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Conceptualizing IS alignment competency in transforming organizations: Key factors for effective IT/IS alignment

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ABSTRACT

This paper proposes a framework to support corporate and IT managers in guiding organizational transformation through the alignment of information systems (IS) with business agility. As market conditions frequently change, organizations are often required to shift their business strategies. However, initial IS designs rarely account for such shifts, and there is a lack of practical or academic guidance for organizations, especially those with limited resources, on how to align existing IS with new strategies or replace them altogether. This study identifies key factors that influence successful IS alignment, including the quality of the business strategy, the current IS, and the IT department. It redefines the relationships among these elements and highlights the importance of evaluating the existing IS to prevent misalignment from affecting future systems. The findings show that a well-defined business strategy is essential for IS success and that even advanced IT infrastructure cannot compensate for strategic inconsistencies. The study also underscores the role of a capable IT department in enabling agile IS alignment in competitive environments. This research fills a gap in the literature by offering a structured approach to aligning IS with evolving business strategies and provides practical guidance for organizations undergoing transformation or planning new IS development.

1. Introduction

Organizations' success is largely determined by their business strategy type. Previously, changing the strategy type was challenging but infrequent, but dynamic political, cultural, and economic environments make businesses more vulnerable, requiring them to adapt to high-risk environments to survive. Thus, ignoring the necessity to evaluate, revise, or even change the current business strategy type can be either very expensive or threatening to the continuity of the organization. Moreover, most organizations do not take into consideration the possibility of changing their business strategy when designing there is (Pearlson et al., 2024). Consequently, they incur significant losses during a strategy-type transition in terms of resources required to align the current information system (IS) with the new strategy type, and revenue since a misaligned IS will adversely impact business operations continuity. Furthermore, any delay in the launching of the IS alignment or replacement will only increase these losses and may even threaten the very existence of the organization. Indicators of the need for a major strategic change in many cases are often realized late, and its inference comes from within the company's internal industry through methods and means such as ROI, budget analysis and profitability, and even stock markets indexes (Prondzinski and Miller, 2024).

In other words, companies that need to undergo a major strategic change to survive often realize that late, and hence, may not have sufficient resources to invest in IT or a new IS due to the high associated expenses. Although some studies suggest that not all firms benefit equally from allocating scarce resources to improve IS alignment (Yin et al., 2020), the alignment between the IS and business strategy is critical for business operations and the organization's performance (Pesce and Neirotti, 2023). Operations and performance improvements are usually determined by indicators such as reduced operation costs, and increased productivity. The degree of alignment determines the quality of improvements the IS contributes to the success of the organization.

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2. Motivation and theoretical background

Research regarding the relationship between IS alignment and the strategy types implemented by organizations is scarce. Moreover, there's even less literature regarding IS alignment in organizations undergoing a transformation of their business strategy type. Consequently, there's a deficit in terms of guidelines, frameworks, procedures, and evaluation standards for the alignment of ISs that can be used during a strategic transition of businesses from one strategy type to another. In contrast, there's no shortage of literature regarding IS alignment to the organization's strategy, however, most literature overlooked that organizations are increasingly forced to change their business strategy type. According to our investigation of current methodologies on the topic of IT/IS alignment literature, there's a knowledge gap in addressing the topic under discussion. Moreover, the approaches towards the concept of alignment are broad and vary significantly. They include directives, procedures, and techniques to be applied in the alignment process in organizations with the assumption that these organizations already have a well-defined and clear strategy. Most surveys and case studies that offer guidance on how to properly perform alignment vary greatly in form and substance. They cover a wide range of issues, crucial success factors, or tasks that need to be incorporated into the alignment process but haven't been consolidated yet, with a wide range of used terminologies such as alignment, fitness, adoption, and integration. So far, research has not yielded a substantial foundation from which to derive well-grounded procedures for conducting alignment in transforming an organization. Similar problems apply to the field of IS planning directives proposed by literature. The context of our research's problem stems from the rapid and unstable market conditions that require strategy type changes, rapid IT industry evolvement, and the variation of strategy type between organizations.

The main question raised by this research is: What are the key factors that determine the successful IT/IS alignment in organizations undergoing a major change in their business strategy type? The focus of this question is the attributes that enable ISs to efficiently and effectively survive a change in strategy type without exhausting the organization's resources. Hence, we attempt to address this question by investigating the key aspects in relation to the existing IS that should be focused on, revised, and addressed to increase its flexibility and sustainability during strategy transition in order to ensure it continues to be a source of competitive advantage, or at least, does not become a Critical Failure Factor (CFF) (Zabukovšek et al., 2023).

The main objective of the research is to identify key factors that govern the success of IS alignment in organizations undergoing a strategy-type change. Our subsequent objective is to establish a framework for IS alignment that provides guidance to transforming organizations by highlighting critical factors and focus areas that should be emphasized to evaluate and determine IS flexibility in preparation for a strategic transformation (Mardan et al., 2023).

2.1. IS alignment and business strategy types

The business strategy is the long-term plan an organization implements to generate value for the company and its stakeholders and to obtain a competitive edge in the marketplace. The business strategy type can be defined as the path the organization chooses in order to achieve the sought-after objective(s) from establishing the business practice. There are many types of business strategies that organizations implement, and many organizations usually pursue more than one type of business strategy or a combination of strategy types. Examples of well-defined business strategy types in literature and practice are forward integration, backward integration, horizontal integration, market penetration, etc. (Henry, 2021). Our investigation into available literature indicates that there is no literature addressing the relationship between ISs and specific business strategy types implemented by firms. This in turn highlights the novelty and significance of our work. As a result of this lack of directives, organizations going through a business strategy-type transition face serious theoretical and practical issues with IS alignment. Nonetheless, a few research studies address the issue, although from broad and different perspectives. For example, according to Zacharia (2009), the process of strategic alignment mainly emphasized the importance of coordinating IS strategies with organizational and business plans to reduce the risks of project failure or disappointment. Organizations ensure that an IS can be a good fit for the business strategy. Alignment as characterized by Issa-Salwe et al. (2010), is the capacity to demonstrate a positive relationship between ISs and the recognized financial performance metrics (Issa-Salwe et al., 2010). According to the study conducted by Johansson et al. (2014), the alignment between Information strategy and business strategy is determined by the company's success. Their study examined the revenue growth of businesses using a questionnaire poll on respondents' perceptions of the alignment between information strategy and business strategy (Johansson et al., 2014). In the following, we focus our review on alignment literature in relation to changing organizations on the dynamic contexts of alignment, or the relation between organizations and the IT environment in general. Galliers (2006) suggested that the approach to IS planning and strategy through the alignment of ICT systems with an organization's business strategy faces challenges such as the dynamic nature of an organization's environment, the inability to predict future information requirements, and the role of information in forming proactive responses to

changing circumstances. His work suggests a revised IS strategizing framework, aiming to formulate an agile IS strategy (Galliers, 2006). The study presented by Newkirk et al. (2008), focused on strategic IS planning (SISP) to align the IS strategy with the business strategy. Their study tested the impact of business and IT change on the SISP horizon, planning itself, and alignment of IS and business strategies. The Results indicated that business change predicted longer strategic IS planning horizons, while IT change predicted neither longer nor shorter ones, and that practitioners should assess their own caution in setting planning horizons in response to business and IT change (Newkirk et al., 2008).

