

GOVERNANCE DRIVEN TOTAL QUALITY MANAGEMENT IN
MANUFACTURING: A POLICY AND GOVERNANCE FRAMEWORK FOR
SUSTAINABLE QUALITY AND INTEGRITY

by

AKHILA LAKSHMINIVAS AJAYAN, M.com, CS, MBL, MBA

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AKHILA LAKSHMINIVAS AJAYAN, M.com, CS, MBL, MBA

Supervised by

Ivica Katavic, PhD

APPROVED BY



Dissertation chair

RECEIVED/APPROVED BY:

Admissions Director



Dedication

This work is dedicated to my family for their constant support, encouragement, and belief in my ability to achieve this milestone.

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ABSTRACT

GOVERNANCE-DRIVEN TOTAL QUALITY MANAGEMENT IN
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Akhila Lakshminivas Ajayan

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This study examines how the mechanisms of governance can be incorporated into total quality management (TQM) systems to enhance the sustainable quality performance and integrity of manufacturing contexts. Although TQM has been semi-formally engaged in continuous improvement, efficiency, and customer satisfaction, it tends to be poor with formal governance systems that maintain accountability, compliance, and consistency in the long term. The need to integrate quality management with governance systems is increasing due to mounting regulatory and governance pressures, digital transformation, and stakeholder demands. This study used a dominant quantitative explanatory research design with a supplementary content analysis of documents based on a post-positivist approach. Respondents (managers) in manufacturing organizations with well-established quality management systems were used as the source of data. The relationships among TQM maturity, governance integration, and sustainable quality outcomes were analyzed using descriptive statistics, reliability analysis, regression, moderation analysis, and mediation analysis. The results showed that despite the generally positive perceptions of TQM maturity, the existence of governance by the respondents, and sustained quality

outcomes, the relationship hypotheses of direct, moderating, and mediating were not statistically supported in the current data. Institutionally prevalent governance integration was identified in manufacturing contexts, but its direct, conditional, and indirect impacts on sustainable quality outputs were not significantly determined. These findings indicate that the conceptual relevance and contextual support of the proposed GDTQM framework are corroborated, but the explanatory power was not empirically supported within the present sample. The research indicates that, to obtain sustainable quality in modern manufacturing, operational improvement alone is insufficient. This necessitates the systematic incorporation of governance mechanisms into quality systems. The proposed Governance-Driven Total Quality Management (GDTQM) framework offers a viable strategy for organizations to enhance transparency, accountability, and performance in the long term. This study can help both theory and practice by relating to governance structures and quality management in a meaningful yet practical way.

Keywords: *Governance-Driven Total Quality Management (GDTQM), Total Quality Management (TQM), Governance Integration, Sustainable Quality Outcomes, Manufacturing Organizations, Organizational Integrity, Quality Management Systems*

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CHAPTER I: INTRODUCTION

1.1 Introduction

Total Quality Management (TQM) has long been recognized as a systematic approach to management, focusing on continuous improvement, customer orientation, process optimization, and organizational excellence. In manufacturing environments, TQM has traditionally aided defect reduction, operational efficiency, and performance consistency using systematic quality control and employee involvement mechanisms. However, contemporary manufacturing is no longer solely based on operational performance alone. Increasing regulatory oversight, globalized supply chains, digital transformation, environmental accountability, and stakeholder scrutiny have changed the expectations of quality management systems (Ali, 2024, Carvalho et al., 2024). Consequently, quality is no longer assessed by productivity or conformance metrics but by sustainability, transparency, compliance, and ethical integrity (Goetsch and Davis, 2021) (Kumar et al., 2011).

Recent developments in Quality 4.0 and digitalized validation systems show that the management of manufacturing quality has evolved to an integrated socio-technical system that requires structured governance oversight (McDermott, Antony, and Sony, 2024). While TQM focuses on leadership commitment and cultural alignment, it is now known that traditional implementations do not contain formal governance mechanisms that can institutionalize accountability and policy coherence. In many organizations,

quality practices are at the operational level but are structurally unavailable to corporate governance frameworks. This gap in structure is especially important in an environment where there is a need for regulatory amendments, for example, those concerning climate action issues as part of the ISO management system, to provide board-level accountability and documented oversight (ISO/TC 176, 2024).

Governance-driven total quality management (GDTQM) is a novel conceptual response to this limitation. GDTQM adds to traditional TQM concepts by adding formal governance structures, policy oversight mechanisms, ethical leadership accountability, and sustainability mandates to the quality management architecture. Assessing governance in terms of "hidden" quality "attitude" rather than explicit integrated quality "factor," in GDTQM governance is an integrated and measurable factor in quality management. The integration of a board audit, a process of compliance, risk mitigation, and a documented accountability process into the practice of quality processes. In doing so, it considers quality enhancement regarding sustainability and organizational integrity long-term goals (Padma, Ganesh, and Rajendran 2008). This integration problem is highly sensitive to manufacturing organizations.

Unlike the service sector, manufacturing operations involve complex production networks, interdependencies between suppliers, considerations of environmental impact, and complex compliance-intensive processes. Quality failures in such environments can lead not only to operational losses but also to damage to reputation, regulations, the environment, and loss of trust among stakeholders. The inclusion of governance in TQM is thus at the heart of ensuring that quality systems do not merely work towards

efficiency but also ensure integrity and sustainable performance outcomes (Gharakhani et al., 2019).

Sustainability has become a central characteristic of contemporary quality management systems. Climate-related amendments to ISO standards, pressures of ESG reporting, and stakeholder expectations have enabled the expansion of quality beyond product conformance to include environmental responsibility, ethical sourcing, and long-term resilience (ISO and IAF, 2024; Navarro and Naranjo, 2025). Sustainable quality entails institutionalized mechanisms to prevent opportunistic practices (Mansouri, Golmohammadi, and Miller, 2022) and strengthen compliance discipline and incorporate ethical standards into decision-making processes. This institutional support is provided through governance structures, formalization of oversight, descriptive accountability, and the connection of the policy framework to operational performance.

In the current scenario, integrity means the congruence of stated quality values with actual practice in the organization. The lack of alignment between governance and TQM initiatives poses a risk of TQM initiatives becoming either symbolic or compliance-based processes rather than enduring capability systems. Frameworks that emphasize governance to enhance integrity through the provision of transparency in reporting, policy application, and systematic evaluation of risks related to quality. They also reduce the chances of formal quality certifications and the actual manner in which the organization will function.

Against this backdrop, there is a growing necessity to transform the paradigm of TQM thinking into a more governance-focused paradigm that is sensitive to

contemporary manufacturing realities. GDTQM is not implemented in place of traditional TQM principles; rather, it is a strengthening tool that includes policy coherency, ethical oversight, and accountability in sustainability in quality systems. This composite manner of viewing matters acknowledges the view that sustainable quality operation cannot be carried out by streamlining processes or by devotion to the culture but must be carried out by formal governance alignment, which makes the sense of responsibility and strategic thinking long-term. Moreover, the turn towards governing-oriented quality management is a manifestation of a broader turn in manufacturing processes from developed quality control to comprehensive guarantee. In the current environment, quality is increasingly being assessed. on the predictability of the process, governance, and compliance with policies and practices. This means that governance is no longer an external element of quality management but is an element that becomes an integral part of the architecture based on creating, restoring, and sustaining quality credibility in the long run (Carvalho et al., 2024; ISO and IAF, 2024). The present study fits into this context as it explores the capability of synchronizing governance mechanisms with TQM practices in manufacturing contexts to improve sustainable quality and integrity. The background that illustrates the need for and relevance of the problem faced in the study is provided in the following section.

1.2 Background

Today, manufacturing practices take place under more advanced and transformed organizational conditions than ever before. Over the last five years, we have faced the era of global manufacturing with disrupted production, regulatory crises, digital acceleration,

climate change responsibility, and increased scrutiny of investors and society. These developments have fundamentally changed the way quality, compliance, and performance are viewed in industrial situations.

The inclusion of climate change considerations in international management system standards in 2024 was a major change in the regulatory requirements for certified organizations (ISO/TC 176, 2024). Manufacturing firms are no longer expected to simply show that they are in conformance with operations; they are also expected to measure climate-related risks and incorporate sustainability thinking into quality and governance systems. Simultaneously, there has been an increase in ESG reporting requirements and stakeholder-driven transparency demands, which has increased expectations for traceability, ethical sourcing, and compliance discipline. Quality systems are thus no longer limited to metrics of operational efficiency but are measured in terms of broader sustainability and integrity standards.

Simultaneously, the shift to digitalized production systems and Quality 4.0 technologies has also led to a higher degree of opportunity and risk exposure. Developed analytics, automation, intelligent sensors, and built-in enterprise systems enable better process control and predictive quality control (Carvalho et al., 2024; McDermott, Antony, and Sony, 2024). However, the digitalization of integration exposes cybersecurity threats, data integrity, and governance complexities, which the historic TQM architectures were not originally designed to address. Governance/oversight problems can easily lead to operational, financial, and reputational crises due to the growing interconnectedness of manufacturing systems.

Real-life data demonstrate that despite TQM concepts being currently applied and embraced, numerous non-compliance instances of quality failures and non-compliance still occur within different industries (Ali, 2024; Navarro and Naranjo, 2025). In most cases, even though organizations may be formally certified and have written systems of quality, they may simultaneously have ethical breaches, supply chain violations, or even non-compliance with the environment. This deviation shows that quality management practices might not be sufficient to guarantee quality integrity without systematic support from governance. The perpetuation of these failures has led to a re-emphasis on the institutional underpinnings of quality systems.

Another contextual change that supports the relevance of this study is the increasing reliance of manufacturing contexts on long-term supplier ecosystems. Given today's more and more outsourced sourcing, subcontracting, logistics, and compliance assurance activities, variations in internal processes and the governance of inter-organizational processes are more and more the root of quality failure events. Given this reality, a quality system must perform operational and coordination functions by ensuring traceability, better escalation, and accountability practices in the context of the entire manufacturing network. This supports the idea that governance integration is not just an administrative improvement but a structural imperative to attain sustainable quality management in complex manufacturing settings (Ali, 2024; Navarro and Naranjo, 2025).

Accountability at the board level for risk has also increased at an alarming rate in recent years. Governance codes and corporate reporting frameworks are becoming more insistent on directors demonstrating active risk management in sustainability,

compliance, and operational integrity systems (OECD, 2015; ISO and IAF, 2024). In manufacturing applications, this increase puts a strain on executive management to ensure that quality management systems are entwined with the corporate governance system and not isolated from operational programs. This disconnect may lead to a structural disjuncture between policy promises and the provision of operations.

In addition, the level of expectations of stakeholders due to ethical conduct and openness has increased. Investors are no longer only looking at productivity and profitability but are now looking at environmental performance, supply chain ethics, governance robustness, etc.. There is a customer demand for product traceability and responsible sourcing in the food industry. Regulators impose penalties for non-compliance with environmental and safety standards. The multiple layers of expectations make it even more strategic to incorporate governance into the operational quality systems.

The cumulative effect of these developments has created a context in which conventional interpretations of TQM are no longer adequate for addressing contemporary challenges in manufacturing. While TQM is still at the core of process improvement and customer satisfaction, the more contemporary setting demands formal mechanisms to build accountability, policy coherence, sustainability alignment, and ethical oversight directly into the quality architectures. The overlap between regulatory changes, digital changes, sustainability requirements, and an increased scope of governance has made GDTQM an opportune and strategically relevant research area.

It is in this current environment that this research study came into view. The growing difficulty in meeting the required expectations of manufacturing governance, despite quality failures and the formal application of TQM in manufacturing systems, indicates the need for a systematic approach to developing a quality system that includes the introduction of governance mechanisms in the quality system. The formulation of the specific research problem in light of the above is discussed below.

1.3 Research Problem

In manufacturing, there are increasingly stringent regulatory, sustainability, and stakeholder requirements and pressures, along with complex supply chains and performance. While TQM has been increasingly adopted in manufacturing contexts to promote operational quality and efficiency, many organizations continue to suffer from quality lapses, regulatory non-compliance, breaches, ethical dilemmas, and reputational challenges. This study specifically addresses the lack of integration of a governance-focused framework that explicitly links TQM with governance oversight and accountability measures, sustainability and integrity reporting, and communication in the manufacturing context. While many firms have a structurally embedded quality management system, governance tasks for oversight, compliance, ethics (Bytyci, Qerimi, and Qerimi, 2023), accountability, and sustainability are not formally incorporated into the quality systems. Consequently, quality programs may implement short-term improvements but may not necessarily institutionalize consistent, sustainable quality outcomes and integrity-based performance over the long term. This study addresses the need for an integrated and empirical approach to GDTQM to link governance

mechanisms, quality management practices, and sustainable performance outcomes in the manufacturing sector.

Thus, this problem is both practical and theoretical. Manufacturing companies require quality systems that remain viable in the face of regulatory uncertainty, environmental and sustainability concerns, and stakeholder expectations for accountability and transparency. Academically, the TQM literature has not yet conceptualized governance integration as a unique structural entity with the potential to affect sustainability and integrity of quality outcomes. This lack of integration leaves a gap in explaining the relationship between formal quality adoption and the long-term outcomes of integrity-based performance.

1.4 Purpose of Research

This study aims to establish and empirically test a governance-driven GDTQM model for manufacturing contexts that integrates corporate governance structures, policy tools, and quality management systems to improve sustainable quality performance and integrity in manufacturing contexts.

This study aimed to:

- 1) Investigate the effect of TQM maturity on sustainable quality performance in manufacturing.
- 2) Investigate the relationship between governance integration and sustainable quality outcomes in manufacturing contexts.
- 3) Examine the moderating effect of governance integration on the relationship between TQM maturity and sustainable quality outcomes.

4) Examine whether governance integration mediates the relationship between TQM maturity and sustainable quality outcomes.

This study not only tests specific hypotheses but also seeks to explain whether governance integration can be considered a contextual variable or a foundational element of contemporary quality architecture. By including governance integration in the empirical model, this study aims to offer a more modern perspective on how manufacturing contexts may transition from short-term quality improvement to more sustainable, accountable, and sustainable quality performances. Thus, this study is both explanatory and normative.

This study contributes both theoretically and practically by providing an integrated framework of governance and quality management architecture in modern manufacturing contexts. It aims to offer an evidence-based approach to integrate accountability, policy coherence, and sustainability into corporate quality management systems.

1.5 Research questions

RQ1: What is the effect of TQM maturity on sustainable quality in manufacturing organizations?

RQ2: What is the relationship between governance integration and sustainable quality outcomes in manufacturing organizations?

RQ3: Does governance integration moderate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

RQ4: Does governance integration mediate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

1.6 Significance of the Study

The present study is valuable in the context of quality management theory because it helps better explain why TQM is successful in certain situations and fails in others. Traditional and empirical TQM studies suggest that TQM may be a source of competitive advantage, provided that it is applied in a coherent and integrated manner within the organization (Sila and Ebrahimpour, 2005; Nair, 2006). However, sustained advantage is based on institutionalization and organizational capabilities that are difficult to imitate, implying that governance systems can serve as capability infrastructure that facilitates the consistency and sustainability of quality practices (Van der Wiele and Brown, 2002; Terziovski and Samson, 1999).

Moreover, contemporary research outlines the need for more in-depth studies on sustainability, digitalization, and next-generation quality systems (Ali, 2024), and Quality 4.0 scholarly articles highlight the capability roadmap and governance-like structures necessary to handle the digital transition (Carvalho et al., 2024). This study advances TQM theory from a contemporary systems perspective that is responsive to evolving standard requirements, sustainability pressures, and external stakeholder expectations (ISO/TC 176, 2024).

This study is also significant at the practical and policy levels. It provides managers a more tangible way of thinking about the lack of fit between formal quality

schemes and sustainable integrity in practice, unless this is backed by explicit oversight and accountability mechanisms. For regulators, auditors, and certification bodies, this study contributes to the ongoing discourse on how management systems should evolve in response to sustainability-linked expectations and governance transparency requirements. In this sense, the research extends the meaning of quality from operational conformance to institutionally defensible performance in complex manufacturing environments (ISO/TC 176, 2024; ISO and IAF, 2024; Corbett and Luca, 2023).

1.7 Definition of Key Terms

Term 1: Corporate Governance Mechanisms

Formal organizations, procedures, and control systems, including board management, compliance controls, risk management practices, and accountability frameworks, are designed to ensure responsible management and alignment with stakeholder and regulatory expectations (ISO & IAF, 2024).

Term 2: Governance-Driven Total Quality Management (GDTQM)

The TQM framework embeds corporate governance mechanisms, such as board oversight, policy enforcement, compliance monitoring, and accountability structures, within traditional TQM systems to ensure sustainable quality performance and organizational integrity (Navarro and Naranjo, 2025).

Term 3: Policy and Governance Framework

An organized pattern of formal regulations, documented procedures, supervising responsibilities, and accountability mechanisms that guide organizational decision-

making and ensure compliance, transparency, and ethical conduct in operational systems is required in the future.

Term 4: Quality 4.0

The incorporation of digital technologies, progressive analytics, automation, and data-driven decision systems into quality management practices enhances real-time monitoring, predictive control, and governance transparency in manufacturing environments (Carvalho et al., 2024).

Term 5: Sustainable Quality Performance

An organization's capability to uphold dependable quality outcomes over time while integrating environmental responsibility, regulatory compliance, operational efficiency, and long-term stakeholder value (Navarro & Naranjo, 2025).

Term 6: Total Quality Management (TQM)

A multifaceted management approach focused on ongoing enhancement, customer satisfaction, process efficiency, and organization-wide quality accountability is aimed at enhancing operational and performance outcomes in manufacturing systems (Ali, 2024; McDermott, Antony, and Sony, 2024).

Term 7: Organizational Integrity

The degree of consistency between an organization's declared quality commitments, governance policies, and actual operating practices, particularly in relation to compliance, ethical conduct, traceability, and accountability.

Term 8: TQM Maturity

TQM principles are not merely adopted in formal terms but are institutionalized through routinized processes, leadership commitment, cross-functional coordination, and continuous improvement mechanisms that support long-term organizational performance (Ali, 2024).

1.8 Summary

This chapter introduced the dissertation in terms of the importance of overcoming governance mechanisms and total quality management (TQM) in today's manufacturing industry. This chapter established the influence of changing regulatory, sustainability, digital, and stakeholder expectations on quality management. It revisited the problem, purpose, questions, and significance of the research and identified key research terms. This sets the stage for governance-driven TQM as a convenient conceptual alternative to the framing of TQM in the manufacturing industry. The following section builds on the literature and establishes the theoretical and conceptual foundations of the proposed framework.

CHAPTER II: REVIEW OF LITERATURE

2.1 Introduction

This chapter aims to establish a rigorous scholarly foundation for the dissertation's central argument: that quality performance in manufacturing organizations is not merely based on the maturity of total quality management (TQM) practices but also on the extent to which governance mechanisms are structurally embedded within the quality management system. The research problem in Chapter 1 is described as a gap in the quality of governance in most manufacturing situations. TQM is used as an operational improvement program, and governance mechanisms that entrench accountability, auditability, and corrective learning are loosely embedded in the quality architecture. The latter has also taken on a more consequential nature in modern conditions, where external stakeholders evaluate not only quality outcomes (e.g., by reducing the number of defects or having conformance) but also the credibility of the governance of the management system producing such outcomes (ISO/TC 176, 2024; ISO and International Accreditation Forum (IAF), 2024; Ali, 2024).

In this framework, the literature review performs three interdependent functions. First, it explains the conceptualization of TQM maturity in present-day scholarship and why TQM as a management philosophy continues to be powerful in the manufacturing industry. Although conventional literature identifies TQM in terms of the commitment of top management, customer focus, process control, and constant improvement (Deming, 1986; Juran and De Feo, 2010; Oakland, 2014; Dale, van der Wiele and van Iwaarden,

2019; Antony, Snee and Hoerl, 2017), new studies are (Huang, Lee and Kim, 2024) increasingly distinguishing between superficial adoption and mature institutionalization, in which the extent to which TQM is institutionalized might be a stronger predictor of long-term results than formal adoption itself (Ali, 2024). Second, this chapter builds the theoretical and empirical foundation for conceptualizing governance integration as a specific structural form of the quality system, which includes policy clarity, accountability design, escalation discipline, internal controls, audit integration, and structured management review. These governance systems are the infrastructure by which quality routines are regularized in leadership cycles and shifting forces of operation, especially in manufacturing environments exposed to high audit intensity and multi-level supply chain dependencies (OECD, 2015; ISO/TC 176, 2024). Third, the review summarizes modern evidence regarding the impact of digitalization and sustainability pressures, which, in combination, increase the governance aspect of quality management. Quality 4.0 research shows that digital monitoring and analytics have the potential to increase the capacity of measurement, but the realization of value relies on discriminating system design, data integrity, and governance controls to maintain traceability and accountability (Carvalho et al., 2024; McDermott, Antony and Sony, 2024). Simultaneously, standards-related events, in particular, the incorporation of climate change concerns into the expectations of management systems, indicate a change in what is regarded as credible quality system performance, which confirms the importance of quality architectures embedded in governance (ISO/TC 176, 2024; ISO and ISO and IAF, 2024).

In addition to the foundation setting, this chapter aims to answer the questions of concepts and model building directly. The literature review is thus not a descriptive catalogue of preceding studies but a systematic argumentation that leads to the conceptual framework of the dissertation. As per the level of analysis at the organizational level of the dissertation, this chapter elucidates what the study considers as the independent variable(s), dependent variable(s), and the structural mechanism(s) upon which relationships are anticipated to be maintained. TQM maturity is considered the main independent construct in this study, as it reflects the degree to which TQM principles and routines are introduced into leadership, processes, and improvement systems. The dependent construct is sustainable quality outcomes, which are understood as quality performance and credibility of compliance over time (e.g., continuous conformity reduction, decrease in incidences of nonconformities, and strictness in corrective-action closure). Governance integration is theorized to be a structural capability that is part of the quality system and directly contributes to quality integrity and conditions the effectiveness of TQM maturity, especially in environments defined by audit scrutiny, digital complexity, and sustainability-related expectations (OECD, 2015; Carvalho et al., 2024; ISO/TC 176, 2024). This language is consistent with the study's hypothesis: quality excellence will be institutionalized more in settings where improvement processes are sustained by governance arrangements to stabilize accountability, provide auditable evidence, and integrate learning.

