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Guideline of Digital Platforms Creation for Creating a Competitive Opportunity in Industrial Business Section

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Abstract
Consumer behavior increasingly relies on technology to access products and services rapidly, giving rise to new forms of business innovation. Consequently, business organizations must adapt in a timely manner to ongoing changes. This study aimed to develop guidelines for building digital platforms to create competitive opportunities in the industrial business sector. A mixed-methods design was employed. The qualitative phase consisted of in-depth interviews with 9 experts and a focus-group discussion with 11 specialists. The quantitative phase used a questionnaire administered to 500 industrial firms that had successfully implemented digital platforms. Data were analyzed using descriptive statistics, inferential statistics, and multivariate techniques. The findings revealed four prioritized components: (1) Cooperation Network ($\overline{X}$ = 4.55, S.D. = 0.33), with the highest-rated item being executive support in fostering engagement, awareness, operational acceptance, and responsiveness to change; (2) Design and Development ($\overline{X}$ = 4.55, S.D. = 0.35), with the highest-rated item being the requirement for design and development testing, together with documented reports on digital platform accessibility and performance; (3) Data Analytics ($\overline{X}$ = 4.54), with the most important item being the establishment of systematic data-related policies and data governance; and (4) Digital Technology ($\overline{X}$ = 4.50), with the most important item being the development of a digital platform capable of integrating with business partners. The hypothesis-testing results showed no statistically significant difference at the 0.05 level between medium-sized and large-sized industrial firms in the importance they assigned to the guidelines for building digital platforms to create competitive opportunities. The structural equation model demonstrated excellent fit with the empirical data, with χ^2 probability = 0.081, χ^2/df = 1.128, GFI = 0.956, and RMSEA = 0.016.
Keywords: digital platforms, industrial business, competitive opportunity, technology

1. Introduction

Digital transformation has become a major driver of economic systems and business competition in the twenty-first century, especially in the industrial sector, where firms face pressure from costs, supply-chain volatility, rapidly changing customer demands, and continuous innovation-based competition. Digital platforms are therefore not merely technological tools; they are strategic infrastructures that connect stakeholders, data, processes, and services in an integrated manner (Gawer, 2020; Parker et al., 2021). In industrial business contexts, digital platforms support both internal operations and external linkages with partners, customers, government agencies, and ecosystem allies. Well-designed platforms with sound data management and secure interoperability can accelerate decision-making, reduce transaction costs, support innovation, and create opportunities for platform-based business models and ecosystem-based competition (Constantinides et al., 2018; Cenamor et al., 2022).

However, many industrial organizations still face important constraints, including fragmented technology investments, the absence of clear data-governance mechanisms, discontinuous data exchange across departments and organizations, and platform designs that do not align with real usage contexts. These limitations prevent digital investment from being fully converted into competitive advantage, even when organizations possess numerous tools and systems (Vial, 2021; Marzi et al., 2023).

In Thailand, the push toward a digital economy and smart industry requires business organizations to develop digital mechanisms that improve not only efficiency, but also data connectivity, ecosystem formation, and user experience. Without a holistic perspective, platform development risks becoming only a set of isolated IT projects that fail to create a tangible competitive impact.

Against this background, this article synthesizes the full five-chapter dissertation into a research paper that clarifies which components should constitute digital platform development for competitive opportunity creation in Thailand's industrial business sector, how those components are interrelated, and how organizations can apply them in practice to produce concrete competitive outcomes.

2. Research Objectives

2.1 To examine the structure and digital operating characteristics of industrial businesses.
2.2 To identify the components of guidelines for building digital platforms to create competitive opportunities in the industrial business sector.
2.3 To develop a structural equation model of guidelines for building digital platforms to create competitive opportunities in the industrial business sector.

3. Conceptual Framework and Literature Review

This study synthesizes concepts from digital platform theory, the resource-based view (RBV), dynamic capabilities theory, cooperation-network theory, and knowledge discovery from data. It argues that competitive advantage in industrial firms operating in the digital era is not derived from technology alone, but from the ability to integrate four interrelated dimensions into a coherent system: Digital Technology, Cooperation Network, Data Analytics, and Design and Development (Barney, 1991; Warner & Wäger, 2019; Fayyad et al., 1996).

Digital technology provides the infrastructural basis for connectivity, cloud systems, cybersecurity, and cross-platform operations. Cooperation networks reflect trust, executive involvement, cross-organizational coordination, and access to external resources. Data analytics transforms data into actionable insight for decision-making. Design and development translate business and user requirements into systems that are usable, adaptable, and capable of delivering positive user experiences (Brown, 2020; Mikalef et al., 2022; Zhou et al., 2022).

Contemporary literature on industrial platforms indicates that platform success does not result from any single component in isolation, but rather from managing the relationships among platform architecture, governance, system openness, and the organization's capacity for continual learning and adaptation. This study therefore emphasizes the development of an integrated framework that is more suitable for the context of Thai industrial businesses than the direct adoption of frameworks originally designed for consumer-platform contexts.

Accordingly, the conceptual framework proposes that industrial organizations capable of balancing and integrating these four dimensions will be better positioned to develop digital platforms that generate business value, agility, and sustainable competitive opportunities.

4. Research Methodology

The study employed a three-phase mixed-methods design: (1) a qualitative phase using in-depth interviews with 9 experts to identify key components and indicators; (2) a quantitative phase using questionnaires administered to 500 industrial organizations that had implemented digital platforms and maintained profits for three consecutive years; and (3) a focus-group discussion with 11 experts to validate the appropriateness of the proposed model.