On the other hand, the most relevant work to ours is the study conducted by Hsiao and Ormerod (1998) that investigated the dynamics of information technology-enabled strategic change. Their study examines how the strategic use of information technology can assist organizations in achieving organizational and operational effectiveness. In their study, they used empirical data from a range of organizational situations to examine the dynamic nature of strategic change made possible by information technology (IT). Their study described four change patterns (archetypes) that result from planned or emergent modes of change, driven by different change elements under different case studies of different situations (Hsiao and Ormerod, 1998). Although, the study is empirically extensive and discussed alignment in four organizations undergoing planned or emergent strategy-type change, nevertheless, all four cases were organizations shifting to either: horizontal integration, vertical integration, or both. Their study also considered processes of restructuring and process reengineering as an integral part of an IT-triggered change. The problem with this view is that it unjustifiably assigns an inherent value to IT/IS as an active variable by default and not as an exception. The work of Henderson and Venkatraman (1999) on using IT for transitioning organizations bears a distant indirect relation to our research for strategic management of IT as their model focuses on four domains: business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes (Henderson and Venkatraman, 1999). Their model emphasizes strategic fit and functional integration, providing four perspectives for building management practice but from the perspective of the future role of IT in organizations and how to utilize IT capabilities in transforming the business. From the previous literature review, we can notice that the approaches to the concept of alignment are numerous and significantly vary, as do the used terminologies and definitions. A reason for such variances can be the intricate nature of involved concepts relating to the dynamic utilization of IT entities in businesses today. Nonetheless, these complexities and inconsistencies motivated us to develop our framework model based on an approach to redefine the roles and boundaries between the entities involved in the alignment process.

2.2. IT/IS alignment models and key success factors

In the past three decades, considerable research has been generated on the strategic alignment between IT/IS and business. Assessing whether and how aligning the business and IT/IS creates value for the company has been the focus of this literature (Al-Surmi et al., 2020). Developing alignment between IT and business strategy has the potential to boost profitability and create a long-lasting competitive advantage (Adama et al., 2024). However, a lack of alignment or misalignment may lead to resource depletion and unsuccessful IT initiatives, which could have a negative impact on the organization's finances and performance (Chen et al., 2010). In practice, top management has always been concerned with IT-business alignment. As a result, scholars studying alignment have created a variety of models to describe how alignment benefits businesses. Nonetheless, the definitions and metrics of alignment used by these models vary greatly, which have produced contradictory findings and might have impeded the advancement of this important field of study. While definitions of alignment can be relatively similar, the issue of measuring alignment proves to be a problematic one. The fact that IT executives still rank alignment as one of the top three management issues may be contributing to this persistent concern about alignment. In contrast to the conventional market-based views, contemporary perspectives within the IT and IS industry tend to recognize a resource-based view as a more substantiated way to explain sustainable competitive advantages (Feng et al., 2020; Wade and Hulland, 2004). This suggests that aligning ISs is an important strategic capability and a Critical Success Factor (CSF) across all types of businesses or industries, as ISs can serve as a potential source of competitive advantage. However, while ISs can play a valuable role in a company's strategic planning, they do not always lead to a competitive advantage. In the following section, we review milestone contributions to the literature on alignment models and alignment success factors for the purpose of establishing a baseline for our introduced model and further discussions.

2.2.1. IT/IS alignment models

Alignment models are classified into three categorical types. The first category is the functional alignment models. These models examine the relationship between business and IT strategy, focusing on how IT supports strategy, creates value, and sustains alignment. An example of such a models is the popular Strategic Alignment model (SAM) presented by Henderson and Venkatraman (1992). Their model identifies four strategic interaction perspectives between IT and business activities; the

strategy component, which views business strategy as the driver of organizational design choices and IT infrastructure logic; the technology perspective involves formulating an IT strategy to support business strategy; the competitive perspective focuses on leveraging emerging IT capabilities; and the service level perspective, which focuses on building world-class IT organizations ensuring effective resource use and responsiveness to user demands (Henderson and Venkatraman, 1992). Another functional alignment model is the one introduced by Luftman (2000) who introduced a Strategic Alignment Maturity (SAM) model to achieve and sustain business-IT alignment. The maturity model consists of six steps: setting goals, understanding the business-IT linkage, analyzing the gaps, specifying actions, choosing success criteria, and sustaining alignment. The model can be used to assess and evaluate related business activities for common organizational improvement. The effectiveness of IT-business linkages is crucial for sustaining competitive advantage in hyper-competitive global markets (Luftman, 2000).

The second category is the structural alignment models. These models explain the relationship between corporate and strategic business units' strategies and their interaction for value creation. The main concern in IS structural alignment literature is centralization and decentralization. An example of a structural models is the one introduced by Hodgkinson (1996), in which he proposed a model that investigates the structural alignment between IT organization and business strategy at corporate and strategic business units' levels. His alignment model examines the relationship between IT organization and business strategy, focusing on the trade-off between centralization and decentralization. Strategic business units often balance these factors, shifting IT expenses to corporate levels or prioritizing their own priorities (Hodgkinson, 1996). Another example of this category is the model presented by Broadbent and Kitzis (2005). They identified four types of IT infrastructure, with superior performance contingent on alignment between IT infrastructure and the organization's strategy (Broadbent and Kitzis, 2005).