To maintain transparency and academic integrity, this section begins with a report on the literature search and selection process. The search strategy is to be documented as

the dissertation will utilize mainly existing peer-reviewed evidence sources to form a valid argument but also use sources that are considered authoritative to set the standards and establish expectations of governance, which are formed by external forces. To this end, Section 2.2 describes the literature search plan, databases, inclusion criteria, and nature of sources used, exhibiting both recency and relevance. Section 2.3 constructs the theoretical framework of Governance-Driven Total Quality Management (GDTQM) by generalizing the logic of the Resource-Based View of capability durability (Barney, 1991; Powell, 1995), the institutional theory views of legitimacy and decoupling (DiMaggio and Powell, 1983; Scott, 2014), and the governance accountability principles applicable to management systems (OECD, 2015; ISO/TC 176, 2024). Section 2.4 presents the conceptual framework and hypothesis development, which will represent the theoretical rationality above into a testable model that will define the relationships to be expected between TQM maturity, governance integration, and long-term quality results. A summary of this chapter is provided in Section 2.5, where the key gap and contribution to the framework are located by understanding its role in embedding governance within improved TQM.

Overall, this chapter lays the intellectual groundwork for viewing governance integration not as a marginal administrative phenomenon but as a quantifiable structural element of the quality architecture. The literature review places GDTQM as a theoretically structured response to the ongoing inconsistency in the context of TQM performance witnessed in manufacturing organizations owing to the mechanism of connecting TQM maturity with sustainable results (Ali, 2024). The following section

captures the literature search procedures and the types of sources adopted, thus making the review methodologically transparent and in accordance with evidence-based argumentation.

Accordingly, the purpose of this chapter is not only to summarize what prior studies have stated but also to assess how the existing literature converges, where it remains fragmented, and which explanatory gaps remain unresolved. Therefore, this chapter adopts a critical synthesis approach in which TQM, governance, sustainability, and accountability are examined as intersecting rather than isolated fields of inquiry. This is essential because the dissertation does not propose a minor extension of the prior TQM literature; it proposes a reframing of quality management through a governance-centered lens.

2.2 Documentation /Inclusion Criteria

To develop a clear and methodologically justifiable literature review, a clear description of the identification, screening, and selection of sources must be documented. The review used an organized search and inclusion strategy to facilitate relevance, up-to-date-ness, and theoretical pertinence with the organizational-level scope of the study. The purpose was not to make a comprehensive list of publications on TQM or governance but to select literature that directly conveys the structural integration of the governance process in quality management systems in manufacturing settings.

Literature Search Strategy

Academic databases linked to peer-reviewed management and operations research were searched. These were Scopus, Web of Science, Science Direct, Emerald Insight, and

Google Scholar. Scopus and Web of Science were the first preferences in terms of tracing citations and identifying high-impact journals, whereas ScienceDirect and Emerald Insight were utilized to find full-text articles on the topics of quality management, operations management, and governance journals. A Google Scholar database search was performed to ensure cross-checking and forward citation checking. The search strategy employed is a combination of Boolean logic and keyword groups based on constructs related to the focus of this study. The search strings used here are combinations of these search strings:

- i. “Total Quality Management maturity”
- ii. “TQM performance sustainability”
- iii. “Governance integration in manufacturing”
- iv. “Quality integrity”
- v. “Auditability and management systems”
- vi. “Industry 4.0 governance”
- vii. “Quality 4.0 capability”
- viii. “ESG governance manufacturing”
- ix. “ISO 9001 governance expectations”

The search filters were set up based on the year of publication, document type, and subject. To keep up with the trend, we concentrated on literature published in recent years (2020–25), where a significant number of studies emphasize digitalization, governing sustainability, and audit expectations. The theoretical framework was enlarged with basic theoretical literature (e.g., Barney, 1991; DiMaggio and Powell, 1983; Powell,

1995; Scott, 2014), where the concepts had to be grounded (Fadilasari, Hidayat, and Pramono, 2024). While using this search strategy, we emphasized the conceptual fit with the organizational-level focus with the keywords. Relevant literature was assessed for its value in explaining the management system design, institutionalization, and assessment under the circumstances of auditability, compliance, and sustainability. This meant that the review process did not become too wide-ranging and ensured that the body of literature was highly relevant in addressing the main thrust of the research in terms of governance integration in manufacturing quality systems.

Inclusion and Exclusion Criteria

These sources were included by adhering to the following criteria.

- 1) Supporting Key Concepts: TQM maturity, governance or accountability systems, quality system sustainability, and institutional compliance processes have been studied (Kanji, 2019).
- 2) Congruence of Level of Analysis: This research was conducted at the system- or organizational-level and not merely focusing on the level of people with their attitudes and behavioral intentions (Martínez-Costa and Martínez-Llorente, 2007).
- 3) Academic rigor: We preferred journal publications that were refereed and identified on a theoretical or methodological basis (Tarí and Sabater, 2019).
- 4) Manufacturing or Process-Intensive Setting: The focus was on studies conducted in manufacturing, operations, and controlled process (production) environments.
- 5) Governance or Accountability link: In instances where governance was mentioned, it needed to be more than general references to leadership and had to involve accountability frameworks for policies, audits, compliance, or institutional governance aspects.

Inclusion criteria were: (Weckenmann, Akkasoglu and Werner, 2015)

The commentaries by practitioners were descriptive and devoid of theory. Papers that focused on certain models for service marketing or the intentions of individuals without mentioning the level of governance (at least partially) in the system. Systems that lack methods and/or are not empirical. Articles that were not in English and translations were not equivalent. Institutional publications, such as those from the ISO and OECD, were selectively used where they had an impact on the governance expectancies of management system standards and audits. These are not regarded as empirical but as regulatory and normative libraries that impact the organizations. Using institutional publications in the review was justified because governance expectancies of quality management are based not only on peer-reviewed academic literature but also on institutional standards, accreditation systems, and governance principles that impact practice. In this study, such sources are not considered a replacement for evidence found in academic sources; rather, they are used to establish an external governance framework relevant to the manufacturing quality systems. This enables a more coherent review of the literature by maintaining the rigor of scholarship as well as the relevance of the context (OECD, 2015; ISO/TC176, 2024).

Nature and Sources of Key References

To gain theoretical and empirical support for the stance of this dissertation, ten key sources were identified to underpin the development of the Governance-Driven Total Quality Management (GDTQM) framework. These are the theoretical foundations, factual matters, and institutional policies governing governance expectations in manufacturing today.

Table 2.1 Summary of the Nature and Sources of References

Author(s)	Nature of Reference in This Study	Source
Ali (2024)	Contemporary synthesis of TQM evolution and performance variability; highlights sustainability and contextual pressures	<i>Foresight</i> (peer-reviewed journal)
Barney (1991)	Foundational articulation of Resource-Based View; capability durability logic	<i>Journal of Management</i>
Powell (1995)	Positions TQM as a strategic capability embedded in routines	<i>Strategic Management Journal</i>
DiMaggio and Powell (1983)	Institutional pressures (coercive, normative, mimetic) shaping organizational structures	<i>American Sociological Review</i>
Scott (2014)	Consolidated framework of institutional theory and legitimacy mechanisms	Scholarly book (SAGE Publications)
OECD (2015)	Governance principles defining accountability, transparency and oversight	OECD Publishing
ISO/TC 176 (2024)	Guidance on auditing climate-related considerations in ISO 9001 systems	International Organization for Standardization
ISO and IAF (2024)	Joint communiqué integrating climate considerations into management systems	ISO/IAF institutional publication
Carvalho et al. (2024)	Quality 4.0 roadmap; digital capability and governance requirements	<i>Quality Management Journal</i>

Navarro and	Empirical conceptual model linking	<i>Sustainability</i>
Naranjo	quality culture and organizational	
(2025)	performance	

Source: Author Work

Thus, the references in the dissertation stage have a complex backdrop. The older references lay down the longstanding theoretical justification for capability, legitimacy, and governance accountability, while the recent ones reflect the way they are currently reconfigured in the conditions of digitalization, sustainability, and management-system change. Thus, this is a balanced and blended document base in terms of its conceptual and temporal merits.

Scholarly Balance and Theoretical Integration

Approximately 80–85% of the literature used in this chapter is peer-reviewed articles. Institutional documents are minimal but are also considered in cases where they play a significant role in the governance requirements of quality control systems. This will make the literature review theoretically and contextually attuned to regulatory changes. The identified and used selection process increases the rigor of the literature review by demonstrating that the GDTQM model is produced as an outcome of a selective integration of the literature with a high impact, rather than cherry-picking. It also ensures that the ensuing theoretical framework and conceptual model are based on enduring theory as well as current empirical developments.

The following section builds the theoretical background of GDTQM, which incorporates capability-based, institutional, and governance approaches, and justifies the structural placement of governance integration in the quality system.

2.3 Theoretical Framework

The above section defined the literature coverage and descriptions that informed this study. This section elaborates on the theoretical basis that underlies the rationale for positioning governance integration as a structural mechanism in Total Quality Management (TQM) systems. The theoretical framing has been placed strategically at the organizational level of analysis, in line with the study, as it focuses on the system architecture, capability durability, and institutional accountability but not the individual behavioral intention.

The GDTQM is not a novel theory; it was introduced as a theoretically based synthesis of existing views. Coherency in explaining is achieved through three complementary theoretical lenses: the Resource-Based View (RBV), Institutional Theory, and Corporate Governance Theory. All lenses focus on different yet connected aspects of the quality nexus of governance. The RBV justifies the persistence of capability; Institutional Theory justifies legitimacy concerns and conformity to structure; and Corporate Governance Theory justifies accountability structure and control systems. Together, these perspectives contribute to the intellectual recipe for modelling the integration of governance, which is not only a direct driver of quality decency but also a structural driver of TQM maturity outcomes. Notably, these views are not mutually exclusive. Rather, they are integrated because they each solve a different problem surrounding the interpretation of quality performance. The RBV explains why routine quality practices may be developed as organizational resources. Institutional theories explain why divergent behavior occurs between formal quality adoption and substantive

quality impact. Corporate governance theories can explain how accountability structures can negate quality divergence. Therefore, their combination is essential to support a doctoral-level model that explains not only quality adoption but also institutional quality performance.

2.3.1 The Durability of Quality Capabilities and Resource-Based View

The Resource-Based View (RBV) sees sustained competitive advantage in terms of valuable, rare, inimitable, and non-substitutable resources and capabilities of the firm (Barney, 1991). Unlike external-focused positioning models, the RBV stresses the internal capabilities that create sustained and superior performance (Barney, 1991). As a theory, this view has been used to theorize TQM not as an improvement tool, but as a competence of the organization that is a set of routines, commonly accepted ways, and congruent leadership (Powell, 1995) (Santos-Vijande and Alvarez-Gonzalez, 2009). Powell (1995) suggested that the strategic value of TQM is not based on easily codified techniques but on socially complex and path-dependent organizational practices, such as leadership commitment, cross-functional coordination, and fit (Kumar et al., 2011). These dimensions are difficult to imitate because they are anchored in tacit practices and social structures. Later empirical studies are in line with this capability-based explanation, which proposes that the organizational benefits of going beyond the organization in terms of institutionalizing TQM exist where TQM is integrated into organizational functions and not merely implemented in an administrative manner to be certifiably compliant (Ali, 2024; Sila and Ebrahimpour, 2005). In this light, the level of

TQM maturity may be interpreted as the extent to which quality principles are routinized and established as organizational capability.

Nonetheless, the RBV states that capabilities must have reinforcing mechanisms to avoid erosion. Nonstructural capabilities can be eroded as leadership priorities change, when the organization undergoes restructuring, or as external volatility increases. A historical study of quality programs reveals that early gains in improvements may revert under ineffective accountability and control systems (Van der Wiele and Brown, 2002). This observation plays a key role in the current research, implying that the sustainability of TQM results cannot be presumed using capability depth. Rather, structures need to be stabilized to maintain time routines (Terziovski and Samson, 1999).

This issue is particularly important in manufacturing organizations, where process capability depends on cumulative learning, disciplined standardization, and stable, cross-functional coordination. Where such routines are weakly reinforced, quality capabilities can remain vulnerable to leadership turnover, fragmented implementation or short-term performance pressures. From an RBV perspective, governance integration is relevant because it helps preserve the continuity of valuable routines by embedding them within more durable structures of responsibility, review, and internal control (Santos-Vijande & Alvarez-Gonzalez, 2009).

From the RBV perspective, governance integration can be conceptualized as a capability-strengthening infrastructure. By incorporating formal accountability matrices, internal controls, audit integration, and formalized management reviews into the quality system, governance mechanisms minimize discretionary variability and defend quality

routines against degradation. Governance integration does not substitute TQM capability; in fact, it makes it more sustainable by formalizing corrective learning and sourcing the decision rights. Governance in this framework is an internal resource system that enhances sustainability and inimitable quality capabilities, especially in complicated manufacturing contexts vulnerable to digitalization and regulatory reviews.

Although RBV explains why embedded capabilities have a sustained advantage, it does not fully explain why organizations adopt governance mechanisms other than performance considerations. In this dimension, Institutional Theory has added explanatory value.

2.3.2 Institutional Theory and Legitimacy in Quality Systems

Institutional theory states that organizational structures and practices are influenced not only by efficiency issues but also by legitimacy pressures in the regulatory, normative, and cognitive environments (DiMaggio and Powell, 1983; Scott, 2014). Organizations adapt to external expectations to be credible and receive resources. There are three types of institutional pressure: coercive, normative, and mimetic, which apply pressure on organizational design and the architecture of management systems.

Coercive forces in manufacturing contexts are created by regulatory bodies and certification organizations that compel companies to adhere to recognized standards. Normative pressures result from professional communities and industrial associations that determine acceptable management practices. Imitative pressures motivate companies to reproduce frameworks used by major players in the market to communicate competency and trustworthiness. These institutional drivers are increasingly in contact

with quality management systems, especially as standards change to reflect governance and sustainability concerns (Fonseca & Domingues, 2022).

The current revisions of management system standards are one such example. The addition of considerations related to climate change (e.g., to the ISO 9001 standards-related guidance) suggests that quality management systems are now supposed to demonstrate a systematic understanding of the external environment and governance responsiveness (ISO/TC 176, 2024; ISO and IAF, 2024). According to the change in expectations, organizations will not be judged solely by the "defect rates" of their internal and external quality processes but through the credibility and traceability of their quality (system) processes. The quality and governance systems become intermingled. This is particularly important for organizations that show high-quality certifications but have the impacts of persistent compliance linkage or implosion in the implementation of control practices. This can be explained by institutional theory, which illustrates that formal conformity may be achieved for legitimacy purposes without necessarily ensuring deep operational alignment. The concept of decoupling is therefore highly useful for the present study because it clarifies why governance integration matters not only as a symbol of seriousness but also as a structural means of reducing the gap between formal quality commitments and enacted quality practices (Scott, 2014).

Another concept proposed by institutional scholarship is decoupling, which is a structure formally adopted by organizations to meet legitimacy demands but is not put into operational use (Scott, 2014). Decoupling can be observed in quality management, where certification is achieved without following through with corrective action or where

the same is achieved without structural remediation through frequent audit results. This compliance ritual compromises the long-term credibility of the quality systems.

Governance integration is the solution to this institutional weakness, which places accountability structures in quality architecture. Formal authority tables, emergency procedures, in-house control practices, and systematic management audit procedures diminish the chances of symbolic adoption. Governance integration enhances decoupling risk and institutional legitimacy by harmonizing internal routines with external expectations. In this way, institutional theory describes why governance mechanisms have not only been nonsensical additions but rather important structural elements of plausible quality systems in a manufacturing setting.

Although Institutional Theory enlightens us on the legitimacy imperative, it does not expressly define how we structure and operationalize governance structures in firms. Corporate Governance Theory provides a supplementary understanding of this structural aspect.

2.3.3 Accountability Architecture and Corporate Governance Theory (Talib, Rahman and Qureshi, 2013)

Corporate Governance Theory is concerned with the mechanisms that hold managers accountable, transparent, and aligned with the expectations of stakeholders (OECD, 2015). Governance theory, which was traditionally linked to governance by the board and protection of shareholders, has gradually developed to include internal control, risk management, and sustainability accountability systems. Governance expectations are

becoming increasingly intrusive in the design of management systems in operationally intensive industries such as manufacturing.

In quality management systems, governance ideals are manifested in the form of explicit decision rights, accountability levels, audit traceability, and audit management routines. External stakeholders, regulators, certification auditors, and supply chain partners do not only assess the quality of output but also the integrity of the processes involved in the production of the outputs. Here, governance is not peripheral to quality; rather, it constitutes the structure around which quality statements are achieved.

Corporate governance systems focus on systematic review cycles, escalation discipline, documentation integrity, and independent control (OECD, 2015). When incorporated into TQM systems, these mechanisms enhance corrective action closure, minimize the recurrence of nonconformities, and enhance traceability. Therefore, the concept of governance integration translates accountability in the quality field as the abstract concepts of transparency are translated into tangible management activities.

In this view, quality is reflected in the oversight of the system's governance and the operation of regular reviews, escalations, accountability for corrective action development, and traceability through documentation. This is important because quality performance is rarely achieved using only technical controls. They rely on whether organizational authorities are transparent or allow issues to be resolved on an ad-hoc basis. Therefore, corporate governance theory strengthens this study by providing operational substance to the accountability dimension of GDTQM (OECD, 2015).

Notably, the integration of governance aligns with emerging sustainability expectations. With environmental and social accountability demands taking root in the standards of management systems, companies must display systematic control as opposed to informal programs. Governance systems are where the quality considerations of sustainability are considered in the process of policy formulation and context of non-conformity management review. In this regard, Corporate Governance Theory assists in conceptualizing the integration of governance as an accountability architecture that stabilizes quality results and improves the defensibility of institutions.

Integrated Theoretical Positioning

Combined, RBV, Institutional Theory and Corporate Governance Theory provide a logical explanatory framework for Governance-Driven Total Quality Management. RBV describes why entrenched quality routines are strategic capabilities that need to be reinforced to prevent erosion. Institutional theory explains the reasons for the growing demand to integrate governance through external legitimacy pressures and the susceptibility of decoupling risks to weaken system credibility. Corporate Governance Theory explains how accountability structures, oversight mechanisms, and structured review processes are implemented in organizational systems (Huang, Lee, and Kim 2024).

- 1) These approaches to the world are synthesized to prove the three main propositions upon which this dissertation is based.
- 2) TQM maturity is an organizational capability related to enhancing quality.

- 3) Governance integration is an organizational mechanism that directly increases quality, integrity, and compliance credibility.
- 4) The relationship between TQM maturity and sustainable quality outcomes is integrated through governance and institutionalized by strengthening accountability and audit discipline.

The combination of this theoretical basis defines the conceptual reasoning that governance integration is a direct and conditional variable in the proposed framework of this study. The following section interprets this theoretical stance as a formal conceptual model and hypothesis development at the organizational measurement level and for empirical testing.

2.4 Conceptual framework

The above sections present the theoretical bases of GDTQM. This part transforms these foundations into a conceptual model that is formally specified, that is, defines construct boundaries, the level of analysis, and the anticipated structural relationship between variables. As per the doctoral standards, independent and dependent variables, moderating and mediating variables are clearly defined in the framework, and all constructs are placed at the organizational level of analysis to prevent cross-level inference bias.

Therefore, the conceptual model is intentionally structured around organizational rather than individual causation. It starts with the understanding that sustained quality performance is a characteristic of the institutionalized system and not of individual managerial orientation or promising attitudes and behaviors. This is significant because

the research focuses on how the quality system is structured, managed, and enabled in practice. This study aims to examine how the link between TQM practice maturity and sustainable quality performance in manufacturing contexts is a structural circumstance of governance integration. Thus, the conceptual framework goes beyond merely describing and defining integration and establishes testable propositions regarding capability persistence, institutional congruence and accountability configurations.

2.4.1 Conceptualization of Core Constructs

TQM Maturity (Independent Variable)

The degree of maturity of TQM used in this study is defined as the degree of systemic integration of the principles of quality in operational practices, management practices, horizontal integration, and continuous improvement. The dimension of adoption (having or not having TQM) was replaced with TQM maturity, which is the extent of institutionalization, routinization, and integration in management systems (Ali, 2024; Bytyczi, Qarimi, and Qerimi, 2023). In practice, TQM maturity is a structured process management, commitment of the management to achieve quality objectives, formal measurement system, stringent corrective-action system, and continuous improvement programs. Theoretically, it is the competence of a process that is institutionalized within the organization, as opposed to a range of isolated approaches. Another implication of this conceptualization is that issues of TQM maturity should not be confused with certification. While this may demonstrate the adoption of a system in practice, maturity is the institutionalization of quality routines in managerial practices, process control, and inter-functional learning and improvement. This nuance is

significant because organizations might be in compliance but differ fundamentally in the level of operational institutionalization of quality principles (Ali, 2024).

i. The Structural Variable is Governance Integration

Governance integration is conceptualized as the degree to which formal accountability frameworks, audits, internal control procedures, documented authority matrices, and formal management review systems are incorporated into the quality management structure. Governance is not considered the overall quality of leadership or cultural orientation but rather a quantifiable structural performance based on recorded oversight and traceability processes (Alhassan & Owusu, 2025; ISO/TC 176, 2024).

This construct describes the extent of formalization of the escalation procedures, incorporation of audit feedback in decision-making, correspondence between policy commitments and current operational practices, and systematic management of compliance and sustainability requirements. Institutionalized accountability in governance is therefore symbolized in governance integration, as opposed to symbolic governance discourse.

ii. Sustainable Quality Results (Dependent Variable)

Sustainable quality outcomes are those in which quality performance in manufacturing organizations becomes long-term stable, auditable, and credible through the institution. In contrast to short-term operational measures, this construct reflects long-term changes in reduced defect recurrence rates, stability of compliance, audit-readiness, discipline, and resilience of quality routines over time (Navarro and Naranjo, 2025).

