decision-making & employee involvement | | 0.721 | | |
| Use of standardized procedures & checklists | | | 0.811 | |
| Root-cause reviews of rework events | | | 0.793 | |
| Adequate formal channels for raising issues early | | | 0.752 | |
| Clear contractual arrangements & early contractor involvement | | | 0.731 | |
| Client-focused orientation | | | | 0.836 |
| Incentives/rewards for quality performance (zero-defects) | | | | 0.804 |
| Project leaders visibly support rework-prevention actions | | | | 0.772 |

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization*

## CONCLUSION AND RECOMMENDATION

This study examined the influence of organisational culture on rework in construction organizations. The findings revealed that Clan, Hierarchy, and Adhocracy cultures are prevalent in construction organizations, with Clan culture being the most dominant. The study established that organisational culture significantly influences rework, primarily through communication effectiveness, leadership commitment, quality orientation, teamwork, and supervision, rather than through flexibility or market competitiveness. Poor communication, absence of quality orientation, and weak supervision were identified as the major cultural-driven causes of rework. Furthermore, the study identified key cultural attributes for rework reduction to include leadership commitment to quality, ethical culture and accountability, workforce competence, clear contractual arrangements, and early contractor involvement. Factor analysis confirmed that rework reduction and performance improvement depend on an integrated cultural approach encompassing strong leadership and quality culture, collaborative learning, systematic process control, and client motivation alignment. Overall, the findings indicate that managerial practices and interpersonal relationships are more critical in reducing rework than technological factors alone. Therefore, fostering a positive organisational culture focused on

communication, quality, and leadership is essential for minimizing rework and improving profitability in construction projects.

On the basis of findings of the study, it is recommended that the construction organisation should Strengthen Leadership Commitment to Quality, Enhance Communication Channels, Promote Ethical Culture and Accountability, Adopt Systematic Quality Management Systems, Encourage Early Stakeholder Involvement. Implementing these cultural strategies will help construction organizations minimize rework, improve operational efficiency, and enhance project performance and profitability.

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