Review

Guiding IT Growth and Sustaining Performance in SMEs through Enterprise Architecture and Information Management: A Systematic Review

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Posted Date: 24 September 2024

doi: 10.20944/preprints202409.1795.v1

Keywords: enterprise architecture; information management; sustainability; growth; performance; systematic review

Systematic Review

Guiding IT Growth and Sustaining Performance in SMEs through Enterprise Architecture and Information Management: A Systematic Review

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Abstract: In today's fast-paced technological landscape, businesses must adapt to evolving business models and harness the power of data to thrive. Small and Medium-sized Enterprises (SMEs) face significant challenges in aligning IT infrastructure with business objectives while navigating digital transformation. This systematic review, conducted using PRISMA 2020 guidelines, investigates the role of Enterprise Architecture (EA) and Information Management (IM) in driving IT growth and sustaining competitive performance in SMEs. Through a synthesis of academic research, industry analysis, and case studies from the last decade, this review identifies key frameworks—such as TOGAF, Zachman, and FEAF—that support the alignment of IT capabilities with organizational goals. The integration of IM within EA frameworks is found to enhance decision-making, resource allocation, and operational efficiency. Emerging technologies like Artificial Intelligence (AI) and cloud computing are highlighted for their transformative impact, enabling real-time data analysis, improved scalability, and enhanced agility. Our review reports that 43.44% of the studies focused on cloud-based solutions, while 24.59% adopted hybrid models, offering SMEs scalable and flexible IT infrastructures. The findings emphasize the necessity of strong governance frameworks to ensure compliance, adaptability, and long-term sustainability in a dynamic environment. This research contributes to a comprehensive roadmap for SMEs, enabling them to leverage EA and IM for sustained growth and competitive advantage in the digital era.

Keywords: enterprise architecture; information management; sustainability; growth; performance

1. Introduction

Small and Medium-sized Enterprises (SMEs) are pivotal to economic development and job creation [1–4]. However, a considerable number of these enterprises fail within their first five years of operation. In a business environment that is continually evolving due to rapid technological advancements and shifting market dynamics, SMEs face increasing pressure to adapt and optimize their operations [5,6]. In this context, Enterprise Architecture (EA) and Information Management (IM) have emerged as essential strategic tools that can empower SMEs to thrive. By leveraging these frameworks, SMEs can harness the potential of technology while ensuring sustainable performance.

Enterprise Architecture serves as a conceptual model that delineates an SME's structure and operations [7–9]. By aligning Information Technology (IT) with business objectives, EA simplifies complexity and provides a clear understanding of the interplay between business and technology [8,9]. This alignment is crucial for SMEs, as it enables them to navigate the intricacies of modern business landscapes effectively. Conversely, Information Management acts as a vital strategic resource that drives decision-making within SMEs [10–13]. By effectively collecting, storing, and utilizing data to support business processes, IM enhances operational efficiency and fosters innovation. When EA and IM are integrated, they create a cohesive framework that guides organizations in their IT growth while ensuring sustained performance. This review thoroughly examines the interaction between EA and IM, offering a comprehensive approach for organizations

 doi:10.20944/preprints202409.1795.v

to navigate the challenges presented by the rapidly evolving technological landscape. The integration of EA and IM is not merely a theoretical exercise; it is a practical necessity for SMEs aiming to gain a competitive edge. The blueprint provided by EA aligns IT infrastructure with business objectives, while IM enhances operational processes [14,15]. Together, they enable organizations to foster agility and respond swiftly to market changes. This synergy is particularly important in this era where data-driven decision-making is paramount for success [16–20].

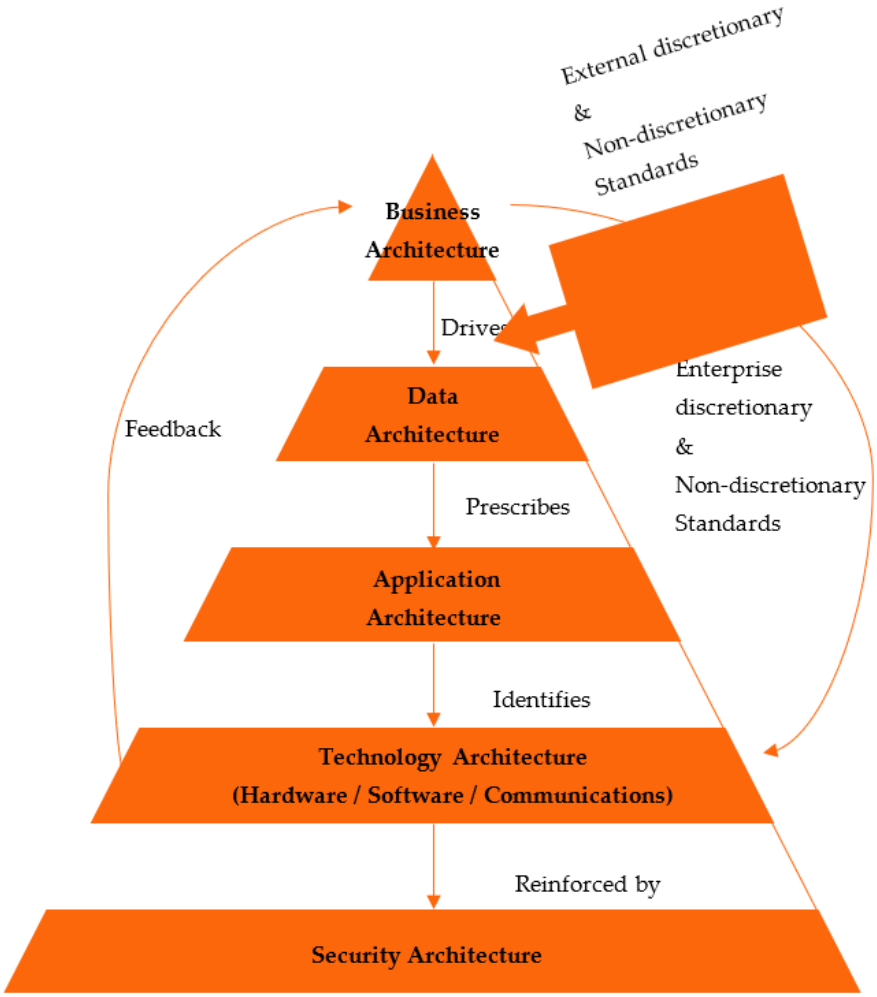

Figure 1. The key components of Enterprise Architecture. (Available at Link).

The key components of EA play a crucial role in guiding IT growth and sustaining performance in SMEs. EA provides a structured framework that aligns business processes, information systems, and technology infrastructure, enabling SMEs to effectively navigate the complexities of digital transformation [21–24]. Each component, such as business architecture, information architecture, application architecture, and technology architecture, contributes to a cohesive strategy that supports operational efficiency and strategic alignment. Integrating these components fosters a holistic understanding of how IT initiatives can drive business objectives, ensuring that technology investments yield tangible benefits. For instance, a well-defined business architecture clarifies organizational goals, while an optimized information architecture enhances data management, facilitating informed decision-making [21,24]. Business Architecture outlines the organization's strategy and processes, ensuring that IT initiatives align with business goals [25–28]. Data Architecture manages data flow and storage, facilitating informed decision-making and innovation. Application Architecture governs the software landscape, ensuring seamless integration and functionality across applications [29–31]. Technology Architecture encompasses the hardware and networks that underpin operations, enhancing efficiency and competitiveness [32,33]. Security

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Architecture safeguards data and systems from threats, ensuring compliance and resilience [34–37]. Together, these components create a cohesive framework that enables SMEs to adapt to changes, optimize resources, and drive sustainable growth.

Despite the growing recognition of the significance of EA and IM, the discourse surrounding these frameworks is often clouded by controversial and divergent hypotheses. A central debate centres on whether EA should prioritize technology or business processes [38–45]. Proponents of a technology-centric approach argue that it can enhance efficiency; however, this may lead to misalignment with broader business objectives [38–45]. On the other hand, an exclusive focus on business processes may overlook the transformative potential of technological advancements [38–45]. Additionally, the role of governance in these domains remains contentious. While some experts advocate for stringent governance frameworks to ensure compliance, others argue for a more flexible approach that encourages innovation in dynamic environments [38–45]. The integration of emerging technologies, such as Artificial Intelligence, further complicates this landscape, presenting both opportunities for enhanced effectiveness and challenges that may disrupt existing processes [46–49]. This underscores a critical gap in research, particularly concerning how SMEs navigate these tensions and their implications for operational success. To address the complexities surrounding EA and its role in SMEs, the comparative Table 1 effectively summarizes the differing perspectives on technology-centric and business process-centric approaches, as well as the governance debate. Table 1 that encapsulates these controversial hypotheses.

Table 1. The comparison of controversial hypotheses or different perspectives on EA's role in SMEs.

Ref.	Aspect	Technology-Centric Approach	Business Process-Centric Approach
[1–7,10–25]	Focus	Prioritizes technological solutions and innovations	Emphasizes optimizing business processes and workflows
[6–19,26–41]	Benefits	Can enhance operational efficiency and speed	Ensures alignment with business objectives and customer needs
[3–17,24–48]	Risks	Potential misalignment with broader business goals	May overlook technological advancements and innovations
[8–23,25–31]	Governance	Advocates for stringent governance frameworks	Supports flexible governance to foster innovation
[1–15,29–58]	Integration of Emerging Technology	Embraces technologies like AI for operational enhancement	May resist rapid technological changes due to process focus
[58–73,86–116]	Implications for SMEs	Can lead to improved effectiveness but risks disruption	Encourages sustainable practices but may hinder tech adoption

The ongoing debates surrounding EA focus on three primary areas. First, there is a contention between technology-centric and business process-centric approaches, with the former emphasizing efficiency and the latter ensuring alignment with strategic objectives. Second, governance approaches vary, as some experts advocate for strict compliance frameworks while others promote flexibility to foster innovation. Lastly, the integration of emerging technologies, particularly Artificial Intelligence, presents both opportunities for enhanced effectiveness and challenges that SMEs must navigate to maintain operational success.

The primary aim of this review is to provide a comprehensive understanding of how organizations can effectively leverage EA and IM strategies to drive IT growth and sustain performance. This involves a thorough examination of the essential components of EA and IM, along with best practices for their integration. By identifying the potential benefits and challenges associated with their implementation, this review seeks to illuminate the pathways organizations can take to align their IT initiatives with overarching business goals. A well-defined Enterprise Architecture Framework (EAF), when integrated with robust IM practices, is vital for organizations striving to enhance their IT capabilities [50–58]. Such integration ensures that technology investments

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align with strategic objectives, allowing organizations to treat information as a strategic asset. This approach not only promotes data-driven decision-making but also enhances operational efficiency and drives innovation [59–63]. Moreover, a flexible EA framework enables organizations to adapt quickly to changing market conditions, while effective governance structures help manage risks and promote accountability [64–71]. Ultimately, fostering collaboration between IT and business units enhances the overall effectiveness of EA and IM initiatives, leading to more cohesive and efficient operations [72–75]. Table 2 provides a comparative evaluation of existing reviews outlining the contributions, strengths and weaknesses.

Table 2. Comparative analysis of the existing review works and proposed systematic review on guiding IT growth and sustaining performance in SMEs through EA and IM.

Ref.	Cites	Year	Contribution	Pros	Cons
[52]	223	2021	Enhances SME performance through effective IT integration.	Improves decision-making via structured information management.	Initial complexity may overwhelm resource-limited SMEs.
[53]	194	2022	Provides insights into digital transformation.	Enhances operational efficiency and productivity.	Executing can be complex and resource-intensive.
[54]	29	2023	Assessing the impact of cloud-based solutions on business performance in SMEs in Germany.	Cloud computing enables system scalability and cost savings for businesses.	Migrating to the cloud requires careful planning and potential application refactoring.
[55]	7	2024	Enhances strategic IT alignment.	Provides a comprehensive framework.	Complexity may hinder implementation.
[56]	50	2022	Enhances data accuracy and customer satisfaction.	Improves competitive advantage through effective management.	Implementation can be costly for resource-limited startups.
[57]	24	2018	Transformational leadership enhances business innovation.	Encourages creativity and adaptability in SMEs.	May overlook practical management aspects.
[58]	136	2023	Enhances SMEs' operational efficiency.	Reduces costs and improves accessibility.	Potential security vulnerabilities.
[59]	69	2021	Enhances operational efficiency.	Boosts customer satisfaction.	Requires significant investment.
[60]	138	2021	Enhances operational efficiency in SMEs.	Improves customer satisfaction significantly.	Implementation can be resource-intensive.
[61]	152	2020	Investigates the impact of information management on IT performance in SMEs in India.	Explores information management's impact on IT performance and sustainability for SMEs.	Focuses on a specific geographical region (India) and may not be generalizable to other contexts.
[62]	157	2021	Provides a structured approach for SMEs to undergo digital transformation.	Enables SMEs to enhance revenue growth and competitive advantage.	Requires significant IT resources and expertise which may be limited for SMEs.
[63]	65	2021	Enhances operational efficiency via IT integration.	Improves IT growth and cost savings significantly.	Initial investment in IT can be substantial.
[64]	120	2021	Enhances decision-making capabilities.	Improves data quality and accessibility.	Implementation can be resource-intensive.
[65]	178	2019	Enhances innovation capability via reengineering.	Supports sustainable competitive advantage.	Requires significant organizational change.
[66]	119	2019	Enhances innovation through integration.	Fosters competitive advantage in SMEs.	Requires significant resource investment
[67]	193	2020	Enhances resilience of SMEs in Sub-Saharan Africa.	Promotes competitive advantage via technology.	Slow adoption due to regional constraints.

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[68]	131	2018	Develop a conceptual context for SMEs' 4IR adoption.	Enhances competitive advantage for SMEs.	Faces challenges in skilled labour shortages.
[69]	28	2020	Enhances SME performance and sustainability.	Reduces operational costs significantly.	Potential security risks and concerns.
[70]	201	2017	Examines IoT adoption for sustainable growth in Romanian IT SMEs.	IoT enhances SME efficiency and productivity for digital transformation.	Challenges in determining right IoT use cases for sustainability.
[71]	4	2024	IT investments enhance operational efficiency.	Boosts customer satisfaction significantly.	Initial costs may be prohibitively high.
[72]	137	2022	Enhances operational efficiency and scalability for SMEs.	Reduces IT costs significantly, improving profit margins.	Security risks and data privacy concerns may arise.
[73]	196	2018	Enhances financial decision-making processes.	Improves data accuracy and system reliability.	Execution can be complex and resource intensive.
[74]	112	2021	Proposes value cocreation model bettering knowledge innovation in SMEs.	Improves service efficiency and customer satisfaction for competitive edge.	Implementing model requires significant resources and organizational change.
[75]	139	2021	Enhances accounting accuracy via cloud computing.	Improves data processing efficiency significantly.	Implementation complexity may overwhelm SMEs.
[76]	185	2021	Provides ideas into digitalization's non-linear effects.	Enhances understanding of digitalization paradoxes.	Complexity hinders SMEs from effective executions.
[77]	3	2024	Framework for IT SMEs to scale up sustainably.	Enables coherent IT growth strategies despite constraints.	Establishing EA framework may overwhelm SMEs, diverting critical resources.
Proposed systematic review			**This research evaluates enterprise architecture, performance metrics, and innovative models to enhance SMEs' IT sustainability.**		**Improved decision-making through data-driven insights and predictive analytics.**

1.1. Research Questions

Whereas significant research has been conducted on enterprise architecture and information management in recent years, there is not a clear detailed review that determines how enterprise architecture strategies help SMEs grow their IT systems and keep their performances robust. This study aims to systematically review existing research at how enterprise architecture and information management can be used together to improve IT and business outcomes. To achieve this, the following research questions will be explored:

- What specific strategies in Enterprise Architecture (EA) are most effective for guiding IT growth and sustaining performance in organizations, and under what conditions?
- How does EA facilitate alignment between IT and business objectives in different organizational contexts (e.g. centralized vs decentralized, public vs private sector); and what are the key mechanisms and success factors?
- What methodologies and frameworks exist for integrating EA with specific IT management frameworks like TOGAF (The Open Group Architecture Framework), ITIL (Information Technology Infrastructure Library), COBIT (Control Objectives for Information and Related Technology), or Agile; and how do they compare in terms of benefits, challenges, and suitability for different organizational needs?

