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Research Paper

Unlocking Potential: Digital Transformation and Decision Support in Automotive Repair - A Case Study

Natalia[1]*, Pri Hermawan[1] iD
[1]Bandung Institute of Technology, Indonesia

Abstract

In today's rapidly evolving business landscape, the significance of digital transformation for Small and Medium-sized Enterprises (SMEs) cannot be overstated. CV Karya Makmur, an Indonesian automotive repair shop, stands at the forefront of this change, recognizing the urgent need to incorporate advanced Information and Communication Technologies (ICTs) into its operations. This transformation is not just about adopting new technologies; it is a comprehensive shift that redefines how the business interacts with customers, optimizes operational processes and improves its overall financial health. The journey of CV Karya Makmur highlights the broader implications of digital transformation in this sector. This case study delves into the multifaceted process of integrating technologies such as augmented reality (AR) and artificial intelligence (AI) to enhance service efficiency, tackle logistical hurdles, and improve access to vital information. Yet, the transition from conventional practices to a digital framework is fraught with obstacles, primarily due to resistance to change. Effective change management, focusing on the human elements of organizational transformation and employee engagement, is pivotal. CV Karya Makmur's experience underscores the critical need for digital systems that promote data-driven decisions, standardize operations, and facilitate better communication. Despite the initial challenges, the potential benefits—increased productivity, reduced operational costs, and a competitive edge in the market—are compelling. This study suggests that considering an organization's unique context and objectives, a tailored digital transformation strategy is essential for leveraging technology to enhance business outcomes in developing countries like Indonesia.

Keywords *Digital Transformation, SMEs, Automotive Repair, Information and Communication Technologies (ICTs)*

INTRODUCTION

CV Karya Makmur, a small and medium-sized automotive repair shop, is embarking on a challenging digital transformation journey. Historically reliant on less automated systems, the company is now tasked with incorporating advanced Information and Communication Technologies (ICTs) into its demand-responsive business model. This model, which initiates services only upon customer orders, inherently leads to longer lead times and a reactive approach to business. Despite these challenges, CV Karya Makmur sees significant potential in digital transformation to enhance its operational efficiency, customer acquisition, staff productivity, and overall financial economy.

SMEs like CV Karya Makmur are essential to Indonesia's economy as they contribute significantly to the nation's GDP and employment. Digital transformation for these enterprises is not just about technological upgrades but a strategic reevaluation of aligning people, processes, and data to improve customer interaction and service delivery. This transformation is critical for gaining a competitive edge in the industry, as it leads to better operational control, reduced service times, and heightened efficiency. However, the transition from traditional practices to digital operations often encounters resistance, underscoring the complexity of this transformational journey, especially in service-oriented sectors like vehicle repair.

The automotive industry has seen significant changes in product complexity and service offerings, necessitating a shift in business models and operational structures. Technicians at CV Karya Makmur must now adapt to new technologies and data analysis methods to sustain operational efficacy. Integrating digital tools like augmented reality (AR) and artificial intelligence (AI) can greatly enhance efficiency, addressing challenges such as supply shortages and limited information access. These advancements not only improve productivity but also reduce downtime costs, a significant concern in the industry (Ayuningtiyas et al., 2023; Bashokoh et al., 2023).

In automotive SMEs like CV Karya Makmur, the journey towards digital transformation is fraught with several formidable challenges across technological, financial, and human resource domains. A critical barrier is the lack of robust technological infrastructure, which is essential for integrating advanced digital solutions. This deficiency, coupled with the high costs of acquiring, maintaining, and updating digital technologies, strains SMEs limited financial resources. Additionally, there is a palpable skills gap in the workforce; employees proficient in manual and technical tasks of automotive repair may lack the necessary digital skills, making the transition to digital tools and processes daunting. This scenario is further complicated by staff's inherent resistance to change, who might view new technologies with scepticism, fearing job displacement or the demands of acquiring new skills.

Addressing these obstacles necessitates a strategic and multifaceted approach. Financial constraints require innovative solutions such as partnerships, government grants, or phased technology investments to mitigate upfront costs and spread financial risk. Meanwhile, fostering a culture that embraces change is crucial; this involves not only training employees in new digital skills but also actively involving them in the transformation process to mitigate resistance and build a shared vision for the future. Effective change management, emphasizing the benefits of digital adoption for efficiency, customer satisfaction, and competitive advantage, becomes paramount. Furthermore, tackling data security and regulatory compliance demands a proactive stance, ensuring that digital transformation efforts are secure and aligned with industry standards and legal requirements. Through these concerted efforts, SMEs like CV Karya Makmur can navigate the complexities of digital transformation, setting the stage for enhanced operational efficiency and sustained growth in the digital age.

