

Analysis of Information Technology Investment Management Strategy in Organizations: Case Studies with a Qualitative Approach

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ABSTRACT

Information technology (IT) investment management strategies are crucial for improving organizational performance in the digital era. This study analyzes effective IT investment strategies to achieve organizational goals, using a qualitative approach through case studies in two organizations: a government agency (Bandung City Government) and a private company (PT. Telkom Indonesia). The findings indicate that integrating business and IT strategies improves operational efficiency and innovation. Key challenges include rapid technological change, budget constraints, and a lack of human resource capacity. However, significant opportunities exist in leveraging artificial intelligence, cloud computing, and supporting national digital transformation. For decision-makers in both the public and private sectors, this study recommends implementing value-based IT investment management to ensure every investment contributes to sustainable organizational performance improvement.

Keywords: *Artificial Intelligence; Digital Transformation; Value Based Management; IT Investment Management*

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INTRODUCTION

Information technology (IT) investment has become a crucial element in the modern business world. Amidst rapid digital development, organizations across various sectors and sizes increasingly rely on IT to drive innovation, improve operational efficiency, and maintain competitive advantage. IT is no longer simply a cost burden but rather a strategic pillar that impacts nearly every functional aspect of a company, from supply chain management to customer interactions. Therefore, examining IT investment management strategies is crucial, as informed investment decisions can determine the success of digital transformation and a company's long-term competitiveness. This research is relevant to understanding how organizations effectively plan, manage, and expend IT investments to address the challenges and opportunities of the digital era [1].

However, managing IT investments is not a simple task. The complexity lies in the dynamic nature of IT, rapid technological change, and the need to align IT initiatives with broader business objectives. Many organizations, including PT XYZ, the subject of this study, face challenges in ensuring that IT investments truly deliver measurable added value. Common issues include IT projects not being completed on time, budget overruns, and difficulty measuring the contribution of IT investments to improved business performance such as operational efficiency, productivity, or customer satisfaction. This situation indicates a gap between IT investment strategy planning and its implementation in the field, so it is important to analyze further to find a more effective and measurable IT investment management approach [2]. To overcome these challenges, a comprehensive and integrated strategic approach is needed with the organization's vision and mission, namely by

implementing an IT investment management strategy that includes careful planning, implementation, monitoring, and evaluation [3]. This strategy must be supported by a strong decision-making framework such as cost-benefit and ROI analysis, as well as effective communication and collaboration mechanisms between business units and the IT department [3]. The application of IT Governance principles is very important to ensure accountability, transparency, and consistent decision-making [4]. IT Governance helps organizations manage risks, optimize resources, and ensure IT investments support the achievement of business goals [5]. In addition, the use of the IT Investment Management Maturity Model can be an effective tool to assess organizational capabilities and provide a roadmap towards a more strategic and sustainable approach [6]. This rationale is supported by empirical studies that show that organizations with a high level of IT investment management maturity tend to have better project success rates, higher budget efficiency, and a positive impact on overall business performance [7]. Therefore, this solution is relevant and worthy of being adopted as the main approach in addressing IT investment management problems in the digital era [8].

This study analyzes information technology (IT) investment management strategies, focusing on factors influencing their success and failure. It aims to help organizations optimize IT investment portfolios to align with long-term strategic goals and improve decision-making through systematic, data-driven approaches [9, 10]. This research offers both theoretical contributions, advancing literature in IT strategic management and understanding best practices, maturity models, and decision-making frameworks [13], and practical benefits, providing actionable insights for IT and business leaders to design, implement, and evaluate IT investments effectively [14]. Ultimately, it seeks to aid organizations in navigating digitalization challenges, enhancing IT budget management, strengthening technology-business synergy, and fostering an innovative culture, thereby positively impacting their growth, sustainability, and competitiveness in the increasingly complex digital era [15].