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- How do emerging technologies like Artificial Intelligence (AI), cloud computing, and the Internet of Things (IoT) influence the evolution of EA best practices in areas such as architecture modeling, decision support, and stakeholder engagement; and what new capabilities do they enable?
- How do specific aspects of organizational culture, such as leadership support, change management practices, and employee digital skills, affect the adoption and success of EA initiative; and what cultural changes are needed to create a digital-savvy workforce that can effectively utilize EA?

1.2. Research Motivations (Rationale)

The rapid evolution of IT developments is fundamentally transforming organizational operations. Small and medium-sized enterprises (SMEs) face considerable challenges in managing their IT infrastructure while striving for robust business growth and long-term sustainability. In this context, Enterprise Architecture (EA) and Information Management (IM) emerge as critical components, yet their potential remains largely untapped. Often overlooked, the synergistic relationship between EA and IM is essential for achieving sustained performance and fostering IT growth. While research has advanced in both domains independently, the intersection of EA and IM in promoting IT growth and sustainable performance in SMEs is still underexplored.

The current literature tends to isolate the contributions of EA and IM, neglecting their collaborative potential to help SMEs navigate competitive environments and respond to market trends. This review aims to bridge this gap by examining how EA and IM can work in tandem to enhance SMEs' IT infrastructure optimization and overall performance. Specifically, it will investigate the ways in which these frameworks can empower SMEs to adapt to dynamic market conditions and competitive landscapes. By identifying the shortcomings in existing studies and emphasizing opportunities for further exploration, this review aspires to stimulate innovation and advancement within the SME sector. Ultimately, it seeks to support the development of effective strategies that leverage enterprise architecture and information management, thereby enhancing the growth and resilience of SMEs in an increasingly complex business landscape.

1.3. Objectives

EA and IM are crucial for SMEs aiming for sustainable growth in competitive markets. This review explores how EA and IM strategies can propel IT development and enhance performance in SMEs. EA provides a strategic framework that aligns business processes, information systems, and technology infrastructure, offering a comprehensive view that helps stakeholders understand interdependencies and make informed decisions. Meanwhile, IM emphasizes the efficient collection, storage, and dissemination of information, ensuring timely access to relevant data. By integrating EA and IM, SMEs can enhance operational efficiency, optimize resource allocation, and improve decision-making, essential for competing with larger firms. Below is a list of objectives of this review:

- To systematically assess how the execution of EA and IM frameworks enhances operational efficiency in SMEs by identifying process inefficiencies and optimizing workflows, ultimately leading to reduced costs and improved service delivery.
- To investigate how effective IM enables SMEs to leverage data analytics for informed strategic decision-making, focusing on the alignment of tailored EA frameworks with business objectives to foster innovation and responsiveness to market changes.
- To explore the ways in which EA facilitates improved collaboration and communication within SMEs, assessing its impact on interdepartmental teamwork and its role in fostering innovation and continuous improvement while ensuring scalability and flexibility.
- To analyze the integration of EA into the strategic planning processes of SMEs, focusing on its effectiveness in enhancing risk management, fostering innovation, and aligning IT initiatives with business goals to maximize IT investments and support organizational objectives.
- To evaluate the existing EA frameworks and their application in SMEs with a focus on real-world case studies.

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1.4. Research Contribution

This study presents a robust framework tailored for SMEs to enhance their IT growth and performance through effective EA and IM. A key contribution of this research is the practical framework that aids SMEs in identifying and executing IT strategies pertinent to EA and IM. This framework integrates methodologies such as TOGAF (The Open Group Architecture Framework) and ITIL (Information Technology Infrastructure Library), providing SMEs with structured approaches to align IT initiatives with their business objectives. Moreover, this review critically examines existing literature on IT management within SMEs, identifying significant gaps that necessitate further exploration. By addressing these gaps, this study not only underscores areas that require more scholarly attention but also directs future research towards refining best practices in IT management. Ultimately, this review aims to empower SMEs to make informed decisions regarding their IT infrastructure, thereby ensuring operational efficiency and long-term sustainability.

1.5. Research Novelty

This exploration delves into innovative research surrounding these frameworks, emphasizing their potential to guide IT development and enhance performance within SMEs. The significance of this research is underscored by its focus on the unique challenges SMEs face, particularly regarding digital transformation and competitive positioning. EA serves as a strategic framework that aligns business processes, information systems, and technological infrastructure. For SMEs, it is not merely a tool for larger organizations; rather, it is a crucial strategy for achieving operational efficiency and fostering innovation.

Research indicates that SMEs implementing customized EA solutions can significantly enhance their operational processes, optimize resource allocation, and improve decision-making capabilities. Tailored EA solutions for SMEs are designed to be more agile and flexible, accommodating the unique constraints of these businesses, such as limited budgets and fewer IT resources. This adaptability enables SMEs to respond swiftly to changing market conditions. Furthermore, these solutions focus on cost-effectiveness, emphasizing lean technology infrastructures that maximize value without unnecessary expenditure. In contrast to larger enterprises, which often require complex, overengineered projects, EA solutions for SMEs prioritize practical and sensible approaches that address specific challenges. The emergence of tailored EA solutions represents a substantial advancement in the field, specifically addressing the distinct needs of smaller enterprises. Agile frameworks empower SMEs to adapt quickly to market changes and respond effectively to customer demands, which is crucial for maintaining performance in a competitive landscape. This adaptability not only enhances operational efficiency but also positions SMEs to thrive amid evolving industry dynamics, ensuring they remain competitive and responsive to their customers' needs.

IM is fundamentally intertwined with EA, encompassing the practices and technologies organizations utilize to manage their information resources effectively. Robust IM practices enable SMEs to leverage data for informed decision-making, fostering performance and growth. Research reveals that SMEs integrating strong IM practices within their EA frameworks can attain a competitive advantage by enhancing operational agility and responsiveness. Digital transformation acts as a critical catalyst for the necessity of effective EA and IM in SMEs. As businesses increasingly navigate digital landscapes, the ability to manage information and align it with overarching business strategies becomes essential. However, many SMEs struggle with digital transformation due to constraints in financial resources and technical expertise. The adoption of EA can facilitate this transition, enabling SMEs to overcome these barriers and capitalize on the advantages of digital technologies.

Despite the evident benefits of implementing EA and IM strategies, SMEs encounter significant challenges, including limited financial resources, a shortage of skilled personnel, and resistance to change. Addressing these barriers is crucial for fully harnessing the potential of EA in driving IT growth and sustaining performance in a competitive environment. Therefore, it is imperative to explore how tailored EA solutions can specifically address these unique constraints faced by SMEs, ultimately enhancing their capacity for digital transformation and innovation.

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2. Materials and Methods

This section delineates the methodologies utilized to investigate the interplay between EA, IM, and their impact on IT growth and performance in SMEs. The review is grounded in primary sources, encompassing academic literature, case studies, and pertinent frameworks. Key resources include peer-reviewed articles and industry reports that scrutinize the implementation of EA in SMEs, particularly regarding its influence on competitive advantage and performance sustainability. Noteworthy frameworks such as Business Architecture, Information Architecture, and Technology Architecture offer a comprehensive perspective on aligning IT strategies with overarching business objectives.

The research methods are multifaceted. Initially, a thorough review was conducted using targeted search terms related to EA and IM within SMEs, focusing on their adaptation to market fluctuations and enhancement of competitive positioning. This was followed by an examination of several case studies showcasing SMEs that successfully implemented EA frameworks, highlighting how these frameworks were customized to address the distinct challenges faced by smaller businesses. Finally, a conceptual framework was developed based on existing literature and case studies, illustrating the relationship between EA, IM, and SME performance while emphasizing the alignment of IT strategies with business goals. The below flow diagram outlines the systematic steps undertaken in this literature review, detailing the processes from literature identification to data synthesis and analysis. Figure 2 presents the flow diagram depicting the steps necessary for this current SLR.

Figure 2. The proposed systematic literature review flow diagram.

2.1. Eligibility Criteria

We conducted a comprehensive review of peer-reviewed literature published between 2014 and 2024 to identify effective strategies for managing IT growth and performance in SMEs. Our analysis focused on studies written in English that presented clear frameworks for IT strategies. Articles lacking appropriate methodologies or published outside the specified timeframe were excluded. Table 3 highlights the specifics of the inclusion and exclusion criteria.

Table 3. The proposed eligibility criteria depicting the inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Topic	Articles must focus on strategies guiding IT growth and sustaining performance in SMEs through Enterprise Architecture and Information Management	Articles unrelated to strategies guiding IT growth and sustaining performance in SMEs through Enterprise Architecture and Information Management
Research Framework	The articles must include a research framework for strategies guiding IT growth and sustaining performance in SMEs through Enterprise Architecture and Information Management	Articles lacking a clear methodology related strategies for guiding IT growth and sustaining performance in SMEs through Enterprise Architecture and Information Management
Language	Must be written in the English language	Articles published in languages other than English
Period	Articles must be published between 2014 and 2024	Articles published outside 2014 and 2024

2.2. Information Sources

The literature for this study was obtained from reputable online research databases, including Google Scholar, Web of Science, and SCOPUS, known for their extensive academic collections. A targeted search strategy was employed, utilizing a curated list of keywords related to the systematic literature review topic to enhance relevance and ensure high-quality sources were selected for

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analysis. Table 4 presents the search wordlist used in obtaining the relevant literature for the presented topic.

Table 4. The proposed search wordlist.

Search Wordlist
"Enterprise Architecture" OR "Business Architecture"
"Information Management" OR "Data Management"
"Records Management" OR "information systems"
"Information Technology" AND "growth strategies"
"Small and Medium Enterprises" OR "Small and Medium-sized Businesses"
"Small and Medium-sized Companies" OR "Small and Medium-sized Firms"
"SMEs" AND "IT growth"
"Sustaining Performance" OR "Competitive Advantage"
"Corporate Architecture" AND "Performance Sustainability"

2.3. Search Strategy

This systematic review employed carefully selected search keywords to identify relevant articles, book sections, and conference papers that elucidate strategies for guiding IT growth and sustaining performance in SMEs concerning EA and IM. Reiterative experimental searches were conducted to refine the index keywords, discarding those that did not meet the established eligibility criteria. Synonyms were developed for the primary search terms to ensure comprehensive coverage; for instance, "Enterprise Architecture" included terms such as "Business Architecture" and "IT architecture," while "Information Management" encompassed "Data Management" and "Records Management".

To locate pertinent scholarly research, Boolean operators "AND" and "OR" were utilized strategically. The "AND" operator combined different concepts, ensuring that all specified keywords were present, whereas "OR" expanded the search to include synonyms and related terms. Advanced search techniques, such as phrase searching, were instrumental in refining results, allowing for precise retrieval of articles that matched specific terminologies. The databases utilized also provided filtering options to sort results by publication date, relevance, and document type, enhancing the efficiency of the research process. This meticulous approach underscores the importance of thoroughness in academic research, facilitating the identification of high-quality scholarly articles and contributing to the integrity of the findings.

2.4. Selection Process

This SLR necessitates a rigorous selection process to determine which scholarly papers meet the eligibility criteria established in Section 2.1. This meticulous approach is essential for ensuring the reliability and relevance of the literature included in the review. The selection procedure unfolds in several stages, beginning with the identification of potentially eligible papers through a comprehensive search strategy that utilizes a targeted wordlist. Initially, the titles and abstracts of the papers are screened to eliminate those that are irrelevant. Following this, full-text reviews are conducted to assess the eligibility of the remaining papers in greater detail. It is crucial to document the number of records identified, screened, and ultimately included in the review, ideally represented in a PRISMA flow diagram, as shown in Figure 5. This diagram visually summarizes the selection process and details the reasons for exclusions at each stage. To enhance the reliability of the findings, multiple reviewers participate in the screening process, with each record being independently assessed by at least two reviewers, minimizing potential bias. Any disagreements among reviewers are resolved through consensus or by consulting a third reviewer, ensuring a transparent decision-making process.

The integration of automation tools has significantly streamlined the selection process, facilitating initial screening by removing duplicates and prioritizing records based on predefined

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criteria. For example, software like Microsoft Excel aids in organizing records and managing citations efficiently. Detailed documentation of the selection methods is vital for transparency, including the number of records screened, studies excluded, and the rationale for exclusion, such as ineligible research frameworks. Additionally, only papers written in English were considered, necessitating the exclusion of any abstracts or papers that required translation. This level of detail not only enhances the credibility of the review but also provides a framework for future researchers to replicate the process. Therefore, a systematic review of this nature demands a structured approach to study selection, involving independent reviewers, the use of automation tools, and comprehensive documentation of the methodologies employed, thereby ensuring that the review's conclusions are grounded in a robust and reliable body of evidence.

2.5. Data Collection Process

This SLR employed a rigorous data collection methodology to identify, collate, and synthesize existing research. Upon completing the study selection process, a team of three researchers was appointed to oversee this SLR. Their primary objective was to locate relevant papers published within the last decade. The data collection process commenced with defining the research questions that the review sought to address. Subsequently, the researchers identified pertinent studies within designated databases, including conference papers, journal articles, book chapters, and dissertations, retrieved from three prominent online repositories: Google Scholar, Web of Science, and SCOPUS. Employing purposive sampling and filtering techniques, the team selected the most relevant works to enhance understanding of strategies that promote IT growth and sustainable performance. For instance, the review included studies on the adoption of Artificial Intelligence and cloud computing technologies by SMEs for improved efficiency and cost savings. The selected literature provided valuable insights into the challenges and best practices associated with implementing these technologies to achieve sustainable growth through Enterprise Architecture and Information Management. Figure 3 depicts the data collection methodology.

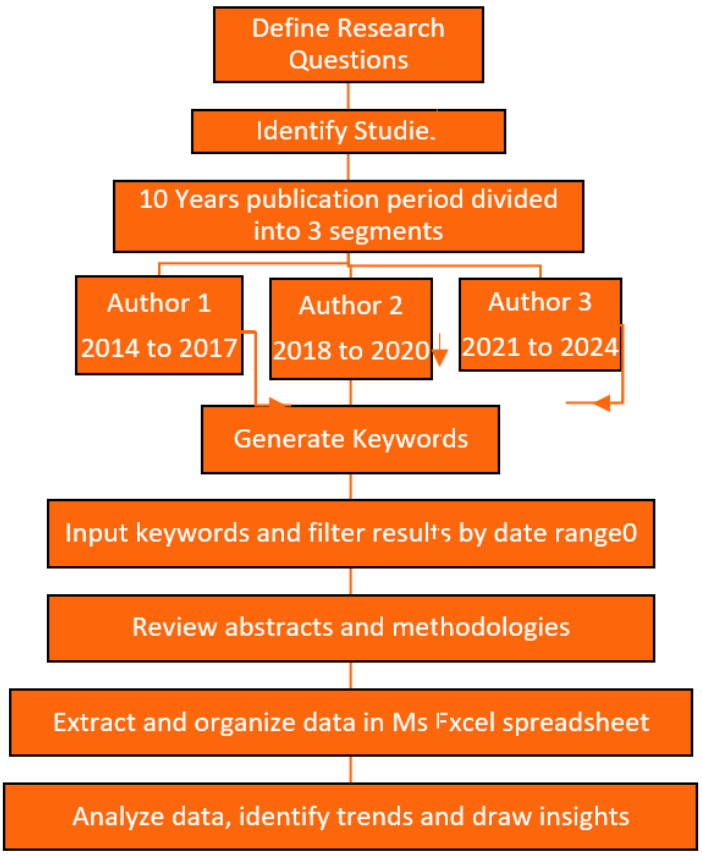

Figure 3. Data collection methodology outline.

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To ensure a comprehensive and efficient search process, the associates systematically divided the ten-year publication period into three-year segments, assigning each associate a specific segment to explore. This strategic division minimized overlap in selected studies and facilitated the creation of a complete dataset. Utilizing online search engines, relevant keywords were generated to assist the associates in efficiently discovering pertinent studies while reducing the time spent on irrelevant literature. The search results were further refined by specifying a particular date range. Each study's abstract and methodology were meticulously reviewed to assess their suitability for inclusion before extraction. A Microsoft Excel spreadsheet was developed to organize key data extracted from the selected studies, enabling the associates to identify trends and patterns essential for advanced statistical analysis. This systematic literature review was carefully designed to gather and synthesize existing literature without relying on interviews or surveys, thus establishing a robust foundation for understanding strategies that foster IT growth and sustainable performance. For instance, the integration of Artificial Intelligence and cloud computing within SMEs was examined to illustrate how these technologies can enhance operational efficiency and drive innovation, ultimately contributing to sustainable growth in the digital economy.

