

Human Capital Development, ISO 22000 Adoption, and Performance Sustainability of Small and Medium Enterprises in the Food Sector: An Integrated Theoretical and Descriptive Analysis

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ABSTRACT

Small and medium enterprises play a foundational role in national economies through employment creation, innovation, income generation, and social stability. In developing and emerging economies, SMEs constitute the largest proportion of registered businesses and are especially dominant in the food sector, where they directly influence public health, consumer trust, and economic resilience. Despite their importance, food-based SMEs face persistent challenges related to survival, competitiveness, regulatory compliance, and performance sustainability. Among the most critical of these challenges are inadequate human capital development practices and limited adoption of internationally recognized food safety management systems such as ISO 22000. This research article develops an extensive theoretical and descriptive analysis that integrates human capital development, ISO 22000 implementation, and firm performance within the context of SMEs operating in the food supply chain. Drawing strictly on the provided references, the study synthesizes insights from SME policy definitions and statistics, human capital theory, firm performance measurement literature, food safety management standards, regulatory compliance frameworks, and contemporary perspectives on business consulting for SMEs.

Keywords: Small and medium enterprises, human capital development, ISO 22000, food safety management systems, firm performance, organizational survival

INTRODUCTION

Small and medium enterprises have long been recognized as the backbone of modern economies, particularly in developing and emerging markets where they constitute the majority of business establishments. In Malaysia, for example, SMEs are formally defined and categorized by

SME Corp. Malaysia based on criteria such as sales turnover and number of employees, reflecting their structural and economic significance (SME Corp. Malaysia, 2020). Statistical evidence further demonstrates that SMEs account for a substantial share of employment and value creation, reinforcing their central role in economic

development and social stability (SME Statistics, 2020). Within this broad SME landscape, enterprises operating in the food sector occupy a uniquely sensitive position because their activities directly affect consumer health, regulatory compliance, and public trust.

Despite their importance, SMEs in the food sector face persistent challenges related to survival and performance sustainability. Organizational survival is not guaranteed by market presence alone but depends on the firm's ability to adapt, learn, comply with regulations, and continuously improve internal capabilities. Onyebuch (2018) emphasizes that human capital development is a fundamental determinant of organizational survival, arguing that firms lacking skilled, knowledgeable, and adaptable employees are structurally disadvantaged in volatile and competitive environments. This perspective is particularly relevant for food-sector SMEs, where operational complexity, hygiene requirements, and regulatory scrutiny demand a high level of employee competence and organizational learning.

At the same time, the regulatory environment governing food safety has become increasingly stringent and standardized. The ISO 22000:2018 Food Safety Management Systems standard represents a globally recognized framework that integrates hazard analysis, prerequisite programs, and management system principles across the entire food chain (International Organization for Standardization, 2018). The growing global demand for ISO 22000 reflects heightened consumer awareness, international trade requirements, and regulatory expectations (Hyseni, 2024). However, SMEs often perceive ISO 22000 implementation as resource-intensive, complex, and burdensome, leading to partial adoption or complete avoidance (Escanciano & Santos-Vijande, 2014).

Firm performance, meanwhile, remains a multidimensional and contested concept. Omar Taouab (2019) highlights that performance cannot be reduced to financial indicators alone but encompasses operational efficiency, customer satisfaction, market position, compliance, and long-term sustainability. For SMEs, particularly those in regulated sectors, performance measurement must account for both economic outcomes and legitimacy-related factors such as certification,

compliance, and reputation.

The existing literature, while rich in isolated discussions of human capital development, food safety standards, and firm performance, reveals a notable gap in integrated analysis. Few studies comprehensively examine how human capital development enables SMEs to adopt ISO 22000 and how such adoption, in turn, influences performance sustainability. Moreover, the role of regulatory requirements as control measures, particularly within HACCP-based models in the European Union context, adds another layer of complexity that warrants deeper theoretical exploration (Karageorgou & Tzikas, 2025).