The third category of models is the dynamic alignment model. These models: under which our conceptual model can be classified; emphasize the dynamic relation between various alignment entities or factors about time. They are based on a comprehension of dynamics that consider the temporal aspect of strategic decision-making as well as the cross-sectional links within an organization. The model introduced by Sabherwal et al. (2001) is an example of such a model. According to Sabherwal's et al. (2001) punctuated equilibrium alignment model, there are brief intervals of rapid, widespread, or revolutionary change interspersed with extended periods of relative stability or mild evolutionary change. Through their work, they observe that revolution, involving changes in most or all dimensions of the strategic IS management profile, interrupts the evolutional changes, which is in line with punctuated equilibrium theory (Sabherwal et al., 2001).

Additionally, many models were introduced to explain IT/business alignment. For example, DeLone and McLean (2003) presented an IS Success Model that is widely accepted in the technology field. Their model suggests that the main factors that introduce net benefits to users and impact the use and satisfaction of ISs are system quality, information quality, and service quality (DeLone and McLean, 2003).

The various categories of alignment models, along with the many types within each category, highlight the need for a clear and systematic approach to aligning IT/IS with business goals. Ultimately, the most important factor affecting an organization's efficiency and financial performance is how well its IT capabilities and resources are aligned with a consistent and well-defined business strategy.

2.2.2. Alignment of key success factors

There are several research attempts to identify the main factors that govern the IS-business alignment concept. For example, Petter et al. (2013) suggested that the significant factors affecting the successful adoption of technologies in businesses are task characteristics, user and social characteristics, project and organizational characteristics, and technology characteristics (Petter et al., 2013). The SAM model presented by Henderson and Venkatraman (1992) also proposed a broad range of factors influencing IT-business alignment. It identifies three types of alignment: intellectual, operational, and cross-domain. The model also defines four types of cross-domain combinations of strategy and infrastructure relations: strategy execution, technology transformation, competitive potential, and service level. Strategy execution impacts IT infrastructure but is constrained by business alignment. Technology transformation affects IT infrastructure but is constrained by strategy. Competitive potential impacts business infrastructure but is constrained by strategy. However, although the SAM model can be used as a conceptual model for generic guidance, nevertheless, in practice it is ineffective as it proposes complicated generalizations that offer no clear directives. Chan presented a study that explores the relationship between business and ISs strategies and its impact on organizational performance. They identified that the critical factors affecting alignment are shared domain knowledge and prior IS success, with mechanisms varying by business strategy and industry. Their study also considered other factors such as planning sophistication, organizational Size, and environmental uncertainty, but found them to be relatively insignificant (Chan et al., 2006). Luftman et al. (2017), in a later work, also highlighted six factors as criteria measures of Strategic Alignment Maturity

(SAM) for IT/business alignment success. These factors are communications; competency/value measurements; governance; partnership; scope and architecture; and skills (Luftman et al., 2017). Teo and Ang (1999) approached the issue from a different perspective that focuses on critical success factors for aligning IS strategies with business strategies. The results of the empirical study they conducted show that top management commitment to strategic IT use, IS management knowledge about business, and top management confidence in the IT department are the top three critical success factors (Teo and Ang, 1999). However, although the second and third factors are reasonable and can be justified, there rarely exists a situation where top management commitment isn't guaranteed, especially in organizations today. In the survey conducted by Wang and Rusu (2018) in Chinese small and medium enterprises, they identified 26 factors hindering Business- IT alignment. These factors are grouped into six main themes: communication, competency and value measurement, governance, partnership, scope and architecture, and skills (Wang and Rusu, 2018). Another study conducted by Padayachee and Shano (2019) investigated the factors influencing IT-business alignment within Business Process Reengineering (BPR) in large organizations in Lesotho. Their study identified the following factors: intention and support; working relationship (communication); shared domain knowledge; IT projects and planning; alignment factor; and IT performance (Padayachee and Shano, 2019).

As we can observe, key factors affecting the success of the IS alignment process in the literature vary considerably because of the variation of approaches used to address the issue of alignment. This in turn caused inconsistency regarding which guidelines or directives to follow. Moreover, upon a comparison between the alignment models and the alignment success factors in literature from a wider perspective, we can notice to which extent these approaches and views differ.

3. Research method

Our research methodology adopts a theory-based, deductive methodology in investigating all factors that affect IS alignment projects in organizations in general and transforming organizations in particular. However, the knowledge gap in the literature regarding the discussed topic presented a considerable challenge to our work, as there's an acute shortage of research regarding the relation between IS and specific strategy types, and not just in organizations transforming from one type of strategy to another. We developed our conceptual framework by systemically reviewing the available literature addressing the concept of IS alignment from all perspectives. The basis of this development is formulated on two foundations; the recognition and utilization of the instrumental role of IT/IS, and the redefinition of the relations and boundaries between the entities involved in the IS project within the organization. Through the extensive survey and analysis of these key factors, we developed a framework to guide corporate and IT management in the alignment process under various scenarios. The presented framework does not only operate as an IS alignment process guide for transforming organizations but can also provide directives for IT/IS strategic planning as a model that primitively prepares organizations for a potential strategy-type change during the actual transformation process. The main considerations of the research methodology regarding the observed key factors are efficiency and practicality. While practicality can be justified by our aim to introduce a clear and useful framework, efficiency can be warranted through the allocation of resources in terms of cost, time, and effort, which are resources most crucial to the survival of transforming organizations, especially in unpredictable and competitive environments (Al-Jaafreh et al., 2023).

4. Research model and framework

The model consists of the three key factors most crucial for IS alignment in transforming Organizations. These factors represent the main entities involved in the alignment process, which are the new business strategy, the current IS, and the IT department. Fig. 1 illustrates these factors in addition to the old business strategy to be transformed, and the desired objective, which is the success of the alignment of the new information system.

Our methodology redefines the relationships and boundaries between key entities by clearly separating business-related and IT-related domains. The business strategy plays a central role and includes all aspects related to the business domain within the organization, such as:

- Developing a new business strategy that aligns with market conditions (based on the type of strategy used) and ensuring internal consistency through plans and processes that reflect this strategy. This also involves planning for the transformation process.
- Managing the transformation process from a business perspective, including business restructuring, organizational restructuring, business process reengineering, and resource allocation.

The Information System (IS) domain covers all IT/IS-related aspects of the organization, excluding the IT department itself. The IS domain includes elements such as the IT strategy, IT strategy planning, and the IT/IS infrastructure—comprising hardware, software, networks, database management systems (DBMS), cloud services, data centers, and security systems.

We include IT strategy and IT strategy planning within the IS domain because they are outcomes of

the business strategy. The business strategy shapes the IT strategy, which is then implemented through the information system (Fig. 2).