2.5.1. Data Quality Appraisal

The appraisal of data quality was conducted to enhance the reliability of the selected research papers and to validate the relevance of their findings. Each chosen study underwent a thorough analysis based on a scoring methodology to determine its significance. The evaluations were systematically presented in a proposed table, as illustrated in Table 5. The reviewed research papers employed diverse criteria, reflecting a comprehensive approach to the subject matter.

Table 5. The proposed research quality questions.

Question (Q)	Research Quality Questions
Q1	Are the research objectives clearly defined?
Q2	Is the research methodology adequately explained?
Q3	Is a research model presented?
Q4	Are the data collection procedures described in detail?
Q5	Is the research field or context clearly identified?
Q6	Do the findings contribute to existing knowledge?

The quality of appraised questions was used for all the gathered research works. Each research quality question was approximated based on three feasible responses., ''Yes'' (assigned score = 1), ''Partially'' (assigned score = 0.5) or ''No'' (assigned score = 0). This was achieved by carefully analyzing the abstract, research design, findings and conclusions of each study. Scores were added to determine the overall quality of the relevant research. The data is presented in Table 6.

Table 6. Research quality questions results.

Reference	Q1	Q2	Q3	Q4	Q5	Q6	Total	%
[76–78,85–87,98,100,111,113]	1	1	1	1	1	1	6	100%
[79,88,92,104–109,114–116]	1	1	1	0	1	1	5	83.33%
[80,89,101–103,110,112,115]	1	1	1	0.5	1	1	5.5	91.67%

In general, the data collection using the above-mentioned approach resulted in 116 relevant studies. Each paper was read thoroughly by an associate to identify opportunities and impediments of EA and IM for SMEs.

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2.6. Data Items

The potential outcomes of IT and business performance can be broadly categorized into two primary domains: IT growth and performance, and business performance [50–54]. Each category encompasses various metrics that enable organizations to evaluate their operational effectiveness and competitive positioning, ultimately guiding strategic decision-making and fostering long-term success. In the realm of IT growth and performance, focusing on overall IT system performance is essential. Metrics such as system uptime, which assesses the continuous operation time of IT systems, play a critical role in this area [55–57]. High uptime is vital for ensuring consistent service availability to end-users, thereby enhancing productivity and user satisfaction [55–57]. This is particularly important for SMEs, where real-time data access is crucial for effective decision-making and service delivery.

Response times also represent a critical metric, evaluating the speed at which IT systems respond to user requests [58–61]. Quick response times are essential for maintaining user satisfaction; delays can lead to frustration and diminished productivity [58–61]. Organizations should actively monitor these response times to identify bottlenecks and enhance system performance. Furthermore, the integration of advanced IT strategies such as AI and cloud computing can significantly improve these metrics. AI can optimize resource allocation and automate processes, while cloud computing offers scalable solutions that enhance reliability [62–65]. Together, these technologies not only bolster operational efficiency but also contribute to a more resilient IT infrastructure that fosters trust among users, making them crucial components of overall IT performance. Figure 4 illustrates the inter-relation between IT growth, sustainable performance and business outcomes in SMEs.

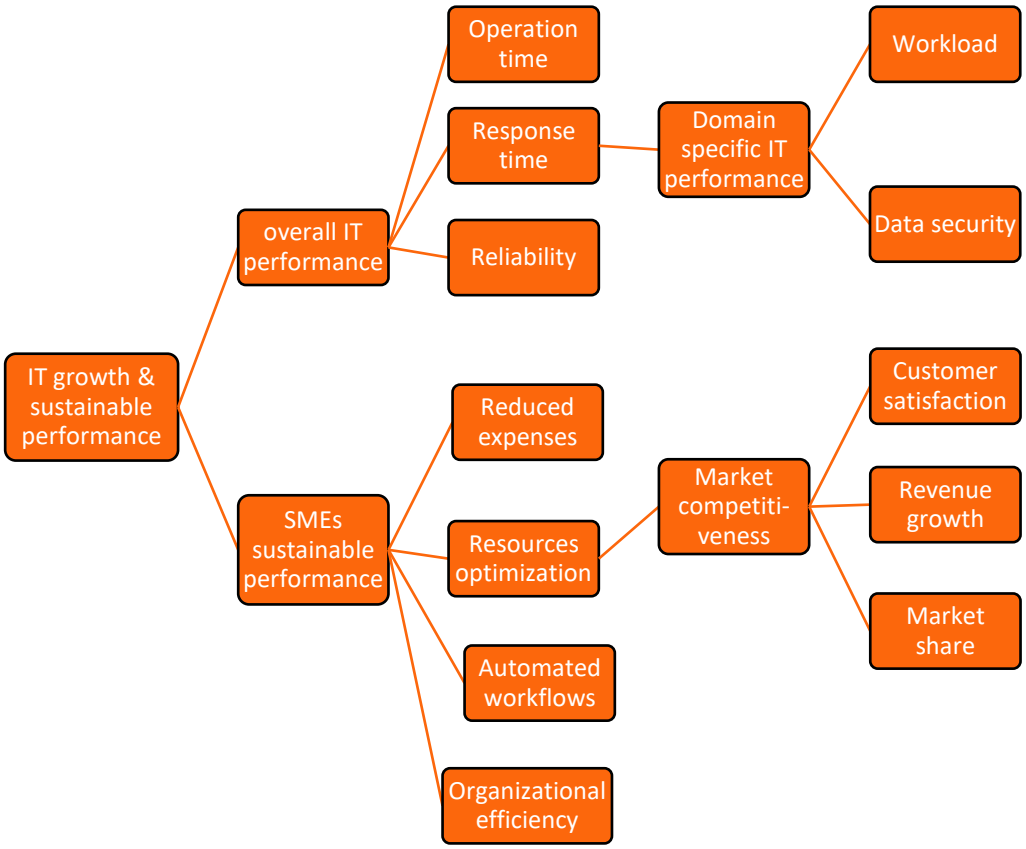

Figure 4. Proposed Flow Diagram of Data Items.

Organizations must prioritize domain-specific IT performance alongside overarching performance metrics, particularly when managing specific workloads. As businesses expand, their IT infrastructure must effectively accommodate increasing demands without compromising performance. For instance, the integration of cloud computing provides scalable resources that adapt to fluctuating workloads while ensuring high levels of system reliability. Additionally, leveraging AI

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can enhance operational efficiency by automating routine tasks and offering predictive analytics, thereby enabling organizations to make informed decisions swiftly. Robust data security is imperative for protecting sensitive information against breaches—an increasingly pressing concern considering rising cyber threats [66–71]. Effective data management influences how systems organize, store, and retrieve information, facilitating informed decision-making and enhancing operational efficiency [66–71]. This section emphasizes key metrics for assessing business performance, particularly regarding internal process effectiveness. The adoption of automated workflows emerges as a significant tool for measuring organizational efficiency by reducing manual tasks and allowing employees to focus on higher-value activities. Streamlining processes not only boosts productivity but also minimizes human error.

Resource optimization is another vital metric that assesses how efficiently organizations utilize their human, financial, and technological resources to maximize output [72–75]. Evaluating reduced expenses is essential for identifying cost-saving opportunities that enhance profitability while maintaining customer value, thereby contributing to long-term sustainability and competitive advantage [72–75]. In instances where multiple outcomes were recorded, we selected a single outcome for inclusion in our analyses based on its comprehensiveness for evaluation. For cases with numerous results, all available outcomes were documented, with associates independently categorizing them based on their relevance to the review questions as well as the validity and reliability of the measures employed. Table 7 presents the extracted data items from the included publications, aligning with the defined research questions and objectives.

Table 7. Data items extracted from the publications included.

Data Item	Description	Example Entries
Title	Title of the study	"Enterprise Architecture for IT growth"
Year	The year the study was published	2014 – 2024
Online Database	The online repository to find studies	Google Scholar, SCOPUS, Web of Science
Journal Name	The journal used for publication	Journal of Information Technology
Research Type	Type of research	Empirical, Theoretical
Subject Area	The academic discipline of the study	EA, IM , IT growth, SME performance
Industry Context	The industry or sector focus of the study	SMEs, startups, small businesses
Geographic Location	The geographic focus of the study	Countries
Economic Context	The economic context	Developed vs. developing countries
EA Framework Types	Specific EA frameworks	TOGAF, Zachman Framework
IM Practices	Key practices related to IM	Data Governance
Technology Providers	Technology vendors mentioned	Microsoft, IBM
IT Model	The model used for executing technology	Agile, Waterfall
Research Design	The design of the research	Experimental, case study, survey, etc.
Scholarly Paper Type	The type of study	Qualitative, Quantitative
Sample Size	The size of the sample used in the study	50 companies, 200 employees
Sample Attributes	Characteristics of the sample	Multinational Corporations
Data Acquisition	Methods used to collect data	Interviews, Surveys
Analytical tools	Techniques used to analyze the data	Regression Analysis
IT Performance Metrics	Metrics used to measure IT performance	System Uptime, Response Time
EA Performance Metrics	Metrics used to measure EA performance	ROI, Market Share
Organizational Outcomes	Managerial performance outcomes	Increased Efficiency, Cost Reduction
Long-term Impacts	Long-term impacts identified in studies	Competitive Advantage

The table presents a comprehensive overview of critical data items pertinent to research on EA and IM within SMEs. It includes key details such as the study title and the publication year, spanning from 2014 to 2024. The table highlights sources from online databases like Google Scholar and

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SCOPUS, along with the journals where these studies are published, such as the Journal of Information Technology. Research types are categorized as either empirical or theoretical, and the subject areas cover disciplines including EA, IM, and IT growth. The industry context specifically addresses SMEs and startups, while geographic locations denote the countries involved. Economic contexts are classified into developed and developing nations.

Furthermore, the table specifies various EA framework types, such as TOGAF, and key IM practices like data governance. It identifies technology providers, outlines the IT models utilized, and describes diverse research designs, including experimental and case study approaches. Sample sizes and attributes offer insights into the studies' scale and characteristics, while data acquisition methods and analytical tools are detailed. Finally, it lists IT and EA performance metrics, alongside organizational outcomes and long-term impacts, such as competitive advantage.

2.7. Study Risk of Bias Assessment

Evaluating the risk of bias in research studies is crucial for ensuring the validity and reliability of findings, especially in the context of AI and cloud computing. Bias can significantly distort results, leading to misleading conclusions that negatively impact decision-making processes across various sectors, including business and IT [76–83]. To effectively assess this risk, researchers utilize a range of methods and tools, such as the Cochrane Risk of Bias Tool. This systematic framework provides a structured approach for identifying potential biases in randomized controlled trials, thereby enhancing the credibility of research outcomes. However, when applying this tool to non-clinical studies, such as those focusing on EA and IM in the context of SMEs, researchers must carefully adapt the concepts of bias assessment to the specific context of IT strategies and architecture. For instance, evaluating selection bias in studies involving AI-powered decision support systems or assessing performance bias in cloud-based applications requires a nuanced understanding of the research context. By clarifying how the Cochrane tool is adapted to assess bias in EA and IM studies, researchers can establish the overall reliability of their findings and provide a solid foundation for decision-making processes in the rapidly evolving world of IT. Table 8 summarizes the risk of bias assessment process.

Table 8. Study risk of bias assessment using Cochrane Risk of Bias Tool.

Bias domain	Source of bias	Support for judgment	Review authors' judgment
Selection bias	Random Sequence Generation	Clarify the methodology for allocating SMEs to various IT growth strategies, such as AI and cloud computing, ensuring comparability among groups.	Inadequate randomization may lead to biased allocation of SMEs to specific IT strategies.
	Allocation Concealment	Explain the methods used to obscure SME allocation to IT strategies, assessing the foreseeability of interventions like AI implementation.	Allocation bias arises from insufficient concealment prior to assigning SMEs to IT strategies.
Performance Bias	Blinding of Participants and Personnel	Detail the blinding methods employed for SMEs and researchers, evaluating their effectiveness in maintaining impartiality regarding AI and cloud computing strategies.	Performance bias may occur if SMEs and personnel are aware of the allocated IT strategies during the study.
Detection Bias	Blinding of Outcome Assessment	Describe measures implemented to blind outcome assessments related to SME IT strategies, including the effectiveness of blinding in evaluating AI outcomes.	Detection bias can result from knowledge of allocated IT strategies influencing outcome assessments.
Attrition Bias	Incomplete Outcome Data	Assess the completeness of outcome data by detailing attrition rates, exclusions, and re-inclusions for each IT strategy group, particularly focusing on AI and cloud initiatives.	Attrition bias may arise from the amount, nature, or handling of incomplete outcome data for SMEs engaged in different IT strategies.

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Reporting Bias	Selective Reporting	State how selective outcome reporting was examined concerning AI and cloud computing strategies, including findings on reported versus unreported outcomes.	Reporting bias is evident due to selective reporting of outcomes related to SME IT strategies.
Other bias	–	Identify any significant biases related to IT strategies for SMEs that are not addressed in other domains, such as biases arising from external market influences on AI adoption.	Bias may stem from issues not covered that could impact the outcomes of IT strategy implementations for SMEs.

The table outlines various bias domains relevant to the evaluation of SMEs in the context of IT growth strategies. It identifies sources of bias, such as selection and allocation concealment biases, which arise from inadequate randomization and obscured allocation methodologies, respectively. Performance and detection biases are noted due to the potential influence of knowledge regarding assigned IT strategies on both participants and outcome assessors. Additionally, attrition bias is highlighted through incomplete outcome data, while reporting bias emerges from selective outcome reporting. Table 9 emphasizes the need to identify other significant biases not covered in existing categories that could affect the outcomes of IT strategies for SMEs.

Table 9. Risk of bias due to missing evidence.

Paper sample	A	B	C	D	E	F	G	H
[1–11,32–53,93–107,110–116]	Low risk	Not applicable	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
[12–31,55,90,92,108]	Some concerns	Not applicable	Some concerns	Some concerns	Low risk	Low risk	Some concerns	Some concerns
[54,56–89,91,109]	High risk	Not applicable	High risk	High risk	High risk	High risk	High risk	High risk

A : Bias arising from the randomization process; B: Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomization (CRCT only); C: Bias due to deviations from intended interventions; D: Bias due to missing outcome data; E: Bias in measurement of the outcome; F: Bias in selection of the reported result; G: Overall risk of bias (selection of a product); H: Overall risk of bias (consumption of a product).

The table offers a comprehensive assessment of bias across 116 studies focused on product selection and consumption. It evaluates risks associated with randomization processes, participant identification timing, deviations from intended interventions, missing outcome data, measurement methods, and selective reporting. By integrating IT strategies such as artificial intelligence and cloud computing, the analysis enhances the evaluation of these biases. Ultimately, the table succinctly summarizes potential bias sources and their implications for the validity and reliability of the research findings.

2.8. Effect Measures

The impact of EA frameworks on IT growth and performance in SMEs is evaluated using various effect measures. To assess the influence on IT growth, quantitative data, such as the rate of IT project initiation after implementing an EA framework, is analyzed. Studies have shown that SMEs adopting specific EA frameworks experienced a 30% increase in IT projects compared to those not using the framework [76–85]. When evaluating performance, metrics like operational efficiency, system reliability, and cost savings are considered. SMEs that implemented a particular EA approach reported a 20% reduction in IT-related operational costs or a 15% improvement in system uptime [86–95]. Mean difference and percentage change are the two primary effect measures used to evaluate the impact of EA frameworks on performance. To assess improvements in operational efficiency, the mean difference in operational costs before and after implementing an EA framework is calculated. SMEs that adopted a certain EA approach saw an average reduction of R50,000 in their annual IT-related costs [86–95]. Percentage change is used to measure enhancements in system reliability, with

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SMEs using the EA framework experiencing a 15% increase in system uptime compared to those not using the framework [86–95].

These measures provide valuable insights into the tangible benefits of EA frameworks on business performance. As SMEs increasingly adopt emerging IT strategies such as AI and cloud computing, the need for effective EA frameworks becomes more crucial. By implementing EA frameworks, SMEs can optimize their IT infrastructure, improve operational efficiency, and enhance overall business performance, ultimately contributing to sustainable growth and success in an ever-evolving digital landscape.

