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Formulating the performance improvement strategy for Indonesian higher education in the digital era

LINDA MAULIANI PURNAMASARI[1*], VANESSA GAFFAR[2], LILI ADI WIBOWO[3], AND PUSPO DEWI DIRGANTARI[4]

Abstract

This study aims to formulate a performance improvement strategy for Indonesian higher education institutions in the digital era. A qualitative approach, using in-depth interviews with 10 purposively selected higher education management experts, was employed. Participants were chosen based on their expertise and experience in autonomous public universities. Data were collected over 81 days via online interviews and analyzed using six-stage thematic analysis.
The findings identify three strategic stages. First, institutions should develop digital capability (DC) and organizational agility (OA) as foundational capacities. Second, DC and OA act as key enablers of the digital transformation strategy (DTS). Third, DTS can be strengthened by focusing on electronic customer relationship management (E-CRM) to deliver data-driven, personalized services. This study proposes a structured framework for digital transformation in higher education. However, the findings are limited to expert perspectives and require further validation through broader, longitudinal studies.

Keywords

Digital capability, digital transformation strategy, E-CRM, higher education performance, organizational agility

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[1]Universitas Pendidikan Indonesia, Bandung, Indonesia, Corresponding author: lindamauliani@upi.edu
[2,3,4] Universitas Pendidikan Indonesia, Bandung, Indonesia

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Introduction

The development of digital technology over the past two decades has progressed not merely at a rapid pace, but at an exponential one (Abdallah & Alriyami, 2022). Cloud computing, artificial intelligence, learning analytics, collaborative platforms, and increasingly integrated data ecosystems have fundamentally reshaped how organizations design services, manage resources, and create value (Abonamah et al., 2021; Ågerfalk, 2020; AlGhamdi, 2022). Higher education institutions lie at the very heart of this transformation, as their core missions in education, research, and community engagement depend heavily on knowledge production, information management, and large-scale human interaction (Barnard et al., 2022). At the same time, stakeholder expectations have evolved substantially: students increasingly demand responsive and personalized academic services; faculty require robust technological support to enhance teaching and research (Gašević et al., 2023); industry seeks digitally adaptive graduates (Al-Momani et al., 2023); and society expects universities to function as data-driven hubs of innovation and problem-solving (Abo-Khalil, 2024). These dynamics have compelled universities worldwide to pursue adaptive and transformative pathways, not by merely adding technology as a supplement, but by repositioning it as a foundational element of governance, organizational culture, and academic processes (Akour & Alenezi, 2022; Maphosa & Maphosa, 2023).

However, the digitalization of higher education has never been a matter of simply "adopting applications." Digital transformation entails systemic change: reconfiguring academic business processes, strengthening digital literacy across the academic community, integrating data across organizational units, ensuring cybersecurity, and establishing policies that ensure technology serves educational goals rather than the other way around. In many contexts, digitalization also raises deeply humanistic questions: how to ensure inclusive access, safeguard academic integrity (Rangel-de Lázaro et al., 2023), protect privacy, and prevent technology from widening existing inequalities. Consequently, digital transformation in higher education must be understood as a socio-organizational endeavor rather than a purely technical project. It requires leadership, strategic direction, and the capability to manage change—an inherently complex and often non-linear undertaking (Al-Filali et al., 2023; Al-thani et al., 2014).

In developing countries, this complexity is further compounded by resource constraints and infrastructural disparities. Universities in such contexts, including those in Indonesia, particularly outside major growth centers, pursue digitalization amid significant challenges: limited funding, uneven ICT capacity across institutions, variable network quality, and dependence on technological solutions that are not always aligned with local needs (Aprilia et al., 2022; Gaus & Hall, 2016). Heavy administrative and regulatory burdens often drain organizational energy, causing digital transformation efforts to devolve into fragmented, short-term initiatives. Yet universities are simultaneously pressured to move quickly, as higher education competition becomes increasingly open and learning models shift towards hybrid, flexible, and platform-based formats. Within this context, digital transformation frequently appears paradoxical (Abdullah, 2017; Abo-Khalil, 2024; Akour & Alenezi, 2022): the urgency to change intensifies, while the capacity to do so remains uneven.