Effective change management is crucial in navigating the complexities of digital transformation. Understanding and addressing the human factors involved in organizational transformation is essential (Vial, 2019). A comprehensive change management strategy incorporating strategic, tactical, and operational elements is needed to effectively guide the transition. Engaging employees through participatory structures and creating a sense of ownership in the transformation process is critical for success (Okorie et al., 2023; Satpathy et al., 2020). As CV Karya Makmur continues its journey in digital transformation, the focus on change management will be a pivotal aspect in achieving its objectives and maintaining its competitive position in the evolving automotive repair industry (Sirait & Purnama, 2021).

While CV Karya Makmur is making strides in digital transformation, a key research gap emerges in understanding the specific challenges and opportunities unique to SMEs in the automotive repair sector. The current body of research predominantly focuses on digital transformation in larger corporations or different industry sectors, leaving a gap in insights specific to SMEs like CV Karya Makmur in the automotive repair industry. This gap is particularly evident in developing countries like Indonesia, where SMEs form a significant part of the economy but face unique challenges in digital adoption.

Additionally, there is limited comprehensive research on the integration of specific advanced technologies, such as AR and AI, in the day-to-day operations of automotive repair SMEs

(Blake et al., 2003; Muhammad et al., 2022). The impact of these technologies on operational efficiency, customer service, and financial performance in the context of smaller-scale businesses remains underexplored. Furthermore, research on the human aspect of digital transformation in SMEs, including employee resistance and change management strategies tailored to smaller organizations, is scarce. This includes a lack of studies on effective methods for engaging SME employees in digital transformation initiatives and creating a culture conducive to technological adoption and innovation.

Moreover, the research gap extends to the exploration of effective digital strategies for demand-responsive business models like that of CV Karya Makmur. Studies specifically addressing the challenges of incorporating digital solutions into businesses operating on customer-initiated services are limited. This gap signifies a need for tailored research that can provide insights into optimizing digital transformation strategies for businesses operating with reactive service models.

To bridge this research gap, future studies should focus on the peculiarities of digital transformation in SMEs within the automotive repair sector, considering their specific operational, financial, and human resource dynamics. This includes an in-depth analysis of the adoption and integration of emerging technologies, effective change management approaches in smaller business environments, and strategies for transforming reactive business models into proactive, digitally empowered operations. Addressing these research needs will provide valuable guidance for SMEs like CV Karya Makmur and contribute to the broader understanding of digital transformation in diverse business contexts.

LITERATURE REVIEW
Digital Transformation

Digital transformation marks a significant shift in the operational paradigm of organizations in the contemporary business environment. It transcends the mere adoption of digital technologies, encompassing a comprehensive overhaul of business culture, processes, and strategies to build and sustain a competitive edge in the digital era. Central to this transformation is enhancing customer experiences, optimizing operational efficiencies, and reducing costs. As outlined in the June 2023 publication "Rewired: A McKinsey Guide to Outcompeting in the Age of Digital and AI," senior experts from McKinsey globally highlight several key elements for successful digital transformation (Ogrean & Herciu, 2022). These include establishing a clear strategy to deliver tangible business value and identifying specific areas, such as customer journeys or functional domains, for significant improvements. Building an internal digital talent bank is crucial, not just in hiring expertise but in fostering an environment conducive to the growth and development of digital skills. The importance of a scalable operating model is emphasized, enabling effective cross-functional collaboration for potentially hundreds or thousands of teams involved in the transformation process, with models like digital factories and company-wide agility being particularly noteworthy (Conca et al., 2021; Wessel et al., 2021).

In addition, the approach necessitates a distributed technology environment, where teams can readily access necessary data, applications, and development tools, and a data architecture that supports easy and effective data governance and access. Strong adoption and change management are integral, involving changing processes, training users, and planning for adoption and scaling from the outset (Fleaca et al., 2022; Ufua et al., 2021). The concept of 'domain' in digital transformation refers to specific functional areas or customer journeys that become the focus of change, encompassing all related activities required to deliver comprehensive solutions within that domain. The role of artificial intelligence, especially generative AI, is also crucial, offering value in content creation, innovation discovery, and automation, though it is essential to align its use with

clear business objectives to ensure it adds real value.