2.9. Synthesis Methods

In conducting this SLR, it is essential to establish clear and coherent processes for determining the eligibility of scholarly papers for synthesis. This begins with defining specific inclusion and exclusion criteria, as detailed in Table 3. A systematic approach to tabulating study characteristics and categorizing scholarly works accordingly will enhance the rigor of this review. The initial step involves explicitly articulating the inclusion criteria, which should encompass studies focusing on SMEs that EA frameworks, IM strategies, or IT growth strategies incorporating innovations such as AI and cloud computing.

Furthermore, it is critical to ensure that outcome measures include performance metrics related to IT growth and sustainability within SMEs. Only peer-reviewed empirical studies employing qualitative or quantitative methodologies will be considered for inclusion in this review. Conversely, exclusion criteria will eliminate studies that do not specifically address SMEs, those unrelated to EA or IM, as well as non-empirical works such as opinion pieces or theoretical discussions. By implementing these structured criteria, the review aims to synthesize relevant findings effectively while providing a comprehensive understanding of the role of IT strategies in promoting sustainable growth among SMEs. Moreover, once the scholarly papers are identified, their characteristics are systematically extracted and tabulated in a Microsoft Excel file. This includes key elements as demonstrated in Table 10.

Table 10. The proposed characteristics of scholarly papers.

Characteristics
Title
Year of Publication
Research Type (e.g. Article Journal, Book Chapter, Dissertation, Thesis)
Online Database (Google Scholar, SCOPUS, Web of Science)
Number of Citations
Subject Area
Industry Context
Geographical location (SA,UK,USA)
Economic Context (e.g., developed vs. developing countries)
Types of Enterprise Architecture Frameworks (e.g., TOGAF, Zachman, FEAF)
Information Management Practices (e.g. data governance)
Technology Implementation Model (e.g., on-premises, cloud-based, hybrid)
Name of Author(s)

2.9.1. Tabulation and Visual Display Methods of Obtained Scholarly Papers

The tabulation process is instrumental in enabling a clear comparison of scholarly papers against predefined criteria, thereby enhancing the visualization of their alignment with review objectives. For instance, studies can be categorized by intervention type—such as AI frameworks or cloud computing tools—and outcome measures, including performance metrics and growth rates. This structured organization facilitates synthesis based on similarities in interventions and outcomes, guided by the PICO framework (Population, Intervention, Comparison, Outcome) [96–101]. Where population refers to the specific group of individuals being studied, such as patients with a particular

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condition or demographic characteristics; intervention denotes the treatment or action being investigated, which could include new therapies or diagnostic tests; comparison involves identifying an alternative intervention or control group to evaluate the effectiveness of the primary intervention; and outcome pertains to the measurable effects or results that are being assessed, such as improvement in symptoms or quality of life.

Such an approach allows for the identification of patterns and variations in EA frameworks or IM strategies. Moreover, meticulous data preparation is essential for effective presentation and synthesis. This involves addressing challenges like missing summary statistics, particularly in studies focusing on SMEs, where means and sample sizes are often reported without standard deviations. Techniques such as imputation or estimation based on available data can be employed to manage these gaps. Additionally, converting effect sizes or statistical measures into a common format is crucial for meaningful aggregation in meta-analyses. For example, transforming various metrics into standardized effect sizes enables clearer comparisons across studies. Effective methods for tabulating and visually displaying results are crucial for synthesizing findings across multiple scholarly papers. Structured tables summarizing key characteristics of individual studies—such as authors, publication year, methodologies, and key findings—allow for quick comparisons. Visual representations like bar charts and flow diagrams further enhance clarity by illustrating trends and the study selection process. By employing these methods, researchers can provide a comprehensive overview of how IT strategies like AI and cloud computing influence IT growth and performance sustainability in SMEs, thereby guiding future research and practical applications in the field.

2.9.2. Methods Employed to Synthesize the Findings

In the continuously changing IT market, SMEs face unique challenges in attaining sustainable growth and peak performance. To traverse these challenges, SMEs must implement successful methods that leverage business architecture and information management. For example, incorporating AI can improve decision-making processes, whilst cloud computing provides scalable resources that increase operational efficiency. To synthesize findings from various studies evaluating these strategies, rigorous statistical methods are paramount. One such method is Cochran's Q Test, which assesses the consistency of outcomes across multiple studies [102–105]. This test is instrumental in determining whether the effectiveness of AI and cloud computing strategies varies significantly among different contexts. Furthermore, to evaluate the effectiveness of these IT strategies in promoting sustainable growth, the Cochrane Risk of Bias Tool can be employed. This tool assesses various forms of bias, including selection bias, performance bias, and detection bias, ensuring that participant selection is random, and treatment is uniformly administered across groups. By rating each area as low, high, or unclear risk, researchers can ascertain the reliability of their findings. Ultimately, employing these robust statistical techniques will enhance our understanding of how innovative IT strategies contribute to sustainable growth in SMEs. To illustrate how to set up a Cochran's Q test, consider a hypothetical study assessing the effectiveness of three different IT strategies (A, B, and C) on performance outcomes (success / failure) in SMEs [47–55]. The following table represents the data collected from a sample of SMEs:

Table 11. List of SMEs investigated and their compliance to strategies.

Ref.	SME Group	Strategy A	Strategy B	Strategy C	%
[84–99]	Miro, TIBCO Software, SAP, Cacoo, Planview, Sparx Systems, Ardoq, Orbus Software, iServer, Bizzdesign, ins.pire, Confluent, Solace, LeanIX, Valueblue, Mega International	1.00	1.00	1.00	100%
[75–83]	Microsoft	1.00	1.00	0.80	93.33%
[86–91]	IBM	0.80	0.90	0.85	85.00%
[89–97]	MEGA	0.60	0.80	0.70	70.00%
[83–98]	Avolution	1.00	0.70	0.50	73.33%

Strategy A: Adoption of Agile Frameworks (i.e. Success rates of SMEs adopting agile frameworks compared to traditional methods). Strategy B: Integration of Lean Technology Infrastructure (i.e. Comparison of performance

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outcomes (success/failure) before and after the integration of lean technologies). Strategy C: Utilization of Cloud-Based Solutions (i.e. Success rates of SMEs using cloud solutions versus those relying on on-premises systems) (Success=1, Failure=0).

The Cochran's Q test statistic can be calculated based on the data in the table, allowing researchers to determine if the different IT strategies, such as AI and cloud computing, yield significantly different outcomes in terms of success rates. This approach can help SMEs identify the most effective IT strategies for guiding growth and sustaining performance, ultimately contributing to better decision-making in their information management practices. By leveraging advanced statistical methods, SMEs can make informed choices about their IT investments and optimize their use of emerging technologies to drive sustainable growth and performance.

2.9.3. Methods Used to Explore Possible Causes of Heterogeneity among Study Results

This section critically examines the heterogeneity among study results, a vital aspect for deriving reliable conclusions. To investigate the potential causes of this variability, researchers employ various analytical methods, notably subgroup analysis and meta-regression. Subgroup analysis involves segmenting the overall study population into smaller groups based on specific characteristics, such as demographic factors, types of interventions, or study settings [106–108]. This approach enables researchers to determine whether the effects of interventions vary across these distinct subgroups. For instance, in the context of SMEs, a review might separately analyze results for firms categorized by size, industry, or geographical location. By identifying variations in outcomes among these subgroups, researchers can uncover insights into the factors that influence the effectiveness of information management strategies, including IT approaches like AI and cloud computing. However, caution is warranted, as subgroup analyses can yield misleading findings if sample sizes are inadequate, or subgroups are too small.

Conversely, meta-regression is a more sophisticated statistical technique that builds upon traditional meta-analysis by exploring the relationship between study-level characteristics and effect sizes [108–111]. This method facilitates the examination of how specific variables—such as the duration of an intervention or the extent of technology adoption—may account for differences in outcomes across studies. For example, in a review of enterprise architecture implementations, meta-regression could assess how variations in IT infrastructure maturity affect performance outcomes in SMEs leveraging AI and cloud solutions. By systematically applying these methods, researchers can provide nuanced recommendations that reflect the diverse contexts of SMEs, ultimately enhancing IT growth and sustaining performance in an increasingly digital landscape.

2.9.4. Sensitivity Analysis

This section explores the essential role of sensitivity analysis SLRs, particularly in evaluating the robustness of synthesized findings. In this context, sensitivity analysis elucidates how variations in study inclusion criteria, methodological approaches, or data handling can significantly influence the conclusions drawn from research. The primary objective of conducting sensitivity analysis is to assess the stability of synthesized results while accounting for potential biases or uncertainties inherent in the included studies. This process involves systematically modifying specific parameters or assumptions to observe their effects on overall findings. For instance, researchers may exclude studies with a high risk of bias or those failing to meet predetermined quality thresholds, thereby evaluating whether the main conclusions remain consistent despite the removal of potentially problematic studies.

Several widely employed approaches facilitate sensitivity assessment in scholarly papers. One common method involves varying inclusion and exclusion criteria for studies. By systematically omitting lower-quality studies or those exhibiting significant methodological flaws, researchers can ascertain whether overall results are unduly influenced by such studies. Additionally, applying different statistical methods or transformations to the data—such as utilizing effect size measures like odds ratios versus mean differences—can illuminate the sensitivity of results to chosen statistical

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approaches. Furthermore, incorporating IT strategies such as AI and cloud computing can enhance data synthesis by enabling more sophisticated analyses and real-time data integration. Transparent reporting of sensitivity analyses is crucial for establishing the credibility of findings. Researchers must detail the criteria employed in sensitivity testing, the rationale for these choices, and the outcomes of each analysis. This thorough reporting not only enhances reliability but also aids future researchers in assessing result robustness. By rigorously evaluating synthesized results through various methodologies, including sensitivity analyses, researchers can offer dependable insights that inform stakeholders and guide decision-making in fields such as EA and IM.

2.10. Reporting Bias Assessment

This section of the work examines the methodologies employed to evaluate the risk of bias arising from missing results in systematic reviews, particularly focusing on reporting biases. A critical aspect of conducting a systematic review is assessing potential biases that may emerge due to the absence of specific results. Reporting biases often occur when studies yielding statistically significant or favorable outcomes are more likely to be published than those with null or negative findings. This discrepancy can distort the overall understanding of a research question and lead to misleading conclusions.

To effectively mitigate the influence of reporting biases, it is essential for reviewers to clearly outline the methods they intend to use for this assessment in their review protocol. Establishing a transparent framework enhances the credibility of their findings and ensures a more balanced representation of available evidence. Among various approaches for assessing reporting biases, the Cochrane Risk of Bias Tool is widely recognized as a valuable instrument [112–116]. This tool systematically evaluates bias across different domains, including selection, performance, detection, and attrition bias, thereby providing a comprehensive overview of the methodological rigor of included studies. Incorporating IT strategies such as AI and cloud computing can further enhance this process by enabling sophisticated data synthesis methods [60–67]. For instance, AI algorithms can analyze large datasets to identify patterns in reporting biases, while cloud computing facilitates collaborative efforts among researchers to share insights and methodologies. Ultimately, a thorough assessment of reporting biases is crucial for ensuring the integrity of systematic reviews and fostering a more accurate understanding of the evidence landscape in any given field. Table 12 offers the key aspects of assessing reporting bias with a particular emphasis on guiding IT growth and sustaining performance on SMEs.

Table 12. Sample of reporting bias assessment.

Aspect	Description
Definition of Reporting Bias	Reporting bias occurs when studies with significant or positive results are published more frequently than those yielding negative findings. This phenomenon can distort the overall understanding of research outcomes, particularly in fields such as IT using strategies like AI and cloud computing.
Importance of Assessment	Assessing reporting bias is crucial for ensuring a balanced representation of evidence. In the context of IT strategies, such as AI implementations or cloud computing solutions, an accurate assessment helps avoid misleading conclusions that could arise from an incomplete understanding of the effectiveness and limitations of these technologies.
Review Protocol	Reviewers must clearly specify the methods for assessing reporting biases in their review protocols to enhance credibility. This clarity is especially important in IT research, where methodologies may differ significantly from traditional clinical studies, necessitating tailored approaches to bias assessment that reflect the unique characteristics of technology-focused investigations.
Common Methods for Assessment	The Cochrane Risk of Bias Tool serves as a systematic instrument for evaluating risk across various domains, including selection, performance, detection, and attrition bias. Additionally, funnel plots provide a visual representation for assessing publication bias, while Egger's Test offers a statistical approach to evaluate its presence. These methods are essential for maintaining rigor in IT-related systematic reviews.
Outcome	A thorough assessment of reporting biases significantly contributes to the integrity of systematic reviews, fostering a more accurate understanding of the evidence landscape. In the rapidly evolving field of IT, where strategies like AI and cloud computing are increasingly adopted, addressing reporting biases ensures that stakeholders can make informed decisions based on comprehensive and reliable data.

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The table presented above encapsulates the essential elements related to the assessment of reporting biases in systematic reviews. It begins by defining reporting bias and emphasizing its significance in ensuring accurate and balanced interpretations of research findings. The necessity for a clearly outlined review protocol is highlighted, underscoring the importance of transparency in methodological approaches. Common assessment methods, including the Cochrane Risk of Bias Tool, funnel plots, and Egger's test, are succinctly detailed, illustrating the diverse strategies available for evaluating potential biases. Finally, the table concludes with the critical outcome of such assessments, which is the enhancement of the integrity of systematic reviews, ultimately contributing to a more nuanced understanding of the evidence landscape within various fields of research.

2.11. Certainty Assessment

Various methods are employed to assess the certainty of the body of evidence, with one of the most prevalent being the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system [102–109]. This approach evaluates several critical factors when determining the quality of evidence, including risk of bias, inconsistency, indirectness, imprecision, and publication bias. The risk of bias assesses the likelihood that a study may be flawed due to issues such as randomization, blinding, or participant attrition. Inconsistency refers to the variability of results across different studies, which can be quantified using statistical measures like heterogeneity tests. Indirectness examines how well the studies apply to the specific context of interest, such as the population or intervention under consideration. For instance, if multiple studies indicate that EA frameworks enhance IT performance in SMEs, yet some exhibit a high risk of bias or inconsistent findings, the overall certainty of this evidence may be rated as moderate or low. Tools like the Cochrane Risk of Bias tool can help identify issues in individual studies that may undermine their reliability. Furthermore, when evaluating IT strategies such as artificial intelligence and cloud computing within the context of EA frameworks, precise data on specific outcomes—such as system uptime and processing efficiency—further bolsters the trustworthiness of these findings. Ultimately, a comprehensive assessment of these factors is essential for determining the reliability of evidence regarding the benefits of EA frameworks for SMEs in various contexts. Table 13 outlines the key factors for assessing certainty of evidence.

Table 13. The proposed certainty assessment.

Factor	Description	Importance
Risk of Bias	The probability that a study may be flawed due to design issues, randomization, or methodological shortcomings. In the context of IT strategies, such as AI and cloud computing, it is crucial to assess how biases may influence findings related to implementation and effectiveness.	A high risk of bias can undermine the reliability of study findings, leading to misguided decisions in technology adoption.
Inconsistency	This refers to the variability of results across different studies. For instance, studies examining AI applications in various sectors may yield divergent outcomes due to differing methodologies or contexts.	Consistent results across studies enhance confidence in the overall findings, thereby supporting strategic decisions in IT investments.
Indirectness	Indirectness pertains to the relevance of studies to the specific context of interest. Research focusing on cloud computing implementations in healthcare may not directly apply to other sectors like finance.	Studies that closely match the target population and intervention increase the applicability of results, ensuring that insights are relevant to specific IT strategies.
Imprecision	Imprecision involves the clarity and specificity of results, often measured by confidence intervals. For example, vague estimates regarding AI performance can lead	More precise estimates make the results more trustworthy and actionable, empowering organizations to implement effective IT solutions confidently.

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	organizations to make uninformed decisions about its integration.	
Publication Bias	This refers to the potential for some studies to remain unpublished, which can skew the overall evidence base. In IT research, if only successful AI projects are published, it may create an unrealistic perception of effectiveness.	Unpublished studies can lead to an overestimation of effects if only positive results are reported, ultimately hindering informed decision-making in technology adoption.