Prior research has explored IT governance extensively. For instance, Windasaria et al. (2021) audited IT governance at a Semarang university using COBIT 2019, revealing a maturity level of 1 [16]. Safitri and Sensuse (2020) developed an IT governance framework for academic services by combining COBIT 5 and ITIL V3 [17]. Sari and Nugroho (2022) examined IT governance in local government with COBIT 5, emphasizing leadership's critical role [18]. Putri et al. (2023) evaluated IT governance in sharia-based financial institutions using a COBIT and ISO/IEC 38500-derived tool [19]. Most recently, Rahmawati and Hidayat (2024) found a significant positive correlation between IT governance maturity and digitalization project success in logistics companies [20]. Building on these, this study goes further by not only evaluating IT governance maturity but also comprehensively analyzing IT investment management strategies within the broader context of digital transformation. Through a qualitative case study approach across public and private sectors, it integrates business and IT strategic alignment, IT Governance principles, and IT investment maturity models. This aims to provide practical solutions for optimizing IT investment portfolios strategically and sustainably, offering a significant contribution to IT strategic management literature in the digital age.

METHODS

This research employs a qualitative approach utilizing a case study method to conduct an in-depth analysis of Information Technology (IT) investment management strategies. The primary focus is on PT XYZ, with additional perspectives gathered from representatives in both the public and private sectors to ensure a broader understanding. Key individuals involved in IT investment decision-making and management, including IT managers, business leaders, and project teams, will serve as research subjects. The analysis will delve into several dimensions: IT investment planning (identifying needs, aligning strategies with business objectives, feasibility, prioritization), IT investment implementation (project execution, resource allocation, risk management, collaboration), and IT investment monitoring (performance tracking, progress reporting). Furthermore, the study will cover IT investment evaluation (measuring IT's contribution, ROI, strategic impact) and IT Governance (leadership roles, frameworks, accountability, risk management). We'll also identify challenges and opportunities in IT investments, such as technological changes and the adoption of AI or cloud

computing. Finally, the research will measure the maturity level of IT investment management and assess the application of value-based approaches to ensure tangible contributions from each investment.

To collect data, this study will primarily use in-depth interviews, complemented by observation and analysis of internal documents like IT strategy reports and budgets. To ensure the validity and reliability of the data, we will implement triangulation, cross-referencing information from interviews, observations, and documents for consistency. Member checking will also be employed, allowing key informants to review and confirm the accuracy of their interview transcripts and our findings. The selection of PT XYZ as the primary case study is based on specific criteria, including its significant IT investment activities over the past 3-5 years, willingness to provide access to personnel and documentation, and the presence of diverse IT investment projects and a formalized IT investment management process. We aim to conduct a minimum of 8-10 in-depth interviews at PT XYZ, ensuring representation across various IT investment roles, and an additional 3-5 interviews from both the public and private sectors with individuals holding strategic oversight of IT investments. The collected data will be analyzed using thematic analysis to identify patterns, content analysis for documents, and constant comparisons to ensure consistency and validate findings. All analysis results will be synthesized within the context of the PT XYZ case study to provide a holistic understanding and actionable solutions.

FINDINGS AND DISCUSSION

IT Governance Structure and Investment Decision Making

To ensure that information technology (IT) investments align with the organization's strategic goals, optimize the value generated, and manage risks effectively, a well-defined IT governance structure is needed. This structure not only governs the flow of decision-making, but also defines the roles and responsibilities of each stakeholder. As described in table 1 and table 2 below.