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At the constitutional policy level, the Indonesian government, through the Ministry of Higher Education, Science, and Technology (Kemdiktisaintek), has consistently promoted the digital transformation of higher education (Aprilia et al., 2022; Gaus & Hall, 2016). This commitment is reflected in initiatives to modernize governance, strengthen digital learning ecosystems, leverage data for decision-making, and improve the quality of academic and student services. Such policy directions position digitalization as a strategic lever for enhancing quality, efficiency, accountability, and institutional competitiveness (Mohamed Hashim et al., 2022). Nevertheless, implementation outcomes have often fallen short of expectations. In many institutions, digitalization remains at a stage of partial adoption: information systems are poorly integrated, data are inconsistent, digital services are insufficiently user-oriented, and digital learning innovation depends more on individual initiatives than on established institutional policies.

This significant disparity between ambitions and actual results indicates a pressing concern for the academic community. When policy mandates acceleration while institutions face strategic uncertainty and capacity gaps, fundamental questions emerge: what truly impedes transformation? Are the obstacles rooted in infrastructure, human resource capabilities, leadership, organizational culture, governance, or strategic design that fail to reflect the characteristics of Indonesian universities? This divide between what is envisioned and what is operationally feasible has stimulated scholarly interest in moving beyond surface-level diagnosis to the formulation of viable solutions (Alenezi et al., 2023; Fumasoli & Hladchenko, 2023; Msomi, 2024). In this regard, research serves as a bridge, connecting policy aspirations with institutional realities.

Preliminary field findings underscore this urgency. Interviews with seven university leaders revealed a prevailing sense of pessimism. While they did not reject digitalization, many acknowledged it as inevitable; they questioned how to translate it into a strategic, coherent, and realistic course of action. Digitalization in higher education, they argued, is frequently articulated as a policy slogan without being accompanied by a transformative strategic model that offers practical guidance. The absence of such a model leaves universities operating amid uncertainty: digitalization plans often become technology procurement lists rather than roadmaps for change; human resource development is sporadic; system integration progresses slowly; and program sustainability is vulnerable to leadership turnover or shifting budget priorities. Moreover, leaders emphasized that strategies derived from "copying" practices of large, resource-rich institutions often prove ill-suited for universities with different sizes, governance structures, resource endowments, and social contexts.

These conditions highlight that the most pressing need lies not in technology itself, but in a context-sensitive transformation strategy. One that articulates stages of change, establishes priorities, aligns internal policies, and incrementally and measurably builds organizational capacity. Accordingly, this study is grounded in the recognition that digital transformation in higher education should be understood as a comprehensive process of institutional performance enhancement, encompassing academic quality, service delivery, governance, and competitiveness in the digital era. The study, therefore, aims to formulate a strategy to improve the performance of Indonesian higher education institutions that accounts for both resource constraints and the increasing demands for quality and accountability.

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To achieve this objective, the study is guided by the following research question: "What constitutes an effective strategy for enhancing the performance of higher education in the digital era?" This question calls for answers that go beyond generic recommendations towards an operationalizable strategic formulation: identifying key strategic components, sequencing transformation stages, clarifying critical actors and resources, and establishing mechanisms for systematically assessing transformation progress. By addressing this question, the study seeks to contribute to both practice and policy. In practice, it aims to support university leaders in making informed, strategic decisions about digital transformation. At the policy level, it offers stakeholders insights into designing more targeted and equitable support mechanisms. Ultimately, digital transformation in higher education is not merely about becoming "more modern" but about ensuring that universities remain human-centered, inclusive, and meaningful in fulfilling their mandate to shape the nation's future.

Methodology

Research design and participants

A qualitative approach employing the in-depth interview model was adopted in this study, as it aligns with the research objectives (Bourgeault et al., 2010; Braun & Clarke, 2023). Drawing on Bingham's (2023) framework for in-depth interviews, the research design was structured to develop a relevant strategy for enhancing the performance of Indonesian higher education institutions in the digital era, derived from the perspectives of purposively selected higher education management experts (Charli et al., 2022; Palys, 2008). The criteria for purposive sampling employed in this study are presented in Table 1.