This article addresses this gap by developing an extensive theoretical and descriptive analysis that integrates human capital development, ISO 22000 implementation, and firm performance within food-sector SMEs. By synthesizing insights from SME policy documents, human capital theory, performance measurement models, food safety standards, and regulatory compliance literature, the study seeks to provide a holistic understanding of how SMEs can achieve sustainable performance in increasingly demanding regulatory and market environments.

Methodology

The methodological approach adopted in this study is qualitative, theoretical, and descriptive in nature. Rather than relying on primary empirical data collection, the research employs an extensive integrative literature review and conceptual synthesis based strictly on the provided references. This approach is particularly appropriate given the study's objective of generating a comprehensive theoretical framework that explains complex relationships among human capital development, ISO 22000 adoption, and firm performance in SMEs.

The first methodological step involves a systematic conceptual analysis of SME definitions and statistical contexts as provided by SME Corp. Malaysia (2020) and SME Statistics (2020). These sources establish the structural and economic characteristics of SMEs, providing a contextual foundation for understanding capacity constraints and strategic priorities. The second step

focuses on human capital development theory, drawing primarily on Onyebuch (2018), who conceptualizes human capital as a dynamic and strategic resource essential for organizational survival. This theoretical lens is used to interpret skill development, training, knowledge accumulation, and learning processes within SMEs.

The third step involves an in-depth examination of firm performance definitions and measurement models as discussed by Omar Taouab (2019). This analysis enables a multidimensional understanding of performance, extending beyond financial metrics to include operational, strategic, and compliance-related dimensions. The fourth step integrates food safety management systems literature, particularly ISO 22000:2018, its global relevance (Hyseni, 2024), and empirical insights into implementation motivations and constraints among SMEs (Escanciano & Santos-Vijande, 2014).

Finally, the methodology incorporates regulatory and consulting perspectives by analyzing HACCP-based regulatory models in the EU (Karageorgou & Tzikas, 2025) and contemporary SME consulting frameworks (Kovalchuk, 2025). These perspectives enrich the analysis by highlighting external support mechanisms, regulatory pressures, and institutional contexts that shape SME behavior.

Throughout the methodological process, the analysis emphasizes theoretical coherence, internal consistency, and conceptual depth. Claims and interpretations are systematically linked to the cited literature, ensuring academic rigor and traceability. The descriptive nature of the methodology allows for nuanced exploration of interactions, tensions, and complementarities among key constructs, aligning with the study's objective of producing a publication-ready theoretical contribution.

Results

The descriptive analysis of the integrated literature reveals several interrelated patterns that collectively explain the performance sustainability of food-sector SMEs. First, SMEs are structurally characterized by limited resources, informal management practices, and high dependence on owner-managers, as indicated by SME Corp. Malaysia (2020) and SME Statistics (2020). These

characteristics influence their approach to human capital development, often resulting in reactive rather than strategic training initiatives.

Second, human capital development emerges as a central enabling factor for organizational survival. Onyebuch (2018) demonstrates that firms investing in employee skills, knowledge, and adaptability are better equipped to respond to environmental changes and operational challenges. In the context of food-sector SMEs, this translates into improved understanding of hygiene practices, hazard analysis, documentation requirements, and continuous improvement processes associated with ISO 22000.

Third, ISO 22000 adoption is found to be both a technical and social process. Technically, it requires the establishment of structured food safety management systems, hazard controls, and monitoring mechanisms (International Organization for Standardization, 2018). Socially, it demands cultural change, employee engagement, and management commitment. Escanciano and Santos-Vijande (2014) highlight that SMEs often face constraints such as limited expertise, cost concerns, and resistance to change, which can undermine effective implementation.

Fourth, performance outcomes associated with ISO 22000 adoption extend beyond immediate financial gains. According to Omar Taouab (2019), performance should be understood in terms of operational reliability, customer trust, market access, and long-term viability. The literature suggests that SMEs achieving meaningful ISO 22000 implementation experience enhanced process control, reduced risk of food safety incidents, and improved organizational legitimacy, which collectively contribute to sustainable performance.