4.1. Utilizing the instrumental role of IT/IS

The complex role of IT/IS in businesses, along with the different approaches to aligning IS with strategy, plans, and business processes, has led some studies to suggest that businesses should follow IT's lead to improve performance. However, if a business process needs to be restructured based on IT requirements in a way that significantly differs from its original design, this may indicate that the initial process design was flawed.

While ISs have become essential to all organizations, regardless of their industry or market, IT should still be viewed as a tool that supports and reflects business strategy. The widespread daily use of ISs and the growing reliance on IT systems do not in themselves justify IT-driven changes. Exceptions occur when a new technology or product offers a clear strategic opportunity and justifies the risks of initiating an alignment project. For example, the release of a new database management system (DBMS) with enhanced features and much lower licensing costs might warrant the replacement of the existing system if a feasibility study shows the benefits outweigh the costs and risks.

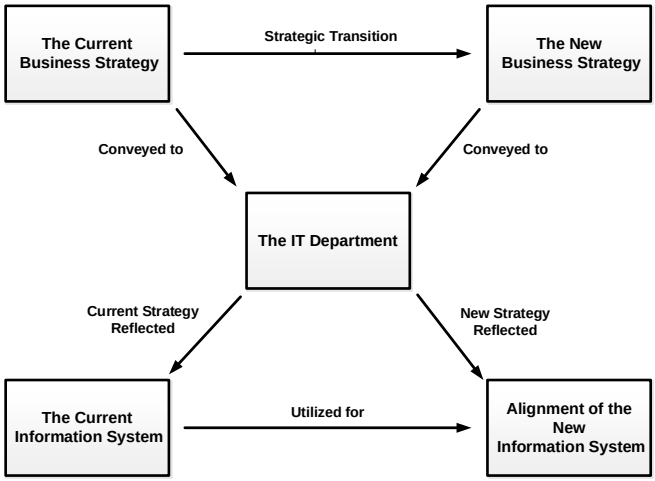

Fig. 1: Key factors in IS alignment in transforming organizations

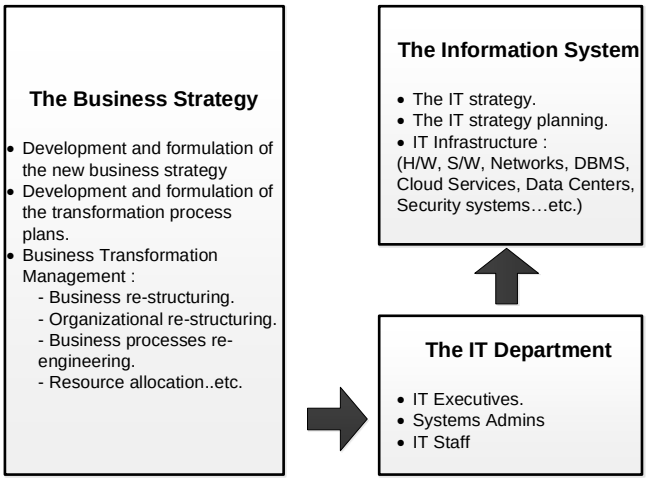

Fig. 2: Component boundaries of the main entities involved in the alignment process

Conversely, some studies argue that IT has no intrinsic value on its own (Hensen and Dong, 2020; Peppard and Ward, 2005). Furthermore, as with any process, the quality of the output depends on both the quality of the input and the process used to produce it. Therefore, the effectiveness of an IS reflects not only the quality of the input provided by the organization but also the development process carried out by the project team. This process includes the planning, analysis, design, implementation, and ongoing operation and maintenance of the IS. Most importantly, it is influenced by the quality and competence of the project team (Varajão et al., 2019). Our emphasis on the critical role of IT and the approach of utilizing the instrumental role of IT/IS can be justified by the fact that an inconsistent business strategy will lead to failure despite having "a state of the art" IS or IT infrastructure including the IT department personnel. Thus, turning to IT for solutions when the problem source is the business strategy or operational problems related to business plans derived from the strategy is irrational. Moreover, whether the business strategy is expressed in terms of external market conditions or internal infrastructure, the IS should reflect the business

strategy accordingly in both situations. Additionally, if an organization strategy type remains the same along with the associated business processes, then the alignment process will only involve launching a project to either update or replace the existing IS using the newly emerging tools and technologies the IT industry has to offer at the time. Thus, these tools are used merely to reproduce the same IS. However, the previous hypothetical scenario is rarely the case with organizations today, as they are continuously in the process of redesigning and reengineering their business processes. Moreover, increasing business strategies are being affected by emerging technologies in a manner that gradually alters their business strategy itself and not only the formations, methods, and channels through which they conduct their business. Therefore, the alignment process can be defined as ensuring that the firm's strategy is accurately reflected in the IT strategy and the IS. Furthermore, irrespective of how far the IT industry has evolved, it should not have any influence on forming the business strategy. Yet, there are some exceptions which we discussed earlier in this section. Finally, although many studies highlight the importance of 'IT-enabled' strategic change in facilitating business transformation the approach is often rooted in formal planning and strategic portfolio planning. Nevertheless, any strategic change initiated by IT developments should be considered an exception in emerging case studies and not a rule.

5. Results and discussions

Our analysis of the available models and factors influencing the IS alignment projects in general, and the alignment projects in transforming organizations identified three key factors. Here we present them in detail.

5.1. The new business strategy

The first and most important factor affecting the IS alignment in transforming organizations is the quality of the new business strategy. The strategy type is the main determinant of the success or failure of the organization, as it reflects the consistency and alignment to the market conditions. The initial concern regarding the quality of the new business strategy is whether it is a sound and clear business strategy to begin with. The reason for such emphasis emerges from our view on utilizing the instrumental role of IT/IS. However, company managers frequently find it difficult to comprehend formal company strategy due to their ambiguity (Campbell et al., 2005). The distinctions between declared objectives, strategies in practice, and managerial actions, many of which may be inconsistent with one another, present managers with uncertainty. The fact that corporate strategy is frequently either imprecise and/or difficult to adjust or is unknown altogether is a recurrent problem in numerous alignment studies (Menz et al., 2021). This presents a considerable obstacle because most alignment models in the literature assume an established business strategy, business plans, and processes that the alignment project team can use to align the IS.