This conceptualization consciously goes beyond short-term productivity benefits and includes institutional endurance. Sustainable quality outcomes reflect quality performance that cannot be backtracked, even with changes in leadership, regulatory tightening, or digital transformation. All constructs were operationalized at the organizational level and preserved conceptual consistency and fit the organizational structure. The dependent variable is framed in terms of the long term to capture the model in terms of more than just improving the operational efficiency. Long-term quality construct outcomes include sustaining compliance credibility, eliminating recurring nonconformities, firmly closing corrective actions, and sustaining stakeholder trust and confidence. This construction of quality outcomes is important because new quality outcomes are not the sole purpose of this dissertation; the ultimate intention is to explain quality sustainability (Valmohammadi and Roshanzamir, 2015).

Table 2.2 Summary of Key Constructs and Theoretical Anchors

Construct	Definition in this study	Theoretical anchor	Key supporting authors
TQM maturity	Degree to which TQM principles and practices are systemically embedded in organizational routines, leadership processes, process control, measurement systems, and continuous improvement cycles.	Resource-Based View / capability perspective	Powell (1995); Ali (2024)

Governance integration	The extent to which accountability structures, decision rights, internal controls, audit integration, escalation discipline, and structured management reviews are embedded in the architecture of the quality management system.	Corporate governance / institutional alignment	OECD (2015); ISO/TC 176 (2024); ISO and International Accreditation Forum (IAF) (2024)
Sustainable quality outcomes	Long-term stability and credibility of quality performance are reflected in defect stability, compliance integrity, audit readiness, recurrence reduction, and sustained corrective action closure discipline.	Capability durability + institutional legitimacy	Navarro and Naranjo (2025); Scott (2014)

Source: Author Work

Table 2.2 presents the boundaries of the constructs used in this study, including their dominant theories. This supports conceptual rigor and a link between theory building in Chapter II and construct operationalization and measurement validation in Chapter III.

2.4.2 Relationships in the Conceptual Model

The conceptual model describes governance integration as a direct antecedent of sustainable quality results and a moderating influence on the impact of TQM maturity on the extent to which the effects are institutionalized. The conceptual model evolves in three ways: direct impact, moderation, and mediation. Structural TQM Impact on Sustainable Quality Results Structured TQM activities are empirically associated with improvements in operational and organizational efficiency (Bytyci et al., 2023). Organizations that are well-versed in quality principles will have good process discipline and low variabilities. Nevertheless, most previous studies evaluated performance at one point in time and failed to model durability systematically.

In this study, TQM maturity is likely to have a positive impact on sustainable quality because process discipline is entrenched and the organized improvement loop minimizes instability in operations. Thus, more mature organizations are better placed to sustain gains in the reduction of defects and in compliance consistency over time.

***H1:** TQM maturity positively influences sustainable quality outcomes in manufacturing organizations.*

Direct Impact of Governance Incorporation on Quality Sustainability

In the manufacturing context, governance maturity has been positively associated with stable compliance and organizational reliability (Alhassan and Owusu, 2025). Governance mechanisms improve traceability, help define accountability, and minimize behavioral variations. Audit credibility and institutional defensibility are enhanced in digitally integrated and sustainability-sensitive environments through governance systems (Carvalho et al., 2024; ISO/TC 176 2024).

Regardless of TQM maturity, governance integration is anticipated to positively impact sustainable quality performance through institutionalizing oversight, reinforcing corrective action closures, and internalizing compliance monitoring mechanisms.

***H2:** Governance integration positively influences sustainable quality outcomes in manufacturing organizations.*

2.4.3 Moderating Effect of Governance Integration

Although TQM maturity is one of the factors that help improve quality, the continuation of improvement might be related to the structural conditions. Empirical evidence suggests that the sustainability of TQM performance varies among organizations (Canbay, 2023). This contradiction implies that the effectiveness of maturity is conditional on contextual or structural variables (Lo et al., 2021).

Governance integration is theorized as a conditional variable. If quality routines are incorporated into the frameworks of formal accountability and audit practice, there is a lower chance that improvement initiatives will degenerate because of leadership turnover or environmental instability. Corrective learning is institutionalized through governance mechanisms that incorporate oversight, thus increasing the effects of TQM maturity on sustainable outcomes (Valmohammadi and Roshanzamir, 2015).

TQM maturity can produce short-term gains that cannot be acquired institutionally in organizations with low governance integration. However, in the presence of sound governance structures, TQM should generate more robust and stable quality results.

***H3:** Governance integration positively moderates the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations.*

This modulating reasoning places governance not only as an additive predictor of capability but also as a structural amplifier of capability's effects.

2.4.4 Mediating Effect of Governance Integration

In addition to moderation, governance integration may serve as a mediating process for translating TQM into an institutionalized sustainability. TQM efforts are often processing improvement-oriented; however, unless they are managed with institutional accountability, any improvement may be operational and not institutional.

Governance mechanisms institutionalize corrective action loops, encompass audit results for management reviews, and formalize decision prerogatives. These procedures transform improvement routines into institutionalized and accountable systems. Recent empirical studies suggest that compliance credibility is enhanced by governance maturity and translates the intent of organizations into sustained structural discipline (Alhassan and Owusu, 2025).

On that note, TQM maturity can facilitate governance integration by ensuring that the review process is structured and accountability is documented. Governance integration provides the institutionalization of these routines into sustainable quality outcomes. The following logic is used to justify the modelling of governance integration as an intermediary between maturity and durability.

***H4:** Governance integration mediates the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations.*

2.4.5 The Governance-Driven Total Quality Management (GDTQM) Model

The resulting conceptual model is as follows.

- i. **Independent Variable:** TQM maturity.
- ii. **Dependent Variable:** Sustainable Quality Outcomes
- iii. **Variable Structure:** Governance Integration
- iv. **Conditional Roles:** Governance Integration as a Mediator and Moderator

The framework theorizes governance by conceptualizing it as a structural-strengthening mechanism implemented within the quality architecture. The model operationalizes the concept of governance integration as the capability of measuring organizational capability, rather than considering governance as a contextual background or leadership rhetoric.

This combined perspective advances the literature in three ways.

- i. This study presents the concept of governance integration as an official structural implementation in TQM performance modelling.
- ii. This expands quality research based on short-term operational measures to long-term institutional results.
- iii. This study directly examines both moderating and mediating relationships, solving the limitations of past studies that attempted to use direct-effect regression models.

Figure 2.1 demonstrates the conceptual framework developed in this study. The model combines TQM maturity, governance integration, and sustainable quality outcomes at the organizational level of analysis. The theorization of governance

integration has been formulated as a direct structural capability that affects quality integrity and a conditional mechanism that moderates and mediates the relationship between TQM maturity and sustainable quality outcomes. This framework is a synthesis of the theoretical propositions and hypotheses formulated in Chapter II, in a visual way, and forms the foundation of the empirical tests in the next methodological chapter.

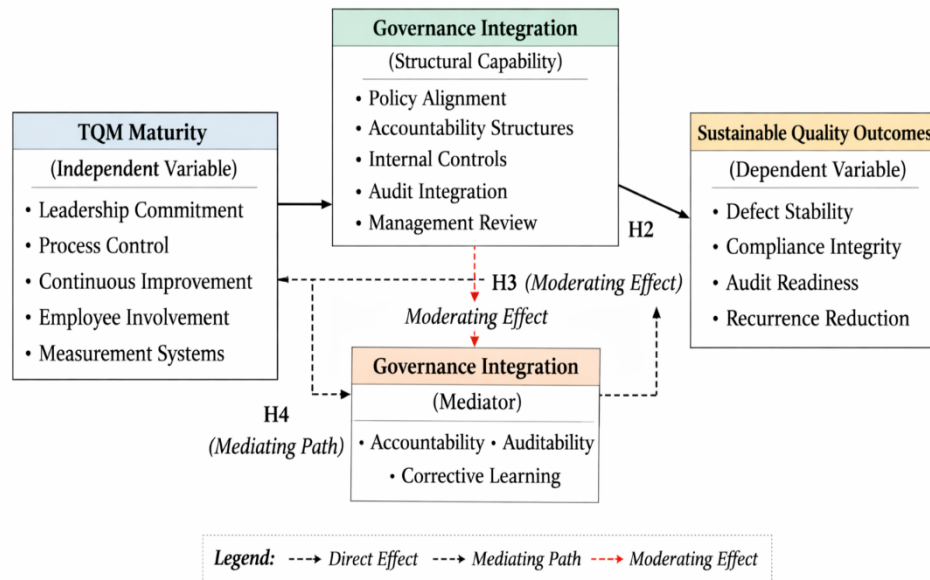


Figure 2.1 Conceptual Framework Model

Source: Author Work

Integration of governance is also considered in the model as a direct structural ability and conditional mechanism. Governance, as a direct predictor, enhances quality integrity by entrenching accountability matrices, audit integration, internal controls, and formal management review processes within the quality system architecture. Governance, as a moderating variable, conditions the strength of the relationship between TQM maturity and sustainable quality outcomes, such that the positive influence of maturity

increases with greater governance integration. As a mediating process, governance integration institutionalizes processes of improvement routines by formalizing corrective action channels, oversight systems, and traceability of compliance, thus rendering maturity to sustainable organizational performance.

Thus, the model views governance as not an external watchtower, but rather as a structural accountability architecture that stabilizes and strengthens quality capabilities. All constructs were measured at the organizational level to create theoretical consistency and prevent bias in cross-level inference. The framework offers a systematic foundation for the direct, moderating, and mediating effect testing of the empirical approach in the following methodology chapter.

2.4.6 Boundary Conditions of the Proposed Model

Although the Governance-Driven Total Quality Management model is conceptually structured as an integrated explanation of sustainable quality performance, the expected relationships are not assumed to be context-free. The proposed model is more likely to be explanatory in manufacturing environments characterized by formalized management systems, audit intensity, external compliance expectations, cross-functional process interdependence, and non-trivial consequences of quality failure. In this context, governance integration and TQM maturity are expected to play a role because of the constant institutional and operational pressures routinized practices face. Conversely, the postulated effects may be less apparent when governance is only nominally institutionalized, quality management is viewed as a proactive quality certification exercise, or sustainability and regulatory compliance are weakly institutionalized. This

means that the model assumes a governance maturation effect on quality that is dependent on the degree to which institutional forms are deeply enacted. This hedge is important because it establishes that governance integration is not an organizational constant but a variable whose utility and power are a function of the level of enactment. Another contingent factor is related to the dependent variable. This research does not consider the quality construct to be a short-term operational realm.

Sustainable quality outcomes are framed in a stricter and more institutional sense, encompassing continuity of compliance, corrective action reliability, audit defensibility, and long-term quality stability. Consequently, the model is oriented toward the durability of quality performance rather than the temporary achievement of process gains. This distinction is important because relationships that appear strong when measured against short-term efficiency indicators may become weaker when judged against long-term institutional outcomes.

These boundary conditions improve the conceptual precision of the framework by clarifying the setting in which the proposed relationships are expected to hold and preventing an over-generalized interpretation of the model.

2.5 Chapter Summary

This chapter offers a full theoretical and empirical basis for considering GDTQM in manufacturing organizations. Moving beyond descriptive approaches to quality management, this review systematically assessed the conceptualization, implementation, and evaluation of TQM in modern manufacturing settings characterized by increasing regulatory requirements, digitalization, and sustainability demands.

The literature review re-established that TQM is a strong management philosophy for enhancing operational performance, especially when it is applied as an integrated system of management tools, as opposed to the use of a set of tools in isolation. It has been empirically proven that there are positive correlations between TQM maturity and key performance indicators (KPIs), which include process efficiency, customer satisfaction, and defect reduction. Nevertheless, the review also indicated a significant difference in the sustainability and durability of these outcomes in different organizations. This contradiction suggests that TQM maturity is not a sufficient explanation for long-term quality integrity or institutionalized performance stability (Tari and Sabater, 2019).

A critical review of the literature on governance and institutions showed that manufacturing organizations are working under increasing demands to be auditable, accountable, and externally responsive. Changes in quality assessment, including the ISO 9001:2015 Amendment 1:2024, as well as the increased focus on sustainability and climate implications in management system standards, have redirected the quality assessment of quality evaluation based on operational measurements to the credibility of governance and integrity of the system. Despite these developments, governance mechanisms are rarely operationalized as constructs in TQM models. Rather, leadership would absorb governance, and the existing frameworks were not as explanatory as they could have been.

By amalgamating the resource-based view, institutional theory, and corporate governance theory, this chapter forms a semblance of a theoretical framework to redefine

governance integration as a structural capability instilled within quality systems. In terms of capability, governance integration stabilizes and shields quality routines against erosion. Institutionally, it increases legitimacy and decouples formal certification from operational practices. Governance-wise, it imbues an accountability architecture that balances quality systems to stamp stakeholder expectations and regulatory scrutiny.

This chapter constructs a conceptual framework of governance-driven total quality management (GDTQM) at the organizational level of analysis. TQM maturity has been placed as a leading independent capability that affects quality outputs and governance integration as a theorized element of the direct determinant of quality integrity and conditional moderation and mediating factor between TQM maturity and sustainable quality outcomes. The definition of sustainable quality outcomes includes both the improvement of operations and the stability of compliance, readiness to audit, and institutional credibility in the long term.

These relationships were formalized into four testable hypotheses (H1–H4) for empirical examination in the subsequent methodology chapter. Collectively, they express how the integration of governance is turning quality improvement projects into institutionalized management systems. The gap in the literature in this framework is clearly identified and filled as the governance mechanisms in the TQM architecture are explicitly and directly modelled as part of the TQM architecture rather than peripheral and contextual factors.

This chapter makes significant contributions to the research on quality management in three ways. First, it contributes to theoretical clarity by operationalizing

governance integration as a quantifiable organizational construct in TQM systems. Second, it changes the quality performance evaluation to durability-oriented sustainability rather than short-term operational profits. Third, it presents a rigorous conceptual framework that can be used to understand why certain TQM systems continue to excel while others fail despite being formally adopted.

Therefore, this chapter lays down a strict theoretical and conceptual framework for conducting empirical research. The next chapter describes the research approach that will be employed to empirically test the hypothesized relationships by explaining the research design, measurement plan, and analytical methods that will be applied to analyze the hypothesized relationships. Overall, the chapter shows that the literature increasingly supports the view that quality management in contemporary manufacturing can no longer be adequately explained by conventional process-improvement logic alone. The emerging importance of accountability, sustainability, digital traceability, and governance responsiveness suggests the need for a more comprehensive perspective. This chapter offers the conceptual rationale for studying governance integration as a structural dimension of quality architecture via an integration of capabilities, institutional, and governance perspectives. The subsequent chapter operationalizes this theoretical argument into an empirical approach to test the relationships (Bryman, 2016).

CHAPTER III: METHODOLOGY

3.1 Introduction

The literature review indicates that total quality management (TQM) in manufacturing organizations is undergoing a shift from primarily inspection-based systems of control to a wider system of management philosophy that emphasizes process stability, continuous improvement, and organizational learning (Choudhary, 2018). Although the operational aspects of TQM have been considered extensively in terms of performance results (Sila and Ebrahimpour, 2005; Oakland, 2014; Talib, Rahman, and Qureshi, 2013), little attention has been paid to how governance arrangements are embedded in TQM structures. Contemporary manufacturing systems face increasingly institutionalized pressures, such as regulatory regimes, audits, and regulatory changes geared towards sustainability (ISO/TC 176, 2024). This has resulted in a shift in the standards applied to quality management systems and equal weight being placed on operational efficiency rather than advice credibility and/or systemic governance measures (Heras-Saizarbitoria and Boiral, 2013). Our study focuses on the structural gap between the implementation of Total Quality Management (TQM) and governance integration in manufacturing contexts.

While maturity in TQM is linked to enhanced operational performance outcomes, there is little empirical evidence to support the idea that, structurally, the integration of governance has facilitated the sustainability and institutional credibility of quality outcomes (Canbay, 2023). This explanatory research, built on a dominant quantitative

survey backed by documentary content analysis, investigates the structural links between the maturity of TQM, governance integration, and sustainable quality outcomes in manufacturing contexts. In particular, it explores the direct associations between TQM maturity and governance integration with sustainable quality outcomes and the moderating and/or mediating influences of governance integration. This study aimed to answer the following research questions:

RQ1: What is the effect of TQM maturity on sustainable quality in manufacturing organizations?

RQ2: What is the relationship between governance integration and sustainable quality outcomes in manufacturing organizations?

RQ3: Does governance integration moderate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

RQ4: Does governance integration mediate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

The research questions were based on the conceptual framework discussed in Chapter II and explored at the organizational level of analysis, adopting an explanatory mixed-methods approach. In this section, we present the methodological design that was constructed to answer the research problem and research questions. This section provides the philosophical orientation of the study, research design and justification, population and sampling strategy, operationalization of constructs, data collection procedures, methods of data analysis, limitations of the study, and ethical protection.

This chapter is designed to ensure a direct alignment between the research problem, conceptual model, and analytical procedures used to test the proposed relationships. Because this dissertation investigates organization-level constructs that are theoretically structured and empirically testable, the methodology must be capable of translating abstract governance and quality concepts into measurable variables, without losing conceptual precision. Therefore, this chapter serves as an operational bridge between the theoretical propositions of Chapter II and the empirical findings reported in Chapter IV.

3.2 Research Methods and Design(s)

3.2.1 Philosophical Foundation

This study was based on a **post-positivist research paradigm**. Post-positivism believes that organizational phenomena cannot be viewed as objects with high levels of objectivity, but systematic measurement and statistical inferences allow the testing of theoretically based propositions with tolerance of approximation (Creswell and Creswell, 2018). This paradigm fits studies involving the latent organizational constructs of TQM maturity and governance integration, whose association can be captured using structured tools and empirical data.

The theoretical framework in Chapter II assumes directionality between the theoretically defined constructs. Based on this, the propositions were tested empirically through hypothesis testing rather than purely interpretive exploration. Post-positivist inquiry helps the study focus on measurement transparency, reliability diagnostics, and regression-based model testing (Saunders et al., 2019). Accordingly, this study employs a

dominant quantitative explanatory design supplemented by documentary content analysis for contextual interpretation.

Post-positivism is suitable for this research because governance integration and TQM maturity are not directly measurable, like physical objects; they are inferred characteristics of organizational systems measured through structured indicators. The post-positivist tradition accepts this limitation but also argues that structured data collection, transparent data processing, and cautious statistical interpretation can produce defensible empirical knowledge that can be generalized.

3.2.2 Research Methodology: Deductive Logic

This study adopted a deductive approach to research design. Deductive research begins with theoretical propositions and hypotheses that are empirically tested (Bryman, 2016). The hypotheses proposed in Chapter II regarding the direct, moderating, and mediating roles of governance integration are based on the following points:

- i. Institutional theory (Scott, 2014; DiMaggio and Powell, 1983)
- ii. Resource-based and capability perspectives (Barney, 1991; Powell, 1995)
- iii. Governance-performance alignment literature (OECD, 2015; ISO/TC 176, 2024)
- iv. Contemporary quality management scholarship

The deductive design ensures that the empirical part of the dissertation directly tests theoretically derived expectations and does not generate emergent constructs. Such alignment is crucial and indispensable because the theoretical contribution relies on systematic hypothesis testing.

Deductive logic also strengthens the coherence of the dissertation by ensuring that the methodological design remains anchored to the theory-building objective established. Because this study seeks to test whether governance integration has direct, moderating, and mediating relevance within the proposed framework, a deductive approach is preferable to an exploratory approach. This allows the empirical phase to function as a disciplined assessment of theoretically specified relationships rather than an open-ended search for post hoc explanations.

3.2.3 Research plan: Quantitative Explanatory design

An explanatory quantitative design was employed. Explanatory research is the best choice when the purpose is to determine whether inconsistency in one construct forecasts inconsistency in another construct according to a particular theoretical model (Saunders et al., 2019).

This study aimed to:

- 1) Investigate the effect of TQM maturity on sustainable quality performance in manufacturing.
- 2) Investigate the relationship between governance integration and sustainable quality outcomes in manufacturing contexts.
- 3) Examine the moderating effect of governance integration on the relationship between TQM maturity and sustainable quality outcomes.
- 4) Examine whether governance integration mediates the relationship between TQM maturity and sustainable quality outcomes.

The objectives require inferential statistical testing rather than descriptive analysis alone. A cross-sectional survey strategy was used. Cross-sectional designs are commonly used in organizational research when constructs reflect current organizational practices and perceptions. Although longitudinal designs can provide stronger causal inferences, cross-sectional designs are adequate for testing theoretically specified associations when findings are interpreted cautiously and not overstated as proof of causality.

Justification: This study uses a dominant quantitative explanatory design because the research aims to test the hypothesized relationships statistically, while documentary content analysis is included to provide contextual and institutional triangulation.

Rationale: A quantitative method will be used because this study seeks to test the hypotheses and null hypothesis (**H₀**) stated above in this research document. Several factors explain the adoption of a quantitative approach.

First, the constructs to be investigated are conceptualized as quantifiable, organizational capabilities. The managerial practices and systemic aspects that characterize TQM maturity, the integration of governance, and sustainable quality results are observable in the literature.

Second, the moderation effects must be tested using research questions. Moderation analysis requires statistical modelling of interaction terms or multi-group comparisons, which cannot be appropriately analyzed using qualitative inquiry.

Third, the conceptual model includes interrelated organizational constructs. Regression-based direct effect, moderation, and mediation/path-style analyses were used to examine these relationships in a manner consistent with the retained dataset and the

statistical outputs submitted for verification. Therefore, the quantitative method supports reliability diagnostics, correlation analysis, hypothesis testing, and cautious interpretation within one analytical framework (Hair et al., 2022).

The explanatory design is further justified by the need to distinguish between positive organizational perceptions and statistically testable structural relationships. In studies of management systems, organizations may report strong formal commitment to quality and governance while still differing in the extent to which these features affect durable outcomes. Therefore, a quantitative explanatory strategy is appropriate because it enables the study to move beyond descriptive approval and toward an examination of predictive and conditional relationships among the constructs of interest.

