

Strategic Information Systems Planning for Competitive Advantage and Business Sustainability: A Systematic Comparative Analysis

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Abstract

The development of digital technology has encouraged organizations to transform through the strategic use of information systems. Strategic Information Systems Planning (SISP) is a key mechanism to ensure alignment between business strategy and technology in order to achieve competitive advantage and business sustainability. This research aims to analyze the methodology, framework, and research results related to the implementation of SISP in various sectors. Using a systematic literature review research design and a comparative-historical analysis of seven selected scientific articles, the study evaluated frameworks such as Ward & Peppard, McFarlan Grid, Value Chain, and Enterprise Architecture Planning (EAP). The results show that SISP improves process integration capabilities, digital-based innovation, and strategic resilience. However, there are limitations in research related to SISP's empirical measurement of long-term sustainability. This study concludes that SISP must be integrated into strategic decision-making and digital transformation roadmap to create sustainable competitiveness. This research's contribution provides a new conceptual model that can be quantitatively tested in future research.

Keywords: *Strategic Planning, Information Systems, Competitiveness, Corporate Sustainability, Ward & Peppard, Enterprise Architecture*

Introduction

In the era of digital transformation, information systems are not only an administrative tool, but have become a strategic factor in the formation of organizational value. Technological developments such as cloud computing, big data analytics, and business process automation encourage companies to integrate business strategies and technology. Studies show that operational efficiency, product innovation, and responsiveness to the market increase when organizations have a mature digital foundation. Thus, the company's ability to strategically plan and manage information systems is fundamental to survive global dynamics.

Many organizations are beginning to understand the importance of making targeted and sustainable technology investments. The Ward & Peppard framework has been used to develop strategic information system plans that align with business strategies, which in turn enhances service quality. For instance, in the context of higher education, the framework helped in aligning IT strategies with business goals to improve educational services and stakeholder satisfaction (Prastiwi & Nazief, 2023). A data-driven culture significantly impacts product and process innovation. Firms

that adopt advanced business analytics tools embedded with AI capabilities see substantial improvements in their innovation processes, leading to enhanced organizational performance and competitive advantage (Chaudhuri et al., 2024). Digital transformation enhances organizational flexibility, allowing firms to adapt quickly to changes in the business environment. This flexibility is crucial for maintaining competitiveness in dynamic markets (Chatterjee & Mariani, 2024).

While the contribution of SISP to business performance has been widely discussed, there is a significant gap in scientific understanding regarding how SISP directly contributes to long-term sustainability. Most research still focuses on organizational efficiency, service improvement, or system implementation, while measuring sustainability impacts remains limited. The integration of digital transformation and sustainable policies within organizational contexts is vital for enhancing business performance and achieving operational excellence (Asbeetah et al., 2025).

Effective human resource management practices, including digital training and development, are critical for supporting digital transformation, but implementation is often hindered by a lack of digital skills and resistance to change (Ebnezer & Rajini, 2024). Many organizations struggle with unclear digital roadmaps, which hampers their ability to implement digital transformation effectively (Harish et al., 2023). A clear and well-defined digital strategy is essential for guiding the transformation process and ensuring alignment with organizational goals (Byrne, 2024)

This gap needs to be addressed because the sustainability of modern organizations is crucially determined by their ability to strategically leverage technology. Without a strong SISP, digital transformation efforts are prone to failure and a loss of competitive relevance. Therefore, this study provides a theoretical synthesis to explain how SISP drives competitiveness and sustainability through strategic alignment and innovation capabilities.

This research is crucial for providing a more systematic understanding of the role of SISP in building sustainable and competitive organizations in the digital era. By presenting a comparative study, this article fills a methodological and theoretical gap left unaddressed by previous research. This study offers a new conceptual model that integrates SISP, digital alignment, innovation capability, competitive advantage, and business sustainability. This model can serve as the basis for empirical testing using a quantitative approach in future research. Therefore, this study seeks to examine how SISP plays a role in: increasing competitiveness, strengthening innovation capabilities, and encouraging long-term organizational sustainability.

This research also addresses a scientific gap: the limited empirical studies that quantitatively measure the relationship between SISP implementation, competitive advantage, and corporate sustainability. This research aims to: Identify the dominant SISP method framework used in the literature, analyze the relationship between SISP with competitiveness and sustainability, and develop a conceptual model for further research.