Table 1. *The purposive sample criteria*

No	The Aspects of Participants	Inclusion Description	Exclusion Description
1	The academic qualification	Higher education management	Non-education studies
2	Duration of service as an academic	10 years or more	Less than 10 years
3	Area of expertise	Higher education management: planning, leadership, policy, and evaluation of educational institutions	Expertise in other areas
4	The home base of their institution	Indonesian higher education with "mandiri" categorized	Indonesian higher education with other categories
5	Scopus publication	10 publications or more	Less than 10 publications
6	Book publication	5 publications or more	Less than 5 publications
7	Involvement in the higher education digitalization program	3 moments or more	Less than 3

Initially, a search of Google Scholar and publicly accessible journal websites identified 21 potential participants who met the inclusion criteria. Subsequent validation excluded 11 candidates for failing to meet inclusion criterion 7. This process yielded a final sample of 10 participants, drawn from six leading public universities in Indonesia specializing in education and technology development. According to Bingham (2023) and Mpewe (2019), this sample size is adequate for qualitative research. Consistent with qualitative paradigms, sample determination prioritized the fulfillment of purposive criteria, defined by the researcher based on the relevance of participant expertise to the study's objectives, over numerical quantity.

Instrument and data compilation

The semi-structured interview protocol was developed based on key performance indicators for higher education institutions (Bashir et al., 2023; Gaus & Hall, 2016) and digitalization benchmarks (Akour & Alenezi, 2022). It was rigorously reviewed and refined by the research team to ensure instrument reliability. Once finalized, the protocol served as an initial guide to initiate interviews, followed by probing questions for deeper exploration (Bingham & Witkowsky, 2021). Participant responses were not merely documented passively; instead, they were actively probed with follow-up questions to investigate underlying thought processes.

Rather than accepting expert opinions at face value, participants were challenged to substantiate their views with empirical evidence or robust theoretical grounding, ensuring the collected data were rigorously vetted and substantive. This approach yielded high-quality insights grounded in evidence, rather than unsubstantiated discourse from authoritative sources. Such techniques align with Bingham's (2023) assertion that, in qualitative research, while data collection instruments exist, the researcher serves as the primary instrument. In this study, this role was enacted through critical selectivity, dialogic engagement, and even constructive debate to refine the data. All in-depth interviews were conducted online via Google Meet, sequentially with each participant, until data saturation and sufficiency were achieved.

Data analysis

The in-depth interview data were analyzed using thematic analysis techniques, following the six-step protocol outlined by Ahmed et al. (2025) (1) familiarization with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. These stages were supported by NVivo version 12, a robust, validated software package for qualitative data analysis (Allsop et al., 2022; Edwards-Jones, 2014).

In the first stage (familiarization with the data), the researchers immersed themselves in the raw dataset, comprising verbatim interview transcripts, policy documents on higher education digitalization, and supplementary field notes. Multiple iterative readings generated initial memos and reflective annotations to build an early interpretive understanding. During the second stage (generating initial codes), salient features across the dataset were systematically coded, with each code encapsulating a concise summary of meaningful data segments. NVivo

was employed here to streamline coding and organization. The third stage (searching for themes) involved collating codes into potential themes, followed by exploratory analysis to identify patterns and linkages to the research questions.

The fourth stage (reviewing themes) entailed rigorous evaluation of theme coherence, alignment with the research objectives, and evidential support from the raw data. Themes were refined through iterative cross-checking, leading to mergers, splits, or eliminations when analytic distinctiveness was lacking. In the fifth stage (defining and naming themes), each theme's essence was distilled, yielding clear definitions and succinct labels that sharpened conceptual precision and transparency. The sixth stage (producing the report) synthesized findings into a cohesive narrative, integrating thematic descriptions, illustrative excerpts, and interpretive discussion within the extant literature. Data compilation and analysis proceeded iteratively and integrally, rather than sequentially, to achieve theoretical saturation, a hallmark of qualitative rigor. Iterative compilation ensured comprehensive data coverage until no new insights emerged. The entire process spanned 81 days, from August 11 to October 31, 2025.