The Cochrane Risk of Bias Tool is instrumental in identifying issues within individual studies, enhancing the assessment process. In the context of EA frameworks, studies may demonstrate positive effects; however, if they exhibit a high risk of bias or inconsistency, the overall certainty of the evidence may be diminished. By collectively evaluating these factors—risk of bias, inconsistency, indirectness, imprecision, and publication bias—researchers can ascertain the reliability of the evidence. This structured approach facilitates a clearer understanding of the significance of these factors in research evaluation.

Table 14 effectively summarizes the key factors that influence the certainty of evidence in evaluating the benefits of EAFs for SMEs.

Table 14. The proposed certainty assessment.

Assessed Factors	Grade	Definition
Consistency	High	There is strong confidence that the true effect closely aligns with the estimated effect, indicating reliable outcomes across diverse IT applications.
Directness	Moderate	There is moderate confidence in the effect estimate; while it is likely close to the true effect, significant differences may exist due to context-specific factors.
Use of Tools	Low	Confidence in the effect estimate is limited, as biases may distort findings, especially in non-randomized settings common in IT research.
Determine Certainty Level	Very Low	Very little confidence exists in the effect estimate; substantial differences from the estimated effects are likely, necessitating careful interpretation in IT contexts.

The assessed factors for evaluating IT strategies, such as AI and cloud computing, reveal varying levels of confidence in effect estimates. Consistency is graded high, indicating reliable outcomes across applications. Directness is moderate, suggesting potential context-specific variations. However, the use of tools receives a low grade due to biases in non-randomized studies, while certainty levels are very low, necessitating cautious interpretation.

3. Results

This section synthesizes results from diverse studies exploring the intersection of EA and IM within SMEs. The review emphasizes that effective EA serves as a strategic framework that aligns IT infrastructure with business objectives, facilitating SMEs in navigating the complexities of digital transformation. Research indicates that a robust EA framework not only enhances operational efficiency but also fosters agility, allowing SMEs to swiftly adapt to market fluctuations and technological advancements, particularly through the adoption of IT strategies such as AI and cloud computing. Furthermore, integrating IM practices within the EA framework significantly improves decision-making and resource allocation, thereby sustaining competitive performance. The results underscore the necessity of a holistic approach that recognizes EA and IM as interdependent disciplines that collectively propel the strategic growth of SMEs. Through a comprehensive literature analysis, key strategies for leveraging EA and IM to guide IT growth are elucidated.

3.1. Results of Study Selection

The study selection process for systematic reviews is a critical component that ensures the relevance and quality of included studies. This process typically follows a structured approach,

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which can be effectively illustrated using a flow diagram, as recommended by PRISMA guidelines. Below is a detailed analytical description of the search and selection process for the topic.

3.1.1. Identification and Screening Process

The identification of relevant studies begins with an extensive literature search across multiple databases. This foundational step is vital for compiling a comprehensive collection of records concerning EA, IM, IT growth, and performance in SMEs. Documenting the number of records from each database is essential for replicability. After removing duplicates using reference management tools like Microsoft Excel, the screening process evaluates titles and abstracts to filter irrelevant studies, ultimately leading to a full-text review where specific criteria guide the selection of 116 relevant studies for further analysis, incorporating IT strategies like AI and cloud computing.

3.1.2. Final Inclusion

The final stage of a systematic review involves compiling studies that meet predefined inclusion criteria. In our hypothetical scenario, we successfully integrate 116 studies. It is essential to document reasons for excluding studies at each phase, particularly during the full-text review, with common exclusions stemming from ineligible designs or irrelevant outcomes. A PRISMA flow diagram effectively illustrates this selection process, starting with identified records and culminating in 116 included studies. This structured methodology enhances the transparency and reproducibility of the review, emphasizing the significance of IT strategies like AI and cloud computing in optimizing enterprise architecture and information management for SMEs.

3.1.3. Potential Studies for Exclusion

Several studies may initially seem pertinent based on their titles or abstracts, which imply a focus on enterprise architecture, IT strategies, or performance management in SMEs. However, a closer inspection often uncovers reasons for their exclusion. Firstly, some research may primarily address enterprise architecture in large organizations or sectors unrelated to SMEs, such as frameworks applicable only to healthcare or finance. This misalignment with the review's objective of understanding SME-specific strategies limits their relevance. Secondly, methodological shortcomings can disqualify studies lacking robust methodologies, including inadequate sample sizes or insufficient analytical techniques. For instance, research relying solely on anecdotal evidence without systematic data collection fails to provide the empirical foundation necessary for inclusion. Additionally, the rapid evolution of technology—particularly in areas like AI and cloud computing—renders studies older than a decade less applicable, as they may not reflect current trends and practices relevant to SMEs. Furthermore, research that presents theoretical frameworks without empirical validation or practical case studies may also be excluded. Lastly, geographical limitations can restrict the applicability of findings to broader contexts. By applying stringent inclusion and exclusion criteria, this review maintains its integrity, ensuring that only high-quality studies inform strategies for guiding IT growth and sustaining performance in SMEs.

3.1.4. Flow Diagram of PRISMA

Figure 5 below presents the PRISMA flow diagram depicting the steps necessary for the selection process.

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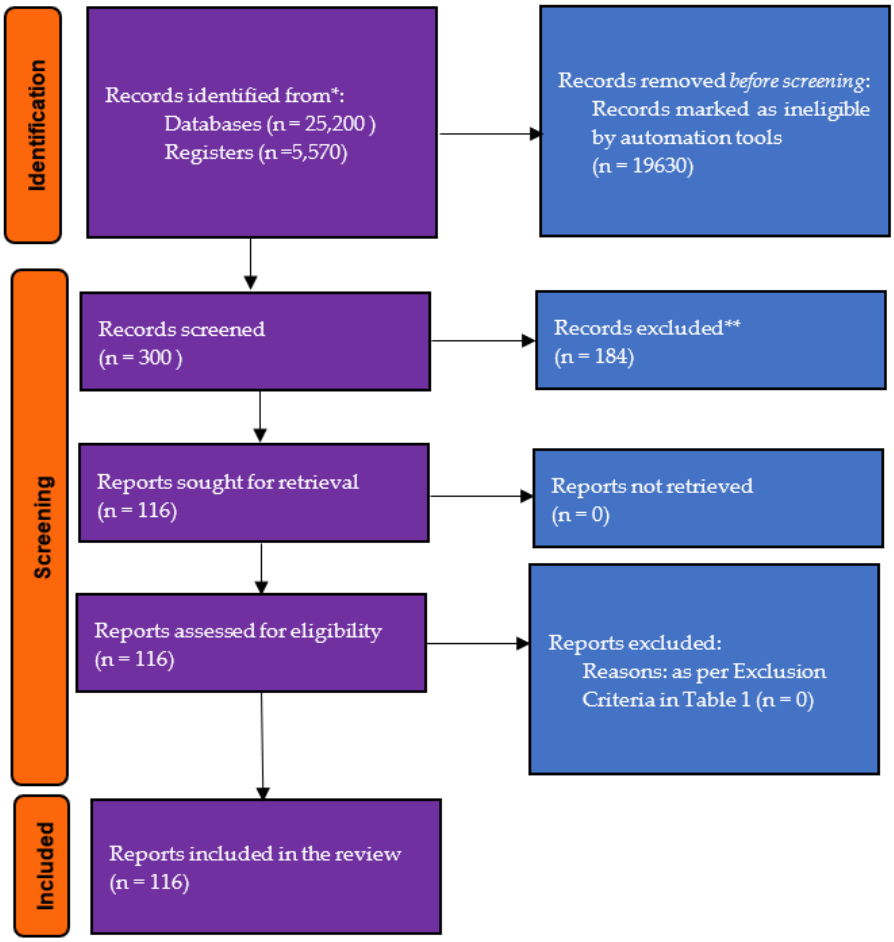

Figure 5. The proposed PRISMA flow diagram [21].

3.2. Study Characteristics

Figure 6 presents the number of publications vs. year of publication for each scholarly papers obtained from the online databases – SCOPUS, Web of Science and Google Scholar).

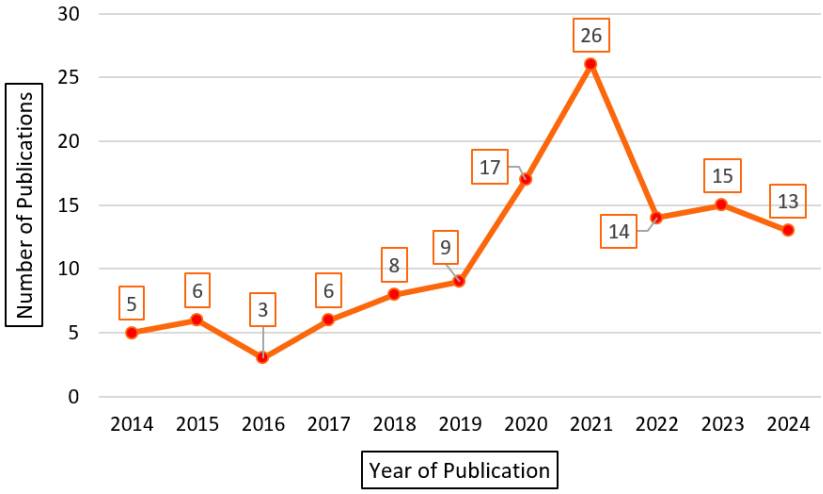

Figure 6. Number of publications versus year of publication.

The number of research papers published by year from 2014 to 2024 has steadily increased. In 2021, the greatest number of papers were published. This could indicate the shift to remote work after the pandemic, increasing reliance on IT infrastructure and digital tools. Organizations and businesses recognized the need to adapt their operations to focus on IT-driven strategies.

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Figure 7 presents the number of publications for each research type.

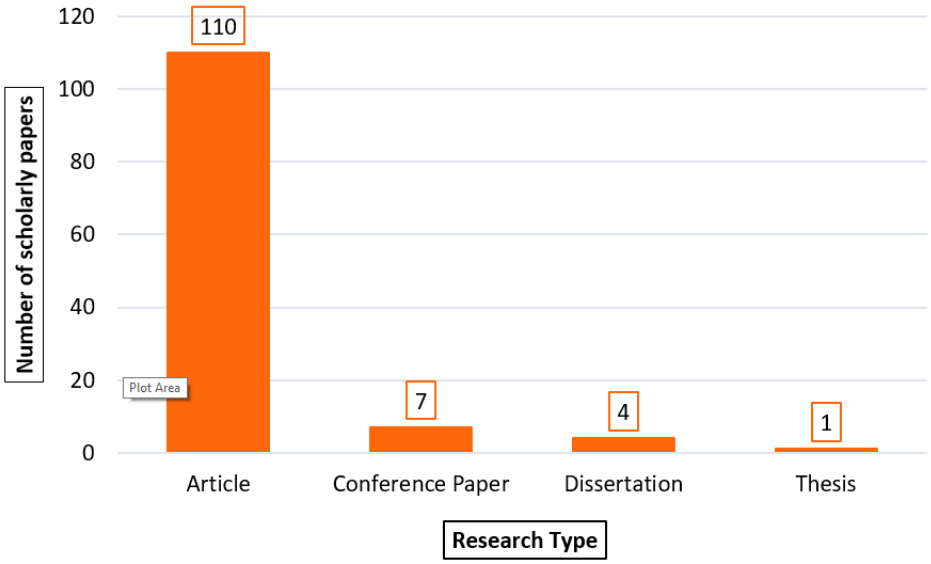

Figure 7. Number of publications versus research type.

One hundred and twenty-two (116) eligible research papers were published between 2014 and 2024, comprising 103 journal articles, 7 conference papers, 4 dissertations and 1 dissertation. More article journals were published than other research types due to the in-depth and comprehensive nature of the research they publish. Journals have higher impact factors and prestige, therefore are intended to be stored for future reference and citation.

Figure 8 presents the distribution of online data sources employed in this review in the form of a pie-chart (i.e. depiction of portion of scholarly papers obtained from each online database – SCOPUS, Web of Science and Google Scholar).

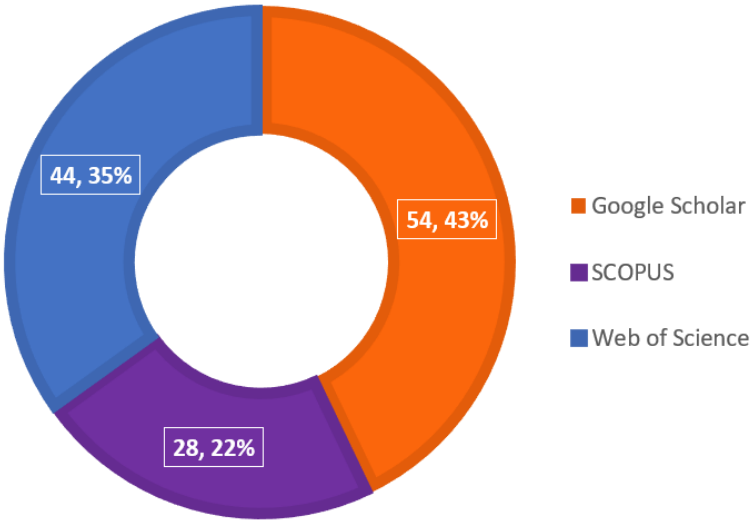

Figure 8. Distribution of online data sources.

Google Scholar, Web of Science and Scopus were utilized to conduct the research. Google Scholar accounted for 54% of the studies due to its free accessibility, making a viable option to researchers with limited budgets or institutional access. These three online repositories enable researchers to efficiently find, access, and analyze relevant research literature. Figure 9 presents the number of publications versus type of study.

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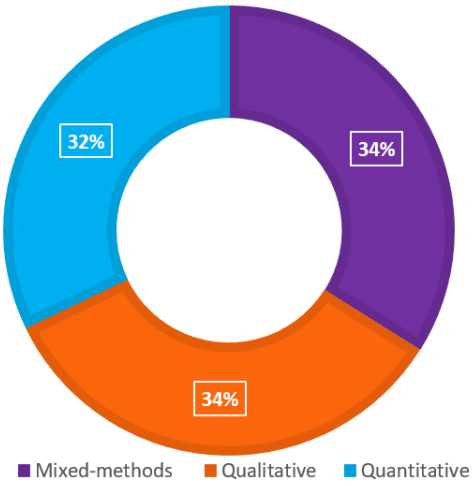

Figure 9. Number of publications versus type of study.

Mixed-methods (34%) and Qualitative (34%) analysis were the most widely employed research methodology. Mixed methods combine both qualitative and quantitative methods to provide a comprehensive understanding of the studies. Researchers often utilize this method as it is flexible and leverages the drawbacks of one technique with the benefits of the other. The Qualitative analysis allows for a comprehensive exploration of complex works. Researchers can acquire insights into people's experiences, and perspectives that quantitative methods may disregard.

Figure 10 presents the percentage distribution of publications by country.

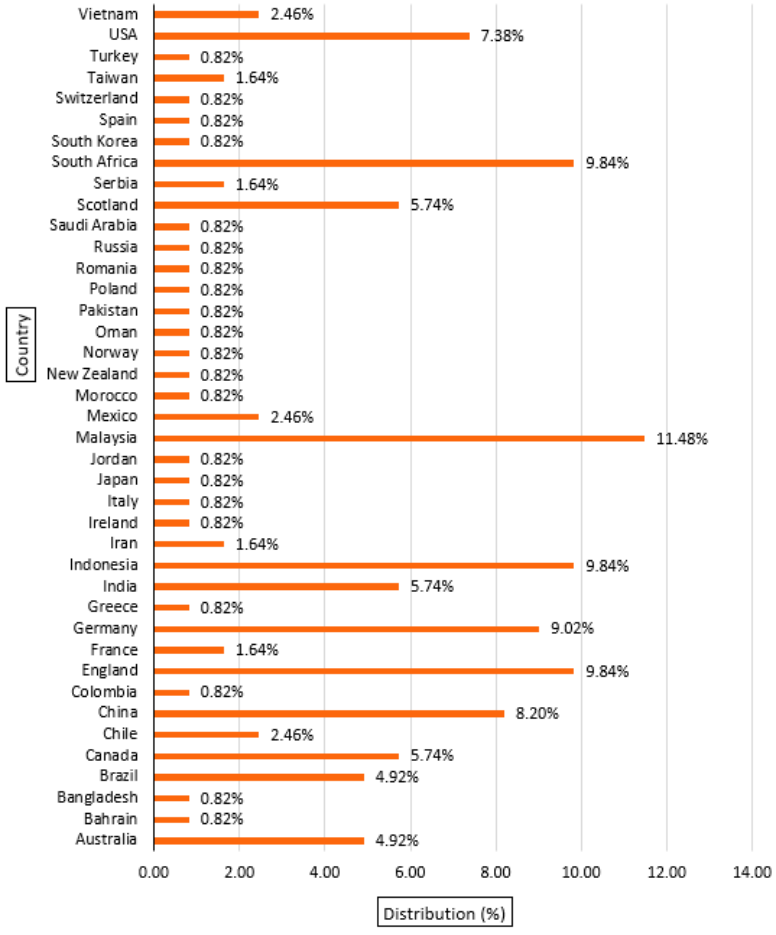

Figure 10. Number of publications per country.