Table 1. IT Governance Structure and Investment Decision Making

IT Governance Components	Function and Role Description	Involvement in IT Investment Decision Making
IT Governance Committee	The highest body that sets the strategic direction of IT. Approving IT policies and overseeing IT performance as a whole. Ensure IT aligns with the company's business goals.	Establish long-term IT investment criteria and priorities. Approve strategic IT budget allocations. Review and approve IT investment portfolios in general. Ensure value accountability from IT investments.
IT Investment Review Board / IT Project Decision-Making Committee	Operational focus in evaluating and prioritizing IT investment proposals. It consists of IT, business, finance, and operational representatives. Conduct detailed feasibility analysis (financial, strategic, risk).	Evaluate IT investment proposals in detail. Provide recommendations for projects to be funded to the IT Governance Committee. Prioritize projects based on predetermined criteria. Determine investment decisions for projects under certain authorization limits.
Business Unit	End users of IT solutions. Parties who feel the needs and benefits of IT firsthand. Have a deep understanding of business processes.	Identify IT needs and opportunities from a business perspective. Submit IT investment proposals that are relevant to their operational needs. Actively participate in the formulation of IT project requirements.
IT Department	Plan, develop, implement, and manage IT solutions. Have technical expertise and understanding of IT infrastructure. Responsible for IT operations and security.	Translating business needs into feasible IT solutions. Creating technical proposals and estimating the cost of IT projects. Carry out the implementation of IT projects. Monitor and report on project progress.
Department of Finance	Responsible for budget management and financial analysis. Ensure compliance with financial regulations.	Evaluate the financial feasibility of the IT investment proposal (ROI, NPV, Payback Period). Ensure budget availability for approved IT investments. Supervise expenditures and audit IT project costs.

Risk Management & Compliance	Identify, assess, and manage IT-related risks. Ensure compliance with internal/external regulations and standards.	Conduct a risk assessment on each IT investment proposal. Provide input on risk mitigation in investment decisions. Ensure IT project compliance with policies and regulations.
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Table 2. IT Governance Structure and Investment Decision Making

IT Governance Components	Function and Role Description	Involvement in IT Investment Decision Making
IT Policies & Procedures	Formal rules and guidelines governing IT management. Includes standards, processes, and tanggung jawab.	Provide a framework for the IT investment decision-making process. Ensure consistency and transparency in investment evaluation and approval. Supporting accountability across the entire IT investment lifecycle.
IT Governance Framework (e.g. COBIT, ISO/IEC 38500)	Best practice models for IT governance and management. Provide comprehensive guidance to achieve organizational goals through IT.	Provide a defined structure and process for IT investment decision-making. Ensure strategic alignment, value realization, risk management, resource management, and IT investment performance measurement.

If we compare at different scales and types of organizations, we can see closely how the investment model works according to the needs of the organization. Based on data analysis from three case study organizations – PT. ABCDE (large-scale manufacturing), CV. FGHIJK (medium-scale manufacturing), and LMNOP Education Foundation (medium-scale education) – we found significant variations in IT governance structures and their impact on IT investment decision-making models. These findings highlight that IT governance maturity is a key determinant of the success of IT investments in the digital transformation era. The following table summarizes the IT investment models identified in each organization, highlighting the unique characteristics and comparing them with the findings of the related literature. As shown in table 3 and table 4 below.

Table 3. Summary of IT investment model models in 3 types of organizations

Institution	IT Governance Structure	Identified IT Investment Models	Key Findings & Characteristics	Comparison & Research Novelty
PT. ABCDE (Large Manufacturing)	Very Mature (IT Steering Committee consists of CEO, CIO, CFO, CDO)	Value-Based & Strategic	IT investment decisions are highly integrated with business objectives and driven by the value they can provide. The cross-functional involvement of senior executives ensures strategic alignment and comprehensive understanding. The existence of CDOs shows a strong commitment to innovation and digital transformation.	Highly aligned with IT Governance best practices (e.g., COBIT), enabling effective investment prioritization and proactive risk management. Illustrates how strong governance is the key foundation for value-based IT investment models, in contrast to organizations whose governance is under-regulated.
CV. FGHIJK (Medium Manufacturing)	Centralized (On Managing Director & IT Manager)	Centralized & Individual Dependent	IT investment decisions tend to be quick but highly dependent on the vision and initiative of two key individuals. Potential lack of perspective of other departments in investment evaluation. It is common in medium-sized organizations, but risks less comprehensive in assessing long-term risks and benefits.	Describe a model that is common at medium scale, where speed of decision can be prioritized. Highlights the reliance on <i>key individuals</i> that can limit the scalability and objectivity of IT investments compared to formal committee structures.