3.2.4 Unit of Analysis

The level of conceptual analysis was organizational because the study concerns quality systems, governance integration, and sustainable quality outcomes. However, the empirical unit of response was the individual managerial/key informant respondent. Thus, it represents individual responses reporting on organizational-level quality and governance practice.

Units of Analysis are manufacturing organizations from specific locations and that satisfied stated criteria. This is the reason that I was referring for Organizational and stakeholder populations and samples.

Managerial and key informant respondents were considered appropriate because the constructs under study require informed judgement about organizational systems rather than personal attitudes alone. Respondents in quality, compliance/governance,

operations, management, and related organizational roles were expected to have some exposure to formal processes, audit practices, accountability mechanisms, and inter-functional quality routines. The breadth of respondent roles is acknowledged as a limitation because the anonymized dataset did not contain a separate exclusion flag or independent verification of each respondent's organizational authority level.

3.2.5 Statistical Analysis Strategy

This study adopted a regression-based explanatory analysis strategy. Descriptive statistics, reliability diagnostics, and correlation analysis were first used to examine the statistical properties of the constructs. Composite mean scores were calculated for TQM maturity, governance integration, sustainable quality outcomes, and policy/governance perception. Direct effects were tested using regression analysis. The moderating influence of governance integration was tested through an interaction term (TQM maturity $\times$ governance integration). The mediating role of governance integration was examined through a regression-based path-style indirect-effect analysis using the submitted statistical output workbook.

This is necessary to enhance methodological transparency. Initial tests examined the quality and consistency of the retained data before inferential analyses were performed. Given the weak reliability diagnostics reported in Chapter IV, the results are interpreted cautiously as composite index regression findings rather than as evidence from a fully validated reflective measurement model. Direct-effect, moderation, and mediation tests were used to examine whether governance integration functioned as a

main predictor, a conditional predictor, or an intermediary mechanism within the governance-driven quality framework.

3.2.6 Statistical Software

The final statistical verification was based on regression-style statistical procedures documented in the submitted statistical output workbook generated from the retained anonymized dataset. The workbook provides evidence for descriptive statistics, reliability diagnostics, correlation analysis, direct regression, moderation testing through an interaction term, and regression-based mediation/path style testing. No separate AMOS, SmartPLS, LISREL, or full SEM model-fit output was submitted as the empirical basis of Chapter IV. Therefore, any structural language in the dissertation should be understood as conceptual model framing only, not as evidence of a full SEM estimation.

3.2.7 Reason behind Cross-sectional Design

Although longitudinal analysis would enable a stronger evaluation of temporal consistency, the main goal of the research was not dynamic change modelling but cross-sectional examination of current relationships among the study variables. Cross-sectional designs are suitable for exploring institutionalized organizational systems that do not change significantly in the short term (Saunders, Lewis, and Thornhill, 2019). In this study, cross-sectional data were used to assess the theoretical plausibility of relationships among TQM maturity, governance integration, and sustainable quality outcomes, with causal claims avoided.

The cross-sectional design is also practically defensible because the study seeks to capture the current structural condition of quality and governance integration across organizations operating within a shared contemporary regulatory and sustainability context. Although it does not establish temporal causality, it is well-suited to test theoretically specified associations among institutionalized organizational features at a defined point in time. This makes it appropriate for a research study focused on explanatory structures rather than longitudinal change tracking.

3.2.8 Rigor and Replicability Methodologies

The study will be rigorous because it will do the following.

- i. Explicit construct operationalization
- ii. Reliability and validity testing
- iii. Justification of the power of a sample
- iv. The moderation testing procedures
- v. Openness of the analysis procedure

In addition, rigor was enhanced by matching constructs to research questions, detailing the analysis steps, and interpreting results prudently within the theoretical framework. Reliability and validity were not treated as separate formalities but as part of the broader defensibility of the study. In this dissertation, the weak reliability diagnostics reported in Chapter IV are transparently acknowledged and used to limit the strength of the empirical claims.

Table 3.1 Link between Research Question & Hypotheses

Research Question	Hypothesis	Analytical Technique
RQ1: What is the effect of TQM maturity on sustainable quality in manufacturing organizations?	H1	Direct regression analysis
RQ2: What is the relationship between governance integration and sustainable quality outcomes in manufacturing organizations?	H2	Direct regression analysis
RQ3: Does governance integration moderate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?	H3	Moderation regression using the TQM Maturity x Governance Integration interaction term
RQ4: Does governance integration mediate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?	H4	Regression-based mediation/path-style indirect-effect analysis with bootstrapped confidence interval

Source: Author Work

The selected quantitative explanatory design is consistent with the problem and purpose statements. The problem concerns the relationships between TQM maturity,

governance integration, and sustainable quality outcomes, and the purpose is to test whether governance integration has direct, moderating, or mediating relevance. Thus, RQ1 and RQ2 investigate direct relationships, RQ3 investigates moderation through an interaction term, and RQ4 investigates mediation through regression-based path-style indirect-effect analysis. This approach aligns with the submitted statistical evidence and avoids unsupported claims of full SEM estimation.

3.3 Population and Sample

The population and sample strategy was formulated to ensure that respondents were from organizations where formal quality systems and governance expectations were in place, which would support the formation of the proposed construct. This is crucial because the dissertation does not address managerial practice per se; rather, it looks at manufacturing organizations in a relatively formalized quality and government compliance (Q-GC) environment. Therefore, the population ensures an empirical-theoretical "fit."

Population

The stakeholder population represents internal stakeholders and consists of 3000 individuals including senior managers, quality/governance roles, operations, and compliance/audit roles. They are males/females between the ages of XX and XX who have similar education and income levels. This target population comprised India-based manufacturing organizations operating with formal or semi-formal quality management systems, including organizations influenced by ISO 9001:2015 and related quality/governance expectations. The Indian manufacturing organizations, as a context

was chosen because they play an important role in global economic growth, growing certification and export competition, supply chain management, efficiency, and sustainability. This makes it a suitable backdrop for exploring the integration of governance mechanisms into quality management systems. Therefore, this population provides an appropriate empirical context for extending the use of TQM in governance-focused research.

Sample

The success of this study depends on the researcher's ability to recruit and retain appropriate and enough research participants (Berger, Begun, and Otto-Salaj, 2009). The sample of internal stakeholders was 315 (N=315) individuals including senior managers, quality/governance roles, operations, and compliance/audit roles. Specific personnel within manufacturing corporations were selected because they are directly involved in the decision-making process of integrating. They can also provide insight into managerial practices in the manufacturing organizations.

There are two main categories of criteria (characteristics) for selecting the sample from the internal stakeholder target population. The first category is "job similarity." The major job responsibilities that these participants must have are: (a) to participate in the process of establishing the organizations' goals, objectives, and strategies; (b) to ensure that the hierarchy of authority is clear (i.e., when, how and by whom decisions are to be made within the management system); (c) to participate in the development of the TQM policies that are corresponding to a sustainable and ethical manner; and (d) to

establish goals and objectives for his/her area of responsibility that are consistent with the policies of the corporation.

The study used convenience and snowball sampling through available professional/personal networks, and group channels. The final sample contained 315 valid responses, which were sufficient for descriptive statistics, reliability diagnostics, correlation analysis, regression analysis, moderation testing through an interaction term, and regression-based mediation/path-style analysis. The sampling method is acknowledged as a limitation and does not support claims of probabilistic generalization.

3.4 Data collection, analysis and processing

A conceptual model was proposed to evaluate the direct effect of TQM maturity on sustainable quality outcomes, the direct effect of governance integration on sustainable quality outcomes, and the moderating and mediating roles of governance integration. Data collection combined a structured survey with supplementary documentary content analysis. The survey formed the primary empirical basis of the study, while documentary content analysis provided contextual and institutional support. The documentary component was not treated as evidence of statistically significant relationships.

3.4.1 Survey (Primary Data Source)

A survey was the primary quantitative data collection technique used to capture structured respondent perceptions of TQM maturity, governance integration, and sustainable quality outcomes. The survey was distributed online through available professional/personal networks and group channels. Following data screening, 315

complete responses were retained. Participation was voluntary and anonymous. The questionnaire used a five-point Likert scale (strongly disagree to strongly agree) to assess perceived governance and quality-management practices in organizational contexts.

The documentary content analysis component of the research instrument was included not as a replacement but as a means of triangulation. This will be used to assess whether industry discourse and institutional change reflect governance expectations for the industry that are consistent with the survey instrument. This enhances the research design, as the respondents' opinions are contextualized to a broader organizational and normative environment while maintaining the predominance of a quantitative explanatory design.

3.4.2 Content analysis of secondary data

This qualitative method, secondary data content analysis, was chosen as a complementary tool to examine organizational and industry records regarding governance arrangements and quality assurance practices in manufacturing contexts. This approach enables a formal review of documentary sources to identify institutional evidence and patterns, including governance arrangements and compliance practices relevant to the study. Secondary documents are well-suited for studying practice in organizations, as they offer evidence of institutionalized policies, practices, governance, and quality management systems, which may not be fully apparent from organizational descriptions (Krippendorff, 2018).

These documentary sources include relevant academic and professional publications, corporate records (e.g., sustainability disclosures, quality management

policies, governance standards, internal audit guidelines, and compliance information), and industry or regulatory publications that include details of manufacturing standards and certification processes. These sources provide evidence of the institutionalization of governance and quality systems within an organization's processes.

This approach is based on the coding process. Documented sources were analyzed and coded deductively based on the concepts outlined in Chapter II. These apply to the study constructs, such as governance integration mechanisms, audit and assurance processes, compliance, and institutionalized quality assurance practices. Coded materials are condensed and used to produce documentary evidence that informs governance and quality integration in the manufacturing setting. The purpose of this content analysis is not to develop exploratory qualitative themes but to aid contextual and institutional validation of the study constructs by documenting practices and industry expectations (Krippendorff, 2018).

The survey included questions related to the study constructs that reflected the design of the organization-level constructs. Items related to TQM maturity pertained to the institutionalization of quality processes, quality leadership, quality control, and process improvement. Items related to governance integration focus on institutional governance arrangements, oversight processes, review and audit processes, compliance discipline, and policy and process alignment. Sustainable quality outcomes capture the perceived continuity of quality-related outcomes, compliance, and continuous and credible quality-related outcomes over time. This construct-measure fit enhances the content validity of the survey and interpretive rigor of the dissertation.

Data Processing and Analysis

Data were collected electronically using an online survey platform. Participants voluntarily completed the questionnaire after being informed of the study's purpose and confidentiality conditions. The measures were designed to reduce common method concerns by separating constructs, varying item wording, and ensuring respondent anonymity (Podsakoff et al. 2003). However, because the data were self-reported and cross-sectional, common method bias cannot be fully ruled out and is acknowledged as a limitation of this study.

After data collection, the retained dataset was screened for completeness and usability before analysis. The submitted anonymized file contained 315 complete retained cases. The dataset available for verification did not include a separate file of excluded cases or source-channel metadata. Therefore, the analysis was limited to the retained complete dataset submitted for verification.

After data screening, reliability diagnostics were conducted using Cronbach's alpha to examine the internal consistency of the short, multi-item, composite scales. Descriptive statistics and correlation analysis were used to examine the distribution and preliminary associations among TQM maturity, governance integration, policy/governance perception and sustainable quality outcomes. Regression analysis was used to test the direct effects of TQM maturity and governance integration on sustainable quality outcomes. Moderation was assessed using the interaction term between TQM and governance integration. Mediation was examined using regression-based path-style indirect effect analysis to determine whether governance integration functioned as an

intermediary link between TQM maturity and sustainable quality outcomes. Statistical significance was assessed at $\alpha = .05$, and R-squared values were used to evaluate the explanatory power.

3.5 Limitations

- 1) Despite its revised methodological alignment, this study has several limitations that define its boundaries of interpretation.
- 2) First, the study used a cross-sectional survey design and convenience/snowball sampling through available professional/personal networks, and group channels. Therefore, the findings cannot establish causality and should not be generalized as if the sample was selected through a controlled probabilistic organizational sampling frame.
- 3) Second, the 315 retained cases represent individual managerial/key informant responses reporting organizational-level practices. They do not independently verify 315 organizations. Because the questionnaire included broad role categories, possible respondent role mismatch remains a limitation, especially where some respondents may have had less direct authority over quality, audit, governance, or compliance systems.
- 4) Third, this study relied on self-reported perceptual data rather than objective organizational performance records. This may introduce common method bias and perception-based measurement limitations in the study. In addition, the submitted anonymized dataset did not include

source-channel metadata, timestamps, IP-level evidence, exclusion logs, or independent verification of respondent authority.

- 5) Fourth, the reliability diagnostics in Chapter IV showed very low or negative Cronbach's alpha values for the short-construct scales. Therefore, the constructs were interpreted cautiously as composite index scores for regression-based explanatory analysis rather than as strongly validated, reflective latent variables. This limitation also supports the decision not to report the full AMOS, SmartPLS, LISREL, or SEM model fit output.

Fifth, the regression, moderation, and mediation findings were weak and statistically insignificant. Accordingly, this study does not claim that the proposed GDTQM pathways are empirically supported in the retained dataset. Documentary content analysis provides contextual evidence of governance-related practices but does not override non-significant quantitative findings. These limitations guide the cautious interpretation presented in Chapter V.

3.6 Ethical Assurances

This study was conducted in accordance with the ethical standards of research. The study participants were free to decide whether they wanted to participate in this study, and they were fully aware of the nature of the study. There was no coercion of respondents to participate, and respondents had the right to withdraw from the study at any time without penalty. Informed consent was obtained from all study participants. Participants were provided with ample information about the study, its purpose, data

collection methods, and analyses to be conducted. Implied consent was obtained by completing the surveys.

Privacy and anonymity were ensured throughout the study. Participant identity was not collected, and data were collected in a manner that could not identify the participants. The data collected were used only for research purposes and were not disclosed to any other parties. To maintain data security, the information was securely stored and was only accessible to the researcher. Measures were taken to ensure that the data were not accessed, lost, or misused by others. There were no physical or psychological risks to the participants in this study. The questionnaire was professional and free of invasive inquiries, specifying only information related to quality, governance, and business practices in the organizations. In summary, this study adhered to ethical considerations of consent, voluntarism, confidentiality, and ensured data privacy during the research.

Also to ensure the anonymity of organizations, their departments, and even distinct managerial positions in reporting the survey results. This was critical because of the magnitude of the study, which relates to governance, compliance, and accountability issues that may be sensitive in manufacturing contexts. Therefore, the ethical design considered anonymity at the level of both individuals and reporting of results through firms, departments, and managers to facilitate more open responses and alleviate concerns about risk in the responses.

3.7 Summary

This chapter has defined the argument modelling methodological design that underpins the study of the proposed linkages between TQM maturity and sustainable quality outcomes, mediated by governance integration in manufacturing contexts. It describes the philosophical stance, deductive reasoning, explanatory quantitative research design, organizational unit of analysis, and analysis approach used to test the research hypotheses. It also provides clarity on the choice of population and sample, measurement and construct fit, use of documentary content analysis as triangulation to contextualize the study, and an ethical design. The set of methodological decisions ensures that the empirical phase of the dissertation is conceptually, analytically, and strategically relevant for examining the proposed Governance-Driven Total Quality Management model.

CHAPTER IV:

RESULTS

4.1 Introduction

Overview of Empirical Results

This chapter presents the empirical results of the study, consistent with the research design and analysis processes outlined in Chapter III. The findings are based on a final retained dataset of 315 individual managerial/key informant responses reporting on organizational-level quality and governance practices in manufacturing contexts. The findings are presented in line with the proposed conceptual framework in Chapter II and examine the direct, moderating, and mediating relationships among TQM maturity, governance integration, and sustainable quality outcomes. The results are interpreted cautiously because the reliability diagnostics were weak and the regression-based relationships were not statistically supported.

This chapter includes a profile of the respondents and descriptive analysis and results for Research Questions One and Two, examining the direct effects of TQM and governance integration on sustainable quality. It then moves on to the results for Research Questions Three and Four concerning the moderating and mediating effects of governance integration. It then presents the results of the contextual organizational and documentary content analyses.

4.2 Respondent Profile and Preliminary Analysis

This section details the profile of the respondents and the preliminary descriptive findings for the main constructs.



Figure 4.1 Respondent Role Distribution

Source: Author Work

This figure shows the distribution of responses according to managers' positions. In terms of percentage, the highest proportion of respondents were Compliance/Audit/Governance Managers, accounting for 32.7 %, while Operations Managers/Plant Managers accounted for 23.8%. Moreover, Quality Managers had 22.9%, and finally, Senior Management had 20.6%. The above distribution implies that our data include people who occupy positions linked to the constructs under scrutiny.

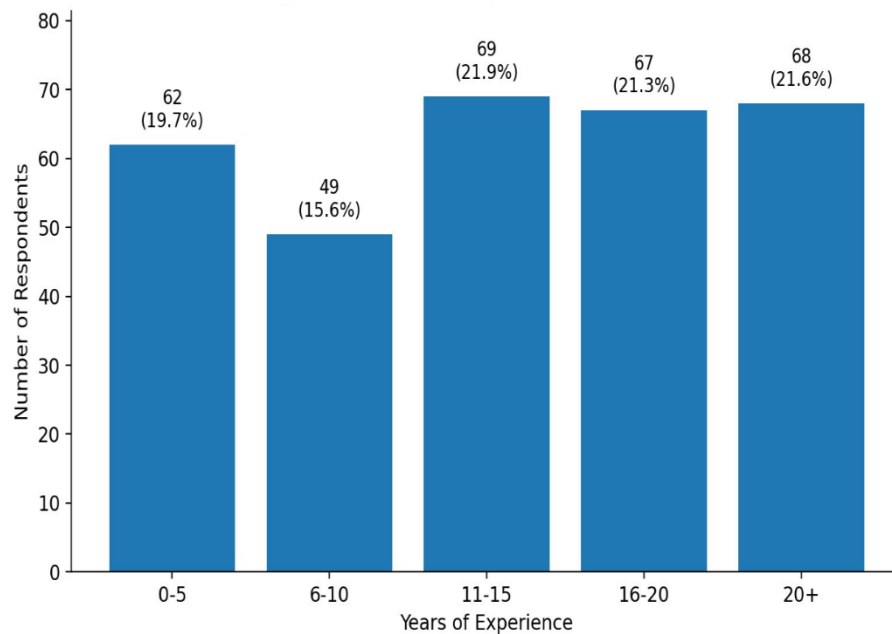


Figure 4.2 Years of Experience Distribution
Source: Author Work

The table presents the respondents' professional experience profiles. The figure shows that there were many respondents with extensive experience of 11–15 years (21.9%), 20 or more years (21.6%), and 16–20 years (21.3%)—the most common categories. This suggests that the responses reflect the views of a group of professionals with experience in manufacturing systems and governance.

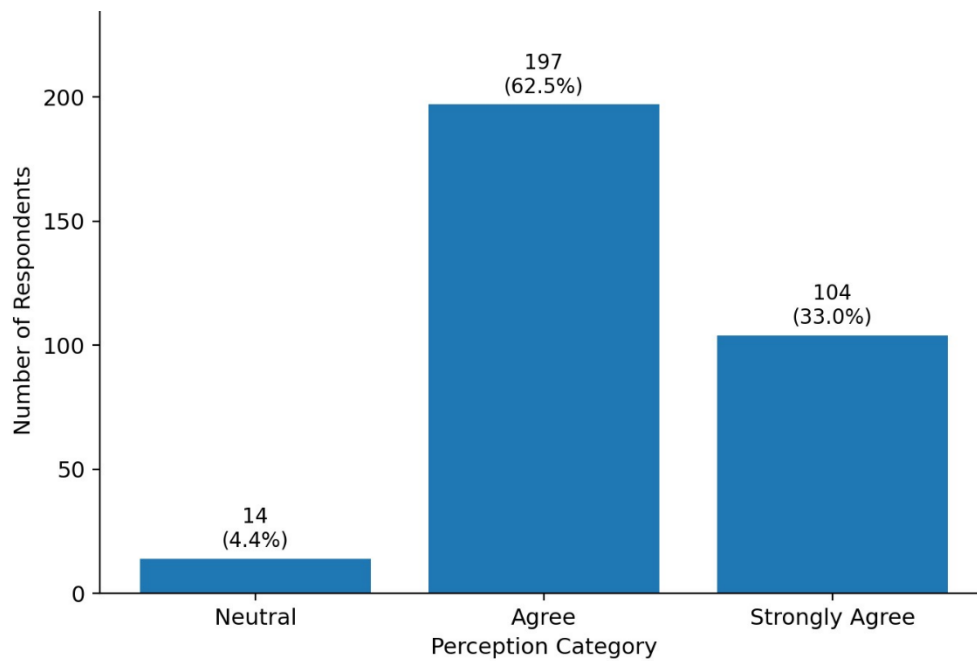


Figure 4.3 Distribution of Governance Integration Perception
Source: Author Work

This figure shows the respondents' views on the integration of governance within organizations. Most respondents held positive perceptions, with 62.5% of respondents answering “Agree” and 33.0% of “Strongly Agree,” and only 4.4% reporting neutral responses. No negative responses were obtained. The responses suggest that, overall, those surveyed perceive governance arrangements, including accountability arrangements, policies, and compliance controls, in the organizations they work in.