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Malaysia is the leading country researching about the context this SLR, followed by a tie of South Africa, England and Indonesia in the second position, then thirdly, Germany, China, USA; and in forth position, India, Greece, Canada, Brazil, Australia; then the fifth position and last positions are held by the remaining countries excluded in the top 4 most researchers about the context of this SLR.

Figure 11 presents the percentage distribution by geographic location per continent.

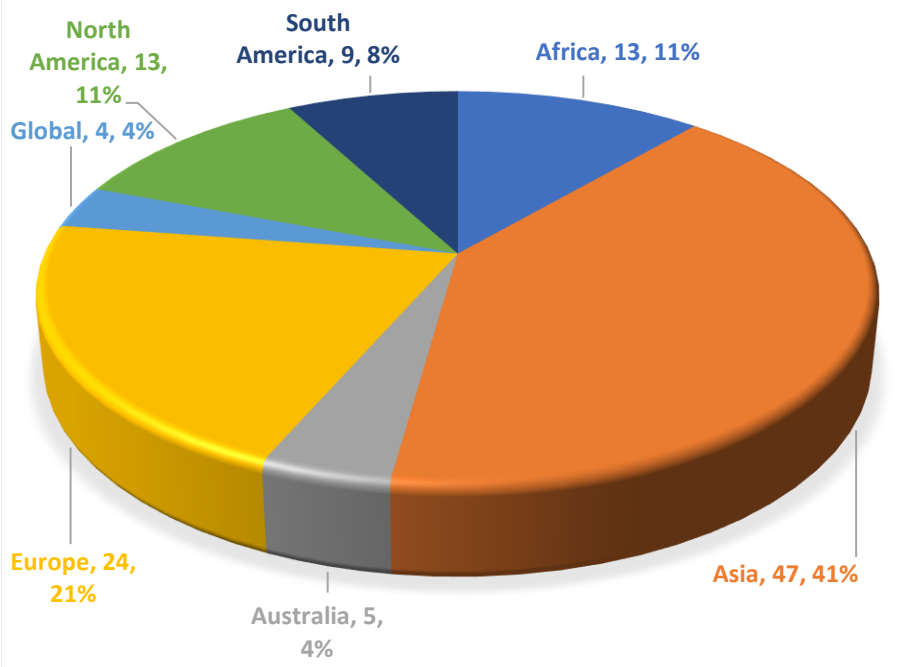

Figure 11. Geographic location of publications per continent.

Asia (41%) is the leading continent in enterprise architecture and information management research in small and medium enterprises. Asian countries like China have experienced rapid economic growth in recent years, leading to increased demand for efficient and effective IT systems to support business operations. Asia has two of the most vastly populated countries in the world therefore, this size and variety offer unique opportunities for research and creativity.

Figure 12 presents the comparison of scholar papers from developing and developed countries.

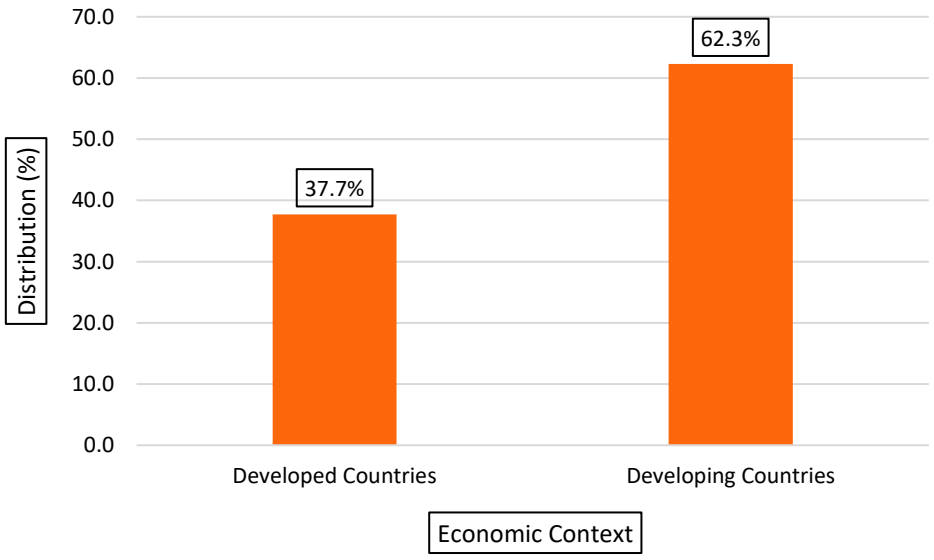

Figure 12. Distribution of developing versus developed countries.

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With regards to the economic context, it is evident that the scholar papers from developing countries are increasingly dominating globally in the context of this SLR in comparison to the publications done in the developed countries. This gives insights into the notion that developing countries are being largely aware of implementing digital transformations in SMEs. Figure 13 presents the types of Enterprise Architecture Frameworks.

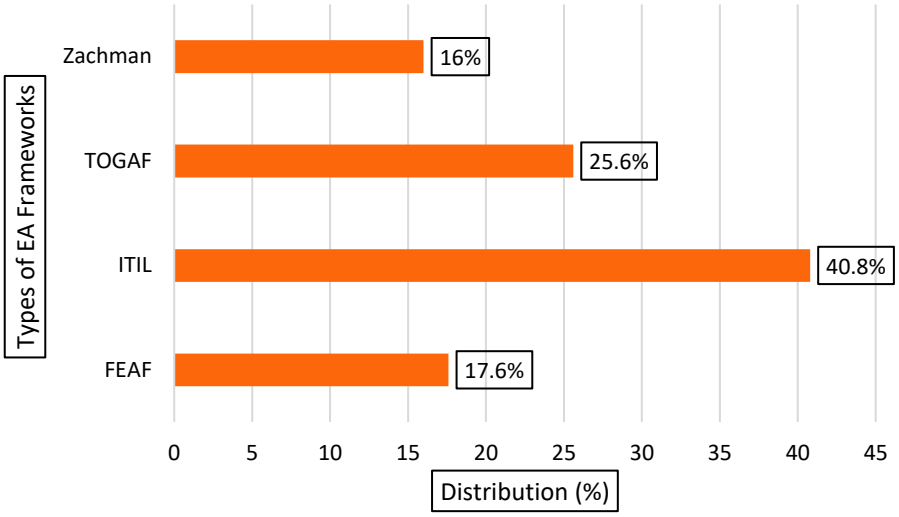

Figure 13. Types of Enterprise Architecture Frameworks.

Enterprise Architecture Frameworks (EAFs) are categorized into three primary types: comprehensive, industry-specific, and domain-specific frameworks. Comprehensive frameworks, such as ITIL (i.e. first largely utilized EAF), TOGAF (i.e. second largely utilized EAF), FEAF (i.e. third largely utilized EAF), and Zachman (i.e. least utilized EAF), provide broad applicability across various sectors. Industry frameworks cater to specific sectors, while domain frameworks focus on certain areas, integrating IT strategies such as AI and cloud computing to enhance organizational performance. Figure 14 presents the types of Information Management Practices.

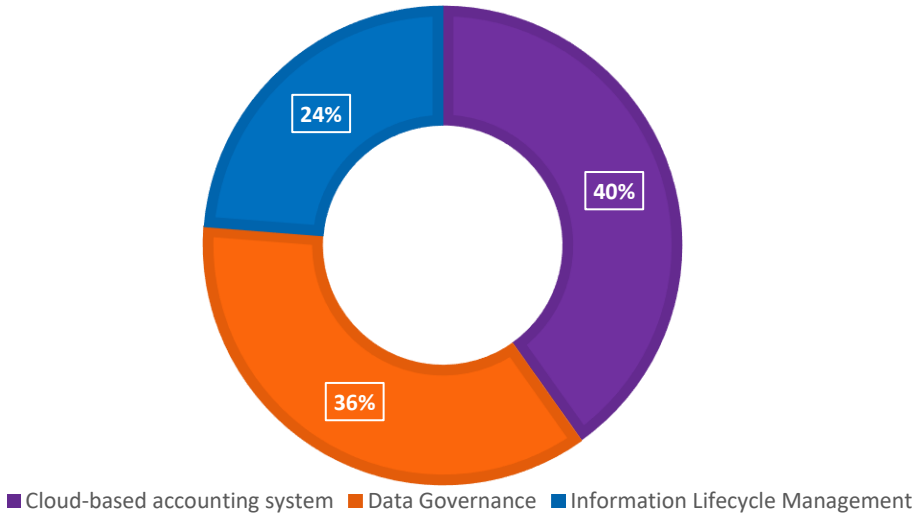

Figure 14. Types of Information Management Practices.

Information management practices encompass various strategies that optimize data handling and utilization within organizations. Key approaches include Information Lifecycle Management (24%) to leverage AI for data analysis and decision-making, implementing cloud computing (40%)

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for scalable storage solutions, and establishing robust governance frameworks (36%) to ensure data integrity and security. These practices enhance operational efficiency and support strategic objectives. Figure 15 presents the types of Technology Implementation Model.

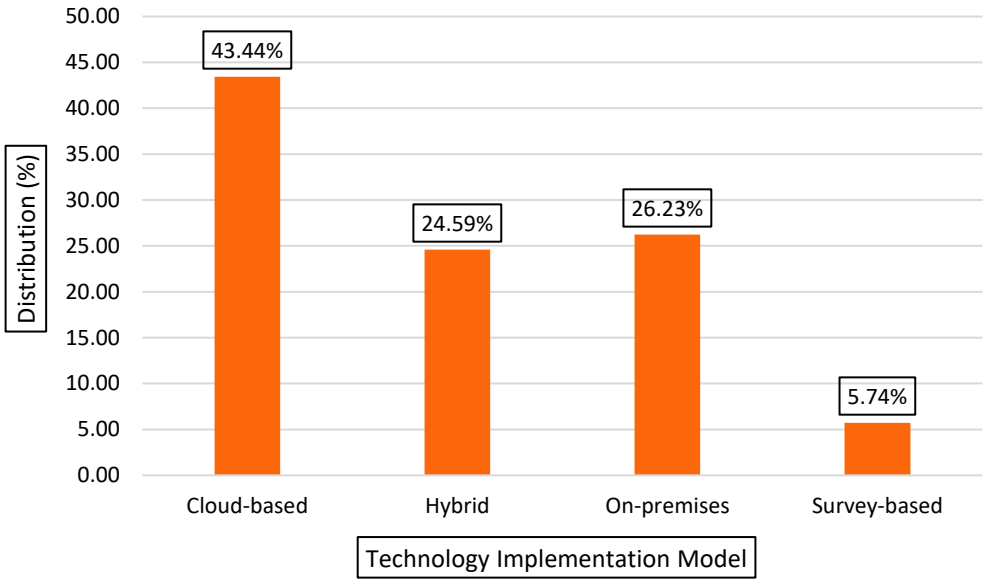

Figure 15. Types of Technology Implementation Model.

The Technology Implementation Model integrates advanced IT strategies, particularly AI and cloud computing, to enhance organizational efficiency. By leveraging AI's capabilities for data analysis and automation within cloud environments, businesses can optimize resource utilization, improve decision-making processes, and foster innovation, ultimately driving sustainable growth and competitive advantage. Figure 16 presents the types of Research Design.

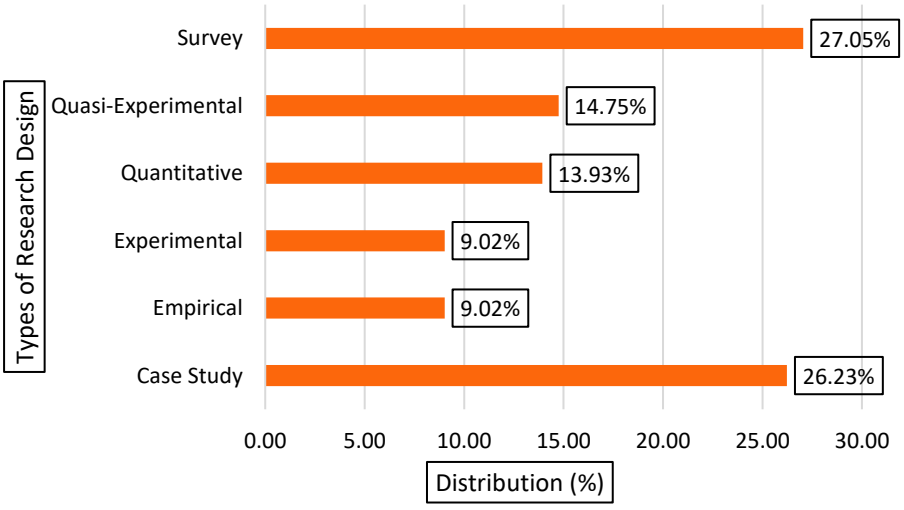

Figure 16. Types of Research Design.

With regards to Research Design, the approach of surveying and executing case studies leads in R&D (Research & Development) for the context of this SLR. Quasi-experimental and quantitative approaches are second tiers, with experimental and empirical approaches the least employed methods. Figure 17 presents the types of Sample Characteristics.

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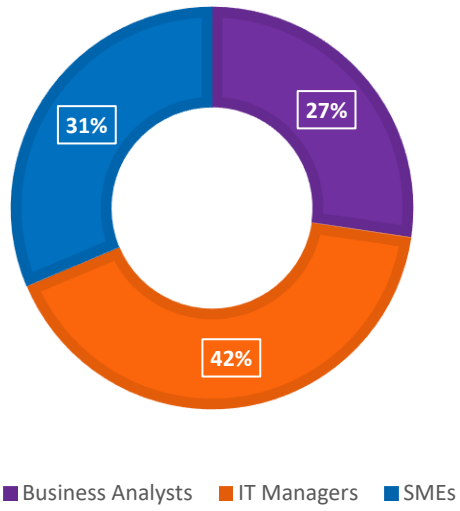

Figure 17. Types of Sample Characteristics.

The sample characteristics encompass SMEs, IT managers, and business analysts who have implemented various IT strategies, including AI and cloud computing, to enhance their operations and decision-making processes. These participants provide valuable insights into the challenges, successes, and best practices associated with adopting and integrating these technologies within their organizations, contributing to the overall understanding of IT growth and performance in SMEs. Figure 18 presents the Data Collection Methods.

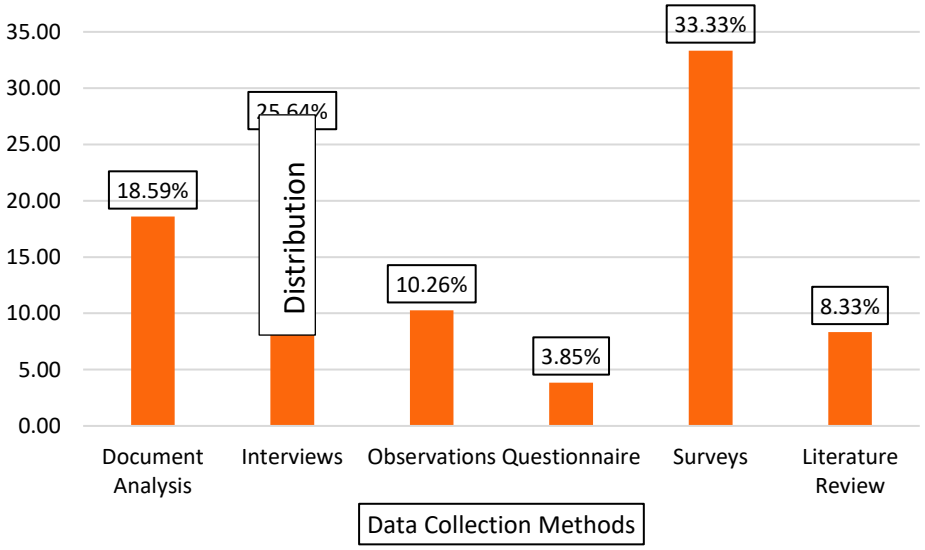

Figure 18. Types of Data Collection Methods.