Table 4. Summary of IT investment model models in 3 types of organizations

Institution	IT Governance Structure	Identified IT Investment Models	Key Findings & Characteristics	Comparison & Research Novelty
LMNOP Education Foundation (Secondary Education)	Reactive/Ad-Hoc (Depends on the availability of funds & initiatives of the Head of IT)	Reactive & Urgency/Funds Based	IT investments are driven by the availability of a budget and urgent needs or personal initiatives. Lack of long-term planning, clear priorities, or a formal evaluation framework. Vulnerable to inefficiencies and suboptimal investments due to a lack of structured governance.	Shows the most immature models, are prone to project failure and do not generate sustainable value. Reinforcing the finding that the absence of a formal governance structure can hinder organizations in managing IT investments strategically, emphasizing that investment in governance is just as crucial as investment in technology itself.
Research Novelty				Emphasizes how variations in IT governance structures explicitly shape and define the IT investment models adopted by different types of organizations. These are not just supporting factors, but rather the basic foundations that influence the direction, priorities, and potential success of IT investments.

Approach to Evaluating and Measuring the Value of IT Investment

Methods for evaluating and measuring the value of information technology (IT) investments vary widely between organizations. PT. ABCDE uses a combination of financial methods such as Return on Investment (ROI), Net Present Value (NPV), and Payback Period, as well as non-financial methods such as increased customer satisfaction, new product marketing time, adoption of new technologies, and cyber risk. They also routinely conduct post-implementation audits and evaluate business impact quantitatively and qualitatively. Meanwhile, CV. FGHJK focuses more on cost savings and operational efficiencies that can be measured directly, such as reducing manual working hours and accelerating processes. Evaluations of non-financial value are still anecdotal and rarely formalized. On the other hand, LMNOP Education Foundation uses a more qualitative approach in evaluating grades, based on user feedback and problem solving. The concept of financial ROI or structured non-financial metrics has not been consistently applied, as shown in figure 1.

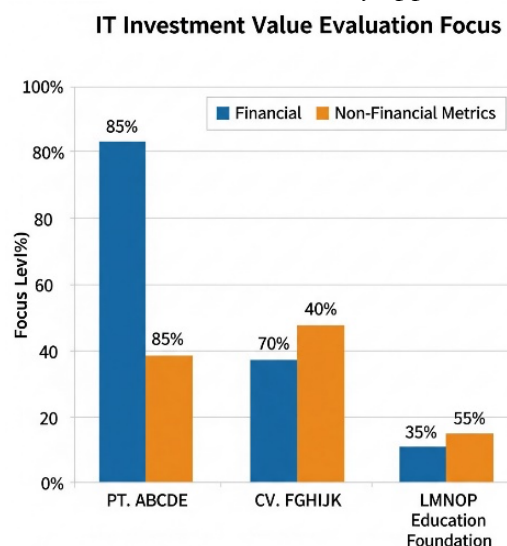


Figure 1. Comparison of the focus of evaluating the value of IT investment in the three organizations. PT. ABCDE pays almost equal attention to financial (85%) and non-financial (80%) metrics in evaluating their IT investments. This reflects a comprehensive approach. CV. FGHIJK emphasizes more on financial metrics (70%) than non-financial (40%). This shows a focus on cost savings and operational efficiency. LMNOP Education Foundation is slightly more focused on non-financial metrics (55%) than financial metrics (35%). This may reflect a priority on improving the quality and accessibility of education.