Leadership is pivotal, particularly for CEOs and C-suite members, who must ensure organization-wide alignment, commitment, and accountability. Each member of the C-suite has a crucial role in overseeing various aspects of the transformation, including technology, talent, change management, and performance measurement. Measuring the success of digital transformation involves looking at various performance indicators such as value creation, team health, and progress in change management, with accurate measurement essential to ensure that the changes implemented deliver the expected value. In today's world, many companies across different industries have successfully embarked on their digital transformation journeys, utilizing technology and AI to enhance operational efficiency, improve customer experiences, and achieve their business goals, underscoring the necessity of digital transformation for organizations striving to remain relevant and competitive in the ever-evolving digital age.

UTAUT (Unified Theory of Acceptance and Use of Technology)

The Unified Theory of Acceptance and Use of Technology (UTAUT), established by Kumar et al. (2023) and Thomas et al. (2013), stands as a significant advancement in the realm of technological acceptance models. This comprehensive model synthesizes the effective components of eight distinct theories into a singular framework, thus providing a more robust explanation of technology acceptance and usage behaviour. The eight integrated theories include the theory of reasoned action (TRA), technology acceptance model (TAM), motivational model (MM), theory of planned behaviour (TPB), a combination of TAM and TPB, model of PC usage (MPTU), innovation diffusion theory (IDT), and social cognitive theory (SCT). Demonstrating greater efficacy than its predecessors, the UTAUT model has been shown to explain up to 70% of the variance in user behaviour, a significant improvement over the individual theories it encompasses (Chang, 2012; Shachak et al., 2019). In their evaluation, Venkatesh and colleagues identified seven key constructs that impact the intention and actual behaviour regarding technology usage, namely performance expectancy, effort expectancy, social influence, facilitating conditions, attitude toward using technology, and self-efficacy. Further analysis revealed that four primary factors—performance expectancy, effort expectancy, social influence, and facilitating conditions—significantly influence behavioural intention and use behaviour, while the remaining constructs showed less direct impact as primary predictors. Additionally, the model identifies four moderators—gender, age, voluntariness, and experience—that influence the relationship between these primary constructs and technology adoption behaviour (Chang, 2012; Shachak et al., 2019).