Ethical consideration

Ethical standards in research were meticulously upheld throughout all phases of this study, in accordance with prevailing institutional and international guidelines (Bredal et al., 2024). Participants were selected not only on the basis of the purposive criteria outlined in Table 1 but also by securing their informed consent and ensuring their involvement was entirely voluntary and revocable at any stage (Belina, 2023; Bingham & Witkowsky, 2021). Interviews were scheduled and conducted exclusively at mutually agreed-upon times between the researchers and participants, respecting participants' availability and preferences to minimize any potential coercion or inconvenience.

To safeguard participant anonymity, a cornerstone of ethical qualitative inquiry, pseudonyms were systematically assigned, replacing real names with neutral codes such as "P1" for the first participant, "P2" for the second, and continuing sequentially to "P10." This anonymization extended beyond individuals to the institutions they represented (Madrah et al., 2024). When participants referenced specific universities as exemplary or cautionary cases during discussions, these were deliberately obscured (e.g., denoted as "University A" or "Institution X") to prevent undue prestige attribution to positively cited institutions or stigmatization of those critiqued. Such measures were particularly salient given the discourse's comparative nature, in which Indonesian HEIs were frequently invoked for benchmarking. This approach not only protected institutional reputations but also fostered candid responses by alleviating concerns over reprisal or public judgment. Additional ethical safeguards included secure data storage on password-protected servers compliant with data protection regulations, transcription processes that excluded identifiable metadata, and post-interview debriefings to confirm participant comfort. No incentives were offered that might compromise voluntariness, and participants were briefed on their right to review transcripts or withdraw from the study at any time before analysis.

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Findings

Based on in-depth interviews with ten experts in higher education management from six leading public universities in Indonesia, renowned for excellence in education and technological development, a strong and evidence-based consensus emerged that strategies to enhance university performance in the digital era must strategically position Digital Capability (DC) and Organizational Agility (OA) as core institutional capital. These two pillars are not merely technical enablers; rather, they constitute essential foundations that allow digital transformation strategy (DTS) to be operationalized effectively and sustainably. Furthermore, this strategy prioritizes a radical transition from conventional Customer Relationship Management (CRM), which relies heavily on face-to-face interactions and manual processes, toward Electronic Customer Relationship Management (E-CRM) grounded in advanced data analytics. This approach is highly aligned with the Industry 5.0 paradigm, which integrates artificial intelligence with a human-centered ethos, and with Indonesia's high internet penetration.

The findings portray digital transformation not as a cold, technology-driven project, but as a fundamentally human-centered process that fosters organizational resilience, empowers the academic community, and enhances institutional responsiveness to stakeholder needs amid inevitable global disruption. The experts, purposively selected for their extensive experience in leading digital transformation initiatives, concurred that this strategy should be implemented in three sequential, interrelated stages, progressing from foundational capability development to the execution of core, customer-oriented programs. The following descriptive narrative articulates each stage clearly and concisely, supported by direct quotations from participants that reflect a diversity of perspectives, ranging from practical analogies to theoretically grounded arguments. However, the experts converge on a shared central premise. These quotations not only strengthen the credibility of the findings but also give voice to the experts, transforming this report from an abstract analytical account into a living dialogue on the future of higher education in Indonesia.