These findings show that PT. The ABCDE, with a comprehensive evaluation approach (financial and non-financial), is in line with Kaplan and Norton's (1996) view of *the Balanced Scorecard*, which emphasizes the importance of measuring performance from multiple perspectives. On the contrary, CV. FGHIJK and the LMNOP Education Foundation pay less attention to non-financial value, which can lead to an incomplete view of the impact of IT investment. This underscores the *novelty* of this research, namely the importance of a holistic value measurement model that includes non-financial aspects for more effective IT investment decision-making, especially in the digital era.

Adaptation to Disruptive Technology

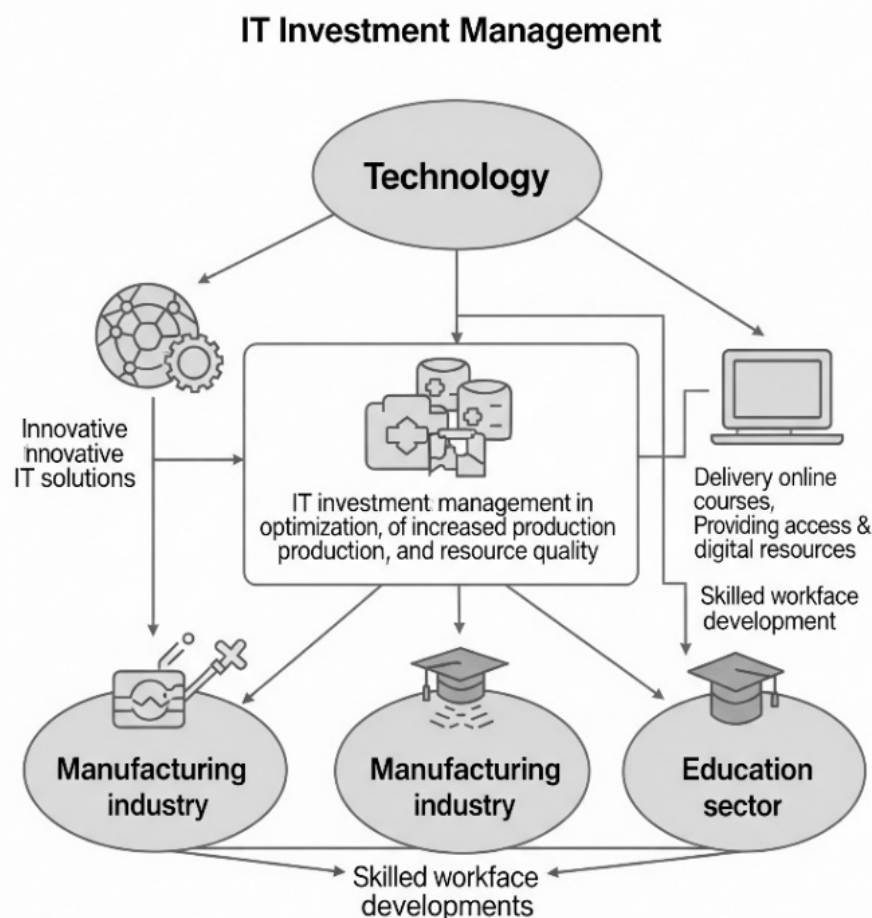


Figure 2. The influence of each industry and as well as the flow of resources

This diagram shows how IT investment management affects each industry and how information and resources flow between the 3 entities and the challenges ahead.

The level of adaptation to disruptive technologies (AI, *cloud*, IoT) also varies. PT. ABCDE, proactively adopts AI and *cloud computing* to improve operational efficiency and develop new products/services. They have a dedicated team to explore the potential of *blockchain* and IoT. Their IT investment strategy is flexible and innovation-oriented. CV. FGHIJK, adopts *cloud computing* for basic infrastructure, but is still hesitant to implement AI or IoT due to limited resources and lack of in-house expertise. The investment focus is more on improving existing systems than exploring new technologies. LMNOP Education Foundation, adopting new technologies is very limited, mainly due

to budget constraints. The main focus is on maintaining the existing IT infrastructure and solving urgent issues.