The UTAUT model's primary purpose is to aid organizations in understanding user responses and patterns associated with the adoption of new technological innovations (Wanganoo et al., 2022a, 2022b). Originating from the Technology Acceptance Model (TAM) in 2003, UTAUT has evolved to accommodate a wider range of applications, extending from organizational settings to individual consumers. This evolution led to the development of UTAUT2, a revised model that incorporates additional factors such as habit, hedonic motivation, and price value, thereby enhancing its relevance and applicability in various contexts. The UTAUT and UTAUT2 frameworks have become instrumental in guiding firms to better grasp the dynamics of user interaction with technology, enabling more effective implementation and utilization of technological advancements across different sectors.
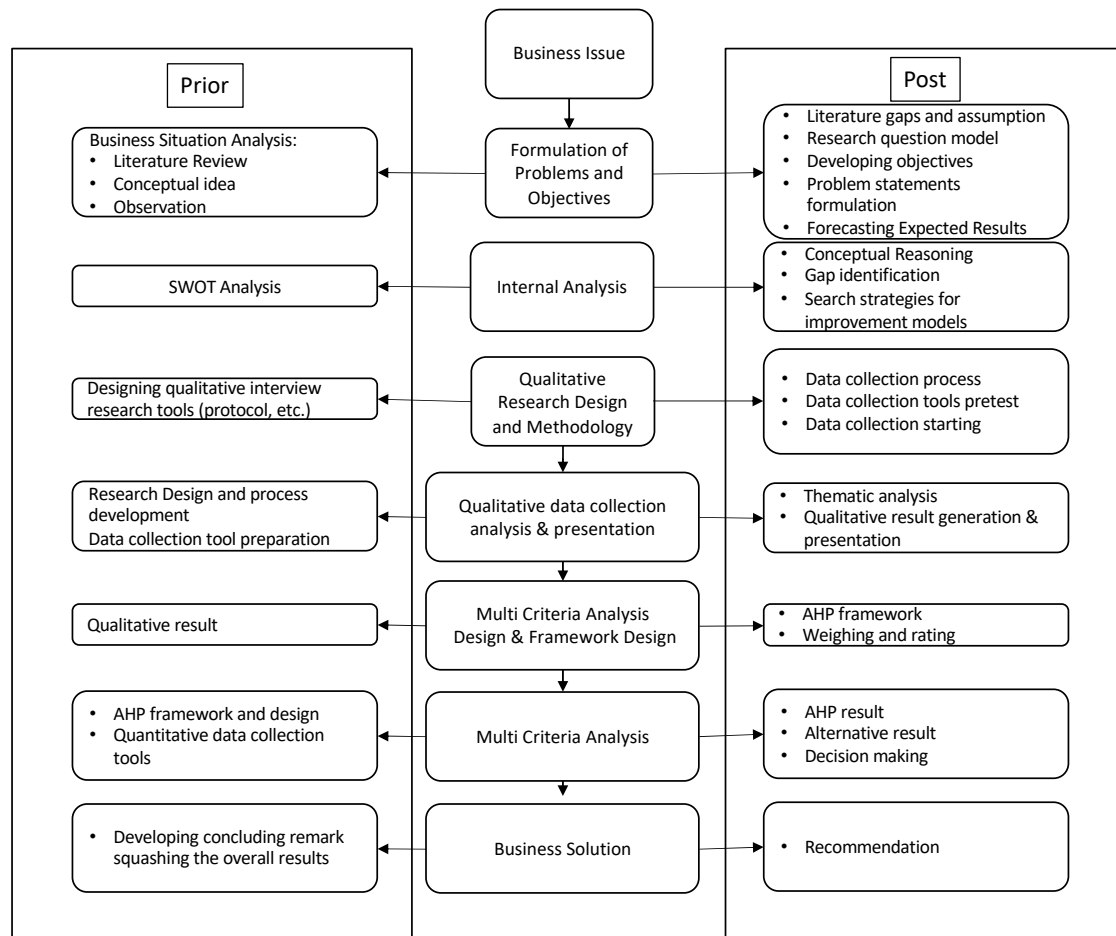
METHODOLOGY

Figure 1. Research Methodology

This methodology delineates a systematic approach to tackling business issues, beginning with identifying the problem, followed by an in-depth business situation analysis through literature review, conceptual ideation, and SWOT analysis. Formulating precise problems and objectives leads to an internal analysis, paving the way for designing qualitative research tools and methodologies. After the research design and process development, qualitative data are collected, analyzed, and presented. This feeds into a multi-criteria analysis framework, further refined through the Analytic Hierarchy Process (AHP) for decision-making, integrating qualitative and quantitative data collection tools. The outcome of this comprehensive process culminates in developing conclusive remarks that encapsulate the findings, which are then leveraged to formulate actionable business solutions and recommendations. This holistic process not only addresses the immediate business issue but also provides a strategic framework for continuous improvement and informed decision-making.

Qualitative Data Collection

In qualitative research, thematic analysis is a structured and methodical approach for identifying, analyzing, and reporting themes within data. This technique is essential for organizing,

describing, and interpreting various aspects of a dataset, thereby establishing itself as a fundamental tool in qualitative research. The thematic analysis process begins with a deep familiarization with the data. Researchers immerse themselves in the material through multiple readings, which is crucial for understanding comprehensively. This phase involves making preliminary notes that capture initial observations and insights, setting the foundation for the subsequent stages of the analysis. Following this, the process of generating initial codes takes place. Here, the data is systematically coded, segmenting it into meaningful units that assist in identifying and categorizing features relevant to the research questions. This coding is an iterative process, continually refining and modifying codes to ensure a dynamic and responsive analysis that accurately represents emerging themes.

The next phase involves searching for and identifying themes, a critical step where the codes are examined and grouped into broader patterns representing the data's underlying ideas. Following the identification of themes, there is a review process to ensure that these themes are coherent and relevant to the entire dataset. This involves splitting or combining themes for accuracy and discarding those that do not have sufficient data support. Defining and naming the themes is another pivotal stage, where each theme is delved into deeply to understand its essence and how it manifests in the data. This stage transforms the raw data into a meaningful narrative, with themes named in a manner that encapsulates their essence.