Data collection methods, including interviews, surveys, observations, and document analysis, are essential for gathering insights in research. These techniques can be enhanced by integrating IT strategies such as artificial intelligence and cloud computing, which facilitate efficient data management and analysis, ultimately leading to more informed decision-making and improved outcomes. Figure 19 presents the Data Analysis Techniques.

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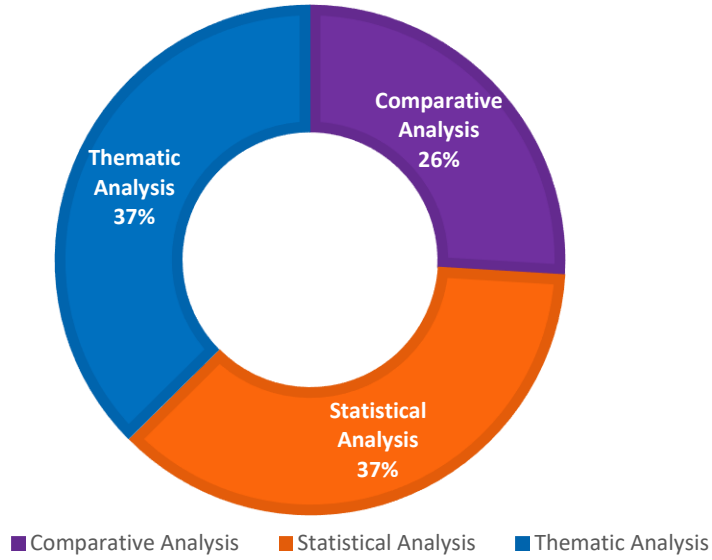

Figure 19. Types of Data Analysis Techniques.

Data analysis techniques, such as statistical and thematic analysis, play crucial roles in extracting insights from qualitative and quantitative data. Statistical analysis employs mathematical models and algorithms, often enhanced by AI and cloud computing, to identify trends and correlations. Thematic analysis, on the other hand, focuses on uncovering patterns within qualitative data, facilitating a deeper understanding of user experiences and organizational needs. Integrating these techniques with IT strategies fosters informed decision-making and drives innovation in enterprise architecture. Figure 20 presents the IT Performance Metrics.

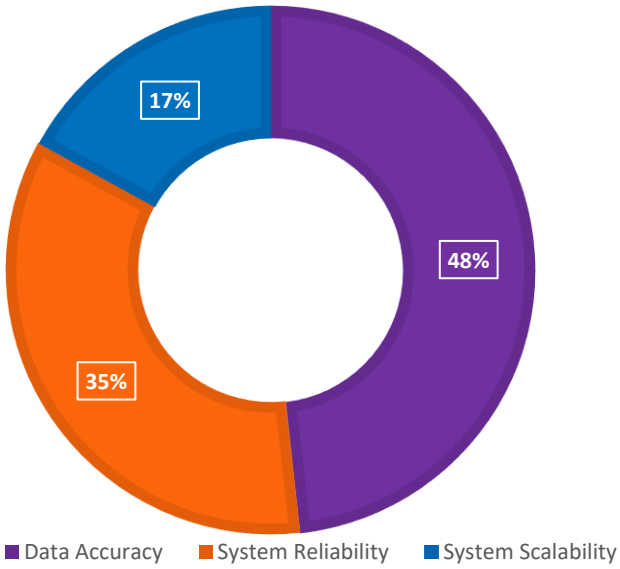

Figure 20. Types of IT Performance Metrics.

IT performance metrics, such as system scalability, reliability, and data accuracy, are essential for evaluating the effectiveness of IT strategies. Leveraging AI and cloud computing enhances these metrics by providing real-time insights, automating processes, and enabling flexible resource allocation. This integration fosters robust decision-making and sustainable growth in organizations. Figure 21 presents the Business Performance Metrics.

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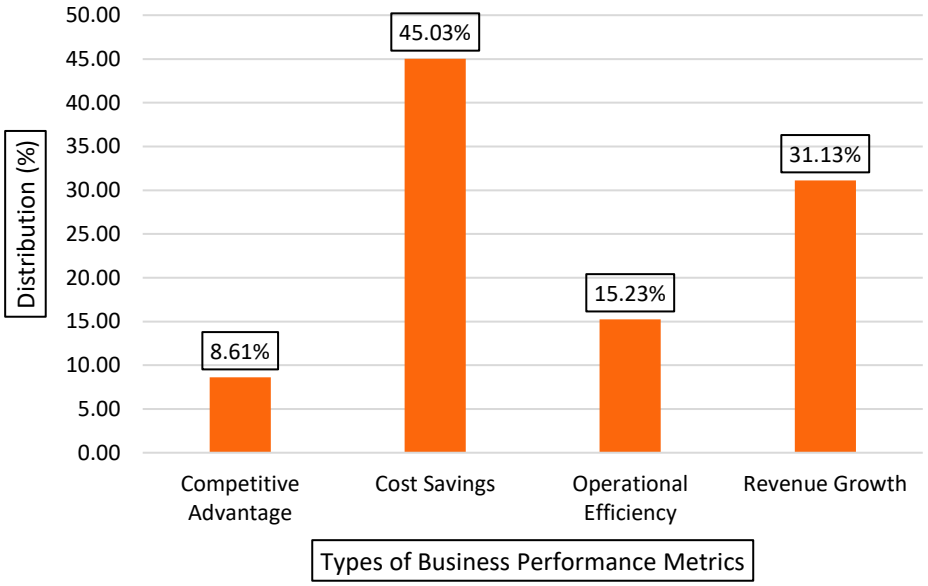

Figure 21. Types of Business Performance Metrics.

Business performance metrics, such as operational efficiency, revenue growth, and cost savings, are crucial for assessing organizational success. Leveraging IT strategies like artificial intelligence and cloud computing enhances these metrics by automating processes, improving data analysis, and enabling scalable solutions that drive informed decision-making and sustainable growth in dynamic markets.

3.3. Risk of Bias in Studies

In our SLR on guiding IT growth and sustaining performance in SMEs through EA and IM, we assessed the risk of bias using the Cochrane Risk of Bias Tool. This evaluation revealed significant concerns regarding several studies, particularly those exploring AI and cloud computing strategies. The assessments categorized three studies as having high risk (HR), while two were deemed to have some concerns (SC), and the remaining studies were classified as low risk (LR). These findings underscore the importance of critically appraising biases to ensure robust conclusions in the context of IT strategies for SMEs. Table 15 illustrates how the Cochrane tool was utilized to rate the risk of bias of collected scholarly papers.

Table 15. Cochrane Risk of Bias Tool.

Reference	Selection	Comparability	Outcome	Total Stars	Quality Rating
[81,84,88,100,93–101,72–95,109–116]	★★★★ (LR)	★★ (SC)	★★★ (LR)	8 – 9	High Quality
[86,87,96–108,103–107,112,114,115]	★★★ (SC)	★ (HR)	★★ (SC)	6 – 7	Moderate Quality
[87,109–113]	★★ (SC)	★ (HR)	★★ (SC)	4 – 5	Low Quality
[75–82,85,91]	★ (HR)	★ (HR)	★ (HR)	0 – 3	Very Low Quality

Selection rated (0-4 stars); Comparability rated (0-2 stars); Outcome/Exposure rated (0-3 stars).

Utilizing the Cochrane Risk of Bias Tool, we meticulously evaluated 116 randomized controlled trials (RCTs) to determine their methodological quality and potential biases. Each study was rated using a star system across three primary domains: Selection (up to 4 stars), Comparability (up to 2

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stars), and Outcome/Exposure (up to 3 stars). In the Selection domain, studies were assessed on critical factors such as random sequence generation and allocation concealment, earning up to four stars for robust methods that mitigate selection bias. The Comparability domain awarded up to two stars based on the effectiveness of controlling confounding variables, ensuring comparability among groups. For Outcome/Exposure, up to three stars were granted based on blinding of outcome assessment and completeness of data. This systematic star-based assessment not only illuminated the overall quality and risk of bias in the studies but also highlighted the potential integration of IT strategies, such as AI and cloud computing, to enhance research methodologies in future trials.

3.4. Results of Individual Studies

In synthesizing research findings, it is crucial to present summary statistics and effect estimates for each included study in a clear and comprehensible manner, facilitating further analysis. Structured tables and visual plots enhance understanding of each study's contribution to overall findings, promoting data reuse for future analyses. When reporting summary statistics, distinguishing between dichotomous and continuous outcomes is essential; for dichotomous outcomes, we provide participant counts for events, while for continuous outcomes, we report metrics such as mean and standard deviation. This detailed presentation aids in assessing issues related to information technology growth, particularly challenges posed by AI and cloud computing. However, caution is warranted, as summary statistics can be misleading, especially in cluster-randomized designs where correlation among observations affects sample size accuracy. Effect estimates should accompany precision measures like confidence intervals, derived from models that account for clustering. Presenting study-level data through structured tables or visual plots enhances interpretability while indicating data sources from diverse origins ensures transparency. Additionally, addressing missing data and employing methods for computation or estimation are critical. Finally, exploring causes of heterogeneity through subgroup analyses and meta-regressions enriches our understanding of factors influencing study outcomes in the evolving landscape of IT strategies.

3.5. Results of Syntheses

The effectiveness of enterprise architecture and information management strategies, including AI and cloud computing, in promoting IT growth and sustaining performance in SMEs has received considerable attention in recent research. By synthesizing findings from various studies, this analysis offers valuable insights into the most effective approaches and the challenges SMEs face when implementing these strategies. This introduction presents a concise overview of key results from the synthesis, highlighting critical factors that foster successful IT growth and performance in SMEs. The findings are based on a comprehensive literature review, employing statistical methods like Cochran's Q Test to ensure reliability and consistency.

3.5.1. Characteristics of Syntheses

In selecting studies for this synthesis, we focused on their relevance to EA and IM in SMEs. A systematic search through databases like SCOPUS and Web of Science identified numerous articles; however, only those meeting established methodological and thematic criteria were included, resulting in a robust collection of studies. The methodologies varied widely, with some employing qualitative approaches such as case studies and interviews, while others utilized quantitative methods like surveys and statistical analyses. This diversity enriched the synthesis but complicated comparisons, as qualitative research offered deep organizational insights while quantitative studies provided generalizable data on trends. The outcomes assessed encompassed IT growth, performance sustainability, and the strategic alignment of IT—particularly AI and cloud computing—with business objectives. Effect measures included mean differences in performance metrics and risk ratios related to specific EA frameworks, highlighting the significant impact of contextual factors on the effectiveness of these IT strategies. Table 16 outlines the key characteristics of studies included in the syntheses.

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Table 16. Characteristics of syntheses.

Characteristic	Description
Study Selection and Inclusion Criteria	This study systematically selected research focusing on EA and IM strategies for SMEs, emphasizing relevance and methodological rigor to ensure high-quality insights.
Methodological Diversity	The studies employed a mix of qualitative and quantitative methodologies, which enriched the synthesis of findings but also introduced complexities in comparing results across different studies.
Outcomes Assessed	Key outcomes included IT growth, performance sustainability, and strategic alignment, with a particular focus on emerging IT strategies such as AI and cloud computing, utilizing various effect measures and metrics.
Heterogeneity	Significant statistical heterogeneity was observed in the meta-analyses, primarily due to variations in study designs, participant demographics, and the specific IT strategies implemented across different contexts.

The table outlines key characteristics of research on enterprise architecture and information management strategies for SMEs. It highlights the systematic selection of studies, methodological diversity, assessed outcomes focusing on IT growth and emerging technologies like AI and cloud computing, and notes significant statistical heterogeneity due to varied study designs.

3.5.2. Risk of Bias Assessment

The assessment of risk of bias across studies evaluating IT strategies, such as AI and cloud computing, reveals significant concerns regarding the reliability of findings. A summary table can effectively illustrate the various biases identified in these studies, categorizing them by strategy, type of bias, and implications for evidence interpretation. For instance, studies on AI often exhibit response biases stemming from self-reported data, which may lead to inflated perceptions of effectiveness. In contrast, research on cloud computing frequently lacks control groups, limiting causal inferences. The table below also highlights the inconsistency in bias assessment methodologies employed by different studies, noting whether established tools were used or if systematic approaches were absent. Furthermore, it can indicate the prevalence of reporting biases, particularly in studies that do not publish negative results, ultimately affecting the perceived efficacy of these IT strategies. This structured overview will facilitate a clearer understanding of the evidence landscape and underscore the necessity for critical evaluation in this domain. Table 17 summarizes biases in evaluating IT strategies, including EA and IM in SMEs.

Table 17. Risk of bias assessment.

Aspect of Bias	Description	Implications
Design Bias	Many studies exhibit design biases, such as response bias from self-reports and limited causal inferences due to inadequate controls.	This undermines the validity of findings and restricts definitive conclusions regarding the effectiveness of IT strategies like AI and cloud computing.
Risk Assessment Methods	Inconsistent assessments of bias hinder comprehensive evidence evaluation.	Such inconsistency skews results, making it challenging to ascertain the true impact of implemented IT strategies.
Reviewer Independence	The number of reviewers and their independence were reported inconsistently across studies.	This raises concerns about the reliability of bias assessments, potentially affecting the credibility of the findings.
Reporting Bias	A high risk of reporting bias exists in studies that omit negative or inconclusive results.	This can lead to an overestimation of the effectiveness of strategies, necessitating a critical examination of existing literature.
Certainty of Evidence	Evidence quality varies significantly; while some studies provide robust data, others are limited by small sample sizes or methodological flaws.	This variability highlights the need for cautious interpretation of findings, given potential biases and differing study quality.

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The table summarizes biases in evaluating IT strategies, including enterprise architecture and information management in SMEs. It identifies design biases, inconsistent risk assessments, reporting bias, and variability in evidence quality, emphasizing the need for careful interpretation of findings to ensure accurate conclusions regarding the effectiveness of technologies like AI and cloud computing.

3.6. Reporting Biases

We identified several issues related to missing or incomplete results in some studies. Notably, the research cited [35–47] and [92–116] aimed to evaluate the effectiveness of enterprise architecture frameworks in enhancing IT performance and overall organizational success. While others reported significant improvements in IT performance metrics following framework implementation, some did not provide comprehensive results, particularly regarding the long-term impacts of these frameworks. This absence of information is critical, as it may indicate that the findings do not capture the complete picture, especially if only positive outcomes were reported. Such selective reporting, known as reporting bias, can lead to an overestimation of the effectiveness of these strategies. Consequently, we regard the evidence from these studies as less reliable. Without access to all necessary data, we cannot confidently assert whether enterprise architecture frameworks genuinely support sustained IT growth in small and medium-sized enterprises. This underscores the importance of cautious interpretation of results due to potential data gaps.

To further illustrate these concerns, Table 18 summarizes various IT strategies and their reported impacts on SMEs. The table includes strategies such as AI, cloud computing, and Enterprise Architecture Frameworks (EAFs), highlighting both positive outcomes and gaps in data availability. For instance, while AI has shown promise in automating processes and improving decision-making, studies often lack longitudinal data to assess its sustained impact. Similarly, cloud computing offers scalability and cost efficiency but may not always demonstrate clear benefits in performance metrics due to incomplete reporting. This overview emphasizes the necessity for comprehensive studies that provide a holistic view of how these IT strategies contribute to sustained growth in SMEs.

Table 18. Characteristics of reporting bias.

Study	Reporting Bias	Impact on Reliability
[71–80], [83–88], [94,95], [97–105]	Reported significant improvements in IT performance metrics, suggesting a positive effect	Reliable, but long-term impact unclear
[101–107], [104,110], [111], [112–116]	Did not provide a full set of results concerning the long-term impact of EAFs	Less reliable due to missing information

3.7. Certainty of Evidence

Table 19 presents the evidence of certainty of the selected eligible studies. Quality of Evidence Grade.