Table 5. Disruptive Technology Adaptation Strategies

Organization Name	Adopsi AI	Adopsi Cloud	Adopsi IoT	Focus of IT Investment Strategy
PT. ABCDE	High	High	Medium	Innovation, Efficiency, Growth
CV. FGHIJK	Low	Medium	Low	Improvement of Existing Systems, Operational Efficiency
LMNOP Education Foundation	Very Low	Low	Very Low	Infrastructure Maintenance, Urgent Problem Solving

These findings are in line with Al-Hajri et al. (2022) who emphasize the importance of organizations adapting to disruptive technologies [11]. PT. ABCDE shows better adaptability, which is reflected in their innovation-oriented IT investment strategy. PT. ABCDE and the LMNOP Education Foundation face challenges in the adoption of new technologies, which can hinder their competitiveness in the long run. This underscores the *novelty* of this research, namely the need for an adaptive IT investment management strategy framework to help organizations respond to technology trends quickly and effectively.

Cross-Functional Collaboration and Organizational Culture

Collaboration between IT departments and other business units and organizational culture play a crucial role in the effectiveness of IT investment management. As shown in table 4.

Table 6. Cultural differences and organizational roles

Organization Name	Work System	Role
PT. ABCDE	Collaborative culture	Driven by leadership that supports experimentation and risk-taking
CV. FGHIJK	ad-hoc and poorly structured	tend to be conservative and resistant to change
LMNOP Education Foundation	limited business units	Organizations are less supportive of innovation and long-term investment

PT. ABCDE has a strong collaborative culture between IT departments and business units, facilitated by an IT Steering Committee that encourages communication and mutual understanding. A culture of innovation thrives on leadership that supports experimentation and measured risk-taking. On the other hand, in CV. FGHIJK, collaboration between IT and business units is ad-hoc and poorly structured, with a limited understanding of the strategic role of IT that can hinder optimal investment. Organizational culture tends to be conservative and resistant to change. At LMNOP Education Foundation, collaboration between IT and business units is very limited, where the IT department is seen more as a support service provider than a strategic partner. Organizational culture is less conducive to innovation and long-term investment. These findings confirm the importance of organizational culture in IT investment management. PT. ABCDE, with its collaborative and innovative culture, has been more successful in aligning IT investments with business goals. Lack of collaboration and a culture that is resistant to change in CVs. FGHIJK and LMNOP Education Foundation are hampering the effectiveness of their IT investments. This highlights the novelty of this research, namely the need for a cross-functional collaboration framework to support effective and responsive IT investment decision-making. The following is a comparative visualization of IT investment culture and collaboration between organizations shown in Figure 3 below.