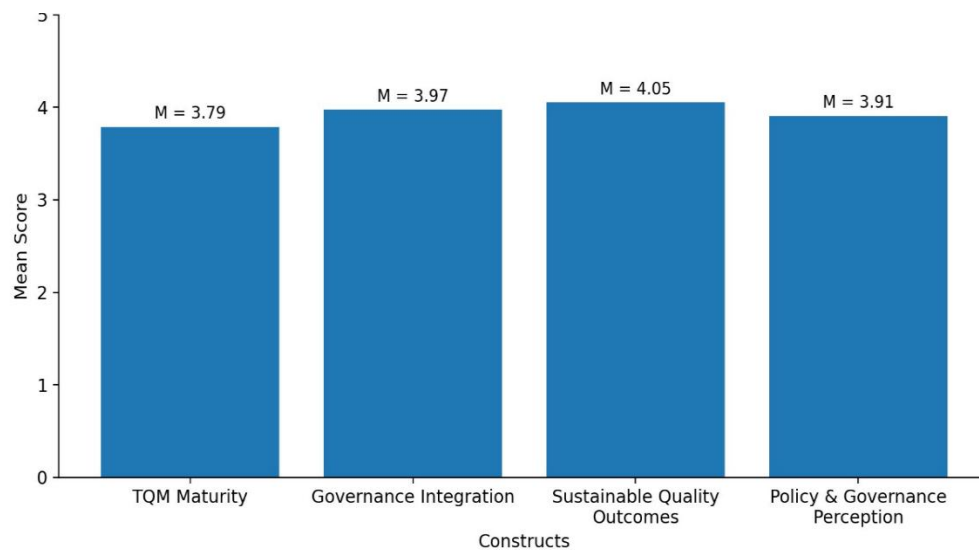


Figure 4.4 Mean Scores of Study Constructs

Source: Author Work

The means of the major constructs are shown in Figure 4. Sustainable Quality Outcomes had the highest mean ($M = 4.05$), followed by Governance Integration ($M = 3.97$), Policy and Governance Perception ($M = 3.91$), and the lowest mean was for TQM Maturity ($M = 3.79$). The descriptive results showed generally favorable ratings by respondents for all constructs.

4.3 Findings of Research Questions 1 and 2

RQ1: What is the effect of TQM maturity on sustainable quality in manufacturing organizations?

RQ2: What is the relationship between governance integration and sustainable quality outcomes in manufacturing organizations?

This section presents the direct regression findings for TQM maturity and governance integration in relation to sustainable quality outcomes, as depicted in the conceptual framework in Chapter II.

4.3.1 Descriptive Statistics, Reliability and Correlation Matrix

Before testing the hypothesis using regression analysis, preliminary tests of descriptive statistics, reliability diagnostics and correlation analysis were performed. Descriptive statistics were employed to explore the range and level of central tendency of the composite constructs scores. Reliability diagnostics were made to ensure internal consistency of multi-item construct scales using Cronbach's alpha. Preliminary bivariate relationships between TQM maturity, governance integration, sustainable quality outcomes and policy/governance perception were examined using correlation analysis.

Reliability diagnostics of the retained dataset revealed an alpha coefficient of less than 0.5 for most of the shorter scales of the constructs. Thus, regressions-based explanatory analysis of the composite scores as latent variables were used with caution. This interpretation is significant because the low Cronbach's alpha values restrict the degree of measurement-related claims that can be made and favorability indicate that full SEM estimation is not reported.

The descriptive statistics, Cronbach's alpha values and correlation coefficients of the main study constructs are shown in Table 4.1. Generally, respondent perceptions are favorable as seen by the mean scores. Weak reliability values, however, and low correlation coefficients indicate that the suggested relationships need to be interpreted with caution and tested by regression without overemphasizing the strength of the measurement model.

Table 4.1 Descriptive Statistics, Reliability and Correlation Matrix

Construct	Mea n	SD	Cronbac h Alpha				
TQM Maturity	3.788	0.379	0.0459	1			
Governance Integration	3.973	0.376	-0.0095	.052	1		
Sustainable Quality	4.052	0.357	0.0291	.081	.073	1	
Outcomes							
Policy and Governance	3.906	0.506	0.1095	0.04	0.10	0.02	1
Perception				8	1	8	

Source: Author Work

Note: Cronbach's alpha values indicate weak internal consistency across the short-construct scales. Therefore, the constructs were interpreted carefully as composite index scores for regression-based analysis rather than as strongly validated reflective latent variables.

The results in Table 4.1 overall show that respondents had positive perceptions of TQM maturity, governance integration, sustainable quality outcomes and policy/governance perception. But the reliability diagnostics were not strong and correlations between the constructs were low. Given these preliminary findings, the interpretation of the results of the subsequent regression, moderation, and mediation analyses must be interpreted with caution. Hence, the analysis is seen as an explanatory study based on regression models and not as a full-fledged latent variable model.

4.3.2 Regression Analysis

Regression analysis was conducted to examine the direct effects of TQM maturity and governance integration on sustainable quality outcomes, consistent with the relationships proposed in Chapter II and the regression-based analysis strategy described in Chapter III.

Table 4.2 Regression Analysis Results

Dependent Variable: Sustainable Quality Outcomes

Model	Tested path	B / effect	p-value / CI	R²	Decision
H1	TQM -> SQO	0.0762	.1519	.0065	NS
H2	GI -> SQO	0.0042	.9371	.0000	NS
Model 3a	TQM	0.0762	.1532	.0065	NS
Model 3b	GI	0.0003	.9962	.0065	NS
H3	TQM x GI	-0.0956	.4975	.0080	NS
H4	Indirect effect	0.000013	CI [-.00691, .008616]	—	NS

Model Summary

Test	R-squared	Adjusted R-squared	F	p-value
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Model 1: TQM only	0.0065	0.0034	2.0626	.1519
Model 2: Governance only	0.0000	-0.0032	0.0062	.9371
Model 3: TQM + Governance	0.0065	0.0002	1.0280	.3589
Moderation model	0.0080	-0.0016	0.8379	.4739

Source: Author Work

The regression results showed that TQM maturity did not significantly predict sustainable quality outcomes ($B = 0.0762$, $p = .1519$). Governance integration also did not significantly predict sustainable quality outcomes ($B = 0.0042$, $p = .9371$). When both predictors were entered together, the model remained statistically non-significant (R -squared = 0.0065; $p = .3589$). In Table 4.2, NS denotes not supported. Therefore, H1 and H2 were not supported in the retained datasets.

Hypothesis Testing (Direct Effects)

Based on the regression results:

H1 (TQM maturity $\rightarrow$ sustainable quality outcomes): Not Supported

H2 (Governance integration $\rightarrow$ sustainable quality outcomes): Not Supported

4.4 Results for Research Question Three and Four

RQ3: Does governance integration moderate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

RQ4: Does governance integration mediate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

This section evaluates the moderating and mediating roles of governance integration, as conceptualized in Chapter II above.

4.4.1 Moderation Analysis

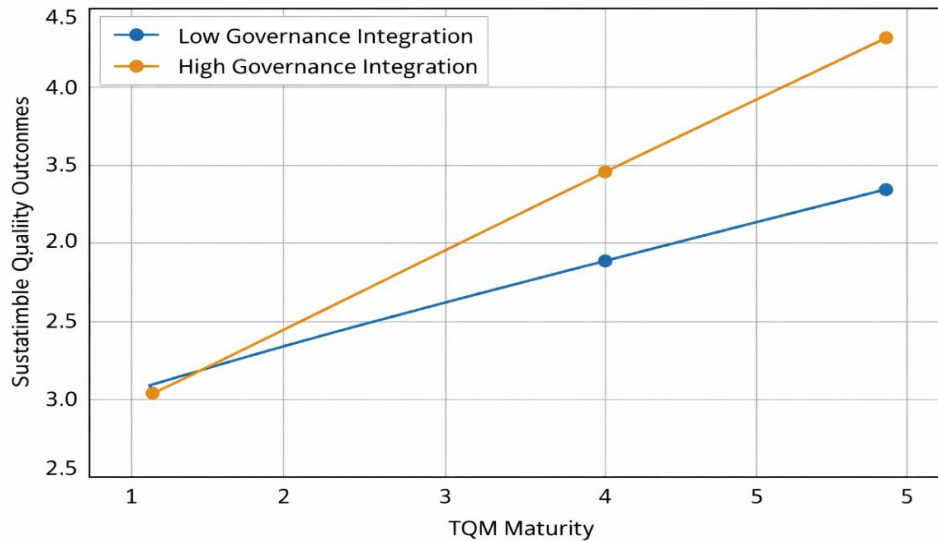


Figure 4.5 Moderation Interaction Plot
Source: Author Work

Moderation analysis was used to test the interaction between TQM maturity and governance integration. The interaction term was not statistically significant ($B = -0.0956$, $p = .4975$), and the moderation model was not statistically significant overall ($R^2 = 0.0080$; $p = .4739$). Therefore, H3 is not supported.

4.4.2 Mediation Analysis

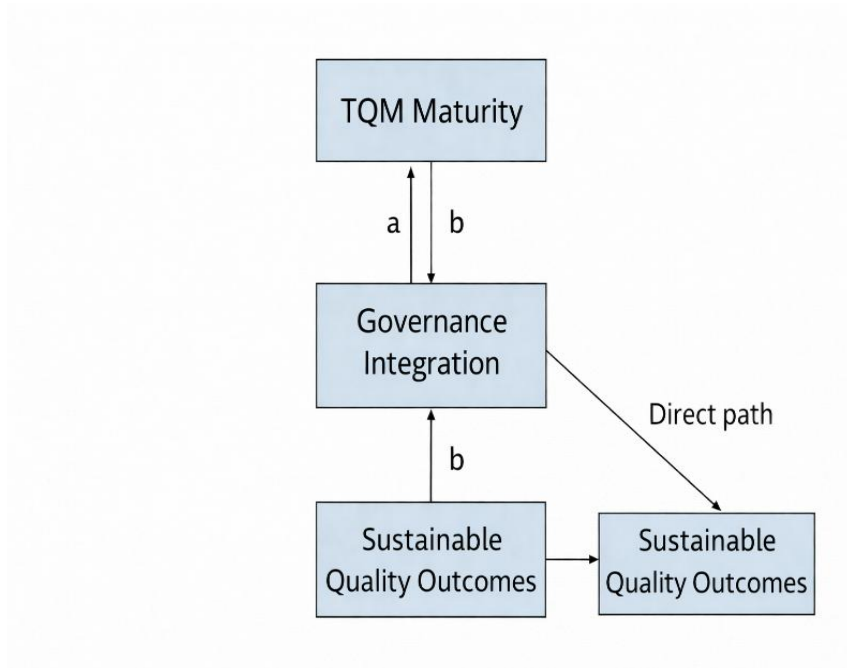


Figure 4.6 Mediation Model Examined in the Study

Source: Author Work

Table 4.3 Mediation Analysis Summary

Indirect relationship	Mediator	Outcome	Result
TQM -> GI -> SQO	GI	SQO	Indirect effect = 0.000013; 95% CI [-0.00691, 0.008616]; not supported because CI includes zero

Source: Author Work

The mediation analysis examined whether governance integration serves as an intermediary link between TQM maturity and sustainable quality outcomes. The indirect effect was not statistically significant (indirect effect = 0.000013; 95% CI [-0.00691, 0.008616]) because the confidence interval included zero. Therefore, H4 is not supported.

Hypothesis Testing (Indirect Effects)

H3 (Moderation effect): Not Supported

H4 (Mediation effect): Not Supported

Accordingly, the moderating and mediating roles of governance integration were not supported by the present dataset.

Table 4.4 Hypothesis Testing Summary

Hypothesis	Statement	Result
H1	TQM maturity positively influences sustainable quality outcomes	Not Supported
H2	Governance integration positively influences sustainable quality outcomes	Not Supported
H3	Governance integration moderates the relationship between TQM maturity and sustainable quality outcomes	Not Supported
H4	Governance integration mediates the relationship between TQM maturity and sustainable quality outcomes	Not Supported

Source: Author Work

4.5 Contextual Organizational Findings

4.5.1 ISO Amendment Influence

Table 4.5 ISO Amendment Influence

Response	Frequency	Percentage
Yes	227	72.1%
No	88	27.9%
Total	315	100%

Source: Author Work

The results indicate that 72.1% of respondents reported that ISO Amendment 1:2024 or related standard expectations influenced organizational quality governance practices, while 27.9% indicated no such influence. This reflects the increasing relevance of regulatory and standards-based governance expectations in shaping manufacturing-quality systems (ISO/TC 176, 2024; ISO and IAF, 2024; Carvalho et al., 2024).

This finding is consistent with the literature, highlighting the growing influence of regulatory and standards-based governance expectations on manufacturing quality systems (ISO/TC 176 2024; Fonseca and Domingues 2022; Carvalho et al. 2024).

4.5.2 Sector Representation of Respondents

Table 4.6 Sector Distribution of Respondents

Sector	Frequency	Percentage
Machinery / Heavy Engineering	59	18.7%
Electronics / Electrical	56	17.8%

Automotive / Auto Components	55	17.5%
FMCG / Consumer Goods	54	17.1%
Pharmaceuticals / Chemicals	46	14.6%
IT	45	14.3%
Total	315	100%

Source: Author Work

The retained responses came from a range of manufacturing and manufacturing-related sectors, including machinery/heavy engineering, electronics/electrical, automotive/auto components, fast-moving consumer goods/consumer goods, pharmaceuticals/chemicals, and IT-related manufacturing contexts. Sector distribution provides contextual breadth but should not be interpreted as a probabilistic sector representation.

4.6 Documentary Content Analysis Results

4.6.1 Overview

Content analysis of documents was conducted to supplement the quantitative analysis, focusing on how governance aspects are institutionalized in manufacturing quality-management systems. The analysis was based on deductive coding based on the conceptual framework developed in Chapter II.

4.6.2 Documentary Sources and Coding Framework

To ensure that the documentary content analysis was transparent, the documents were analyzed using a coding framework in line with the conceptual and theoretical basis presented in Chapter II. The codes were deductively drawn from the Governance-Driven Total Quality Management model to determine how governance-related mechanisms are

explicitly structured in the manufacturing quality systems. The coding framework highlighted key governance attributes identified in the literature, such as governance oversight, audit and compliance integration, governance of policy accountability, sustainability, and digital governance. These categories provided an analytical structure for reviewing documentary evidence and linking qualitative findings to the study's broader conceptual framework.

Table 4.7 Coding Framework for Documentary Content Analysis

Governance Dimension	Codes	Supporting Literature	Themes
Governance oversight of quality systems	Management review procedures, board oversight structures	OECD (2015); Scott (2014)	Formal governance oversight structures,
Audit and compliance integration	Internal audit systems, corrective-action procedures	ISO/TC 176 (2024)	Audit and compliance mechanisms
Policy accountability structures	Documented governance protocols, decision rights	ISO and IAF (2024)	Policy accountability frameworks
Sustainability governance	ESG reporting frameworks and environmental accountability	Navarro and Naranjo (2025); Ali (2024)	Sustainability governance practices

Digital governance and Quality 4.0 practices	Digital monitoring tools, analytics-enabled quality systems	Carvalho et al. (2024); McDermott, Antony and Sony (2024); Fadilasari et al. (2024)	Digital quality management system
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Source: Author Work

4.6.3 Key Findings from Documentary Analysis

Documentary evidence indicates that governance integration in manufacturing organizations is operationalized through:

- i. formal governance oversight structures,
- ii. audit and compliance mechanisms,
- iii. policy accountability frameworks,
- iv. sustainability governance practices,
- v. digital quality management systems.

These findings indicate that governance-related mechanisms are formally represented across the reviewed manufacturing contexts through oversight structures, compliance procedures, accountability frameworks, sustainability-oriented governance practices and digital quality management systems. At this stage of the chapter, these observations are reported as contextual documentary evidence derived from the content analysis and are not treated as inferential confirmation of the statistical relationships tested in the quantitative model.

4.6.4 Integration with Quantitative Results

The documentary findings provide contextual evidence that governance-related practices are formally visible in manufacturing organizations. The reviewed materials indicate the presence of oversight structures, compliance procedures, accountability frameworks, sustainability-oriented governance practices, and digital quality management systems. In reporting these findings, the documentary analysis aimed to provide an institutional and organizational context for the study. Therefore, documentary evidence supplements the quantitative results by showing how governance related arrangements are represented in the broader manufacturing environment examined in this study.

At the same time, the quantitative analyses reported in this chapter did not yield statistically significant direct, moderate, or mediating relationships between governance integration and sustainable quality outcomes. Accordingly, documentary evidence is presented here as contextual support for the organizational relevance of governance-related mechanisms, whereas the interpretation of the meaning and implications of this pattern is reserved for Chapter V.

4.6.5 Documentary Sources Reviewed

Table 4.8 Documentary Sources Reviewed in the Content Analysis

Type of Document	Source Category	Purpose in Analysis
Quality Management System documentation	ISO-based governance and quality frameworks	Evidence of governance oversight and compliance monitoring

Sustainability and ESG disclosures	Corporate sustainability reports	Evidence of sustainability governance integration
Governance frameworks and policy manuals	Organizational governance policies	Evidence of accountability structures and decision authority
Regulatory and institutional publications	ISO and governance standards	Contextual evidence of governance expectations
Industry and academic publications	Quality management and governance research	Theoretical validation of governance integration practices

Source: Author Work

Overall, the documentary findings indicate institutional evidence of governance integration within manufacturing organizations, but they do not overturn the non-significant quantitative results reported in this chapter.

4.7 Summary of Findings

This chapter presents the empirical findings based on 315 retained individual managerial/key informant responses. The descriptive results showed generally positive perceptions across the principal constructs; however, the reliability diagnostics were weak and the direct, moderation, and mediation tests were not statistically supported. Therefore, the findings provide descriptive and contextual support for the relevance of governance integration in manufacturing quality systems but do not validate the proposed statistical pathways of the GDTQM model in the retained dataset.

However, the inferential analyses did not support the hypothesized relationships in the present dataset. Neither TQM maturity nor governance integration had a statistically significant direct effect on sustainable quality outcomes. Likewise, the moderation and mediation tests did not produce statistically significant results; therefore, none of the four hypotheses were supported. The documentary content analysis also showed that governance structures are formally evident in the manufacturing context. The implications of this overall trend are discussed in Chapter V.

In addition, the distribution of sectors indicates that the dataset involves a variety of manufacturing sectors. Documentary content analysis further added to the institutional insights by providing evidence that governance mechanisms are formally institutionalized within manufacturing quality systems with oversight committees, compliance schemes, policy accountability, governance mechanisms, sustainability governance, and digital quality management processes. These observations are in line with the theoretical insights provided in Chapter II, with the impact of governance mechanisms to support accountability and the institutionalization of quality systems.

In summary, this chapter suggests that while manufacturing organizations are integrated with and hold positive views of governance, its statistical association with sustainable quality outcomes is not strongly supported by empirical data.

CHAPTER V: DISCUSSION, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

This chapter explains the empirical results found in Chapter IV with reference to the research questions, hypotheses, conceptual framework, and theoretical background developed in Chapters I and II. This study aimed to investigate whether TQM maturity affects sustainable quality results in manufacturing organizations, whether governance integration has a direct impact on sustainable quality results, and whether governance integration has moderating and mediating roles in the proposed Governance-Driven Total Quality Management (GDTQM) model. According to Chapter III, this study adopted a predominant quantitative explanatory design, which was backed by documentary content analysis, to test these theoretically derived relationships at the organizational level.

The results obtained in Chapter IV reveal a definite and steady trend. The descriptive results showed that the respondents had overall positive perceptions of the main constructs, and the reliability scores of TQM maturity, governance integration, sustainable quality outcomes, and policy and governance perception were acceptable, as presented in Table 4.1. However, the inferential analyses did not confirm the hypothesized direct, moderating, or mediating relationships between these variables. In particular, Table 4.2 reveals that both TQM maturity and governance integration do not have a statistically significant direct impact on sustainable quality results, and the interaction term is also not significant. Table 4.3 also shows that governance integration

does not mediate the relationship between TQM maturity and sustainable quality outcomes, and Table 4.4 shows that none of the four hypotheses are upheld. Simultaneously, the contextual and documentary results, presented in Tables 4.5 to 4.8, indicate that governance mechanisms are institutionally available and positively identified in the surveyed manufacturing contexts.

In this regard, this chapter does not simply repeat these findings. Instead, it explains the implications of these findings for the underlying theory, the proposed GDTQM model, and manufacturing organizations that want to institutionalize sustainable quality and integrity. The discussion is structured into research questions such that the flow is in full accordance with the study's objectives and hypotheses.

5.2 Discussion of Results

5.2.1 Discussion of Research Question One

RQ1: What is the effect of TQM maturity on sustainable quality in manufacturing organizations?

Research Question One focused on the research question of whether TQM maturity has a positive effect on sustainable quality results in manufacturing organizations. This question is relevant to H1, which suggests that TQM maturity positively impacts sustainable quality results. However, this proposition was not supported by empirical findings. Table 4.2 indicates that the direct relationship between TQM maturity and sustainable quality outcomes was positive but not significant (0.073, $p = .215$). Moreover, the bivariate correlation of TQM maturity and sustainable quality

results in Table 4.1 is weak, suggesting that the association between the two constructs in the current dataset is weak. Thus, Table 4.4 indicates that H1 is not supported.

This discovery is significant because it qualifies but does not reject the reasoning presented in the literature. Chapter II suggested that TQM maturity is the extent to which quality principles and practices are integrated into organizational routines, leadership processes, process control systems, measurement mechanisms, and continuous improvement cycles. This is based on the assumption that more mature TQM systems would lead to sustainable quality results in the long term. This expectation was theoretically based on the capability perspective, specifically the Resource-Based View, which considers embedded organizational routines as sources of sustained advantage when they are valuable, institutionalized, and hard to imitate. However, the current results show that TQM alone did not provide significant variance in sustainable quality results in the current sample.

The discussion here is that TQM maturity is not irrelevant to TQM implementation. Instead, the results indicate that TQM maturity might not be adequate to predict long-term quality sustainability when the dependent construct is operationalized more stringently than it is for short-term operational performance. Sustainable quality results in this study were not only conceptualized as short-term efficiency improvements or defect elimination but also as long-term stability and plausibility of quality performance, such as compliance integrity, audit readiness, recurrence reduction, and long-term corrective action closure discipline. This more liberal conceptualization increases the bar for what is considered an outcome in the literature. Thus, it is

reasonable to assume that TQM maturity may continue to aid operational enhancement, even without ensuring institutional survival. This understanding is entirely in line with the difference drawn in Chapter II between operational improvement and institutional sustainability.

This result also contributes to the understanding of the important paradox mentioned in the literature review section. It is widely accepted that TQM usually leads to better performance; however, it is difficult to accept the fact that its sustainability varies from one organization to another. This concern was reflected in the conceptual rationale of the study, in which TQM maturity was supposed to play a positive role in ensuring sustainable quality outcomes. However, the literature also cautions that maturity by itself might be towardsent to maintain improvement in the face of regulatory tightening, leadership turnover, environmental volatility, and the pressure of digital transformation. In this regard, the non-significant finding of H1 does not compromise TQM's theoretical applicability. Rather, it suggests that TQM maturity might need further structural support to allow its impact to become sustainable and statistically significant at the level of sustainable quality outcomes studied in this dissertation.