Finally, the thematic findings are integrated into the research report, weaving the analysis with the existing literature, research questions, and methodology. This integration is not merely an addition of findings but involves contextualizing and explaining the themes within the larger research context. Researchers present selected quotes from the data to illustrate the themes, ensuring these are contextualized and explained within the broader narrative. Reflexivity is vital throughout this thematic analysis process, requiring researchers to continuously reflect on their biases and assumptions and engage critically with both the data and their interpretations. This approach ensures a coherent, compelling, and meaningful contribution to the field, going beyond mere data organization to a deep interpretive engagement with the material.

Quantitative Data Collection

The Analytic Hierarchy Process (AHP), developed by Thomas L. Saaty in the 1970s, is a sophisticated decision-making tool that integrates principles from mathematics and psychology (Ikram et al., 2020; Sequeira et al., 2021). It is particularly valuable in multi-criteria decision-making contexts, where complex decisions are broken down into a hierarchy of more manageable sub-problems, ranging from quantifiable elements to subjective factors. AHP involves pairwise comparisons of criteria and sub-criteria, leading to the establishment of priorities and quantification of each element's relative importance. This results in numerical weights for each criterion, enabling a comparative evaluation of different decision alternatives. Its versatility makes AHP widely applicable in diverse fields such as business strategy, resource allocation, and policy formulation, providing a robust structure for complex decision-making processes.

In AHP and Quantitative Analysis, rating criteria and sub-criteria are crucial. In AHP, this involves pairwise comparisons using a scale of 1 to 9, where each rating level—from equal importance (1) to very strong or demonstrated importance (9)—indicates the relative importance of elements. These ratings are used to calculate weights and priorities, forming the basis of the final decision-making process. This structured approach ensures decisions are made based on a comprehensive evaluation of all relevant factors, blending objective data with subjective judgments. In contrast, Quantitative Analysis might assign values based on statistical data or measurement scales, focusing on objective data collection and analysis. The combination of AHP's

structured approach to breaking down complex decisions and Quantitative Analysis's emphasis on objective data evaluation makes them invaluable for thorough evaluation and informed decision-making in their respective areas. They provide robust frameworks for decision-making, balancing both subjective judgment and objective data, thereby enhancing the effectiveness and reliability of the decision-making process.
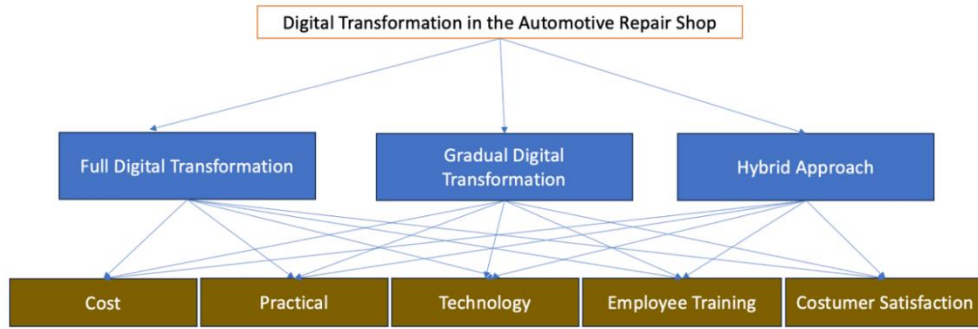

Figure 2. AHP Hierarchy

FINDINGS AND DISCUSSION
Decision Hierarchy Result

Table 1. Decision Hierarchy

Decision Hierarchy			
Level 0	Level 1	Level 2	Glb Prio.
Digital Transformation	Cost 0.165	Initial Investment 0.113	1.9%
		Ongoing Expense 0.367	6.0%
		Return on Investment 0.298	4.9%
		Cost Benefit Analysis 0.222	3.7%
	Practical 0.195	Usability 0.167	3.3%
		Integration with Existing Processes 0.327	6.4%
		Accessibility 0.312	6.1%
		Flexibility 0.194	3.8%
	Technology 0.141	Compatibility 0.237	3.3%
		Scalability 0.268	3.8%