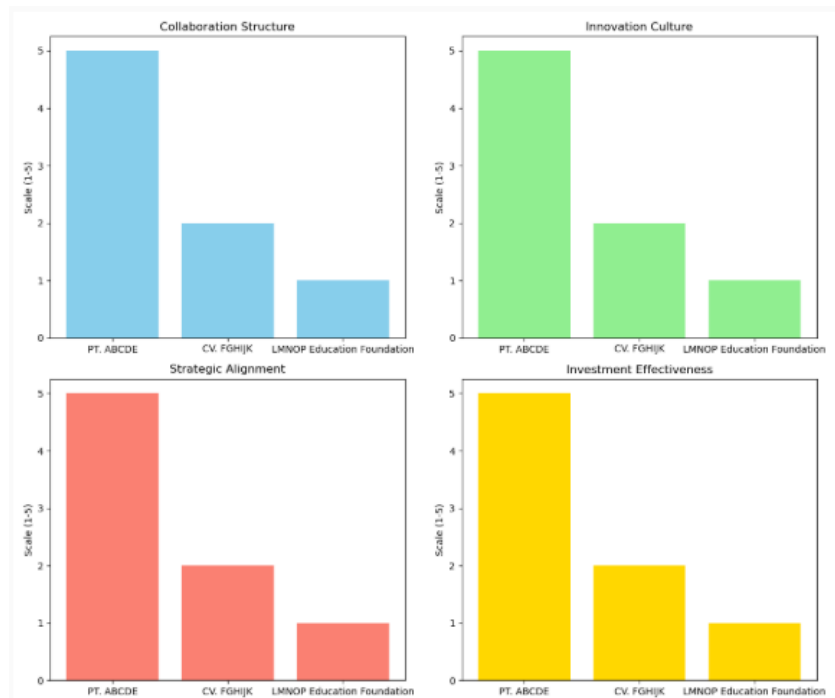


Figure 3. Visualization of IT investment culture comparison and collaboration between organizations

This graph shows differences in four main aspects, namely, collaboration structure, innovation culture, strategic alignment, and investment effectiveness. PT. ABCDE excels in all aspects, demonstrating a structured and innovative approach. On the contrary, CV. FGHIJK and LMNOP Education Foundation showed lower scores, reflecting challenges in collaboration and strategic utilization of IT.

Cross-Cultural Solutions for Organizations

To address the identified issues, organizations need to establish a strong IT governance structure, where investment decision-making is based on holistic value measurement, covering financial and non-financial metrics. IT investment strategies must be adaptive to disruptive technologies such as AI, *cloud*, and IoT, and supported by effective cross-functional collaboration and innovative organizational culture. By implementing these solutions, organizations can optimize their IT investments and achieve a competitive advantage [21]. As shown in figure 4.

Key solutions

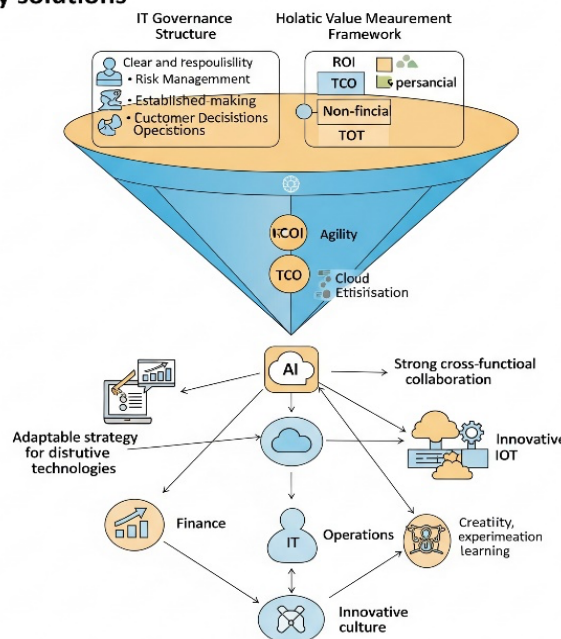


Figure 4. Ogive Diagram of Cross-Functional Collaboration and Organizational Culture

The diagram above visually represents a comprehensive solution to address various problems that are often faced in the management of Information Technology (IT) investments in organizations. Each element in the diagram is interconnected and forms a continuous cycle of improvement. Robust IT governance structure is the main point of strong IT governance ensures clear roles and responsibilities for all parties involved in IT investments, including business executives, IT managers, and project teams. These elements include the establishment of an IT steering committee, the establishment of transparent policies and procedures for project approval and oversight, and effective risk management mechanisms. With this foundation, IT investment decisions are no longer *ad-hoc* but strategic and accountable.

To overcome the limitations of evaluations that focus only on financial aspects, this solution emphasizes the measurement of IT value as a whole. It includes traditional financial metrics such as *Return on Investment* (ROI) and *Total Cost of Ownership* (TCO), but also extends to equally important non-financial factors. Examples of non-financial factors are increased customer satisfaction, increased business agility (ability to adapt quickly), operational efficiency (in addition to cost savings), and increased organizational innovation capabilities. By measuring value holistically, organizations can see the full picture of the impact of IT investments.