Fifth, regulatory frameworks and consulting models play a moderating role. HACCP-based regulatory requirements in the EU, as discussed by Karageorgou and Tzikas (2025), function as control measures that standardize expectations and reduce ambiguity. Meanwhile, business consulting models tailored to SMEs, such as those proposed by Kovalchuk (2025), provide structured guidance that can compensate for internal capability gaps.

Discussion

The findings of this study carry significant theoretical and practical implications. From a theoretical perspective, the integration of human capital development and ISO 22000 adoption challenges narrow compliance-based interpretations of food safety management. Instead, it supports a resource-based and capability-driven view, where standards serve as learning frameworks that enhance organizational competencies. This aligns with Onyebuch's (2018) argument that human capital is foundational to survival and adaptability.

The discussion also highlights the multidimensional nature of firm performance. Omar Taouab (2019) emphasizes that performance measurement models must reflect strategic objectives and contextual realities. For food-sector SMEs, performance is inseparable from compliance, reputation, and trust. ISO 22000 adoption thus functions as both a performance indicator and a performance driver.

However, the analysis also reveals limitations and constraints. SMEs face genuine resource limitations that can make comprehensive human capital development and certification challenging. Escanciano and Santos-Vijande (2014) note that without external support or phased implementation strategies, SMEs may experience certification fatigue or superficial compliance. Regulatory pressure, while necessary, can also exacerbate stress and resistance if not accompanied by capacity-building initiatives.

Future research should build on this theoretical foundation by conducting empirical studies that examine causal relationships among human capital investments, ISO 22000 maturity levels, and performance outcomes. Comparative studies across regions and regulatory regimes would further enrich understanding. Additionally, longitudinal research could explore how human capital development trajectories influence long-term certification sustainability.

Strategic Integration of Human Capital, ISO 22000, and Institutional Support Mechanisms in Food-Sector SMEs

The sustainability and long-term competitiveness of small

and medium enterprises in the food sector cannot be fully understood without examining the strategic integration of internal capabilities and external institutional frameworks. While previous sections of this article have explored human capital development, ISO 22000 implementation, and firm performance as interconnected constructs, a deeper analytical perspective reveals that their true value emerges through systematic integration rather than isolated application. For food-sector SMEs, this integration process is shaped by organizational learning, regulatory embeddedness, and access to structured business support mechanisms.

Human capital development represents the internal engine of organizational capability. Onyebuch (2018) conceptualizes human capital as a dynamic resource encompassing knowledge, skills, experience, and adaptive capacity, all of which directly influence organizational survival. In food-sector SMEs, these attributes are particularly critical because food safety management systems such as ISO 22000 require not only technical knowledge but also interpretive competence. Employees must understand why procedures exist, how hazards propagate through production processes, and how corrective actions contribute to system integrity. Without this depth of understanding, ISO 22000 risks becoming a documentation exercise rather than a functional management system.

ISO 22000:2018 itself is designed as a management system standard rather than a purely technical specification. The standard integrates the Plan–Do–Check–Act logic with hazard analysis principles, emphasizing continual improvement and leadership commitment (International Organization for Standardization, 2018). This design implicitly assumes a certain level of human capital maturity. SMEs with underdeveloped training structures or high employee turnover often struggle to sustain these cycles, leading to fragmented implementation. Therefore, human capital development does not merely precede ISO 22000 adoption; it co-evolves with it.

From a strategic standpoint, ISO 22000 adoption can be understood as a capability-amplifying mechanism. Hyseni (2024) notes that the global demand for ISO 22000 is driven not only by regulatory expectations but also by supply chain integration and market access requirements.

For SMEs, certification functions as a legitimacy signal that reduces information asymmetry between producers, regulators, and consumers. However, legitimacy alone does not guarantee performance improvement. The literature suggests that performance gains are realized only when certification is internalized through employee competence and operational discipline (Escanciano & Santos-Vijande, 2014).

Institutional support mechanisms play a crucial mediating role in this integration process. Kovalchuk (2025) emphasizes that SMEs often lack the strategic planning and methodological expertise required to translate standards into operational value. Business consulting models tailored to SMEs address this gap by providing structured guidance, diagnostic tools, and phased implementation strategies. These consulting frameworks do not replace internal human capital but rather scaffold its development, enabling SMEs to gradually absorb complex management practices.