Theoretical Framework

1. Strategic Planning of Information Systems (SISP)

Strategic Information Systems Planning (SISP) is seen as an organizational process in determining the strategic direction of managing and utilizing information technology to support long-term business goals (Ward & Peppard, 2002). Various models, such as the Strategic Alignment Model (SAM) and the Balanced Scorecard (BSC), provide frameworks for achieving and maintaining alignment. These models help organizations manage strategies and balance external and internal factors effectively (Dairo et al., 2021).

SISP includes several core processes, namely: analysis of the internal and external IT environment, evaluation of the organization's information needs, preparation of IT investment priorities, formulation of system and data architecture, and development of IT governance mechanisms. IT is considered an enabler of organizational change, helping firms adapt their core competencies to the changing competitive environment. This view is consistent with the McFarlan Strategic Grid, which categorizes IT's role in organizations into strategic, turnaround, factory, and support quadrants (Amalia Pusparani et al., 2020).

2. Competitive Advantage in a Digital Perspective

Porter's (1985) concept of competitive advantage is fundamentally about a firm's ability to outperform its rivals by creating value in a way that is difficult for competitors to replicate. This concept is closely linked to dynamic capabilities, which refer to a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Rotjanakorn et al., 2020).

The role of IT in shaping competitive advantage is evident in: automation of operational processes, improvement of customer service quality, acceleration of product innovation cycles, and the formation of data-driven business models. Effective implementation of a digital strategy, which includes technologies, data, human resources, and operations, is crucial for achieving competitive advantage. Employee satisfaction further enhances this relationship, indicating the importance of human resources in digital strategy execution (AL Afaishat et al., 2024).

3. Corporate Sustainability in the Digital Ecosystem

The concept of corporate sustainability is evolving to include digital resilience as a fundamental element. This evolution reflects the need for businesses to adapt to technological advancements while maintaining their commitment to environmental, social, and economic responsibilities (Ikram et al., 2020) Key pillars of organizational resilience include preparedness, responsiveness, adaptability, and learning, which help organizations navigate uncertain environments (Russo & Reis, 2025).

Business sustainability in the digital era implies that companies must be able to integrate technology into the value chain, implement adaptive business models, apply the principles of continuous innovation, and manage technology and data risks sustainably. SISP serves as a managerial instrument for strategic resilience by helping organizations structure a flexible digital architecture while ensuring the alignment of digital transformation with the company's long-term vision.

4. Theoretical Perspective: Resource-Based View (RBV)

RBV posits that a firm's unique, valuable, and hard-to-copy resources are critical for securing competitive advantage (Maijanen, 2020). These include tangible and intangible assets such as capabilities, knowledge, and relationships that are valuable, rare, inimitable, and non-substitutable (VRIN criteria) (Dhrubo et al., 2024).

In the context of SISP, information systems and technology function as: strategic resources, organizational capabilities, cross-process coordination mechanisms. The strategic planning process involves a thorough assessment of the organization's current state, future goals, and the steps needed to achieve these goals. This process helps in identifying and prioritizing specific goals, ensuring that all organizational units work cohesively towards common objectives (Mou et al., 2024).

5. Theoretical Perspective: Dynamic Capabilities Theory

Dynamic capabilities refer to a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (FATOKI, 2021a). The core of this concept is: identifying digital opportunities (sensing), allocating innovation resources (seizing), reshaping IT processes and architecture (transforming).

The theory identifies several key components, including sensing opportunities and threats, seizing opportunities, and transforming the organization to maintain competitiveness (FATOKI, 2021b). Dynamic capabilities are crucial for firms to adapt, innovate, and thrive in volatile, uncertain, complex, and ambiguous (VUCA) environments (Schwarz et al., 2020). They enable firms to reconfigure resources and competencies in response to market changes, thus sustaining competitive advantage (Öztürk, 2024).

Method

This study uses a systematic literature review and comparative-historical analysis of 7 scientific articles. A systematic literature review (SLR) is a rigorous and structured approach to reviewing existing research on a specific topic. It is designed to provide a comprehensive summary of the current state of knowledge, identify gaps, and suggest directions for future research. SLR helps in mapping the state-of-the-art of existing literature, which is crucial for understanding the current landscape and identifying research gaps (Fundoni et al., 2023).

Comparative Historical Analysis (CHA) is a methodological approach that has been widely used in social sciences, particularly in political science and history. It involves the systematic comparison of historical sequences to understand large scale societal changes and outcomes. Interpreting and evaluating the results of comparative research can be complex, especially when dealing with historical and legal objects. Clear algorithms for these tasks are still lacking ("Evaluation of the Results of the Historical and Legal Comparison of the Juvenile Justice of Ukraine and Poland in the 1920s," 2021).