First Stage: Developing digital capability and organizational agility as the foundation

The first step is crucial: developing Digital Capability (DC) and Organizational Agility (OA). Digital capability encompasses the institution's capacity in data literacy, robust ICT infrastructure, predictive analytics skills, and process innovation enabled by cloud computing and artificial intelligence. Organizational agility, in turn, involves structural flexibility through cross-functional teams, an innovation-oriented culture, adaptive leadership, and rapid decision-making mechanisms. The experts consistently regarded this step as an absolute prerequisite, as their preliminary assessments revealed that approximately 70% of digital transformation failures in Indonesian higher education institutions stem from weak foundations, such as reliance on legacy systems and deep-rooted cultural resistance to change. In practical terms, implementation at this foundational stage involves annual capability audits, large-scale training programs for faculty and staff (comprising at least 40 hours per semester),

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organizational restructuring towards agile models (e.g., scrum teams for digital projects), and strategic partnerships with edtech providers to facilitate knowledge transfer. Without such a foundation, digitalization efforts risk becoming sunk investments that not only fail to deliver value but also exacerbate domestic digital divides.
One expert articulated this insight through a sharp global benchmarking analogy:

> "Many universities dream of digital transformation without having clear capabilities. Institutions must first build and strengthen their capital, namely, digital capability (DC) and organizational agility (OA). Only with these in place can digital transformation truly take place in universities. If we look at leading universities in the United States, the United Kingdom, or Australia, they all meet these two requirements before embarking on digital transformation" (Interviewee P5, August 15, 2025).

Supporting perspectives emphasized practical and metaphorical dimensions:

> "Indonesian universities must start from the ground up: build DC through massive training for faculty and staff in AI and cloud computing, while simultaneously enhancing OA through agile, cross-unit teams. Without such preparation, digital budgets merely become wasteful spending on gadgets with no tangible outcomes" (Interviewee P2, August 20, 2025).

> "Do not jump into a digital transformation strategy before DC and OA are solid. It is like building a house without a foundation—it may look impressive on the surface, but it will collapse when the storm of disruption arrives, whether in the form of a pandemic or the next AI boom" (Interviewee P8, September 5, 2025).

Second Stage: Use DC and OA as the main support for the digital transformation strategy

The second step reinforces the roles of Digital Capability (DC) and Organizational Agility (OA) as the operational pillars of a comprehensive digital transformation strategy (DTS). This stage encompasses the end-to-end integration of academic information systems (such as learning management systems seamlessly integrated with enterprise resource planning platforms), the development of hybrid learning supported by virtual and augmented reality technologies, big data analytics for real-time performance monitoring, and enterprise-grade cybersecurity. The experts strongly emphasized that without these two pillars, DTS is likely to become fragmented—a pattern observed in many institutions in the post-pandemic period, where e-learning initiatives stagnated due to insufficient organizational agility.
The implementation roadmap at this stage includes baseline assessments to measure the maturity levels of DC and OA using established frameworks such as the Digital Maturity Model, small-scale pilot projects (for example, a digital KPI dashboard implemented within a single faculty), gradual scaling accompanied by return-on-investment (ROI) tracking, and periodic evaluations based on key performance indicators. These indicators include platform adoption rates (targeting above 85%), administrative efficiency gains (a 30% reduction in

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processing time), and growth in digital research innovation (a 20% increase in AI-based patents). This conviction is clearly reflected in expert statements highlighting the risks of failure:

> "DC and OA are not optional; they are the foundations of DTS. Without digital capability, transformation strategies remain merely policy rhetoric; without organizational agility, universities become trapped in rigid, outdated bureaucracies" (Interviewee P3, August 25, 2025).

> "DTS will fail if DC is weak; just look at how many of our universities are stuck with partial e-learning because faculty members are not agile enough to adapt to new tools. From the outset, these two forms of capital must serve as the foundation of the strategy."

And,

> "Imagine DTS as a car engine: DC supplies the fuel of cutting-edge technology, while OA acts as the agile transmission that navigates the curves of change. Remove either one, and our universities lose stability on the highly competitive digital highway" (Interviewee P1, August 18, 2025).

Third Stage: Focusing DTS on Program Electronic Customer Relationship Management

The third step consolidates the digital transformation strategy (DTS) by prioritizing Electronic Customer Relationship Management (E-CRM). This approach leverages machine learning to enable personalized student services, such as predictive retention analytics, enhanced alum engagement through AI-driven networking portals, and strengthened industry collaboration via dynamic partnership dashboards. In Indonesia, where more than 200 million internet users and a predominantly Millennial and Generation Z student population shape higher education demand, E-CRM aligns seamlessly with the Industry 5.0 paradigm, combining intelligent automation with human-centered empathy to deliver superior customer experiences.