Regulatory environments further shape the integration dynamics. In the European Union context, Karageorgou and Tzikas (2025) demonstrate that HACCP-based regulatory requirements function as control measures that standardize food safety expectations across firms of different sizes. For SMEs, these requirements can act as both constraints and catalysts. On one hand, regulatory pressure may strain limited resources; on the other hand, it creates a clear external reference point that legitimizes investments in training and system development. When regulatory compliance is framed as a learning opportunity rather than a punitive obligation, SMEs are more likely to embed food safety practices into their organizational routines.

The relationship between integration and firm performance must be interpreted through a multidimensional lens. Omar Taouab (2019) argues that firm performance encompasses financial outcomes, operational efficiency, strategic positioning, and long-term sustainability. In food-sector SMEs, integrated human capital and ISO 22000 systems contribute to performance by reducing variability, preventing costly food safety incidents, and enhancing customer trust. These effects may not immediately translate into profit increases, but they strengthen the firm's resilience and

market credibility over time.

A critical aspect of strategic integration is leadership orientation. SME owner-managers often play a dual role as decision-makers and operational supervisors. Their perception of ISO 22000 and human capital investment significantly influences implementation depth. If certification is viewed solely as a market entry requirement, investment in training may be minimal and short-term. Conversely, when leaders recognize the strategic value of skilled employees and standardized systems, integration becomes more substantive. SME Corp. Malaysia (2020) implicitly acknowledges this leadership dimension by emphasizing capability development as a policy priority for SME competitiveness.

Another important consideration is organizational learning. Human capital development and ISO 22000 implementation generate feedback loops that reinforce learning behaviors. Employees trained in hazard identification become more proactive in reporting deviations, while standardized procedures create shared cognitive frameworks across the organization. Over time, this learning orientation enhances adaptive capacity, which Onyebuch (2018) identifies as a core determinant of organizational survival. SMEs that institutionalize learning are better positioned to respond to regulatory updates, market shifts, and technological changes.

Despite these advantages, integration remains uneven across SMEs. Escanciano and Santos-Vijande (2014) identify persistent constraints such as cost sensitivity, limited time availability, and skepticism regarding certification benefits. These constraints highlight the importance of contextual adaptation. Integration strategies must align with SME scale, complexity, and market orientation. For micro and small food enterprises, incremental implementation supported by targeted training may be more effective than comprehensive certification drives.

The strategic integration of human capital, ISO 22000, and institutional support ultimately reframes food safety management as a value-creating process rather than a compliance burden. When aligned effectively, these elements transform SMEs from reactive actors into proactive participants in food supply chains. This

transformation enhances not only firm performance but also sectoral stability and public health outcomes.

In theoretical terms, this integrated perspective bridges human capital theory, institutional theory, and performance management literature. It supports the argument that SMEs operate within nested systems of internal resources and external expectations. Sustainable performance emerges when these systems are aligned through deliberate capability development and structured management practices. This insight contributes to a more holistic understanding of SME development in regulated industries.

Conclusion

This article has provided an extensive theoretical and descriptive analysis of the relationships among human capital development, ISO 22000 adoption, and firm performance in food-sector SMEs. Drawing strictly on the provided references, the study demonstrates that sustainable performance cannot be achieved through isolated initiatives. Instead, it requires strategic alignment among employee capability development, structured food safety management systems, and multidimensional performance measurement frameworks.

Human capital development emerges as the foundational driver that enables SMEs to interpret, implement, and internalize ISO 22000 requirements. ISO 22000, in turn, serves as both a compliance mechanism and a strategic tool that enhances organizational learning, legitimacy, and resilience. When integrated effectively, these elements contribute to organizational survival and long-term performance sustainability.

For policymakers, practitioners, and SME owner-managers, the implications are clear: investment in people and systems is not optional but essential in an increasingly regulated and competitive food industry. By embracing an integrated approach, SMEs can transform regulatory challenges into opportunities for growth, learning, and sustainable success.

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