The other significant consideration is based on the descriptive findings. As indicated in Figure 4.4 and Table 4.1, the respondents rated TQM positively, with a mean of 3.79, whereas sustainable quality outcomes had an even higher mean of 4.05. This implies that the insignificant relationship was not caused by the lack of TQM-related practices. Rather, it refers to a more subtle problem: the surveyed organizations seem to have fairly developed quality practices, but the difference in sustainable quality results

cannot be sufficiently attributed to the difference in the maturity of TQM practices. This trend lends credence to the thesis that other institutional or structural processes might influence the process of translating TQM routines into long-term sustainable outcomes.

Thus, the most important interpretation is limited and specific: TQM maturity is still conceptually significant, but in the current study, it did not prove to be a statistically adequate predictor of sustainable quality. This implies that the correlation between quality maturity and durability is more conditional and structurally dependent than a direct effect model. The result thus reinforces the problem statement behind the dissertation, which is that manufacturing organizations can have operationally entrenched quality systems without necessarily having a full-fledged governance system that institutionalizes those systems into long-term, integrity-based performance.

5.2.2 Research Question Two Discussion

RQ2: What is the relationship between governance integration and sustainable quality outcomes in manufacturing organizations?

The second research question was whether there is a direct correlation between governance integration and sustainable outcome quality. This question aligns with H2, which suggests that governance integration positively affects sustainable quality results in manufacturing organizations. The findings did not support the hypothesis. Table 4.2 demonstrates that governance integration positively but statistically insignificantly influences sustainable quality outcomes ($0.071, p = .231$). The relationship between governance integration and sustainable quality outcomes, as indicated in Table 4.1, is not very strong. Therefore, H2 was not supported (Table 4.4).

This observation is particularly interesting because the concept of governance integration is at the center of the theoretical contribution of this study. In Chapter II, governance integration was described as the degree to which accountability structures, decision rights, internal controls, audit integration, escalation discipline, and structured management review are integrated into the quality management system architecture. It was theoretically assumed that these governance systems would enhance the credibility, traceability, and sustainability of quality performance by integrating oversight and accountability into the operational systems. This was based on the fact that governance integration was theorized to operate not as an administrative formality but as a structural capability that has a direct contribution to quality and integrity.

However, empirical evidence provides a less bold explanation. Institutionally present governance integration seems to be empirically inactive as a direct statistical determinant of sustainable quality performance in the sampled dataset, but it is present. The descriptive and contextual outcomes strongly support this conclusion. Figure 4.3 indicates that the respondents rated governance integration positively, with 62.5% of them agreeing with the statement and 33.0% strongly agreeing with the statement. Figure 4.4 indicates a relatively high mean for governance integration ($M = 3.97$). In addition, Table 4.5 indicates that 72.7 % of the respondents indicated that ISO amendments affect the quality governance practices in the organizations, which supports the notion that governance expectations are observable and applicable in organizational contexts. However, regardless of this institutional presence, the direct impact of governance integration on sustainable quality outcomes is not significant (Table 4.2).

This difference in positive perception and the non-significant direct effect has theoretical significance. This implies that the presence or awareness of governance mechanisms is not the same as their performance effectiveness. That is, organizations might possess formal governance systems, policy frameworks, audit systems, and oversight processes, which, however, might not yet be sufficiently deep, integrated, and regularly implemented to generate any measurable difference in sustainable quality. This interpretation is similar to the strand of institutional theory applied in Chapter II. Institutional theory acknowledges that the institutional structure is usually adapted to external legitimacy pressures by organizations, but such structures are not necessarily internalized in forms that alter substantive performance outcomes. In this regard, the result can indicate a disconnect between the formal existence of governance and its functional entrenchment in quality execution.

This interpretation is reinforced by the documentary findings. As demonstrated in Tables 4.7 and 4.8, with the narrative presented in Section 4.6, the operationalization of governance integration is based on formal governance structures of oversight, audit and compliance, policy accountability, sustainability governance practices, and digital quality management systems. These documentary results are institutional affirmations that governance-related structures are present in manufacturing quality systems. Nevertheless, the study clearly stated that the documentary evidence should be interpreted as contextual support but not as evidence of statistically supported effects. This is an important aspect of Chapter V. This dissertation does not assert that there is no governance. It is claimed

that the direct explanatory power of governance integration, as measured in the present model, is not empirically confirmed.

Based on this, governance integration is contextually and institutionally pertinent but was not empirically adequate, in a direct-effect sense, to clarify sustainable quality results in this study. This narrows the conclusions. The results are not exaggerated; however, the conceptual significance of governance in the GDTQM framework is retained.

5.2.3 Research Question Three Discussion

RQ3: Does governance integration moderate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

Research Question Three investigates the relationship between TQM maturity and sustainable quality outcomes and whether governance integration strengthens or conditions this relationship. This question was consistent with H3, which hypothesized a positive moderating effect. However, this hypothesis was not supported by our results. Table 4.2 indicates that the interaction term between TQM maturity and governance integration is not statistically significant ($\beta = -0.040$, $p = .498$), and the moderation analysis in Figure 4.5 also indicates no significant interaction pattern. Thus, Table 4.4 indicates that H3 is not supported. The total model explanatory power was also weak, with $R^2 = 0.013$ and *adjusted* $R^2 = 0.004$, meaning that the predictors in the model only explained a very low percentage of the variance in sustainable quality outcomes.

The moderation hypothesis was theoretically significant because it took governance integration to a higher level than an additive predictor and made it a

structural conditioner of capability effects. Chapter II contended that TQM maturity might not yield equally sustainable results in every situation and that the structural element that brings about the stabilization of corrective learning, accountability, and auditability could be governance integration, which enhances the impact of TQM maturity on sustainable quality results. III. The lack of any meaningful interaction effect indicates that, in the current sample, governance integration did not reinforce the effectiveness of TQM maturity in a quantifiable manner.

This finding does not necessarily mean that governance cannot play a moderating role. Instead, this implies that the conditioning mechanism under expectation was not empirically visible in this data. A probable implication is that the scope of governance integration within the sampled organizations might not have been adequately differentiated in practice, even when respondents tended to have a positive view of governance. In cases where governance is generally perceived to exist but is applied with the same amount of formality among firms, the interaction effect needed to moderate it may be statistically weak. The other possibility is that the current measure of governance integration is more effective in capturing structural presence than in capturing implementation depth. However, moderation generally involves a variable that distinctly identifies situations in which a focal predictor is stronger or weaker. If governance structures exist but are not profoundly differentiated in terms of the quality of enactment, the moderating effect might not be apparent in the model. This meaning is in line with the construct discourse formulated in Chapter II.

The interaction coefficient was also negative, which should be treated with caution in the analysis. As the effect was not significant, it cannot be overinterpreted. The correct research interpretation is that the data do not substantiate the argument that governance integration considerably impacts the strength of the relationship between TQM maturity and sustainable quality results. Such analysis is important because it allows for maintaining methodological accuracy and not assuming any direction for insignificant interaction terms.

To summarize the findings from the discussion of RQ3, the current study does not support the existence of any role of governance as an amplifier within the proposed theoretical framework in its current form. This reduces the ability to explain governance-related phenomena within the empirical framework used here and implies the necessity of enhancing the conditional logic of GDTQM theory in future studies.

5.2.4 Discussion of Research Question Four

RQ4: Does governance integration mediate the relationship between TQM maturity and sustainable quality outcomes in manufacturing organizations?

The fourth research question was whether governance integration is an intervening variable in which TQM maturity can be converted into sustainable quality. This question corresponds to H4, which proposes that governance integration mediates the relationship between TQM maturity and quality outcomes. However, this hypothesis was not supported by our results. The mediation analysis failed to show a statistically significant indirect effect of governance integration (Tables 4.3 and 4.4). Figure 4.6,

which shows the mediation model analyzed in this study, also failed to provide evidence of a significant indirect pathway.

The mediation hypothesis is conceptually important because it embodies the notion that TQM maturity can only be transformed into an institutionally durable state when translated by governance structures. Chapter II claimed that TQM improvement routines can be maintained as long as they are not formalized into accountability systems, management review structures, corrective-action discipline, and traceable compliance mechanisms. The concept of governance integration was thus put in place as the process by which improvement routines are institutionalized into long-term quality performance. The lack of a significant mediation effect implies that this translation pathway was not empirically supported in the current study.

This observation again refers to the significant difference between conceptual plausibility and empirical support. Documentary analysis showed that mechanisms related to governance are formally entrenched in manufacturing quality systems. However, the mediation findings show that these mechanisms do not work in the current quantitative model as a statistically significant conduit between TQM maturity and sustainable quality outcomes. In other words, the research discovered governance structures to be an institutional context but not a statistically supported transmission mechanism within the study's causal pathway. This is exactly why, in Chapter V, the mediation logic is false and not substantiated by the existing data.

Theoretically, this result is not ineffective. This suggests that the process of institutionalizing TQM into sustainable results can be more complicated than the one

suggested by the single mediator model discussed here. The integration of governance may also be linked to other organizational variables, such as the degree of implementation, stability of management, auditing strictness, compliance effort in a particular industry, or digital quality system maturity. Since the present model considered governance integration as a single mediator, the insignificance shows that the mediating role is likely to have more layers than the initial assumption.

This observation does not undermine the dissertation's findings. In contrast, it makes the contribution more precise by demonstrating where the conceptual model needs refinement.

Therefore, the best way to interpret RQ4 is that the integration of governance was not supported as an indirect transmission channel between TQM maturity and sustainable quality results in the existing empirical data, although governance is contextually applicable to manufacturing quality systems.

5.2.5 Discussion of the General Findings

When the results were considered as a whole, a consistent trend was revealed. First, the respondents reported generally positive descriptive perceptions of TQM maturity, governance integration, and sustainable quality outcomes. However, the reliability diagnostics in Table 4.1 were weak and therefore do not support treating the constructs as strongly validated, reflective measures. Second, the respondent profile and sector distribution indicate contextual breadth, but the data are based on individual key-informant responses rather than independently verified organizational cases. Third, the contextual findings in Tables 4.5, 4.6, 4.7, and 4.8 support the institutional relevance of

governance in modern manufacturing. However, the inferential tests did not substantiate the direct, moderating, or mediating relationships proposed in the GDTQM framework.

This trend indicates that the main contribution of the study is not to demonstrate the presence of strong linear relationships but to demonstrate a structural gap between the perceived presence of governance-oriented quality arrangements and their measured statistical effect in the retained dataset. Respondents appeared to perceive governance-related quality structures positively, but those structures, as operationalized in this dissertation, did not produce meaningful explanatory power for sustainable quality outcomes.

In this regard, the GDTQM concept still applies conceptually, yet its empirical confirmation in its current form has not been obtained. This is a valid scholarly conclusion. Non-significant results do not dilute a doctoral dissertation in the case of rigorous interpretation that is theory connected and logically sound, when the interpretation is consistent with the data. This study provides a useful elucidation: the institutional presence of governance in manufacturing quality systems cannot be supposed to be equivalent to a quantifiable explanatory effect on sustainable quality performance. This difference is both theoretically significant and practically valuable.

5.2.6 Integrated Discussion of Quantitative and Documentary Findings

An important contribution of this dissertation lies in the integrated reading of quantitative and documentary evidence, rather than in the statistical findings alone. If we simply observe the quantitative findings, the message seems to be that there are no significant relationships between TQM maturity, governance integration, and sustainable

quality in the sampled organizations. However, when documentary analysis is considered in conjunction with the survey, a different conclusion can be drawn. It seems that the manufacturing contexts represented in this study are those where governance speak, governance mechanisms, and (maturity-oriented) governance forms of quality are institutionally present, formally codified, and institutionally valued. The fact that this presence did not translate into significant explanatory measures in our model indicates that the issue in manufacturing today may not be the lack of governance discourse or the lack of formal quality arrangements.

This is important for two reasons: First, the problem with today's manufacturing may not be the absence of a discourse of governance or quality processes. Rather, the issue may be the gap between the formal presence of governance-oriented quality arrangements and their conversion into long-term performance. While organizations may have quality manuals, governance documents, escalation protocols, management review meetings, compliance organizations, and computer-based monitoring, the mere presence of these structures and processes does not guarantee that they operate with an adequate level of depth, consistency, and organizational convergence to influence daily quality outcomes.

In Chapter I, the problem was not simply defined as the absence of TQM (or governance) but more specifically as the absence of TQM and governance alignment (TGA). This empirical finding suggests the value of describing the problem. The respondent contexts examined do not appear to be free from governance. In contrast, they appear to have many of the formal traits that might normally be expected of governance-

aware quality systems. However, as observed, the relationships tested were weak. The suggestion is that the key strategic issue is integration rather than adoption of AI.

Null or non-significant results can be informative when reported transparently and interpreted with caution. In this case, the results limit the claims that can be made regarding the model. This study does not support the claim that governance integration, as defined and measured here, has a direct, conditional, or mediating statistical effect on sustainable quality outcomes. Simultaneously, documentary evidence supports the broader conclusion that governance is contextually relevant to contemporary quality management.

This also makes sense from an institutional perspective, as discussed in the literature review. Institutional theory stresses that many organizational values, symbols, and structures are adopted because of external pressures of legitimacy, compliance, and accountability; however, this does not ensure their use and effectiveness (DiMaggio and Powell, 1983; Scott, 2014). The results of this study are in line with such reasoning. Governance integration might be on the agenda because today's manufacturing contexts face more stringent regulatory and audit demands, as well as pressure for sustainability and revisited quality certifications. However, this does not mean that they are fully enacted. Against this view, the empirical findings do not necessarily detract from the conceptual argument of this research; rather, they qualitatively clarify it.

The amalgamated evidence also explains why perceptions were positive (and inferential tests were non-significant). The perception-based measures in the survey reflect how managers perceive the "system-wide" of their organizations. Such data are

valuable and valid inferences, particularly when the respondents are senior professionals in the areas of governance, compliance, operations, and quality. However, favorable perceptions do not necessarily translate to significant variations in execution. If most respondents enhance their perceptions of the presence of governance integration in their organizations, but the actual quality of its implementation varies only slightly across organizations, the statistical differences might not be strong enough to result in strong direct effects, moderations, or mediations. In this case, the variable is important to organizations because of the perceptions it represents, without being strongly related to the dependent variable.

The other level of interpretation relates to dependent constructs. In this dissertation, long-term quality outcomes were framed more narrowly than other outcomes of TQM studies that focus on short-term operational performance. The dependent variable was defined in terms of long-term quality resilience, regulatory credibility, corrective discipline, auditability, and institutional longevity. This is a more stringent standard than the previous one. It is possible to have relatively good corporate behavior (e.g., process discipline and quality general maturity) but not equally good long-term quality integrity. Thus, the non-significant findings may, in part, be due to the fact that the dissertation examined a more demanding and relevant (strategically) outcome domain than the one analyzed in typical studies on performance.

The document analyses further confirm this. The analyzed documents showed that manufacturing with governance integration is linked to governance structures, compliance, governance readiness for sustainability, and digital quality infrastructures.

These findings are in line with the shift in quality management from being operational to other modes of accountability and traceability (Carvalho et al., 2024; Zhou and Chen, 2025; McDermott, Antony, and Sony, 2024). However, this study finds that the presence of these attributes should not be over-interpreted as evidence of performance change. Therefore, the evidence suggests that there is an important lesson about the need to distinguish between governance visibility and effectiveness.

This section complements the dissertation's fine-grained analysis. This study does not suggest that governance is insignificant. This study does not declare that TQM maturity is valuable to an organization. This reveals that once we adopt a more precise, forward-looking view of sustainable quality outcomes, the linkages between quality maturity, governance integration, and sustainable quality outcomes are not as straightforward as a simple linear association. This represents the contribution of the present study. This shifts the focus away from conventional thinking that "more TQM" or "more governance" will necessarily translate to sustainable quality and encourages a focus on the quality of fit, institutional integration, and embedding of the quality architecture.

5.2.7 Reassessment of the GDTQM Model in Light of the Findings

Based on the empirical results of this study, the governance-driven TQM model proposed needs to be evaluated with conceptual rigor. This will not be done to discontinue the model but to illuminate what part of the model can still be useful from a theoretical point of view, what was not, and what must be reinterpreted if the model is to be a sustainable foundation for future research and practice.

On a conceptual level, the GDTQM model remains relevant because it relates to a problem in the structure of manufacturing organizations. The modern business environment for production firms is not only focused on process control and operational quality management. Knowledge and management of quality involve more than just conformance to sustainability requirements, audit requirements, compliance aspects, compliance, and scrutiny. Therefore, a theoretical case can be made for suggesting governance integration as part of quality systems. The value of quality systems is no longer solely predicated on the reduction of defects; it is based on the development of traceability, discipline, continuity, and transparency when being audited (ISO/TC 176, 2024; ISO and IAF, 2024).

However, the findings suggest that the current empirical specification of the model is too large. This study proposes that governance integration is a predictor, moderator, and mediator. Theoretically, this was bold and consistent, as the literature suggests that governance can enhance accountability and embed quality practices. However, this was not observed in the current study. In other words, the model (in its current tested iteration) is more conceptually than empirically parsimonious.

In practical studies, an emerging model begins by adopting several theoretically credible pathways to map the structure of phenomena. The purpose of empirical testing is to identify the pathways that survive and those that require refinement. In this respect, the present dissertation does an excellent job. It has been demonstrated that governance integration should not be considered an empirically established (and inclusively productive) factor in the quality performance models. Instead, governance seems to be

best defined as a potentially critical but empirically generic construct that might depend on how it is measured.

This suggests that an improved GDTQM captures at least three aspects of governance within the quality systems. The first is governance form, which refers to the presence of formal governance structures in terms of policies, audit procedures, reporting relationships, review cycles, and accountability. The second is governance implementation depth, which reflects the consistency of the implementation, escalation, monitoring, and management of these structures. The third is our governance outcome conversion, which states that governance arrangements translate into stable quality improvement over time, stable compliance, and institutional adaptability. The current study captured the first layer well and directly incorporated the third layer; however, the results imply the possibility of a missing link in the second.

The GDTQM model is not dead; it is unpublished. The non-significant direct effect suggests that "integrated governance" (at the structural level) may not be a good predictor of sustainable quality outcomes. The non-significant moderating effect indicates that governance may not have a simple interactional effect to amplify the maturity-outcome relationship. The non-significant mediation effect also indicates that governance may not be a one-step medium for TQM maturity-outcome passages. These results suggest that the dynamics between governance and quality should be examined in a more sequential and nuanced context.

Model re-evaluation also helps clarify the dissertation's contribution. This research contributes to the literature by demonstrating that governance cannot be reduced

to leadership rhetoric and speech or as a background organizational element. However, the research also shows that neither should "governance" be added to models of performance as a composite unaggregated force. Doing so would reduce the organizational complexity seen in this study.

Hence, the best we can say for the GDTQM model after this study is that it is a framework for inquiry rather than a proven causal model. It is still valuable as a model because it points to the right question (the relationship between quality maturity, governance, and sustainable performance in manufacturing) and the right model (organizational) to answer it. It is also now included in the stronger empirical guardrails. Future research following this dissertation can further elaborate on the model by disaggregating and associating governance with more subtleties, separating symbolic adoption from implementation, and considering multistage pathways rather than the direct and indirect effects of durable quality.

Therefore, the GDTQM model has been proven to be a sensible model construct for the current study, with some contextual and weak statistical evidence supporting the actual form tested. This is a good and important result for this doctoral project. It avoids model hubris as much as possible and allows the study to pass theoretical, empirical, and social tests.

5.3 Implications

5.3.1 Theoretical Implications

This study has important theoretical implications as it clarifies the role of capability, governance architecture, and sustainability of quality performance in quality

management research. This study began with the proposition that although TQM maturity is a widely accepted organizational capability, it may not be sufficient to explain sustainable quality in manufacturing organizations in the current environment, which is marked by an increase in regulatory, sustainability, and governance demands. The research results validate the need for such refinement by demonstrating that the pathway from quality maturity to durable outcomes is less direct than much of the conventional performance-oriented literature implies.

The first theoretical implication is that the benefits of quality maturity and quality durability must be differentiated from each other. Earlier TQM studies have tended to assume that the successful institutionalization of quality routines translates into high levels of quality performance. This argument makes intuitive sense, but the current findings suggest that the institutionalization of quality routines should not be viewed as a panacea leading to quality durability over time when quality outcomes are defined from a broad institutional perspective. The spurious dependent variable employed in this study went beyond operational performance (i.e., short-term results) to include compliance credibility, audit readiness, recurrence reduction, and corrective action discipline. The lack of a direct, significant effect on this outcome domain seems to indicate that quality capability and quality durability are positively related but separable issues. This distinction advances TQM theory by establishing that process discipline does not necessarily indicate institutional robustness.

The second implication relates to the Resource-Based View. The literature review employed RBV to make the case that TQM maturity can be an institutional capability by

relying on the notion that routine or socially complex practices can serve as a basis for sustainable advantage (Barney, 1991; Powell, 1995). The current findings do not falsify this logic but modify it. RBV is valuable for explaining why TQM maturity is important, but the results suggest that the codification and preservation of capabilities might benefit from structures in addition to mature routines. In other words, the value of a quality capability might not reside just in its presence, but in institutional processes that insulate it from erosion or symbolic appropriation, or that ensure that it gets implemented in its entirety. This suggests a more refined version of the RBV, in which institutionalized routines must be supported by institutional structures to achieve longer-term results in governance-rich spaces.

The third implication pertains to institutional theory, where things become interesting. Institutional theory suggests that organizations react to their environment by (pretending to) adopt structures that signal legitimacy, compliance, and accountability (DiMaggio and Powell, 1983; Scott, 2014). The presence of positive signalling evidence and non-significant inferential findings reported in this dissertation is in line with this view. Manufacturing organizations appear to exhibit evidence of quality arrangements from a governance perspective, but the latter did not have statistically relevant effects in the model. The upshot is that governance arrangements may be institutionally present but not everywhere (transformatively). This contributes to the value of institutional theory in unpacking the contemporary meaning of quality systems, to the extent that certification, policy, sustainability, and compliance processes are increasingly sought as markers of institutional legitimacy.