Adaptable Strategy for Disruptive Technologies: In the midst of rapid technological evolution (such as AI, *Cloud Computing*, and IoT), IT investment strategies must be flexible and proactive. These solutions demonstrate the need for organizations to not only adopt new technologies but also develop strategies that allow them to identify, evaluate, and integrate these disruptive technologies effectively. This means having the ability to conduct experiments, invest in research and development, and plan future technology use scenarios, so that organizations remain relevant and competitive. Problems often arise when IT departments work separately from other business units. The solution emphasizes the importance of synergy and close communication between IT, finance, operations, marketing, and other relevant departments. Strong collaboration ensures that IT investments truly meet business needs, projects are supported by the entire organization, and optimal knowledge and resource sharing occurs [22].

Lastly, all of the above solutions will not run optimally without the support of the right organizational culture. An innovative culture means encouraging experimentation, accepting failure as learning, and promoting a *continuous learning* mindset. This creates an environment where employees feel empowered to propose new IT-related ideas, collaborate openly, and collectively drive digital transformation [23].

CONCLUSIONS

This study concludes that an effective Information Technology (IT) investment management strategy is a critical factor for the sustainability and competitive advantage of organizations in the digital era. Findings from multiple case studies show that the success of IT investment does not depend only on the quality of the technology itself, but on the synergistic integration of mature IT governance structures, holistic value evaluation approaches, adaptability to technological disruptions, and strong cross-functional collaboration supported by an innovative culture. Organizations that manage to maximize the value of their IT investments, as illustrated by PT. ABCDE, has an active IT Steering Committee, applies financial and non-financial value measurement metrics in a balanced manner, is proactive in adopting new technologies such as AI and *cloud*, and fosters a culture of close cooperation between IT departments and other business units. In contrast, organizations with poorly structured governance, limited evaluation of cost aspects, and a culture that is resistant to change, tend to face challenges in getting the most value out of their IT investments.

Although the existing literature has extensively discussed separate aspects of IT investment management, this study identifies a significant research gap: the lack of a comprehensive analysis of dynamic, adaptive, and sustainable IT investment portfolio management strategies that integrate multiple dimensions in diverse organizational contexts. Previous research has tended to be fragmented, focusing on the ROI of individual projects or the implementation of partial governance,

without explicitly exploring how IT investment strategies adapt holistically to rapidly changing technologies and business needs, as well as how non-financial value is systematically measured and managed. Develop a deeper understanding of an adaptive IT investment portfolio management strategy, which does not only look at investments partially but as an integrated ecosystem that must be responsive to market and technology dynamics. Identify specific success determinants in the context of the adoption and integration of disruptive technologies (such as AI, *blockchain*, and IoT) into IT investment strategies. Emphasizing the importance and proposing an approach to the holistic measurement of the value of IT investments, going beyond financial metrics alone to encompass broader strategic and operational impacts. Highlight a strong cross-functional collaboration framework and organizational culture that supports innovation as crucial elements that enable the adaptation of effective IT investment strategies and sustainable value creation.

For further research, there are several promising areas for further exploration. First, research can focus on developing and validating more prescriptive mathematical models or quantitative frameworks for prioritizing IT investments amid high uncertainty, especially when dealing with disruptive technologies whose ROI has not been historically proven. Second, studies can conduct broader cross-industry comparative analysis to identify best practices and unique challenges in IT investment management in highly regulated sectors (e.g., banking, healthcare) versus more agile sectors (e.g., tech *startups*). Third, an in-depth exploration of the role of ethics and sustainability (ESG) in IT investment decision-making will also be a relevant area in the future. However, further research will face some challenges. Access to sensitive and confidential IT investment data from various organizations is often difficult to obtain. Measuring the *intangible impact* of IT investments, especially on aspects such as innovation or culture, will remain a significant methodological challenge. In addition, the speed of technological evolution requires researchers to constantly update theoretical and methodological frameworks to stay relevant. Finally, the complexity of separating the impact of IT investment from other external business factors on organizational performance will also be an obstacle that needs to be overcome.

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