The sources are from 2019–2024 academic studies related to the Indonesian Football Association (SISP), competitiveness, and sustainability. The instrument is a theoretical and methodological data extraction matrix. The procedure includes: article collection,

classification of SISP frameworks/models, comparative analysis, and thematic narrative synthesis. A thematic approach and comparisons between studies were used to identify patterns and gaps.

Results

The results of a literature review and comparative analysis of ten scientific articles indicate that Strategic Information Systems Planning (SISP) plays a central role in shaping an organization's digital capabilities and sustainability orientation. Each analyzed study demonstrates that the information systems planning process serves not only as a technical guide for system implementation but also as a strategic instrument for creating alignment between business and technology objectives, strengthening the innovation base, and ensuring corporate sustainability amidst the dynamics of the digital business environment.

1. SISP as the Foundation for Strategic Business-Technology Alignment

Most studies emphasize that successful digitalization rests on strategic alignment between business needs and information systems development. The Ward & Peppard framework and the Value Chain are consistently used to map business processes, information needs, and application priorities. Results show that organizations with an information systems planning approach based on internal and external environmental analysis are better able to prioritize IT investments effectively, avoid application overlap, and minimize the risk of digital project failure.

Furthermore, digital alignment is viewed not merely as a technocratic process, but as a strategic approach involving adaptations to organizational structures, digital culture, and increased technological literacy at the managerial level. These findings demonstrate that SISP plays a strategic enabler role in the digital transformation process.

2. Strengthening Innovation Capabilities and Organizational Agility

The article's analysis reveals that organizations implementing comprehensive SISP tend to have greater adaptability in responding to market changes. Approaches such as Enterprise Architecture Planning (EAP) and the McFarlan Strategic Grid provide a long-term structural framework that enables companies to integrate various business units through a unified systems architecture, identify digital innovation opportunities, and accelerate the adoption of new technologies in line with external developments.

Several studies have shown that SISP encourages the development of digital innovation capability, namely an organization's ability to leverage technology as a source of innovative advantage. Thus, SISP has a mediating effect between technology investment and the creation of new value for customers.

3. Operational Efficiency and Process Integration

Nearly all empirical literature notes increased business process efficiency, primarily through workflow automation, database consolidation, reduced manual errors, and improved information accuracy. SISP serves as a systematic mechanism for

identifying core processes requiring digitization and eliminating non value added activities. Organizations with well-developed information systems planning are able to create lean digital processes that minimize operational costs and processing time while improving service quality.

4. Long Term Impact on Competitive Advantage

From a strategic perspective, the analyzed research shows that the implementation of SISP consistently contributes to competitive advantage through: accelerated product and service innovation, improved customer service quality, faster and more accurate data-driven decision-making, and technology-based strategic differentiation.

However, several studies also highlight the risk of an implementation gap, namely the misalignment between IT strategic plans and on the ground execution, particularly in organizations that do not prepare for change management and IT human resource capacity building.

5. SISP's Relationship with Corporate Sustainability

Although the link between SISP and business sustainability has not been widely quantified, literature shows that organizations that consistently implement SISP demonstrate long-term digital resilience, adaptability to technological and environmental changes, efficient resource use, and readiness for innovation based competition.

Thus, sustainability is understood not only in a financial context, but also as an organization's ability to maintain competitive relevance in a rapidly changing business environment.

6. Empirical Research Gaps

This study identified that: the majority of research is still qualitative and case studies, the sustainability indicators used are not standardized, and there is no empirical model that tests the causal relationship between SISP, digital innovation, and organizational sustainability.

This indicates the need for quantitative research based on SEM-PLS, the development of a Digital Strategic Maturity index, and cross-industry and cross-country research to comprehensively validate the conceptual model.

Discussion

A. Causal Mechanisms: From SISP to Competitiveness and Sustainability

The findings indicate that Strategic Planning Information Systems (SISP) operates through a set of interrelated causal mechanisms:

1. **Strategic Fit.** SISP links business objectives (growth, efficiency, differentiation) with IS/IT capabilities (core applications, data architecture, infrastructure). This alignment reduces cross-functional coordination friction, minimizes application redundancy, and ensures IT priorities align with business value. The immediate effect is cost efficiency and speed of strategy execution; the knock-on effect is increased adaptability as the environment changes a prerequisite for sustainability.