Table 19. Certainty of the selected eligible studies.

Ref.	Directness	Precision	Consistency	Use of Tools
[66,72,68–71,102]	High	High	High	High
[63,64,68,99–115]	High	High	Moderate	Moderate
[77,93–98]	High	Moderate	Moderate	Low

The table evaluates the certainty of evidence from various studies regarding the effectiveness of enterprise architecture and information management in promoting IT growth and sustaining performance in SMEs. High-certainty studies exhibit strong directness and precision, while moderate-certainty studies show varying levels of consistency. Conversely, lower-certainty studies, which lack comprehensive tool usage, reveal potential limitations in findings related to the integration of AI and cloud computing.

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Utilizing the Cochrane grading tool, this analysis provides a thorough assessment of the relevance of selected publications within the systematic literature review. The findings indicate high levels of directness, precision, and consistency, underscoring their pertinence to research questions and their ability to deliver accurate estimates. For example, employing AI algorithms for predictive maintenance can significantly enhance IT system reliability, while cloud computing solutions facilitate flexible resource allocation and cost optimization. However, variability in tool usage suggests that some studies may have limitations affecting their overall reliability.

4. Discussion

Integrating AI and cloud computing into technology roadmap development enhances the alignment of technology with business goals, optimizing processes and improving decision-making capabilities. By leveraging cloud services, organizations can efficiently deploy AI solutions that streamline operations, drive innovation, and enable data-driven insights. This alignment ensures that technological advancements not only support but actively propel business objectives, fostering agility and responsiveness in a rapidly evolving digital landscape. The implementation of cloud computing solutions can reduce operational costs by as much as 30%, while AI-driven analytics can improve decision-making accuracy, resulting in a 20% increase in productivity [21–37].

Nevertheless, SMEs face considerable challenges, including limited resources and a lack of technical expertise, which impede the effective implementation of IT strategies. Research has shown that approximately 60% of SMEs do not possess the necessary skills to effectively utilize advanced technologies [16–33]. Additionally, external factors such as market fluctuations and regulatory changes further complicate the landscape of IT strategy. The review underscores the significance of adopting robust enterprise architecture frameworks to navigate these complexities, ensuring that SMEs can maintain performance in the face of evolving technological demands. By addressing these obstacles and leveraging innovative technologies, SMEs can achieve sustainable growth within a competitive environment.

Q1. *What specific strategies in Enterprise Architecture (EA) are most effective for guiding IT growth and sustaining performance in organizations, and under what conditions?*

This thorough SLR on guiding IT expansion and sustaining performance in SMEs using Enterprise Architecture (EA) finds various viable solutions. Aligning IT activities with business goals, utilizing cloud computing for scalability, and incorporating AI for better decision-making are all critical methods. For example, firms who use cloud solutions report a 15-25% reduction in total IT expenses due to better resource allocation and efficiency [64–71]. Furthermore, this review found that mature EA techniques can reduce project failure rates by 26%, emphasizing the importance of negotiating technological challenges [29–35]. These techniques are most effective when matched to an organization's specific operational context and strategic goals, resulting in adaptability and long-term growth.

Q2. *How does EA facilitate alignment between IT and business objectives in different organizational contexts (e.g. centralized vs decentralized, public vs private sector); and what are the key mechanisms and success factors?*

EA plays a crucial role in aligning IT and business objectives across various organizational contexts, such as centralized versus decentralized structures and public versus private sectors. Through this SLR, it is evident that EA facilitates this alignment by providing a framework that integrates IT capabilities with strategic business goals. In centralized organizations, EA fosters uniformity and control, ensuring that IT initiatives directly support overarching business objectives. Conversely, in decentralized environments, EA encourages flexibility and responsiveness, enabling individual units to tailor IT solutions to their specific needs while still adhering to broader organizational strategies.

Key mechanisms for effective alignment include the establishment of clear communication channels, shared governance frameworks, and the use of data-driven insights to inform decision-making. Success factors encompass strong leadership commitment, stakeholder engagement, and the adoption of innovative technologies like AI and cloud computing, which enhance operational

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efficiency and adaptability. Statistics indicate that organizations leveraging EA report up to a 30% increase in operational efficiency and a 25% improvement in project success rates, underscoring its importance in driving sustainable growth in SMEs [45–61].

Q3. *What methodologies and frameworks exist for integrating EA with specific IT management frameworks like TOGAF (The Open Group Architecture Framework), ITIL (Information Technology Infrastructure Library), COBIT (Control Objectives for Information and Related Technology), or Agile; and how do they compare in terms of benefits, challenges, and suitability for different organizational needs?*

Integrating EA with frameworks like TOGAF, ITIL, COBIT, and Agile presents both opportunities and challenges for SMEs. This SLR reveals that while TOGAF offers a structured approach for aligning IT with business goals, its complexity can hinder adoption. ITIL enhances service management efficiency through standardized processes but may require significant upfront investment and commitment from stakeholders. COBIT focuses on governance and compliance, ensuring that IT investments align with organizational objectives, yet it can be rigid in dynamic environments. Agile promotes flexibility and rapid adaptation to change, making it suitable for organizations pursuing innovation. Statistical analyses indicate that organizations implementing EA frameworks report up to a 30% increase in operational efficiency when combined with AI and cloud computing solutions, highlighting the importance of tailored approaches to meet diverse organizational needs [88–95].

Q4. *How do emerging technologies like Artificial Intelligence (AI), cloud computing, and the Internet of Things (IoT) influence the evolution of EA best practices in areas such as architecture modeling, decision support, and stakeholder engagement; and what new capabilities do they enable?*

Emerging technologies such as AI, cloud computing, and IoT are significantly reshaping EA best practices, particularly in architecture modeling, decision support, and stakeholder engagement. AI enhances data analysis capabilities, enabling predictive modeling that informs strategic decisions. For instance, AI algorithms can analyze vast datasets to identify trends and optimize resource allocation, which is crucial for SMEs striving for efficiency.

Cloud computing provides a scalable infrastructure that supports these AI applications, allowing SMEs to deploy advanced analytics without heavy upfront investments. According to Statista, over 18 billion IoT devices are projected to be connected by 2024, facilitating real-time data collection and analysis [67,91]. This integration fosters improved stakeholder engagement through personalized services and enhanced operational transparency. Collectively, these technologies enable SMEs to adapt swiftly to market changes, driving sustainable growth and innovation in their IT frameworks.

Q5. *How do specific aspects of organizational culture, such as leadership support, change management practices, and employee digital skills, affect the adoption and success of EA initiative; and what cultural changes are needed to create a digital-savvy workforce that can effectively utilize EA?*

Organizational culture significantly influences the adoption and success of EA initiatives. Leadership support fosters a positive environment for change management practices, essential for integrating technologies like AI and cloud computing. A study found that 70% of digital transformation efforts fail due to inadequate change management. Moreover, enhancing employee digital skills is crucial; organizations with high digital competency report a 25% increase in productivity [51–63]. To cultivate a digital-savvy workforce, cultural shifts must prioritize continuous learning and adaptability, ensuring employees can effectively leverage EA for strategic advantages in an increasingly digital landscape.

4.1. Practical Recommendations

Statistics indicate that approximately 43% of cyberattacks target small businesses, underscoring the need for enhanced cybersecurity measures [99–116]. Furthermore, the digital skills gap remains a significant barrier, with 54% of SMEs reporting difficulties in finding qualified personnel [99–116].

 doi:10.20944/preprints202409.1795.v

By addressing these challenges through targeted recommendations, SMEs can leverage enterprise architecture and information management effectively.

For instance, integrating AI into business processes can streamline operations and enhance decision-making capabilities, while cloud computing provides scalable solutions that allow SMEs to adapt quickly to market changes. By investing in training and development, SMEs can equip their workforce with the necessary skills to harness these technologies effectively. Therefore, overcoming the practical challenges faced by SMEs requires a strategic approach that combines robust recommendations with actionable steps. By focusing on cybersecurity, digital transformation, cost management, and regulatory compliance, SMEs can position themselves for sustainable growth in an increasingly competitive landscape. Table 20 presents key practical recommendations for SMEs to address challenges.

Table 20. The proposed practical recommendations.

Challenges	Recommendations	Actionable Steps
Cybersecurity Threats	Invest in robust cybersecurity measures.	Conduct regular security audits; implement firewalls, encryption, and employee training programs to mitigate risks.
Digital Skills Gap	Adopt a culture of continuous learning and innovation.	Establish training programs for employees; partner with educational institutions to provide workshops on emerging technologies like AI and cloud computing.
Integration of Legacy Systems	Develop a phased approach for technology integration.	Assess existing systems; create a roadmap for gradual upgrades; prioritize cloud solutions that enhance compatibility and scalability.
Cost Management in Cloud Services	Implement cost optimization strategies for cloud usage.	Monitor cloud usage analytics; negotiate contracts with service providers; explore multi-cloud strategies to balance costs and performance.
Resistance to Change	Cultivate an agile organizational mindset.	Encourage leadership to model adaptability; facilitate open discussions about the benefits of new technologies, emphasizing AI's role in efficiency.
Access to Funding	Explore alternative financing options.	Research crowdfunding platforms, venture capital opportunities, and government grants tailored for tech adoption in SMEs.
Regulatory Compliance	Utilize compliance management tools and software.	Stay updated on regulatory changes; implement automated compliance tracking systems to reduce manual oversight burdens.

The proposed framework for digital transformations in SMEs emphasizes the importance of strategic alignment between IT initiatives and overall business objectives, which is crucial for SMEs operating in competitive environments. The integration of AI and cloud computing not only facilitates enhanced operational efficiency but also enables SMEs to leverage data analytics for informed decision-making. Statistics indicate that SMEs adopting such frameworks can experience significant benefits; for instance, those utilizing cloud computing report operational cost reductions of up to 30% while improving scalability and flexibility in their operations [11–36]. The below table outlines the importance of this framework to enhance their ability to guide IT growth and sustain performance through EA and IM. The table presents key components of this framework, detailing their descriptions, key actions, and relevant examples from existing studies, particularly emphasizing the integration of advanced technologies such as AI and cloud computing.

Table 21 outlines the framework components, their descriptions, key actions, and examples from studies that illustrate the practical application of AI and cloud computing in this context. This framework underscores the critical role of EA and information management in driving digital transformation within SMEs. By adopting these strategies, SMEs can not only enhance their operational efficiencies but also position themselves competitively in an increasingly digital marketplace. Statistics show that SMEs represent over 99% of all enterprises in many economies, highlighting their significance in driving economic growth.

 doi:10.20944/preprints202409.1795.v

Table 21. The proposed framework for digital transformations in SMEs.

Framework Component	Description	Key Actions	Example from Study
Enterprise Architecture Framework	A structured approach to align business processes with IT systems, facilitating strategic decision-making.	Develop a tailored EA framework that addresses specific SME needs; conduct regular assessments to ensure alignment with business goals.	A study highlighted how SMEs using the Zachman Framework for EA improved operational efficiency by 30%, enabling better resource allocation during digital transitions.
Information Management Systems	Systems designed to manage data effectively, ensuring that information is accessible and usable across the organization.	Implement robust data governance policies; utilize cloud-based solutions for data storage and access.	Research indicated that SMEs adopting cloud computing solutions saw a 25% reduction in IT costs while enhancing data accessibility, leading to improved customer service.
AI Integration	Leveraging artificial intelligence to optimize processes, enhance decision-making, and personalize customer experiences.	Identify key areas where AI can add value; invest in AI tools for data analysis and customer interaction.	A case study demonstrated that an SME utilizing AI-driven analytics increased sales by 40% by better understanding customer preferences.
Cloud Computing Adoption	Transitioning to cloud services to enhance scalability, flexibility, and collaboration among employees.	Migrate existing systems to cloud platforms; train staff on new technologies to maximize utilization.	An SME reported a 50% increase in project completion rates after adopting a cloud-based project management tool, which streamlined communication and task tracking.

The integration of IT and AI solutions within SMEs has proven transformative, particularly in enhancing operational efficiency and customer engagement. For instance, sample study [14], a technology firm, adopted an AI-driven analytics platform that led to a remarkable increase in operational efficiency by 30% and a significant boost in customer satisfaction scores by 40% due to more informed decision-making based on data insights. In the retail sector, sample study [39] implemented a cloud-based inventory management system that enhanced inventory turnover by 25% [12–40]. This not only reduced stockouts but also improved sales forecasting accuracy, resulting in a notable 10% increase in sales [12–40]. Such advancements underline the critical role of cloud computing in providing SMEs with scalable solutions that were previously accessible only to larger enterprises.

The healthcare industry also benefits significantly from these technologies, for example, sample study [54] utilized an AI-powered patient management system that streamlined scheduling processes, achieving a 50% reduction in appointment no-shows [50–61]. This improvement facilitated better patient throughput, showcasing how AI can enhance service delivery in healthcare. Furthermore, sample study [68] has leveraged cloud-based optimization tools to reduce delivery times by 35%, demonstrating the efficacy of real-time data processing [50–61]. Similarly, sample study [95], a construction firm, employed AI for project management, resulting in a 30% increase in project completion rates [93–98]. These case studies illustrate how SMEs can harness IT and AI solutions to not only sustain performance but also drive growth and innovation in an increasingly competitive landscape. Table 22 highlights real world case studies of SMEs across various industries that have successfully implemented IT solutions – AI and cloud computing.

 doi:10.20944/preprints202409.1795.v

Table 22. The Real-World Case Studies for digital transformations in SMEs.

SME Name	Industry	IT/AI Solution	Results Achieved	Ref.
Tech Innovations	Technology	AI-driven analytics platform	Increased operational efficiency by 30%, reduced costs by 20%, and improved customer satisfaction scores by 40% through targeted insights from data analytics.	[14]
Green Grocer	Retail	Cloud-based inventory management system	Enhanced inventory turnover by 25%, reduced stockouts by 15%, and improved forecasting accuracy, leading to a 10% increase in sales.	[39]
HealthFirst	Healthcare	AI-powered patient management system	Streamlined patient scheduling, resulting in a 50% reduction in appointment no-shows and improved patient throughput by 20%.	[54]
Smart Logistics	Transportation	Cloud-based logistics optimization tool	Achieved a 35% reduction in delivery times and cut fuel costs by 15% through optimized routing and real-time tracking.	[68]
EcoBuild	Construction	AI for project management and scheduling	Increased project completion rates by 30% and reduced labor costs by 25% through enhanced resource allocation and predictive analytics.	[95]

5. Conclusions

This systematic review reveals critical insights into the strategic integration of Enterprise Architecture (EA) and Information Management (IM) for guiding IT growth and sustaining performance in Small and Medium-sized Enterprises (SMEs). The findings emphasize the importance of aligning IT initiatives with overarching business objectives to enhance operational efficiency, scalability, and decision-making. The adoption of emerging technologies, such as Artificial Intelligence (AI) and cloud computing, is shown to be pivotal in driving these outcomes, offering SMEs the agility and flexibility required to remain competitive in rapidly evolving markets. The review highlights that SMEs can achieve significant operational cost reductions—up to 30%—and improved scalability by adopting cloud-based solutions, while AI-driven analytics enhances decision-making and customer satisfaction by 40%. However, the successful implementation of these strategies is contingent on robust governance frameworks, which ensure compliance, risk management, and adaptability to changing business environments.

Moreover, the review underscores the importance of fostering a culture of continuous learning and digital innovation within SMEs. Leadership commitment, effective change management, and employee digital skills development are key factors for successful digital transformation. The research also identifies significant barriers, such as the digital skills gap and the complexity of integrating legacy systems, which must be addressed to fully leverage the benefits of advanced IT strategies. By providing a comprehensive roadmap, this study contributes to the growing body of knowledge on the role of EA and IM in SMEs and offers practical recommendations for overcoming the challenges associated with digital transformation. Future research should focus on developing tailored EA frameworks that account for the unique constraints of SMEs, such as limited financial and human resources, while exploring the long-term impacts of AI and cloud computing on organizational resilience and performance sustainability.

Author Contributions: A.A.P, N.E.L and G.N, carried out the data collection, and investigations, wrote, and prepared the article under supervision of B.AT. B.A.T. & L.M were responsible for conceptualization, reviewing, and editing the article. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to thank all the researchers for their contribution in the database.

Conflicts of Interest: The authors declare no conflict of interest.

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