Organizational success mainly relies on business strategy, not IT or IS capabilities. A clear, sound strategy can efficiently align IT and IS. However, not all organizations have sound strategies, leading to strategy-type change. Quality concerns persist regarding alignment between strategy and IS, despite market conditions. Moreover, the concept of business strategy is turbulent, and many organizations fail not because of IT/IS alignment inconsistencies but as a result of inconsistent business strategy with market conditions characterized by the strategy type, they follow. Thus, such inconsistency will transform into the IT strategy and the IS. In other words, although the alignment between the business strategy and the IS might be successful, the organization may still be subjected to failure because of the business strategy's inconsistency; with the market conditions, or with business processes that reflect it. Additionally, failure factors of unclear business strategy and the lack of clarity and predictability of corporate goals and objectives are considered the fifth-ranked alignment inhibitor in relation to the communication of the business strategy (Errida and Lotfi, 2021; Luftman et al., 2005). Evidently, organizations with flawed business strategies also have ISs. The strategy inconsistency will be reflected in the IT strategy and the IS, leading to an operational and aligned IS since ISs are instruments utilized to achieve the goals for which they were created.

However, many studies suggest that a sustained capability that gives a company a competitive edge is the capacity to attain a high degree of alignment between its IT strategy and its business strategy (Baker et al., 2018). Nevertheless, this can only be valid if the business strategy of the organization is successful and a source of competitive advantage. Moreover, the business strategy entails both the original strategy which reflects directly on the quality of the current IS, and the new strategy type which is to be characterized by the quality of the alignment process and thereafter, the new aligned IS. Therefore, if there's a misalignment between the IS and the business strategy then the causation for such misalignment with regards to the business strategy is the inconsistency of the business strategy either; with the market conditions that results in implementing an incorrect strategy type, or an internal misalignment between the strategy and the business plans and processes that reflect it.

5.1.1. The current business strategy

There are numerous concerns regarding the current business strategy relating to how well it is aligned with the current IS. The main concern is not only how well is the business strategy reflected onto the IS, but most importantly, the quality of the

current business strategy itself. Any inconsistency either in the current strategy type or in its alignment with the current IS will potentially result in the inheritance of these inconsistencies in the new IS, especially if it is aligned using the current IS. An unclear or inconsistent business strategy leads to a misaligned IS, this in turn will reflect on the new information system.

5.2. The current IS

The second key factor is the IS itself. Business strategy shapes IT strategy, which is then reflected in the IS. Therefore, when there is a misalignment between the IS and the business strategy—assuming the strategy is coherent—this can often be traced back to two main causes: either the IT department does not fully understand the business strategy or the requirements for the IS, or there are technical issues, such as outdated IS infrastructure that no longer meets competitive or market demands.

Assessing the quality of the current IS is essential to identify any misalignment issues that need to be addressed in a new alignment project between the updated strategy and a revised IS. The central concern is whether the existing IS is properly aligned with the current business strategy. A thorough evaluation of the current IS is critical to ensure that any flaws or limitations are not carried over into the new system.

This evaluation involves examining several alignment indicators, including whether all business processes are represented in the IS, the quality of this representation, the quality of related documentation in the project database, and whether the system contains all the information required by the organization.

5.3. The IT department

The third critical factor is the IT department, which consists of all IT department personnel starting from top IT executives down to systems administrators and technical IT Staff. Many studies emphasize knowledge sharing and shared domain knowledge between corporate and IT management as a key factor in IT/IS alignment (De Haes et al., 2020). The main concern with knowledge-related challenges is that corporate management is not necessarily knowledgeable about IT concepts and capabilities, and IT executives are not always aware of corporate strategy. Moreover, studies on strategic IT planning emphasize how crucial it is for corporate managers and IT managers to understand business strategy and IT (Shelley, 2015). Corporate and IS leaders are more likely to create a shared vision and understanding (Johnson and Lederer, 2010), as well as better connections between goals and activities, when they are informed about domain knowledge of business and IT (Pearlson et al., 2024). On the other hand, many studies emphasize how IT executives' comprehension of business challenges facilitates alignment or indicate that corporate management's ignorance of IT hinders alignment. According to other studies, corporate executives need to be knowledgeable about ISs, technologies, and how they could affect their company (Hock-Doepgen et al., 2021; Saarikko et al., 2020). However, corporate managers with an understanding of IT are likely to support IS more and take part in IS planning more actively which in turn promotes alignment (Dong et al., 2021). Other studies discovered that shared domain knowledge is helpful in promoting both short- and long-term alignment, which is consistent with these arguments (Oehlhorn et al., 2020).

The employees of the IT department fully comprehend the capabilities of IT tools as well as the different parts of the IS architecture. However, unless they comprehend the business side of the company's strategy, both conceptually and operationally, they cannot know what is expected of these tools. On the other hand, corporate management understands what is required from the business and how it should achieve business-wise, nevertheless, they may not fully comprehend what IT tools are available and what are the capabilities of these tools, or how they can support the business both strategically and operationally. Conveniently, it is practical and better suited to convey the business strategy to the IT department than trying to convey complicated IT-related concepts to corporate management since they are already burdened with trying to understand the major forces shaping the firm and industry. Therefore, considering the involvement of the IT department; if only as spectators; during the development and formulation of the new strategy is crucial to the success of the alignment process (Gandrita, 2023). This contributes significantly to bridging the gap between IT and the business aspect of the new strategy (Cheng et al., 2020). Thus, considerably reflecting on the alignment project of the new IS. It is recommended; If possible; that all IT department personnel be included to ensure that they completely understand what is required from the new IS both strategically and operationally. This recommendation stems from the fact that they carry the burden of conveying the expectations of corporate management onto the new IS and maintain it thereafter. Additionally, the lack of empirical evidence that alignment is positively impacted by shared information/knowledge between IT executives and corporate management (Singh et al., 2021), only supports our directive to involve the IT department to attend the development and formulation phases of the new strategy. In conclusion, misalignment between the IS and the business strategy may arise from issues within the IT department. One possibility is that the IT department is composed of highly skilled professionals who were not involved in the development of the new strategy and therefore do not fully understand what is required. Alternatively, the department may include less experienced staff who were involved in the strategy formulation and

understand its goals but lack the technical expertise to effectively implement them in the IS.

In such cases, additional IT training can serve as a corrective measure. However, training requires time—a critical and limited resource, especially during periods of organizational change.