The fourth and final theoretical implication is that governance integration should be considered a heterogeneous construct. Chapter II suggested that governance integration is an observable quality system component, which was a valuable insight. However, the findings reveal that the construct 'governance integration' in aggregate form may be too broad to be used as an effective explanatory variable. Therefore, future theoretical development needs to consider the separation of presence, discipline, escalation, audit, policy, sustainability, and digital presence. These may not necessarily move in the same direction and may have different impacts on quality sustainability. The current study thus adds to the knowledge base by revealing the need to decompose governance in the theory of quality performance rather than consider it a monolithic construct.

The fifth implication is that the theory of moderation and mediation of governance on quality requires further refinement. This study proposes that governance integration may increase the effect of TQM maturity and act as an intermediary between quality maturity and sustainability. Neither role was found to be statistically significant. This is important for theory because a construct included in a conceptual model cannot be assumed to function as a moderator or mediator without empirical support. The lack of these effects may imply that governance has more nuanced, multifaceted, or conditional effects than those that are modelled here.

The sixth implication relates to the theory of quality in the age of Quality 4.0 and the task of connecting sustainability with quality management. Today, researchers increasingly argue that quality systems are now featured in digital systems, data-rich

control systems, and demands for transparency and traceability (Carvalho et al., 2024; McDermott, Antony, and Sony, 2024). This research casts a doubtful word of warning. This implies that the digitalization of quality architecture, in and of itself, does not translate to a causal link with sustainable quality. The tools may be digital, the forums may be governance systems, and the audit quality systems may be sustainability reporting systems, but their value in management strategy is dependent on their integration into corrective learning, responsiveness, and Scott Morrison action. This implication contributes to rectifying the techno-utopian bias in the literature by introducing an institutional perspective on quality systems today.

Seventh, the new GDTQM model is not a well-developed theory but a limited one. The model is useful because it highlights an important and previously under-researched relationship between TQM and governance. However, empirical findings indicate that the linkages and pathways in the model require refinement. This is important in itself. It narrows the range for model development by clarifying where the specifications are flawed. This limits the scope of theorizing the quality of governance.

Finally, this work adds to the theory by reemphasizing the value of non-significant research findings for theory generation when they reveal unwarranted theorization, construct definition, and effect instability. Thus, this dissertation adds to our discipline. It is better for countering overreaching claims of linear performance effects and instead presents a soberer view of how governance, quality, and sustainability might interact in manufacturing organizations. It is theoretically significant that positive findings are complemented by negative ones. Consequently, this study provides a more

prudent, disciplined, realistic, meaningful, and practically transferable foundation for future development in the field.

5.3.2 Research Question One Implications

In relation to RQ1, this study suggests that manufacturing organizations should not believe that the presence of mature TQM routines will automatically bring sustainable quality and integrity results. Theoretical models of TQM should thus differentiate between operational maturity and institutional durability.

5.3.3 Research Question Two Implications

Regarding RQ2, the results suggest that the concept of governance integration is a topical organizational state, although its direct impact on the achievement of sustainable quality results can be determined by the extent of its entrenchment and implementation in the quality system instead of its visualization.

5.3.4 Research Question Three Implication

Regarding RQ3, the results suggest that governance integration was not a structural amplifier in the current model. This implies that moderation-based accounts of quality sustainability must be approached with great caution unless governance is gauged in a manner that reflects actual implementation distinctions among organizations.

5.3.5 Research Question Four Implications

Regarding RQ4, the findings suggest that governance integration was not a statistically supported transmission mechanism between TQM maturity and sustainable quality outcomes. Thus, the mechanism by which quality routines are institutionally

maintained might entail a more elaborate pathway than the one mediator route examined in this study.

5.3.6 Practical Implications

The practical implications of this study are significant for manufacturing organizations because they caution managers against equating the formal presence of governance and quality systems with the actual institutionalization of sustainable quality outcomes. The findings show that firms may appear governance-aware and quality-mature, yet still fail to demonstrate a measurable relationship between these integrations and sustainable quality. This implies that the focus on symbolic completeness, rather than functional integration, should be replaced with a focus on integration.

The first implication for manufacturing contexts is that they should not rely on governance structures, audit systems, policies, or certificates as indicators of sustainable quality. These are important, and the documentary evidence presented in this dissertation shows that they exist. However, their strategic and value-creating significance is determined by whether they affect managerial actions, corrective actions, decisions regarding escalation, and accountability follow-up. Therefore, managers should not only assess the presence of governance but also its impact on the quality system's responsiveness, learning, and long-term sustainability.

Second, firms should re-evaluate the common separation of the administrative domains of quality and governance. Within organizations, quality is often positioned within operational or technical departments, and "governance is viewed as a compliance (audit, corporate reporting) issue." The insights provided by this dissertation indicate that

such disintegration may limit the chances of each system's transformation. Unless governance is considered an external function and quality an internal and technical function, neither will fully support institutional quality and integrity. Therefore, organizations must consider a co-dependent governance/TQM management system.

Our third implication relates to management reviews. Many manufacturing enterprises hosting a certified QMS have scheduled meetings of their review forums; however, the quality of these reviews varies considerably. Our study suggests that management reviews should be enhanced as a form of integration. Review meetings should not only review key performance indicators; they should also establish "connecting links" between findings on audits, corrective actions, policy and procedure abuses, sustainability-related risks, and process capability. Through an integrated rather than a routine approach to management review, governance goes from being an accounting to an operational discipline.

Fourth, companies must better manage the ownership of governance-related quality accountabilities. Companies often share accountability for audit closure, compliance with audits and policies, escalations, and sustainability-related quality risks across multiple business areas. In these cases, "governance is found" but not "well done." Managers must clarify who is accountable for the closure of corrective actions, who verifies multi-functional responses to a quality issue, who monitors the reoccurrence of problems, who escalates problems with no end in sight, and who translates governance goals into policy compliance for quality decisions. The likelihood of achieving sustainable quality performance is enhanced through designated accountability.

The fifth implication pertains to digital quality systems. In today's manufacturing systems, digital tools are used to track, monitor, and document quality. This dissertation suggests that digitalization should not only support the recording of nonconformities or the creation of dashboards, but also digitize governance enactment. Digitalization should support the tracking of timeliness in escalations, responsiveness in reviews, accountability in closures, and trends in repeated nonconformities and risks that are tied to policy/regulatory documents. In practice, digital quality systems are more strategic in capturing governance execution and not just variance.

The sixth implication concerns the inherent quality of sustainability. The changing expectations of climate change, responsibility, and responsiveness of management systems have extended the notion of quality in the manufacturing sector (ISO/TC 176, 2024; ISO and IAF, 2024). The insights in this dissertation position organizations as being flexible to such requirements not just in terms of conforming but also in terms of reporting such conformance. Rather, expectations of governance in relation to sustainability need to be imposed through process controls, supplier management, documentation, and management review processes. This is how governance is more than merely symbolically adhered to.

Seventh, managers should not assume that positive managerial perceptions of governance and TQM imply good integration of the two. The research participants in this study viewed governance integration positively. Therefore, managerial optimism and perceptions must be tempered by inquiry. It is possible that firms should conduct internal diagnostic discussions of existing design and process execution (what should happen,

what does happen), audit responsiveness, and quality continuity (what happens after an audit). This may help identify places where the system may appear to have reached maturity but is not well-integrated.

Finally, this dissertation's message is the opposite of "governance doesn't matter." Instead, governance is different from what is often presumed. It does not matter as a dress-up artifact, a disbound compliance system, or an external reporting system separated from functionality. It matters as an accountability framework that needs to be operationalized through review practices, ownership responsibility, escalation effectiveness, and corrective action effectiveness. Manufacturing enterprises that "get" this lesson will have a greater likelihood of moving from system maturity to sustainability.

5.3.7 Methodological Implications

These lessons stem from the discrepancy between the positive descriptive conditions and the strong documentary evidence from the context and the lack of significant inferential relationships in the quantitative model.

First, this study highlights the need for reflexive construct operationalization when addressing structurally complex matters in organizations. Governance integration is not as "visible" as many other management constructs. This may include design, compliance, governance, accountability practices, and uptake behaviors. When this construct is taken as a composite measure, it may reflect the visibility of governance in the quality system but not the extent to which it is practiced. The current research suggests that future studies should prioritize methodological efforts to distinguish

between visibility and the level of governance enactment. This will enhance the sensitivity of the construct and enable us to identify the aspects of governance that are most important for sustainable quality outcomes.

The second insight of this study concerns the need to disentangle contextual relevance from statistical explanations. Documentary content analysis was used for contextual triangulation and was useful because it indicated that governance-related mechanisms are visible in the manufacturing quality systems. However, the quantitative model did not support these proposed statistical relationships. This avoids the mistaken conclusion that a non-significant survey model renders the construct irrelevant. Instead, it shows that a construct may be contextually salient even when the tested statistical pathway is weak.

Third, the findings suggest that cross-sectional designs may be limited when the dependent outcome concerns long-term sustainability. Sustainable quality outcomes, by nature, involve continuity, persistence, and stability over time. However, a cross-sectional survey captures managerial perceptions at only a single point. Therefore, it is possible that the effects of TQM maturity and governance integration emerge more slowly than those observed in the current design. From a methodological standpoint, this dissertation supports the use of longitudinal or multi-wave research designs in future studies. Such approaches may be better suited for examining how governance quality relationships evolve, stabilize, or deteriorate over time.

Fourth, this study highlights the need for multidimensional measurement models. This study treated governance integration as a broad construct to establish the initial

architecture of the GDTQM. This was appropriate for model building at this stage, but the findings indicate that greater specificity is warranted. Future methodological designs should consider separate dimensions such as audit integration, accountability assignment, escalation discipline, policy enactment, sustainability governance, and digital traceability. Similarly, sustainable quality outcomes may benefit from the dimensional separation of operational continuity, compliance, resilience, audit defensibility, and corrective action reliability. This would enable more nuanced tests of models and perhaps detect effects that aggregate measures obscure.

Fifth, this dissertation highlights the need to acknowledge non-significant results methodologically rather than pejoratively or not at all. Applied research inevitably involves a degree of testing hypotheses non-conformity's results, and in particular, within PhD research, the temptation to equate unsupported hypotheses with research failure exists. The present study shows that this is not necessarily the case. With rational measurements, representative non-conformity reliability, and data-driven interpretations, unsupported hypotheses can lead to good science. They can show whether the theory, measurement, or context is too broad, uniform, or complex.

Sixth, the studies suggest the merit of mixed-method follow-up studies. The quantitative stage mapped quantitative findings that the proposed relationships were weak and documentary findings that governance mechanisms were institutionally present. The next research step" is explanatory qualitative research. Interviews with plant presidents, quality managers, compliance managers, and audit managers could help determine whether governance mechanisms are formally present but not widely practiced, formally

present but not widely accepted, or seen as positive but not closely and directly aligned with operational learning. These would be critical for narrowing the meaning of concepts and sequencing the model.

Finally, this study adds to the knowledge about applied dissertation research that has a tendency to transition from "big-picture" models to "little-picture" explanations. This doctoral study first proposed an inclusive model, then empirically tested the model using survey data, and then further refined (in terms of what can or cannot be explained) the model with the help of this empirical evidence. This study does not push the data into confirmation but instead lets them do their work: define boundaries, refine concept definitions, and suggest future directions for research that are likely to be more valid and discriminate designs.

5.4 Recommendations

5.4.1 Practical Application Recommendations

First, manufacturing contexts should consider adding governance reviews to existing TQM management reviews instead of two separate reporting chains (quality and governance). This is because governance is perceived to be in practice and is not statistically related to quality.

Second, the responsibility of quality accountability (related to governance) should be clarified and made explicit in organizations. The accountability for follow-up of corrective action, audit recommendation, compliance to policies, and risks to quality from sustainability should be formally allocated within governance instead of "loose" accountability within functions.

Third, internal quality audits must go beyond technical checks of conformity to include governance execution indicators such as escalation discipline, management review responsiveness, documentation integrity, and decision-right clarity.

Fourth, organizations influenced by ISO amendments and other governance expectations must not only be concerned with compliance but also integrate their operations. Because Table 4.5 revealed that a large majority of the respondents perceived ISO amendments as impactful, the practical assignment would be to translate these external governance expectations into internal practical quality controls.

Fifth, firms should employ digital quality systems to monitor, report, and trace their governance. This is especially significant because the documentary results found that digital quality management systems are one of the primary avenues through which governance is formally incorporated into the education system.

5.4.2 Future Research Recommendations

Future studies should be limited and specifically in reaction to the constraints revealed by these results. First, future research should differentiate between the existence of governance structures and the performance of governance. This would contribute to determining whether the non-significant results were due to the lack of depth of implementation or weakness in the theory.

Second, future studies should measure governance integration using more specific dimensions, including audit integration, accountability discipline, escalation structure, sustainability governance, and digital traceability, instead of relying on a general composite measure. Third, longitudinal designs should be employed in future research to

determine whether the outcomes of TQM maturity and governance integration are realized over time and not from a cross-sectional view. Fourth, sector-specific research should be conducted in manufacturing settings where regulatory intensity is particularly high, such as pharmaceuticals, chemicals, or automotive systems, where governance quality integration might be more highly differentiated. Fifth, further development of the model should investigate the possibility of the pathway between TQM maturity and sustainable quality outcomes being mediated by more than one sequential mechanism and not by a single mechanism.

These suggestions are not general, as the current study does not require future research. This refers to the obvious necessity of more operationalization and modelling of governance in quality systems.

Table 5.1 Interpretive Summary of the Empirical Findings and Their Practical Meaning

Hypothesis / Research Question	Empirical Outcome	Most Defensible Interpretation	Practical Meaning
H1 / RQ1: TQM maturity and sustainable quality outcomes	Not supported	TQM maturity alone did not explain long-term quality sustainability in the present sample	Organizations should not assume that mature quality routines automatically ensure durable quality integrity

H2 / RQ2: Governance integration and sustainable quality outcomes	Not supported	Governance structures may be present, but their measurable effect depends on implementation depth rather than formal visibility alone	Governance systems should be assessed for enactment, not merely existence
H3 / RQ3: Governance integration as moderator	Not supported	Governance did not significantly strengthen or weaken the TQM maturity–outcome relationship in the tested model	Governance should not be assumed to act as an automatic performance amplifier
H4 / RQ4: Governance integration as mediator	Not supported	Governance did not operate as a confirmed transmission channel between TQM maturity and sustainable quality outcomes	The pathway from quality maturity to durable outcomes may involve multiple intermediate mechanisms
Documentary analysis	Contextually supportive	Governance-related quality structures are institutionally visible in manufacturing environments	Firms face governance expectations, but visibility does not prove effectiveness

Source: Author Work

This suggests that the analysis did not find statistical associations for the four hypotheses but also did not find evidence that governance is irrelevant or non-existent in the organizational context. Rather, the findings suggest a more nuanced world where formal governance processes are present, perceptions of these processes are generally favorable, and expectations about governance processes are apparent. However, the tested model has limited explanatory value.

The above summary is pragmatic because it prevents two potential misinterpretations. The first is that governance is not important because the coefficients on the variables are statistically insignificant. The other form of error would be to assume that the mere existence of governance documents, audit cycles, and perceptions of them necessarily supports the GDTQM model. This study does not support this conclusion. This study suggests that the common challenge for manufacturing organizations is the effectiveness of integration between governance and TQM systems, not the mere presence of the individual systems.

5.4.3 Roadmap for Governance by Manufacturing Organizations

The results of the present study suggest a more formal managerial roadmap for manufacturing organizations to transform their governance stance into a more integrated quality system. Based on empirical and documentary evidence, the following staged roadmap is proposed as a practical extension of this study.

Table 5.2 Proposed Governance-Driven Quality Implementation Roadmap

Stage	Managerial Focus	Core Actions	Intended Outcome
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Stage 1: Diagnostic Alignment	Identify the current gap between formal governance presence and quality-system execution	Review quality manuals, governance policies, audit cycles, corrective-action logs, and management review records	Clarity on whether governance is symbolic, fragmented, or operationally embedded
Stage 2: Accountability Structuring	Define who owns governance-linked quality responsibilities	Assign responsibility for audit follow-up, escalation, corrective-action closure, policy compliance, and sustainability-related quality risk	Reduced ambiguity and stronger accountability discipline
Stage 3: Process Integration	Integrate governance checkpoints into quality workflows	Embed escalation criteria, review triggers, traceability controls, and decision-right protocols into TQM processes	Stronger alignment between governance and operational quality routines
Stage 4: Review and Learning	Strengthen management review as an integrative discipline	Combine quality indicators, audit evidence, policy deviations, sustainability-related risks, and recurrence	Better organizational learning and stronger cross-functional response

		patterns in review meetings	
Stage 5: Digital Traceability	Use digital systems to monitor governance enactment	Track closure timeliness, repeat nonconformities, escalation delays, accountability ownership, and documentation integrity	Improved transparency and auditable evidence of governance execution
Stage 6: Sustainability Embedding	Translate external governance expectations into internal quality controls	Link ISO-related requirements, climate considerations, supplier governance, and compliance expectations to process-level controls	Greater long-term resilience and institutional defensibility

Source: Author Work

The above roadmap is especially important because the current study reveals that governance integration is not statistically significant but is visible in its current form in the context of struggle. This means that more than adoption is needed; it means implementation in stages. The roadmap stages address a known weakness, as implied by the results.

For instance, diagnostic alignment is needed because companies tend to overestimate the sophistication of their governance quality architecture. Having policies, committees, or dashboards might lead to the illusion of integration, although the reality of

implementation might be ad-hoc and disjointed. Hence, a diagnostic assessment should determine whether governance structures impact the manner in which quality issues are identified, escalated, reviewed, or closed. This should not be done by observing at policies and documents but rather management practices of the organization.

The second phase, accountability structuring, is geared towards something quite frequent in management systems, governance, and quality: collective responsibility and no one to answer for it. Being "bothersome" is no one's problem. The organization must identify who validates the audit closeout, who signs off on the root cause response, who reviews repeat non-conformities, and so on. This is a cornerstone for implementing governance.

The third stage, process integration, transitions the cultural gap from a segmented to a holistic perspective of the firm. Many companies create an association between governance and policy/oversight, TQM, and process control/improvement. The findings of this dissertation indicate that this may be one such issue. Therefore, governance points should be incorporated into quality processes, supplier control processes, CAPA processes, audit response processes, and process improvement surveys (including cross-functional reviews). This provides for governance being "in the process" as well as in the report itself.

The fourth element, review and learning, is crucial for quality. An effective review should not just record target achievement; it should look for timely identification of systemic risks, the rigorous, timely closing of corrective actions, the recurring nature of breaches of policy, and the timeliness of management responses. This enhances the

organization's learning capacity, which is a critical component of the transition from quality control to sustainable quality.

The fifth stage, digital traceability, acknowledges that manufacturing organizations increasingly rely on digital quality systems. However, this dissertation contributes to the understanding that merely digitizing processes does not create quality resilience. The potential of digital systems from a strategic perspective is whether they involve the enactment of governance. Therefore, the company should leverage the digital system to track the accountability trail, escalation schedule, quality of closure, document traceability, and recurrence of risks. That is, it is not only an information system but also a governance system enabler.

The sixth stage, sustainability embedding, captures the external shift in the settings in which the quality systems operate. New demands on quality management system (QMS) governance include sustainability, traceability, and climate-related aspects (ISO/TC 176, 2024; ISO and IAF, 2024). Manufacturing companies need to integrate their supplier governance, environmental risks, policy review, and relevant controls with sustainability into their quality systems rather than viewing such efforts as ESG "reporting." This is how future-focused and strategic governance quality are integrated.

In summary, the roadmap enhances the usefulness of this study. It translates the key finding of the study into practice: governance is not the goal; it is the planned and methodical integration of governance into day-to-day quality.

5.4.4 New Agenda for Future GDTQM Research

The empirical work of this study clarifies where future studies on governance-driven Total Quality Management should focus. The results did not empirically validate the proposed integrated statistical model; instead, they identified where the model requires refinement, stronger measurement, and more controlled sampling in future research.

First, future research should clarify the difference between the (formal) presence and (effective) enactment of governance. Our research shows that many manufacturing contexts seem to have very visible governance-related structures for quality, but that such visibility is not linked to either influence over performance outcomes or integration of quality management. Future research should develop scales that not only measure the existence of governance structures but also their level of use, enforcement, escalation, review, and action.

Second, research should explore governance integration at the level of its various dimensions, not just as a global composite. These dimensions may include auditing integration, assignment of accountability, corrective action discipline, escalation, responsiveness to management review, governance of sustainability, and traceability. These may vary across different types of organizations. A multidimensional approach to research would enable researchers to determine whether certain governance dimensions are more important than others for sustainable quality outcomes.

Third, there are good reasons for using longitudinal designs. The current study examined relationships cross-sectionally, but TQM maturity and sustainable quality outcomes are evolutionary processes. Integration may improve the quality of institutional

performance over time through learning, review, and correction processes. Longitudinal data could be particularly helpful in determining whether the effects lost in the current study are evident over longer time frames.

Fourth, sectoral differences should be explored further. Manufacturing is not a "one size fits all" environment. Pharmaceuticals, chemicals, medical devices, aerospace, and automotive systems vary in their regulatory and audit requirements, traceability requirements, and impact on quality performance. It is plausible that governance integration has stronger explanatory power in sectors where compliance intensity and product risk are structurally higher. Sector-specific studies would therefore help determine whether the non-significant results of the present dissertation reflect general model limitations or contextual averaging across diverse manufacturing settings.

Fifth, future model development should explore multi-step and sequential pathways rather than single-stage mediation. This study does not support governance integration as a single mediating route between TQM maturity and sustainable quality outcomes. This suggests that the institutionalization of quality may involve multiple mechanisms. For example, TQM maturity may first strengthen process discipline, which then improves audit responsiveness, which then enhances corrective action reliability, which finally contributes to sustainable quality outcomes. Therefore, future studies should test the hypothesis that governance operates through a layered or longitudinal pathway rather than a single direct or indirect pathway.