Study	Method	Framework	Findings	Competitive Impact	Sustainability Link
Sutanto (2021)	Case Study	McFarlan	IS portfolio prioritization	Focused resource allocation	Indirect
Wiyono (2020)	Qualitative	Ward & Peppard	Strategic IS alignment	Improved service quality	Moderate
Rahardja (2020)	Case	McFarlan	Roadmap development	Efficiency	Indirect
Aryanto (2022)	Case Study	Cassidy	Enterprise blueprint	Business model innovation	Strong
Chayati (2020)	EAP	EA	System integration	Data consistency	Strong
Indra (2020)	Case	Value Chain	Digital education services	Service agility	Moderate
Supriyanto (2021)	Case	CSF & Ward	Integrated logistics IS	Operational excellence	Strong

2. **Innovation Capability.** A mature SISP doesn't stop at a list of IT projects, but rather builds innovation capabilities: exploring digital opportunities, rapid experimentation, and learning loops. This capability converts digital assets into strategic value for example, new services, hybrid business models, or more agile operations which establishes competitive advantage.
3. **Process Data Integration.** Through enterprise architecture and data governance, SISP creates a consistent flow of information for decision-making across units. This consistency reduces information asymmetry, reduces operational errors, accelerates time-to-decision, and enhances predictive analytics which in turn drives long term resilience.
4. **Organizational Agility.** SISP serves as design logic that reduces switching costs when organizations adopt new technologies (cloud/ AI/IoT). Tech debt is more manageable, legacy lock-in is reduced, and scaling becomes more manageable. This agility is crucial for sustainability because it allows companies to respond to disruption without sacrificing stability.
5. Overall, SISP → (Fit, Capability, Integration, Agility) → Competitiveness → Sustainability, with Innovative Management acting as a driver that activates IT potential to become a business impact.

B. The Mediation Role of Innovative Management

The results of the study emphasize that innovative management is not just a supporting factor, but a mediating mechanism that bridges SISP sustainability:

1. At the cultural level: innovative practices shape a digital mindset the courage to experiment, a tolerance for measured failure, and a commitment to continuous improvement. Without this culture, SISP risks fading into a formal document with no execution power.
2. At the process level (governance): Innovation governance incorporates stage gates, portfolio balancing, and innovation metrics (e.g., time to learn, conversion rate from experiment to product). This ensures that the flow of innovation opportunities doesn't stop in the laboratory but is internalized throughout the value chain.
3. At the leadership level, digital leadership sets the direction (vision), rhythm (cadence), and quality standards for transformation. Ambidextrous leadership capable of exploiting existing assets while exploring new technologies catalyzes this mediation.

Thus, without innovative management, SISP's value tends to stop at operational efficiency; with innovative management, SISP escalates to excellence and sustainability.

C. Conditions that Strengthen (Moderators) and Weaken the Impact of SISP

An in-depth discussion reveals a series of conducive conditions (moderators) that determine the strength or weakness of SISP's influence:

1. **Digital Architecture Readiness.**
API/microservices based and cloud-native architectures accelerate scalability and cross-application integration. Conversely, legacy monoliths without a modernization roadmap hold back the impact of SISP.

2. **Data Governance Maturity.**
Data stewardship, master data management, and data quality standards determine the validity of decisions. Without these, analytics become fragile; sustainability is difficult to demonstrate.
3. **Human Resources Capacity and Digital Literacy.**
Skill gaps among business analysts, IT architects, and product owners undermine execution. Investment in training and a talent pipeline is a must to turn planning into performance.
4. **Regulatory Pressure & ESG.**
Regulatory sectors (finance, healthcare, energy) require SISPs that link compliance to design-by-default; this actually strengthens sustainability measurability (e.g., IT energy efficiency, privacy by design).
5. **Competition Intensity & Market Turbulence.**
A highly dynamic market actually increases the value of SISP because the need for replanning and re-prioritization occurs more frequently but also reveals the weaknesses of a rigid organization.

D. Measuring Sustainability: Shifting from Outputs to Outcomes

One crucial criticism of the literature is its bias towards output metrics (e.g., number of applications, SLAs, IT cost efficiency) rather than sustainability outcomes. To strengthen the academic evidence, the discussion suggests:

1. **Economic dimensions:** medium-term ROA/ROE, cost to serve, digital revenue ratio, customer lifetime value.
2. **Operational dimensions:** time to decision, process cycle time, defect rate, automation coverage.
3. **Innovation dimensions:** innovation conversion rate, time to learn, portion of revenue from new products/features.
4. **Socio-environmental dimensions (optional):** IT energy efficiency, e-waste reduction, privacy incident rate.