Implementation at this stage includes migrating legacy CRM data to cloud-based E-CRM platforms (such as locally adapted solutions for Salesforce Education Cloud), omnichannel integration across mobile applications, chatbots, and social media, user-centric design training for academic and administrative staff, and the establishment of success metrics such as a Net Promoter Score above 70 and a churn rate below 10%. The experts emphasized the local relevance of this strategy with strong visionary enthusiasm:

> "Center DTS on E-CRM. With Indonesia's high internet penetration, universities must shift from manual CRM to digital platforms that track the student journey in real time. This is the essence of Industry 5.0: data-driven personalization rather than generic one-size-fits-all services" (Interviewee P4, September 2, 2025).

> "E-CRM is the sweet spot of DTS in our context. Millennial students demand fast and personalized digital services. Integrating DC and OA into electronic CRM enables early

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> dropout prediction, enhances satisfaction, and builds lifelong loyalty" (Interviewee P9, October 20, 2025).

And,

> "In the digital era, manual CRM is obsolete; E-CRM will revitalize universities through data-driven relationship management. It must be prioritized within DTS, or we risk losing competitiveness to global edtech platforms such as Coursera that are already far ahead" (Interviewee P6, October 10, 2025).

> On the other hand, P10 says, "Without E-CRM at the core of DTS, digital transformation becomes futile; students will migrate to other platforms that are more agile and responsive in serving their needs in this hyperconnected world" (Interviewee P10, October 28, 2025).

This three-step strategy is not a rigid prescription but a dynamic, human-centered framework that positions universities as adaptive, inclusive, and future-oriented living institutions. With digital capability and organizational agility as core institutional capital, an E-CRM–centered DTS can generate holistic performance outcomes: enhanced educational quality through personalized learning, operational efficiency via intelligent automation, stronger student and alumni retention, and broader social impact through digitally enabled collaboration. These findings do not represent an endpoint, but rather a call to action for university leaders, policymakers, and stakeholders to implement this strategy collaboratively. Transforming the challenges of the digital era into opportunities for sustained competitive advantage in Indonesian higher education. Beneath the data and quotations lies an optimistic tone: our universities are capable, provided they begin with the right foundations and a genuine readiness to change.

Discussion

The findings of this study make a strong conceptual and practical contribution to the discourse on digital transformation in higher education, particularly in developing countries with high internet penetration, such as Indonesia. Drawing on in-depth interviews with ten experts in higher education management from six leading public universities, this study reveals a profound consensus that enhancing university performance in the digital era cannot be achieved through partial or reactive technology adoption. Instead, sustainable institutional performance requires strategically positioning Digital Capability (DC) and Organizational Agility (OA) as core institutional capital, serving as the foundational pillar of digital transformation. Please look at Figure 1.

The experts emphasized that Digital Capability (DC) and organizational Agility (OA) should not be understood merely as technical or operational capabilities. Digital capability reflects an institution's capacity to meaningfully integrate digital technologies, data analytics, and artificial intelligence into its core academic and non-academic processes. Organizational agility, meanwhile, represents the organization's ability to rapidly and adaptively engage in sensing, decision-making, and responding to changes in the external environment, including shifts in student expectations, regulatory dynamics, and developments in digital technology.