Decision Hierarchy

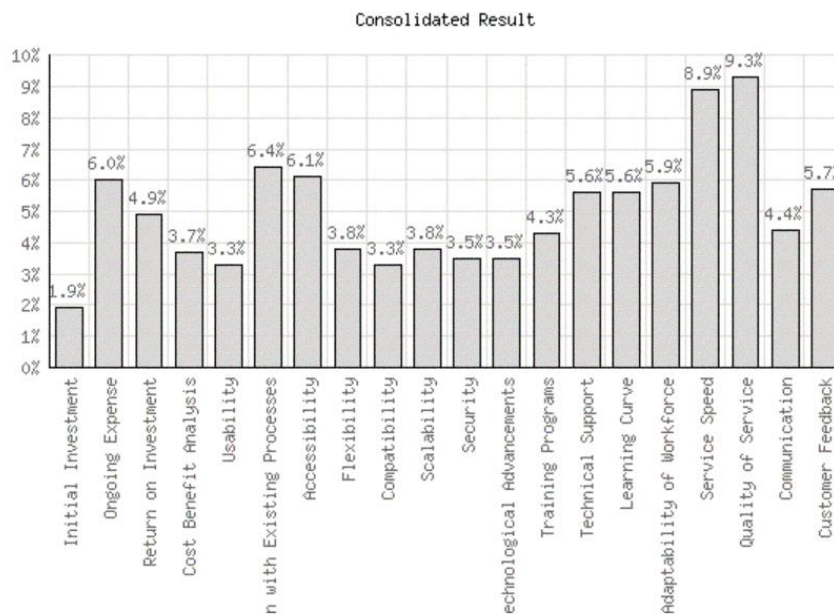|		
	Security 0.247	3.5%
	Technological Advancements 0.248	3.5%
Employee Training 0.215	Training Programs 0.201	4.3%
	Technical Support 0.262	5.6%
	Learning Curve 0.263	5.6%
	Adaptability of Workforce 0.274	5.9%
Customer Satisfaction 0.284	Service Speed 0.314	8.9%
	Quality of Service 0.329	9.3%
	Communication 0.156	4.4%
	Customer Feedback 0.201	5.7%
		1.0

Figure 3. Consolidate result decision hierarchy

The 'Global Priority' values in the decision-making diagram are essential in assessing the overall significance of each factor within the digital transformation process of automotive repair shops. These values result from a calculated product of the weights assigned at 'Level 1' and those

within 'Level 2', effectively capturing the importance of both the general category and the specific factor under it. In the 'Cost' category, the 'Ongoing Expense' factor holds a significant global priority percentage, highlighting the importance of recurring costs post-implementation in the digital transformation journey. In contrast, 'Initial Investment' shows a comparatively lower global priority, indicating it's a less pressing concern in the long-term scope of digital adaptation.

The 'Practical' category underscores factors such as 'Integration with Existing Processes' with a notable global priority percentage. This stresses the importance of compatibility between new digital solutions and existing operational processes in the shop, which is key for a smooth digital transition and maintaining operational continuity. In the realm of 'Customer Satisfaction', which carries the highest weight at 'Level 1', factors like 'Quality of Service' and 'Service Speed' stand out with high global priorities. This emphasis points to the critical role of end-user experience in determining the success of digital initiatives, with improvements in service quality and speed being central to customer satisfaction.

The segment on 'Employee Training' emphasizes the value of effectively preparing the workforce for the digital shift, with factors like 'Learning Curve' and 'Adaptability of Workforce' receiving significant global priority values. This underlines the importance of a skilled, adaptable workforce, proficient in managing and operating new digital systems. These 'Global Priority' values act as strategic indicators, guiding automotive repair shops in prioritizing their efforts and resources for an effective digital transformation strategy. Shops can ensure a more efficient, customer-centric, and technologically advanced operational framework by focusing on these key areas.