5.3.1. The alignment project team

Although it is essential for the alignment project team to include members who represent the business domain—such as business analysts and requirements analysts—the quality of the team from the IT perspective is equally important. This emphasis arises from the critical role of the IT department in understanding the business strategy, which is a key factor in ensuring successful alignment, particularly in organizations undergoing transformation (Fig. 3). Additionally, two of the top five management concerns regarding IT and business alignment are related to the quality of IT personnel. The first is the issue of attracting, developing, and retaining IT professionals, while the second is measuring the value of IT investment (Agarwal and Sambamurthy, 2020). However, the relation to the second concern may not be clear considering that once the IT infrastructure and IS are operational, the main source of the running cost is attributed to the first concern which is the attraction, training, and retention of IT personnel, especially experienced IT project managers (Alvarenga et al., 2019). Arguably, there can be numerous high-quality IT professionals within any organization, with each specialized in their respective fields of IT that constitute the firm's IT infrastructure, such as databases, Networking, programming, software engineering, and etc. However, there are very few tenured IT professionals who really understand the organization's business strategy in relation to the IT alignment and what is expected of the IT department and from the IS in terms of business processes and strategy. Thus, considerably investing in IT through IT personnel attraction and retention is beneficial to any alignment endeavors. The more experienced IT professionals the organization retains, the more likely that the IT department will deliver value to the organization and increase the success rate of the alignment project (Ika and Pinto, 2022). Moreover, understanding the factors that led to the success or failure of previous IS/IT alignment projects is crucial for the success of future alignment efforts. This understanding is often reflected in the IT department's track record with past projects. However, the benefits of prior successful alignment projects can only be sustained if key IT personnel involved in those projects are retained or made permanent, as they possess valuable knowledge about the current IS and its relationship to the business strategy (Oehlhorn et al., 2020). Moreover, while maintaining quality documentation of previous alignment projects in the form of a "lessons learned" database can be thought of as a substitute for the experience of tenured IT project managers and IT staff, nevertheless, the understanding of the business strategy persists to be a challenge. In addition, past implementation failures in IS projects can impact top management's perceptions of IT, potentially affecting future strategic opportunities. Such failures can lead to a loss of credibility, while successful implementation can improve IT-related relationships, trust, and decision-making, ensuring IT colleagues are aware of new business developments and meet evolving needs (Amarilli et al., 2023).

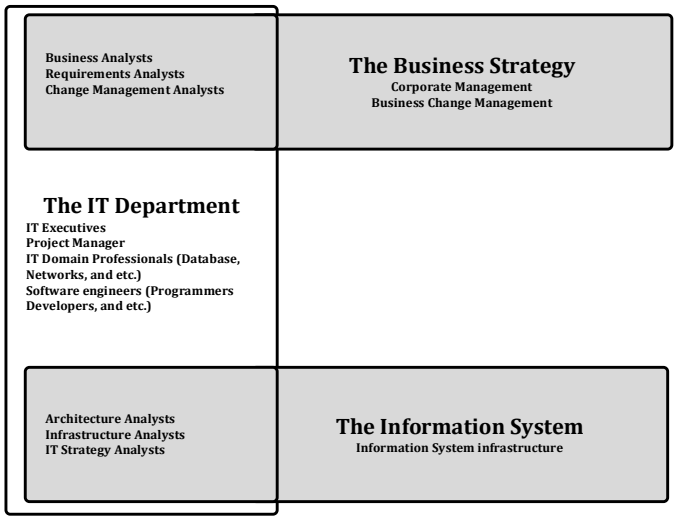

Fig. 3: The alignment project team

The IS department's track record and prior project success can facilitate alignment, suggesting that past credibility gaps should be addressed as a priority. Using new successes to improve the track record can help align the IS organization as a trusted partner (Chan et al., 2006). The organization's history of alignment or previous successful alignment projects of the IT department only bears value if the IT department still consists of tenured

key personnel who were responsible for the success of previous project/s.

5.4. Practical implications of IS alignment alternatives and case study analysis

As mentioned earlier, dynamic alignment models emphasize the dynamic relation between various alignment entities or factors about time. Moreover, our proposed model also emphasizes the concept of efficiency in terms of minimizing the incurred losses. These losses not only result from the cost of the required alignment project but also result from disruption of business operations that generate revenue for the organization. Furthermore, this also applies to non-profit organizations by further minimizing their cost of strategic transition. However, it is worth mentioning that aligning the current IS to the new strategy or building a new IS bares consequences depending on whether new technologies are to be involved in the process. These consequences result from the effect of new technologies on the new IS, they can be either; sustaining, meaning that they support the existing performance attributes, or disruptive to business operations, thus affecting revenue generation (Grant, 2024). Additionally, transforming organizations can use different strategies to address disruptive alignment requirements. One of these strategies is structural Ambidexterity, which includes establishing a separate division to perform these required strategic changes so as not to disrupt the current flow of business operations and revenue. The IBM development of its PC far from its Florida headquarters is an example of such a strategy. However, most organizations do not have the time or financial resources to use this strategy. The practical implications of our proposed model can be demonstrated through two case studies. The first is a generalized integration-type transition to emphasize the various alternatives the organization must choose from, while the second is a case study scenario analysis of a market development strategic transition. As a result of the firm's decision to change its business strategy type, regardless of the strategy type shift, the following phases represent the strategic transformation process in relation to the alignment of the IS with the new business strategy:

1. Develop the new business strategy by means of organizational structure, procedures, and processes.
2. Develop the business transformation plan.
3. Initiate the business transformation project.
4. Evaluate the ability and feasibility of the existing IS in terms of alignment with the new strategy to decide to either; align the existing IS, or to replace it.
5. Launch an IS project based on the reached decision of alignment or replacement.

Additionally, whether a decision to change the current strategy type is planned or emergent, Organizations are faced with a decision whether to; launch the IS alignment project in parallel with the transition process of the business aspect, or to launch the IS alignment project after the formulating the new business strategy. Moreover, the phases and alternative decisions occur in every organization undergoing a strategy-type change that requires an alignment project.

5.4.1. Case study 1: Integration strategy transitions

The importance of efficient IS alignment in transforming organizations can be better understood by examining alternative courses of action, particularly in the context of organizational integration. Although the three types of integration strategies may seem similar, they are fundamentally different—except for horizontal integration, which involves merging with or acquiring competitor organizations.

From an IS perspective, changing the business strategy typically requires adopting a new strategy type, which often implies a shift to a different kind of business and, consequently, a different IS. While horizontal integration may appear less complex, an important question arises: is alignment still needed between the ISs of two merging organizations that share the same business strategy?