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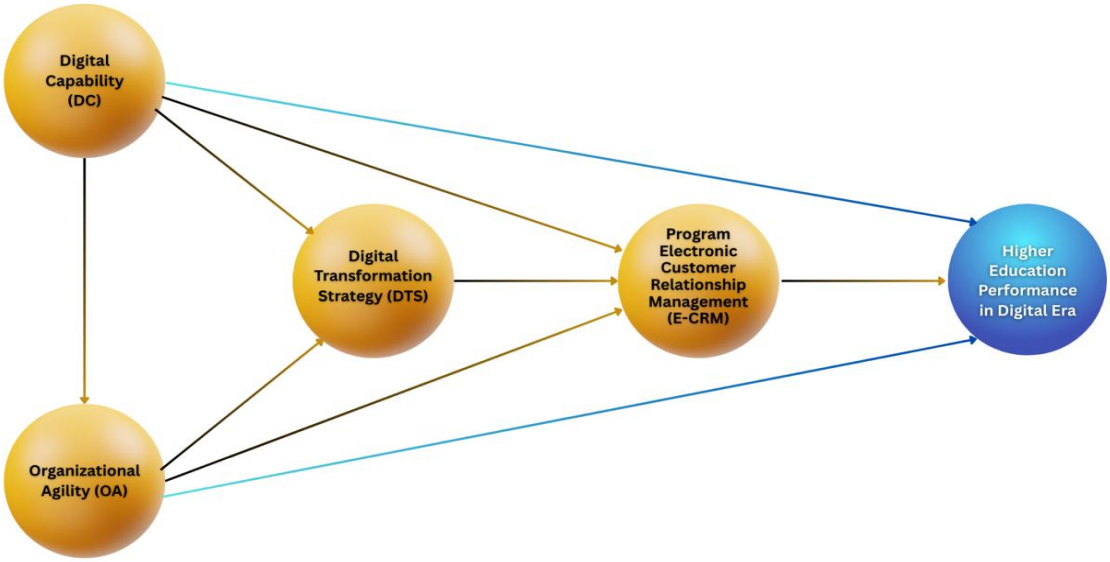
The combination of these two capabilities forms a foundational platform that enables universities to avoid the trap of shallow, technology-driven transformation.

These findings are conceptually aligned with the study by Khin and Ho (2019), which demonstrates that digital capability does not directly enhance organizational performance but operates through a mediating mechanism in the form of digital innovation. In the context of higher education, the present study extends this insight by positioning DC and OA as strategic prerequisites for the effective operationalization of digital transformation strategy (DTS). In other words, without a mature foundation of DC and OA, digital transformation strategies risk devolving into technology projects with limited or insignificant performance impact.

Figure 1. *A strategic model for improving the performance of Indonesian higher education institutions relevant in the digital era*



Furthermore, the experts proposed a staged strategic model consisting of three interrelated steps. The first step is to build DC and OA as foundational institutional capabilities. The second step entails leveraging DC and OA as the primary enablers formulating and implementing the digital transformation strategy. The third step centers DTS on a core, customer-oriented program, namely Electronic Customer Relationship Management (E-CRM). This staged model underscores that successful digital transformation must progress from capability building to strategic execution and ultimately culminate in the creation of tangible value for key stakeholders, particularly students.

This approach aligns closely with Tallon et al. (2019), who emphasize that the strategic value of information technology is mediated by organizational agility. However, the present study advances beyond the framework proposed by Tallon et al. (2019) by explicitly linking organizational agility and digital capability to the design of a customer-oriented digital transformation strategy within the context of higher education. Accordingly, this study not

only explains *how* IT creates value, but also clarifies *where* and *through which strategic mechanisms* value is realized.

The emphasis on transitioning from conventional CRM to data analytics– and AI-driven E-CRM represents one of the key contributions of this study. Unlike traditional CRM systems that rely heavily on face-to-face interactions and manual processes, E-CRM enables universities to build more personalized, predictive, and responsive relationships with students. This finding is consistent with Octavia et al. (2023), who demonstrate that successful educational CRM implementation has a positive impact on institutional performance. Nevertheless, the present study offers a distinct advantage by asserting that E-CRM cannot be implemented effectively without the strategic readiness provided by DC and OA as foundational capabilities.

Compared with Sablan et al. (2017), who focus on identifying the critical success factors of social CRM in higher education, this study makes a more integrative contribution. While Sablan et al. (2017) emphasize managerial, technological, and organizational culture factors, they do not explicitly link these elements to a staged, performance-oriented digital transformation framework. The present study bridges this gap by demonstrating how these factors are orchestrated through DC, OA, and DTS to generate sustainable performance outcomes.