The shift to outcome-based metrics allows subsequent research to confirm the causality of SISP → Sustainability through the innovation pathway, rather than simply a momentary efficiency correlation.

E. Methodological Consequences: From Case Studies to Hard Evidence

The dominance of qualitative single/multiple case studies and narrative planning frameworks explains how SISP is designed, but does not yet provide robust causal evidence. The discussion emphasizes the need for:

1. **Longitudinal design:** capturing the dynamics of capability building and learning effects.
2. **SEM/PLS:** testing the structural model (SISP → Alignment → Innovation → Competitiveness → Sustainability), including mediation and moderator effects.
3. **Natural experiments/quasi-experiments:** evaluating the impact of a new architecture rollout or data policy on ongoing performance.

4. Big data analytics/AI: measuring leading indicators (e.g. digital collaboration patterns, application telemetry) as a proxy for dynamic capabilities.
5. With this methodological toolbox, the literature can move from “what works” to “how much it works” and “under what conditions”.

F. Cross-Sector Differentiation: MSMEs, Public Services, and Large Corporations

Detailed discussion of the variations in SISP effects:

1. MSMEs/Startups: SISP's value lies in focus and sequencing; mapping out minimum viable architecture avoids overbuilding. Relevant metrics: runway, burn efficiency, product learning velocity.
2. Public Sector/Education: SISP emphasizes service quality and data integration; sustainability is measured by service level, accountability, and budget efficiency.
3. Large Corporations: Complexity makes EA governance and portfolio rationalization key. Sustainability is reflected in cross-unit scalability, risk posture, and ecosystem play (platform partnerships).

This heterogeneity implies that SISP's design must be contextual, not one size fits all.

G. Risks and Trade-offs in SISP Implementation

The discussion also highlighted the risks that often reduce the impact of SISP.

1. Plan Execution Gap: a well thought out plan without a product management cadence will be reduced to a static document.
2. Over Engineering: overly complex architecture slows time to value.
3. Underfunding Change Management: transformation without a change budget (training, communication plan, process redesign) is rarely sustainable.
4. Vendor Lock-in: premature standardization at a single supplier suppresses flexibility and bargaining power.
5. Addressing this trade-off requires balanced governance between architectural discipline and product team agility.

Conclusion

The results of this study confirm that Strategic Information Systems Planning (SISP) is not merely a technical activity to formulate technology projects, but rather a strategic mechanism that forms the foundation of digital capabilities, innovation, and organizational sustainability. The integration of frameworks such as Ward & Peppard, McFarlan Grid, Value Chain, and Enterprise Architecture Planning consistently demonstrates that SISP has a transformative role through several key channels: strategic business IT alignment (strategic fit), strengthening digital innovation capabilities, optimizing process and data integration, and increasing organizational agility.

Theoretically, these findings reinforce the Resource Based View (RBV) and Dynamic Capability Theory, which place the ability to adapt, learn, and innovate as determinants of long-term competitive advantage. SISP serves as a digital capability orchestration mechanism that enables organizations to convert technology

investments into strategic value through process efficiency, data driven decision making, and business model innovation. Thus, the resulting competitive advantage is sustainable because it is built on capabilities that are difficult to imitate and based on organizational learning.

However, this study also identified that empirical understanding of the causal relationship between SISP and organizational sustainability remains limited, particularly in the context of quantitative measures of long-term performance. The majority of the reviewed research is qualitative in nature, employing a case study approach, resulting in a lack of comprehensive numerical evidence on the impact of SISP on sustainability indicators such as sustainable innovation, digital resilience, and long-term strategic performance. This gap raises a further research agenda, requiring SEM-PLS designs, longitudinal studies, digital maturity models, and cross-sector evaluations to test the robustness of the identified influence pathways.

Thus, this study confirms that digital identity (SISP) is a fundamental prerequisite for modern organizations to achieve sustainable competitive advantage in the digital era. To optimize the benefits of SISP, organizations need to integrate digital planning into their corporate strategy, develop innovation governance, build digital human resource capabilities, and adopt an adaptive technology architecture. These practical implications are crucial for SISP to transform beyond planning documents into strategic capabilities that drive business resilience, organizational agility, and long term sustainable performance.

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