In practice, the IS of the acquired organization often differs significantly from that of the acquiring firm. This commonly necessitates an integration project to align the acquired organization's IS with the infrastructure and strategic direction of the acquiring organization. If the strategies of the two organizations differ, a broader strategic alignment effort will be required.

In rare cases, the acquiring company may decide to preserve the strategy and IS of the acquired business, maintaining them as a separate entity. As a result, merging organizations generally face four possible scenarios:

- Use the IS of either merging company after deciding which strategy type to follow (usually that of the acquiring organization).
- Integrate both the ISs of the merged organizations (in cases of developing a hybrid strategy).
- Maintaining separation between ISs of the merged organizations.
- Build a new IS.

A practical example of integration alignment challenges can be set from a case study by Olugbode et al. (2008) of a merger of the plumbing division of a company with the electrical services division of the original corporation at which manual and electronic systems were typically used in traditional document control processes, which may result in duplication of effort and further expenditure of time. The main issues were the large number of customized systems, the undocumented manual systems, and the lack of

consistency in the operating processes. This resulted in a case in which process mapping that concentrates on the actual information flows within the organization is the first step solution. This approach results in a process where there are standardized norms for corporate activities and is less resource-demanding. A well-designed set of business processes or value chains is the first step in implementing an organization-wide information system. The second step is a careful exercise in strategic thinking, operational planning, and consultation with all system end users to facilitate user satisfaction, which in turn leads to better system use and performance.

5.4.2. Case study 2: Market development strategy transition

Here, we consider a case study of a small to medium-sized robotics manufacturing firm that required a strategic transition towards a market development strategy to create a robust global presence in important emerging markets. The firm also needed to maintain its market position by developing its current market penetration strategy due to a 20% decline in domestic market share because of bigger, more established competitors' increased rivalry. Additionally, a 15% increase in manufacturing expenses over the past two years has made it even more difficult to scale production capacities and manage international logistics.

The organization's incapacity to scale effectively and its lack of foreign market penetration are the two main causes of its strategic problem. The need for diversification through international expansion has been brought to light by the saturation of the domestic market and fierce competition. However, rising production costs and operational inefficiencies are impeding this goal.

Launching an alignment project while formulating the new business strategy, as shown in Fig. 4, is better suited for organizations that are more concerned with agility. Such organizations usually operate in competitive markets or change their strategy type to enter new business markets or industries. Given that the firm operates in a highly competitive market with its market share declining, this option seems feasible. However, initiating an alignment project before the new strategy is adequately formulated and the business plans and process reengineering are still in development may impact the quality of the new IS. Therefore, if the main concern of the firm is to have an operational IS as soon as possible; as is the case with many firms; then this is a better-suited course of action. However the firm may potentially suffer in the long term because of having to either; launch additional alignment projects in the future, or prolong the parallel alignment project, which may cause further disruption in business processes. This in turn will result in loss of revenue and further increase of losses for the organization.

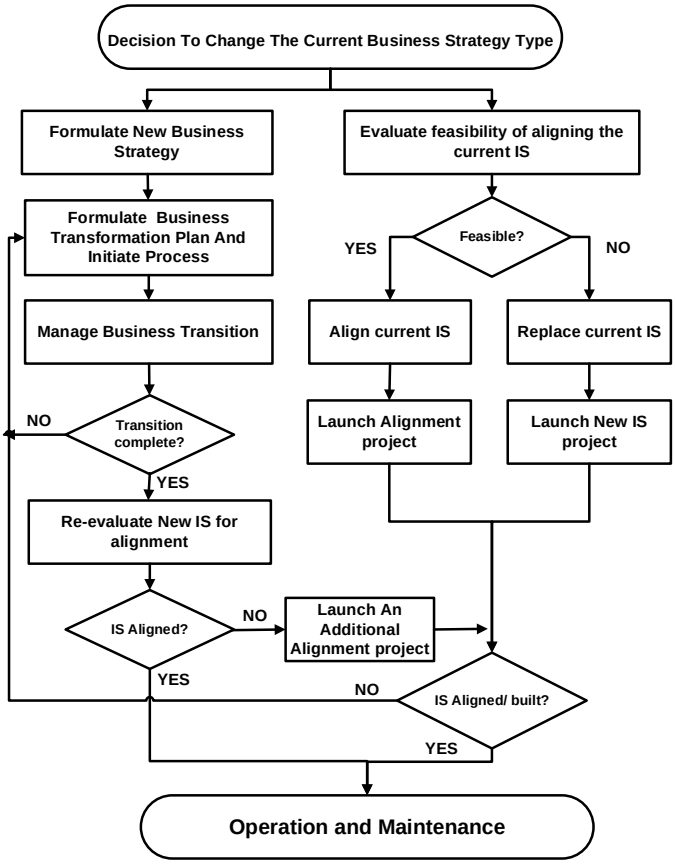

Fig. 4: Launching the alignment project in parallel while formulating the new business strategy

On the other hand, initiating an alignment project after the new strategy has been finalized—as illustrated in Fig. 5—can potentially lead to a well-aligned IS. However, completing all phases of business transformation is a complex and time-consuming process. As a result, the IS alignment may be delayed, which could negatively impact the organization's revenue and competitive position.

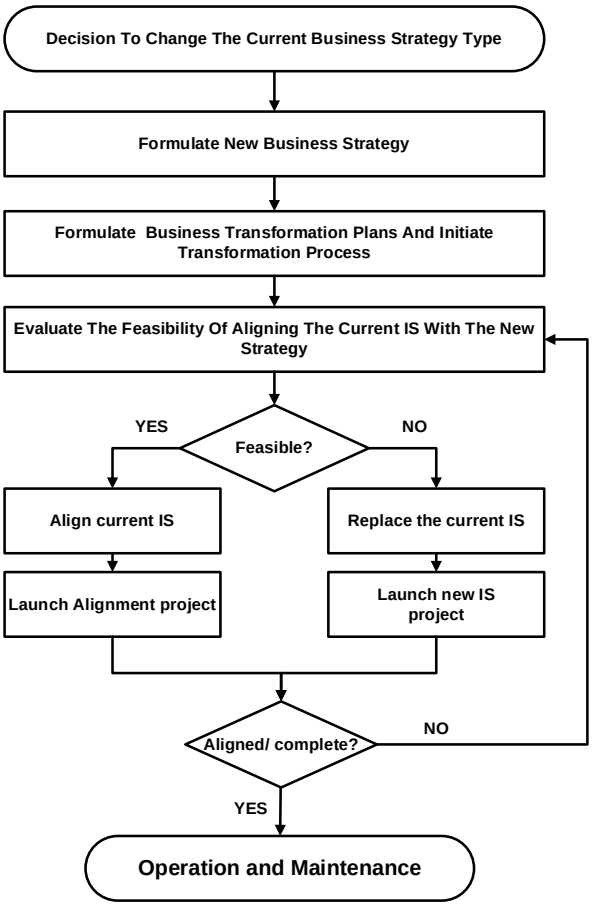

Fig. 5: Launching the alignment project after formulating the new business strategy