This research is conceptually congruent with Khashab et al. (2022), who emphasise the significance of synchronising CRM strategy with institutional strategy. However, the present research goes further by positioning E-CRM as a strategic outcome of digital transformation rather than as its starting point. This approach avoids a common pitfall in CRM implementation, namely, excessive technology orientation that is insufficiently grounded in organizational capabilities.

Within the broader context of higher education transformation, the findings of this study reinforce the arguments advanced by Akour and Alenezi (2022) and Mohamed Hashim et al. (2022), who conceptualize digital transformation as a systemic and strategic shift. However, this study adds a novel dimension by directly linking digital transformation to data- and AI-driven relationship management, which is increasingly salient in the Industry 5.0 era. This perspective emphasizes a balance between artificial intelligence and human-centered values—an aspect that remains underexplored in the higher education literature.

The relevance of these findings is further strengthened when considered alongside Chaudhry et al. (2023), who show that generative AI technologies such as ChatGPT have disrupted traditional systems of academic evaluation and interaction. In this context, data analytics- and AI-enabled E-CRM functions not only serve as a marketing or student service tool but also as an ethically grounded, adaptive decision-support system for strategic management, which can enhance the alignment of educational practices with human-centered values and improve overall institutional effectiveness. Moreover, these findings are consistent with those of Alenezi et al. (2023), who emphasize the importance of institutional, faculty, and student readiness for the successful integration of digital education.

The novelty of research

From a theoretical perspective, this study makes a significant contribution by integrating the literature on digital capability, organizational agility, digital transformation, and E-CRM

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into a single, coherent strategic framework within the context of higher education. The study extends the dynamic capability perspective by demonstrating how Digital Capability (DC) and Organizational Agility (OA) function as strategic enablers of performance-oriented digital transformation. In doing so, it articulates a strategic model for enhancing the performance of higher education institutions in Indonesia that is aligned with the demands of the digital era, as illustrated in Figure 1. From a practical standpoint, these findings offer an actionable strategic guide for university leaders, particularly in Indonesia and other developing countries. The proposed three-step model provides a realistic, context-sensitive roadmap for improving institutional performance in the digital and Industry 5.0 eras. Accordingly, this study is not only academically relevant but also holds strong potential for meaningful policy and managerial impact.

Conclusion

This study demonstrates that improving the performance of higher education institutions in the digital era requires a shift away from fragmented, technology-driven initiatives toward a capability-based and human-centered transformation strategy. Based on in-depth interviews with 10 experts from 6 leading public universities in Indonesia, the findings reveal a strong consensus that Digital Capability (DC) and Organizational Agility (OA) constitute essential forms of core institutional capital. These capabilities function not merely as operational tools but as strategic foundations enabling the effective and sustainable implementation of the digital transformation strategy (DTS).

The study identifies a three-stage strategic model for digital transformation in higher education. The first stage focuses on building DC and OA as foundational capabilities. The second stage leverages these capabilities to support a holistic digital transformation strategy (DTS) that enhances student engagement, improves administrative efficiency, and fosters collaboration among faculty and staff. The third stage consolidates transformation outcomes by positioning Electronic Customer Relationship Management (E-CRM) as a core, customer-oriented program that enables personalized, data- and AI-driven engagement with students and other stakeholders.

A key strength of this research lies in its integration of theory and practice. The findings extend the dynamic capability perspective by clarifying how DC and OA act as strategic enablers of performance-oriented digital transformation rather than direct drivers of performance, illustrating their roles in enhancing organizational agility and responsiveness to market changes. Moreover, by positioning E-CRM as a strategic outcome of digital transformation, this study avoids technology-centric implementation and highlights the importance of organizational readiness and strategic alignment.

Overall, this research offers a coherent and actionable framework for higher education digital transformation that is highly relevant to developing-country contexts and aligned with the Industry 5.0 paradigm. By emphasizing the interplay between technological advancement and human-centered values, the study provides both theoretical advancement and practical guidance for achieving a sustainable competitive advantage in higher education. Future studies with a longitudinal approach are recommended.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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