Alternative Result

Table 2. Alternative hierarchy

Decision Hierarchy

Level 0	Level 1	Level 2	Glb Prio.	Fully Digital Transformation	Gradual Digital Transformation	Hybrid Approach
Digital Transformation	Cost 0.200	Initial Investment 0.250	5.0%	0.333	0.333	0.333
		Ongoing Expense 0.250	5.0%	0.333	0.333	0.333
		Return on Investment 0.250	5.0%	0.779	0.180	0.042
		Cost Benefit Analysis 0.250	5.0%	0.779	0.180	0.042
	Practical	Usability 0.250	5.0%	0.333	0.333	0.333

Decision Hierarchy

0.200	Integration with Existing Processes 0.250	5.0%	0.720	0.209	0.071
	Accessibility 0.250	5.0%	0.333	0.333	0.333
	Flexibility 0.250	5.0%	0.333	0.333	0.333
Technology 0.200	Compatibility 0.250	5.0%	0.333	0.333	0.333
	Scalability 0.250	5.0%	0.333	0.333	0.333
	Security 0.250	5.0%	0.333	0.333	0.333
	Technological Advancements 0.250	5.0%	0.333	0.333	0.333
Employee Training 0.200	Training Programs 0.250	5.0%	0.584	0.281	0.135
	Technical Support 0.250	5.0%	0.779	0.180	0.042
	Learning Curve 0.250	5.0%	0.575	0.304	0.121
	Adaptability of Workforce 0.250	5.0%	0.584	0.281	0.135
Customer Satisfaction 0.200	Service Speed 0.250	5.0%	0.333	0.333	0.333
	Quality of Service 0.250	5.0%	0.333	0.333	0.333
	Communication 0.250	5.0%	0.715	0.218	0.067
	Customer Feedback 0.250	5.0%	0.333	0.333	0.333
		1.0	**47.6%**	**29.2%**	**23.3%**

In the realm of digital transformation strategies, three distinct methodologies emerge: Fully Digital Transformation, Gradual Digital Transformation, and the Hybrid Approach. Each presents a unique method and pace for integrating digital technologies into organizational processes,

reflecting diverse preferences and operational needs.

The Fully Digital Transformation approach, preferred by 47.6% of respondents, represents a complete and immediate shift to digital methods. This approach is characterized by a strong focus on 'Return on Investment' and 'Cost Benefit Analysis', highlighting expectations of substantial financial and efficiency gains from a swift and comprehensive transition to digital. It is ideally suited for organizations ready to embrace radical changes quickly, aiming to fully leverage digital technologies to transform their operations and business models. The key advantages of this approach include a high potential for return on investment and a strategic focus on cost-benefit analysis, ensuring decisions are financially sound. However, challenges in service speed, service quality, and compatibility with existing systems may arise, necessitating careful planning to overcome these hurdles.

Conversely, the Gradual Digital Transformation approach, favoured by 29.2%, advocates for a step-by-step transition. This strategy aims to minimize operational disruption by emphasizing 'Integration with Existing Processes' and 'Technical Support'. It allows a controlled integration of new technologies, ensuring stability and gradual adaptation. This approach appeals to organizations that are cautious about rapid changes or complex legacy systems that need careful integration. The gradual approach's advantages include manageable initial investment and ongoing expenses, along with a focus on usability. However, it may lead to delayed financial benefits and challenges in technical support.

The least favoured yet significant strategy, the Hybrid Approach, preferred by 23.3%, combines elements of both fully digital and gradual transformations. This approach is advantageous regarding initial investment and ongoing expenses, suggesting manageable costs. It also emphasizes usability, catering to specific organizational needs. However, the hybrid model may delay financial returns and face challenges in technical support and communication, given the complexity of managing diverse systems.

These three approaches offer varied perspectives on managing change, risk, and opportunity in digital transformation. The choice depends on the organization's specific context, including industry, size, culture, existing technology, and strategic goals. Each approach has unique advantages and challenges, making it crucial for organizations to carefully evaluate their needs and capabilities before deciding on the most suitable digital transformation strategy.

Previous studies, such as those by AlNuaimi et al. (2022) and Vial (2019), have highlighted the importance of aligning digital transformation strategies with organizational needs and capabilities. The Hybrid Approach, while being the least favoured with a preference of 23.3%, reflects this alignment by offering a balanced strategy that can be tailored to specific organizational contexts. This approach's focus on manageable initial investments and ongoing expenses aligns with findings by Oliveira and Johanson (2021), who emphasized the importance of cost considerations in technology adoption decisions. Additionally, the emphasis on usability echoes the user-centric focus advocated in the technology acceptance models by Venkatesh et al. (2003), highlighting the role of perceived ease of use in successful technology adoption.