5.4.3. Case study analysis

Reaching a decision to choose either alternative course mainly depends on many considerations such as; the nature of the new market or line of business in terms of competitiveness and agility requirements; the type of the new strategy; and the financial status of the firm in terms of available resources for the overall transformation process. While competitive markets demand agility, an organization reverting to a retrenchment or divestiture strategy type; for example, is unlikely to have sufficient resources. The type of the new strategy determines the magnitude of the required IS alignment work. While the need for significant modifications to the current IS might be higher in situations of forward and backward integration compared to horizontal integration, this is also true for unrelated diversification versus related diversification, for instance. In the first case study of the divisions' merger, applying the suggested solution indicates that an alignment project to merge both information systems is required. However, there remains the issue of which business strategy to use to align the hybrid new system. In the second case study, developing solutions to solidify the market penetration strategy while transitioning to a market development strategy to expand to new global markets indicates that launching the alignment project in parallel with the business transition process is the optimal scenario. Nevertheless, further analysis of the financial status of the robotics manufacturing firm is required to determine whether it can withstand the additional potential costs in capital, time, and effort of having to launch additional alignment projects.

6. Implications

6.1. Contribution to practice

The main contribution of this paper to practice is that it introduces a guideline framework to assist corporate management and IT executives in the IS alignment process in transforming organizations. Furthermore, IS sustainability should be taken into consideration early in the phase of IS planning as it is one of the most critical concerns on top management's agenda. This study makes a substantial addition to practice through the field of Strategic Information Systems Planning (SISP). Considering the possibility of changing the strategy type when planning and building the initial IS will significantly reduce the number of losses resulting

from changing the strategy and therefore aligning the information system with any change of business strategy should it be required. Hence, the findings of our study can be viewed as pre-emptive feedback to organizations currently in the process of constructing their initial information system.

6.2. Contribution to theory

The main implication of our work on research is that it invites scholars to establish a new line of research to investigate the relationship between ISs and strategy types or specific types in general, or the relation between IS alignment and business strategy type with regard to transformation between particular strategy types, such a transition from a horizontal integration strategy to a related diversification strategy type for example. The paper's contribution to research can be characterized by encouraging researchers to investigate; whether there is a relation between the IS and the business strategy type an organization is implementing, whether all ISs have the same functionality in organizations regardless of business strategy type, or are certain types of IS better suited for certain types of business strategies, or whether there's a relation between alignment success and the transition between specific business strategy types.

6.3. Limitations and future work

The lack of literature regarding the topic discussed is the main limitation and challenge of our work. Additionally, there is an acute shortage of research regarding the relation between ISs and specific strategy types, and not just in transforming organizations. Future work involves investigating how different scenarios of strategic change from one type of strategy to another will impact the existing information system, and accordingly, how to evaluate the validity and verification of the new transformed system. Moreover, it also involves investigating whether there are common characteristics of ISs in organizations that implement the same type of business strategy across different markets or lines of business. Ultimately, we intend to extend the issue of IS alignment in relation to strategy types to establish guidelines of best practices of alignment like the Project Management Body of Knowledge (PMP-BOK) scheme.

7. Conclusions

The purpose of the study was to bridge the knowledge gap in theory and practice on IS alignment in transforming organizations. The goal is to analyze and identify the main elements that make IS alignment during strategy-type transition successful. By analyzing these factors, we developed a framework model to improve IS's resilience capability to effectively and efficiently survive the transition process. By highlighting focus areas, we can optimize the allocation of limited resources and improve the overall success of the business transformation process. The suggested models and alignment success criteria in the many research on IT/IS alignment vary greatly with ambiguous relationships and overlapping boundaries or excessively assign intrinsic worth and impact to IT and ISs in guiding business strategy. Unlike many studies that presume the reverse, our model's approach leverages the instrumental role of IT/IS to follow the lead of the business plan. Thus, the business strategy should always take the lead when IT and business strategy are coherent. In addition to separating the business-domain and IT-domain components of the three primary entities participating in the information system alignment process, we also redesigned the relationships and boundaries. We found that the success of information systems alignment projects is influenced by three key elements: the quality of the current information system, the IT department, and the quality of the business strategy (both new and existing).

Despite having a "state-of-the-art" IT infrastructure, our first conclusion is that the business strategy is the primary determinant of information system alignment success, and any inconsistencies in the strategy will cause IS to fail to achieve the expected potential. Additionally, in terms of business operations and procedures, "an aligned IS means that the information system reflects the business strategy through the use of the appropriate IT tools designed to reflect the intended business model of the organization without unnecessary complexity at feasible operational and maintenance cost." Therefore, our second finding indicates that an information system can still be categorized as "aligned" even if the business domain of the strategy is not aligned with market conditions or internally with business processes that reflect these conditions. As a result, if the organization decides to utilize the current information system in developing the new information system, it should be checked for misalignment with the quality of the present business strategy to avoid passing that misalignment on to the new information system. The IT component of the alignment process is highlighted in our third conclusion as the deciding factor for information system alignment agility in changing businesses in highly competitive markets. In this context, we explored the stages of information alignment in a changing organization. Through two case studies and scenario analysis of the various options and the ramifications of each choice, the business makes based on variables like resource availability and agility requirements.

Our fourth conclusion highlights how important the IT department is to the organization's performance. Nonetheless, several studies indicate that alignment can enhance corporate management comprehension, emphasize the significance of information systems, and help IT managers comprehend business strategy. However, the

effectiveness of the information system alignment project and the organization's long-term success depend on the IT department's participation in all strategy-related activities. Thus, bridging the knowledge gap between IT and business is greatly aided by investments in the IT department, including worker retention, training, and strategy formulation involvement. Consequently, successful information system alignment results.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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