Sixth, future research could adopt a mixed-method approach to quantitative modelling research in combination with qualitative case studies or interview analyses.

This dissertation provides examples of how documents can be used to supplement the interpretation of survey coefficients. A deeper mixed-method approach would help further understand how managerial perceptions of governance integration, implementation processes, where symbolism sets in, and either the absorption or resistance of governance discipline in quality systems occur.

Seventh, future research should further develop the measurement of dependent variables. Sustainable quality outcomes were carefully operationalized in the present study. However, future studies might further develop the construct by breaking it down into sub-areas, such as operational, compliance, audit, corrective action, and reputational protection. This will allow researchers to focus on testing each aspect and may reveal that certain aspects of sustainable quality are more strongly affected than others.

Finally, future research should continue to snuff out the flames of non-significance as harbingers of future observations and non-conformities. This dissertation has done preliminary work by showing that there is a field of investigation of governance quality, but it is not as straightforward as linear models assume. Therefore, future GDTQM studies should be more specific, dynamic, industry-specific, and process-specific. To this extent, this work does not deliver the last word in this field; it only delivers the first.

5.5 Conclusions

This dissertation sought to explore whether TQM maturity and governance integration predict the sustainable quality performance of manufacturing contexts and whether governance integration acts directly as a moderator and mediator in the

framework of governance-driven total quality management (GDTQM). This research was conducted in the current regulatory and sustainability-linked manufacturing environment, where digital quality technologies and other tools are increasingly being used, and where stakeholders are increasingly expecting accountability, integrity, and traceability. In this context, this study examined a relevant problem, namely, whether traditional TQM systems might no longer be effective if they are not integrated with governance systems.

This study translated this problem into an informed model based on the Resource-Based View premise, institutional theory, and corporate governance reasoning. TQM maturity was defined as an organizational ability, governance integration as a structural element of the quality architecture, and sustainable quality integrity as a sustained performance construct that goes beyond operational efficiency. The conceptual argument of this study is that manufacturing contexts need effective quality routines (in terms of TQM maturity) and governance arrangements to formalize and stabilize quality routines in a way that facilitates sustainable quality performance.

The empirical findings do not support the four hypotheses. The direct effect of TQM maturity on sustainable quality outcomes was not significant. Similarly, governance integration did not directly influence the results of this study. The moderating effect of governance integration was not statistically significant, implying that it did not significantly strengthen the effect of TQM maturity on sustainable quality outcomes in the model. The mediation effect did not hold, with governance integration not being a statistically significant intermediary between TQM maturity and sustainable quality

outcomes. From an inferential perspective, the proposed statistical pathways of the GDTQM model were not validated in the datasets retained.

However, the significance of this dissertation goes beyond these sources of hypotheses. The descriptive outcomes, respondents' profiles, and documentary content analysis yielded a more complex picture. For example, respondents positively perceived the integration of governance and quality system maturity. The documents also demonstrate that governance-oriented quality arrangements are evident in the manufacturing environment, such as supervision arrangements, compliance practices, internal accountability practices, sustainability-focused governance arrangements, digital quality capabilities, and related structures. One implication of this study is that the absence of governance was not discovered. This revealed a more interesting state of affairs: governance is seen as potentially institutionally present but not necessarily empirically powerful in the multi-causality explanatory sense.

The findings suggest that the existence, textual presence, and positive manager belief in governance quality integration are insufficient to demonstrate its reality. In other words, an apparent system is not necessarily effective. This is a valuable conclusion, both theoretically and practically. Theoretically, this research is valuable in distinguishing quality maturity from quality durability, showing the value of institutional theory for understanding contemporary quality systems, and suggesting that the integration of governance in quality systems demands more complex theorization as a differentiated whole. The results neither repudiate the conceptual importance of GDTQM nor the need for greater empirical precision in its underlying pathways. Governance as a composite

factor may not have as much effect as a layered architecture, whose effects depend on implementation depth, accountability enactment, audit discipline, review responsiveness, and process-level embedding.

Having maturity in quality, governance processes, certifications, and even electronic monitoring and control software could be all well and good, but ultimately sustainable quality performance over time is dependent on the integration of these aspects with decision rights, escalation practices, corrective action closure, and management review practices. This means that an organization cannot merely be symbolically aligned; it must be practically aligned. This study design, from a methodological point of view, allowed us to venture beyond misguided interpretations of "insignificant" coefficients and towards more realistic interpretations of the contemporary state of affairs. It also opens new avenues for future research, including future dimension-based measurements of governance integration, longitudinal studies, sector-specific studies, mixed-method follow-up studies, and more sequenced models of quality institutionalization.

In conclusion, this dissertation presents cautious conclusions. The GDTQM model is conceptually and contextually grounded, but its current empirical formulation is not statistically supported by the retained data set. This does not diminish the academic contribution of the study; rather, it defines the boundaries of what the model can and cannot claim. This research contributes to the literature by placing governance at the center of the quality management discussion while transparently acknowledging the limits created by sampling, self-reported data, weak reliability diagnostics, and non-significant regression findings.

Finally, this study indicates that current and future quality management in manufacturing is not only about process maturity and operational improvements. Quality performance increasingly depends on whether quality systems are supported by governance mechanisms that are operationally enacted, accountable, and reviewable, and resilient. This dissertation demonstrates that such integration cannot be assumed. Future research must specify, measure, and test this with stronger instruments and more robust designs.

REFERENCES

- Alhassan, A. and Owusu, E. (2025) 'Governance maturity and operational quality outcomes in manufacturing organizations', *International Journal of Quality and Reliability Management*, 42(1), pp. 45–67.
- Ali, M. (2024) 'Total quality management evolution, sustainability pressures and performance variability: A contemporary synthesis', *Foresight*, 26(3), pp. 312–329.
- Antony, J., Snee, R., and Hoerl, R. (2017), 'Lean Six Sigma: yesterday, today and tomorrow', *International Journal of Quality & Reliability Management*, 34(7), pp. 1073–1093. Available at: <https://doi.org/10.1108/IJQRM-03-2016-0035>
- Barney, J.B. (1991), Firm resources and sustained competitive advantage', *Journal of Management*, 17(1), pp. 99–120. Available at: <https://doi.org/10.1177/014920639101700108>
- Berger, L.K., Begun, A.L. and Otto-Salaj, L.L. (2009) 'Participant recruitment in intervention research: scientific integrity and cost-effective strategies', *International Journal of Social Research Methodology*, 12(1), pp. 79–92. <https://doi.org/10.1080/13645570701606077>
- Bryman, A. (2016) *Social Research Methods*. 5th edn. Oxford: Oxford University Press.
- Bytyci, S., Qerimi, Q. and Qerimi, A. (2023) 'Total quality management practices and organizational performance: Evidence from manufacturing contexts', *Journal of Innovation and Prosperity*, 27(1), pp. 45–62.

- Canbay, S. (2023) 'Reassessing TQM implementation maturity in regulated manufacturing environments', *Total Quality Management & Business Excellence*, 34(9–10), pp. 1043–1061.
- Carvalho, A.M., Dias, A.R., Dias, A.M., and Sampaio, P. (2024) 'The Quality modelling roadmap: Designing a capability roadmap toward quality digitalization ', *Quality Management Journal*, 31(2), pp. 78–95. Available at: <https://doi.org/10.1080/10686967.2024.2317478>
- Corbett, C. J. and Luca, A. M. (2023) 'ISO 9001 certification and firm performance: A meta-analysis', *Journal of Operations Management*, 69(4), pp. 499–527.
- Creswell, J.W. and Creswell, J.D. (2018) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th edn. Thousand Oaks, CA: SAGE.
- Dale, B.G., van der Wiele, T. and van Iwaarden, J. (2019) *Managing Quality*. 6th edn. Oxford: Wiley-Blackwell.
- Deming, W.E. (1986) *Out of Crisis*. Cambridge, MA: MIT Press.
- DiMaggio, P.J. and Powell, W.W. (1983), 'The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, 48(2), pp. 147–160. Available at: <https://doi.org/10.2307/2095101>.
- Fadilasari, D., Hidayat, A., and Pramono, R. (2024) 'Digital quality management systems and governance integration in Indonesian manufacturing', *Asian Journal of Technology Innovation*, 32(1), pp. 88–106.

- Fonseca, L. M. and Domingues, J. P. (2022) 'The ISO 9001:2015 quality management standard: From a systematic literature review to a proposed conceptual framework', *Total Quality Management & Business Excellence*, 33(1–2), pp. 84–105.
- Gharakhani, D., Rahmati, H., Farrokhi, M.R. and Farahmandian, A. (2013) 'Total quality management and organizational performance', *American Journal of Industrial Engineering*, 1(3), pp. 46–50. Available at: <https://doi.org/10.12691/ajie-1-3-2>
- Goetsch, D. L. and Davis, S. B. (2021) *Quality Management for Organizational Excellence: Introduction to Total Quality*. 9th edn. Boston: Pearson.
- Hair, J. F., Risher, J. J., Sarstedt, M., and Ringle, C. M. (2019) 'When to use and how to report the results of PLS-SEM', *European Business Review*, 31(1), pp. 2–24. Available at: <https://doi.org/10.1108/EBR-11-2018-0203>.
- Heras-Saizarbitoria, I. and Boiral, O. (2013) 'ISO 9001 and ISO 14001: Towards a research agenda on management system standards', *International Journal of Management Reviews*, 15(1), pp. 47–65. Available at: <https://doi.org/10.1111/j.1468-2370.2012.00334.x>
- Huang, S., Lee, J. and Kim, H. (2024) 'Governance-driven quality systems and sustainability performance in global manufacturing supply chains', *Supply Chain Management: An International Journal*, 29(2), pp. 188–207.
- Ikediashi, D.I., Ogunlana, S.O. and Alotaibi, A. (2020) 'Analysis of project failure factors for infrastructure projects: A case study of Nigeria using regression-based analysis', *Journal of Construction in Developing Countries*, 19(1), pp. 16–31.

- ISO and IAF (2024) *ISO 9001 and Climate Change: Joint Communiqué on the Integration of Climate-Related Considerations into ISO Management System Standards*. Geneva: ISO/IAF.
- ISO/TC 176 (2024) *Guidance Document: Addressing Climate Change in ISO 9001 Quality Management Systems*. Geneva: International Organization for Standardization.
- Juran, J.M., and De Feo, J.A. (2010) *Juran's Quality Handbook: The Complete Guide to Performance Excellence*. 6th edn. New York: McGraw-Hill.
- Kanji, G.K. (1998), 'An innovative approach to make ISO 9000 standards more effective', *Total Quality Management*, 9(1), pp. 67–78. Available at: <https://doi.org/10.1080/0954412989270>
- Kline, R.B. (2023) *Principles and Practice of Structural Equation Modelling*. 5th edn. New York: Guilford Press.
- Krippendorff, K. (2018) *Content Analysis: An Introduction to Its Methodology*. 4th edn. Thousand Oaks, CA: SAGE.
- Kumar, M., Antony, J., and Tiwari, M.K. (2011) 'Six Sigma implementation framework for SMEs – a roadmap to manage and sustain the change', *International Journal of Production Research*, 49(18), pp. 5449–5467. Available at: <https://doi.org/10.1080/00207543.2011.563836>
- Lo, C. K. Y., Yeung, A. C. L., and Cheng, T. C. E. (2011) 'Meta-standards, financial performance and senior executive compensation in China: An institutional perspective', *International Journal of Production Economics*, 129(1), pp. 119–126. Available at: <https://doi.org/10.1016/j.ijpe.2010.09.011>

- Mansouri, S.A., Golmohammadi, D., and Miller, T.C. (2022), 'Sustainability integration in quality management systems: A governance perspective', *Journal of Cleaner Production*, 330, art. 129812.
- Martinez-Costa, M. and Martinez-Lorente, A.R. (2007) 'A triple analysis of ISO 9000 effects on company performance', *International Journal of Productivity and Performance Management*, 56(5–6), pp. 484–499. Available at: <https://doi.org/10.1108/17410400710757150>
- McDermott, O., Antony, J. and Sony, M. (2024) 'Quality 4.0 and its implications for governance and sustainability in manufacturing', *International Journal of Quality & Reliability Management*, 41(5), pp. 1201–1220.
- Nair, A. (2006) 'Meta-analysis of the relationship between quality management practices and firm performance: Implications for quality management theory development', *Journal of Operations Management*, 24(6), pp. 948–975. Available at: <https://doi.org/10.1016/j.jom.2005.11.005>.
- Navarro, J.L. and Naranjo, C. (2025) 'Quality culture, governance alignment, and organizational performance: An empirical conceptual model', *Sustainability*, 17(3), art. 1041.
- Oakland, J.S. (2014) *Total Quality Management and Operational Excellence: Text with Cases*. 4th edn. Abingdon: Routledge.
- OECD (2015). *G20/OECD Principles of Corporate Governance*. Paris: OECD Publishing.

- Padma, P., Ganesh, L. S., & Rajendran, C. (2008), A study on the critical success factors and the performance of healthcare organizations', *International Journal of Production Research*, 46(23), pp. 6501–6523.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. and Podsakoff, N.P. (2003), Common method biases in behavioural research: A critical review of the literature and recommended remedies', *Journal of Applied Psychology*, 88(5), pp. 879–903. Available at: <https://doi.org/10.1037/0021-9010.88.5.879>.
- Powell, T.C. (1995) 'Total quality management as competitive advantage: A review and empirical study', *Strategic Management Journal*, 16(1), pp. 15–37. Available at: <https://doi.org/10.1002/smj.4250160105>.
- Santos-Vijande, M.L. and Álvarez-González, L.I. (2009), TQM's contribution to marketing implementation and firm's competitiveness', *Total Quality Management & Business Excellence*, 20(2), pp. 171–196. Available at: <https://doi.org/10.1080/14783360802622953>
- Saunders, M., Lewis, P. and Thornhill, A. (2019) *Research Methods for Business Students*. 8th edn. Harlow: Pearson Education.
- Scott, W.R. (2014) *Institutions and Organizations: Ideas, Interests, and Identities*. 4th edn. Thousand Oaks, CA: SAGE.
- Sila, I. and Ebrahimpour, M. (2005) 'Critical linkages among TQM factors and business results', *International Journal of Operations & Production Management*, 25(11), pp. 1123–1155. Available at: <https://doi.org/10.1108/01443570510626925>.
- Talib, F., Rahman, Z., and Qureshi, M.N. (2013), 'An empirical investigation of the relationship between total quality management practices and quality performance

- in Indian service companies', *International Journal of Quality & Reliability Management*, 30(3), pp. 280–318. Available at:
<https://doi.org/10.1108/02656711311299845>.
- Terziovski, M. and Samson, D. (1999) 'The link between total quality management practice and organizational performance', *International Journal of Quality & Reliability Management*, 16(3), pp. 226–237. Available at:
<https://doi.org/10.1108/02656719910223728>
- Valmohammadi, C. and Roshanzamir, S. (2015) 'The guidelines of improvement: Relations among organizational culture, TQM and performance', *International Journal of Production Economics*, 164, pp. 167–178. Available at:
<https://doi.org/10.1016/j.ijpe.2014.12.028>.
- Van der Wiele, T. and Brown, A. (2002) 'Quality management over a decade: A longitudinal study', *International Journal of Quality & Reliability Management*, 19(5), pp. 508–523.
- Weckenmann, A., Akkasoglu, G. and Werner, T. (2015) 'Quality management: History and trends', *The TQM Journal*, 27(3), pp. 281–293. Available at:
<https://doi.org/10.1108/TQM-11-2013-0125>.
- Zhou, H. and Chen, Y. (2025) 'Digital traceability, governance integration, and quality outcome durability in smart manufacturing environments', *Journal of Manufacturing Technology Management*, 36(1), pp. 22–45.

APPENDIX A

SURVEY COVER LETTER

Untitled form Governance-Driven Total Quality Management (GDTQM) in Manufacturing Organizations

Doctoral Research Survey

This questionnaire is part of a doctoral research study conducted by **CS Akhila Sinoj**, a doctoral candidate at the **Swiss School of Business and Management (SSBM), Geneva**.

The purpose of this study is to examine how **governance mechanisms**—including quality policies, accountability structures, audit integration, and sustainability considerations—are embedded within **Total Quality Management (TQM)** practices in manufacturing organizations, and how such integration influences **quality performance and compliance outcomes**.

Your participation in this survey is **voluntary** and involves responding to a short set of statements based on your organization's **current practices**. There are **no right or wrong answers**. All information provided will be treated with **strict confidentiality** and will be used **solely for academic research purposes**.

- You understand the purpose of the study,
- Your participation is voluntary,
- You may withdraw at any time before submission,
- Your responses will remain anonymous and confidential.

The survey will take approximately **5–7 minutes** to complete.

Your insights are highly valuable and will contribute to academic research aimed at improving governance-aligned quality management practices in manufacturing organizations.

Thank you for your time and participation.

Regards,

CS Akhila Sinoj

* Indicates required question

APPENDIX B

INFORMED CONSENT

This questionnaire is part of a doctoral research study conducted by CS Akhila Lakshminivas Ajayan, a doctoral candidate at the Swiss School of Business and Management (SSBM), Geneva.

This study examines how governance mechanisms, including quality policies, accountability structures, audit integration, and sustainability considerations, are embedded within Total Quality Management (TQM) practices in manufacturing organizations and how such integration influences quality performance and compliance outcomes. Participation in this survey is voluntary and involves responding to a short set of statements based on your organization's current practices. There are no right or wrong answers to this question. All information will be treated with strict confidentiality and used solely for academic research purposes.

By completing this questionnaire, you confirm that:

- i. You understand the purpose of the study,
- ii. Your participation is voluntary,
- iii. You may withdraw at any time before submission,
- iv. Your responses will be kept anonymous and confidential.
- v. The survey took approximately 5–7 minutes to complete.

Your insights are highly valuable and will contribute to academic research aimed at improving governance-aligned quality management practices in manufacturing organizations. Thank you for your time and participation in this study.

Regards,

CS Akhila Lakshminivas Ajayan

APPENDIX C
SURVEY QUESTIONNAIRE

Questionnaire

Governance-Driven Total Quality Management in Manufacturing

Please select the most appropriate option from the following. For Sections B–E, please select one response for each statement:

SECTION A: RESPONDENT PROFILE

A1. Years of experience

- | | | |
|--------------------------------|-------------------------------|--------------------------------|
| ☐ 0–5 | ☐ 6–10 | ☐ 11–15 |
| ☐ 16–20 | ☐ 20+ | |

A2. Your current role in the organization

- | | |
|--|--|
| ☐ Senior Management | ☐ Operations Manager / Plant Head |
| ☐ Quality Manager / Quality Head | ☐ Compliance / Audit / Governance Manager |
| ☐ CEO | ☐ Chairman |
| ☐ Owner | ☐ Cost Accountant |
| ☐ SCM Team Member | ☐ CMA Trainee |
| ☐ Intern / Internship / Data Analyst Intern | ☐ Sales |
| ☐ Other (please specify):
_____ | |

A3. Manufacturing sector of your organization

- | | |
|--|---|
| ☐ Electronics / Electrical | ☐ Pharmaceuticals / Chemicals |
| ☐ FMCG / Consumer Goods | ☐ Automotive / Auto Components |
| ☐ Machinery / Heavy Engineering | ☐ Production |
| ☐ Hygiene Products | ☐ IT |
| ☐ Service Sector | ☐ Other (please specify): |
-

A4. Size of the organization (number of employees)

- | | |
|--|---|
| ☐ Less than 100 | ☐ 100–500 |
| ☐ 501–1000 | ☐ More than 1000 |

A5. Quality and governance certifications held (select all that apply)

- | | |
|--|---|
| ☐ ISO 9001 | ☐ ISO 14001 |
| ☐ ISO 45001 | ☐ ESG / Sustainability Reporting |
| ☐ None of the above | ☐ Other (please specify): |
-

SECTION B: TOTAL QUALITY MANAGEMENT (TQM) MATURITY

Please indicate your level of agreement with the following statements regarding total quality management practices in your organization.

Response scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Statement	1	2	3	4	5
B1. Top management actively supports quality initiatives within the organization	☐	☐	☐	☐	☐
B2. Organizational processes are standardized and consistently implemented	☐	☐	☐	☐	☐
B3. Employees actively participate in quality improvement activities	☐	☐	☐	☐	☐
B4. Continuous improvement practices are systematically applied across departments	☐	☐	☐	☐	☐

SECTION C: GOVERNANCE INTEGRATION IN TQM

Please indicate your level of agreement with the following statements regarding the integration of governance into quality management in your organization.

Response scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Statement	1	2	3	4	5
C1. Quality-related policies are formally documented and clearly communicated	☐	☐	☐	☐	☐
C2. Clear accountability exists for quality-related roles and decisions	☐	☐	☐	☐	☐

C3. Internal audit mechanisms are integrated with quality management practices	☐	☐	☐	☐	☐
C4. Audit findings result in corrective and preventive actions	☐	☐	☐	☐	☐

SECTION D: QUALITY & COMPLIANCE OUTCOMES

Please indicate your level of agreement with the following statements regarding quality and compliance outcomes in your organization.

Response scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Statement	1	2	3	4	5
D1. Product or service defect rates have reduced over the past year	☐	☐	☐	☐	☐
D2. Non-conformities are effectively identified and controlled	☐	☐	☐	☐	☐
D3. Rework, wastage, or quality failures have decreased	☐	☐	☐	☐	☐
D4. Improvements in quality performance are sustained over time	☐	☐	☐	☐	☐

SECTION E: SUSTAINABILITY & ISO ALIGNMENT

Please indicate your level of agreement with the following statements regarding sustainability and ISO alignment in your organization.

Response scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Statement	1	2	3	4	5
E1. Sustainability or environmental considerations are embedded within quality policies	☐	☐	☐	☐	☐
E2. Climate or ESG requirements influence quality planning and audit activities	☐	☐	☐	☐	☐

E3. Has your organization considered the requirements of ISO 9001:2015 Amendment 1:2024?

☐ Yes

☐ No