However, as noted in the research, the hybrid model may encounter delays in realizing financial returns and technical support and communication challenges. This observation is consistent with the work of Delone and McLean (2003), who identified system quality and user satisfaction as critical factors in the success of information systems. The complexity of managing diverse systems in a hybrid approach can impact these factors, as suggested by Adebiyi et al. (2012), who discussed the challenges of integration and compatibility in mixed technology environments.

The broader implication of these three approaches—Fully Digital, Gradual, and Hybrid— illustrates the need for a nuanced understanding of change management in digital transformation,

as AlNuaimi et al. (2022) argue. The choice of strategy should be influenced by the organization's industry, size, culture, existing technology, and strategic goals, a concept supported by the contingency theory in organizational studies (Donaldson, 2001). This perspective is essential in acknowledging that there is no one-size-fits-all strategy for digital transformation, as also noted by Firican (2023) and Satpathy et al. (2020) in their study on IT implementation success.

CONCLUSION

The exploration of digital transformation strategies reveals a landscape marked by diversity and complexity, where Fully Digital Transformation, Gradual Digital Transformation, and the Hybrid Approach each present distinct pathways for integrating digital technologies into organizational processes. These methodologies, embodying varying paces and methods of digital integration, cater to different organisations' diverse operational needs and preferences.

The Fully Digital Transformation approach, preferred by many respondents, underscores the eagerness for a complete and rapid shift to digital solutions. Emphasizing immediate financial and efficiency gains, this approach is well-suited for organizations prepared for swift and radical changes, aiming to harness the full capabilities of digital technology. However, it brings challenges like service speed and quality, and system compatibility, requiring strategic planning for successful implementation.

In contrast, the Gradual Digital Transformation approach, with its emphasis on integration and technical support, advocates for a more incremental adoption of digital technology. This method, appealing to those wary of abrupt changes, focuses on minimizing disruption and ensuring a stable transition, highlighting manageable investments and focusing on usability. Nonetheless, this strategy may also lead to delays in realizing financial benefits and technical support challenges.

The Hybrid Approach, while less favoured, offers a balanced strategy that blends elements of both full and gradual transformations. This approach provides manageable costs and emphasizes usability but may encounter delays in financial returns and technical support and communication difficulties. The complexity of managing a mix of traditional and digital systems poses unique challenges in this model.

These diverse strategies underscore the necessity for organizations to tailor their digital transformation journey according to their specific context, including industry, size, culture, existing technology, and strategic objectives. Previous studies reinforce this notion, highlighting the importance of aligning digital transformation strategies with organizational capabilities and the need for a nuanced approach to change management. In conclusion, the digital transformation landscape is not one-size-fits-all; it requires a careful evaluation of organizational needs, capabilities, and contextual factors. The choice of strategy—be it fully digital, gradual, or hybrid—must be informed by an understanding of each approach's unique advantages and challenges, ensuring that the selected path aligns with the organization's overarching goals and operational realities. This strategic alignment is key to navigating the complexities of digital transformation and successfully leveraging technology to enhance organizational performance and competitiveness.

LIMITATION AND FURTHER RESEARCH

While shedding light on the diverse approaches organizations can take, this study's exploration of digital transformation strategies comes with inherent limitations that future research should address. The reliance on self-reported data may introduce biases, and the categorization into Fully Digital, Gradual, and Hybrid approaches could oversimplify the complex spectrum of strategies in the real world. The applicability of findings is also limited by the specific contexts of the surveyed organizations, such as their industry, size, and geographical location,

which may not represent all organizations. Furthermore, the fast-paced evolution of digital technologies suggests that the study's conclusions could quickly become outdated, necessitating ongoing research to stay relevant.

Future studies should consider longitudinal approaches to understand the evolution of digital transformation efforts over time and their long-term impacts. Expanding research to encompass a wider variety of industries, organizational sizes, and regions would help to generalize findings more broadly. In-depth case studies could provide nuanced insights into digital transformation initiatives' practical challenges and successes, highlighting the importance of organizational culture, leadership, and employee engagement. Additionally, investigating the role of emerging technologies like artificial intelligence, blockchain, and the Internet of Things could offer forward-looking perspectives on leveraging these advancements for digital transformation. Lastly, focusing on change management and organizational culture's impact on digital transformation success could yield critical insights, underlining the significance of aligning technological initiatives with human and process factors. Such comprehensive future research would enrich the understanding of digital transformation, offering valuable guidance for organizations navigating this complex but crucial domain.

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