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The quantitative population comprised 1,000 medium-sized and large-sized industrial enterprises operating through digital platforms. A sample of 500 organizations was selected through multistage sampling, equally divided into 250 medium-sized and 250 large-sized firms. The questionnaire consisted of four parts covering organizational profile, digital operating structure and characteristics, components of the digital platform development guidelines, and additional comments.Instrument quality was assessed through item-objective congruence (IOC), pilot testing with 30 respondents, discrimination analysis, and reliability testing using Cronbach's alpha before data collection. Data analysis included descriptive statistics, inferential statistics, t-tests, correlation analysis, and structural equation modeling (SEM) to develop the causal model.This research design allowed the study to move beyond the identification of indicators and to confirm the structural relationships among the components while validating model suitability using both qualitative and quantitative evidence.

5. Research Findings

All four components were rated at a high level, indicating that platform development in the industrial sector is inherently multidimensional. Cooperation Network (CN) and Design and Development (DD) were ranked as the most important components (mean = 4.55), followed by Data Analytics (DA) (mean = 4.54) and Digital Technology (DT) (mean = 4.50).

Table 1 Mean and Standard Deviation of the Four Components of the Guideline of Digital Platforms Creation for Creating a Competitive Opportunity in Industrial Business Section

Component	Mean	S.D. (reported where available)
Cooperation Network (CN)	4.55	0.33
Design and Development (DD)	4.55	0.35
Data Analytics (DA)	4.54	0.34
Digital Technology (DT)	4.50	0.34

SEM results indicated that the model fit the empirical data at an excellent level, with χ^2 probability = 0.081, χ^2/df = 1.128, GFI = 0.956, and RMSEA = 0.016. Taken together, these values indicate that the proposed capability system is highly consistent with the observed relationships among the empirical indicators.

Table 2 Statistical Values Assessing the Goodness-of-Fit of the Structural Equation Model After Model Modification

Fit Index	Value	Typical Guideline Threshold
χ^2 probability	0.081	> 0.05
χ^2/df	1.128	< 2.00
GFI	0.956	> 0.90
RMSEA	0.016	< 0.08

Hypothesis Testing. All hypotheses were supported at the $p < 0.001$ level. Digital Technology exerted the strongest effect on Design and Development (Standardized Regression Weight = 0.77), while Design and Development had substantial effects on both Cooperation Network (Standardized Regression Weight = 0.67) and Data Analytics (Standardized Regression Weight = 0.64). In addition, Digital Technology directly influenced Cooperation Network (Standardized Regression Weight = 0.39) and Data Analytics (Standardized Regression Weight) = 0.37.

Table 3 Results of Hypothesis Testing and Standardized Path Coefficients

Hypothesis	Path	Standardized	Significance	Decision
H1	DT → CN	0.39	p < 0.001	Supported
H2	DT → DA	0.37	p < 0.001	Supported
H3	DT → DD	0.77	p < 0.001	Supported
H4	DD → CN	0.67	p < 0.001	Supported
H5	DD → DA	0.64	p < 0.001	Supported

Structural Equation Model

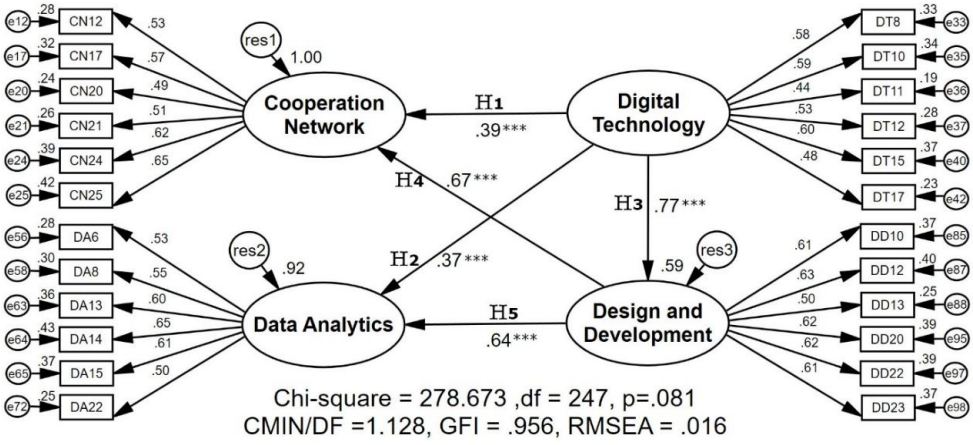

Figure 1. Structural Equation Model

The findings support a sequential capability-development logic in which Digital Technology (DT) forms the essential foundation that first strengthens Design and Development (DD). DD then acts as a key mechanism for translating technology into effective cooperation (CN) and data analytics capability (DA).These findings carry a clear managerial implication: platform success does not depend solely on acquiring technology, but on the organization's ability to make that technology work in practice through disciplined design and development, together with collaboration and data-governance mechanisms that can generate genuine competitive opportunities.

6. Discussion

First, the finding that Cooperation Network was the highest-priority component is consistent with business ecosystem theory and platform orchestration. These perspectives indicate that digital platforms create value most effectively when multiple stakeholders co-create value, including partners, regulators, financial institutions, and technology providers (Gawer, 2022; Gong et al., 2023). In the Thai context, cooperation also helps reduce digital-transition costs and enables organizations to access knowledge, skills, and standards that they may not possess internally. Industrial organizations that are sufficiently capable of implementing operational systems according to the sharing-economy concept can reduce operating costs and align their activities harmoniously with all parties (Wattanakomol, 2023).Second, the high importance of Design and Development, at the same level as Cooperation Network, suggests that digital platforms cannot succeed if they are designed solely from a technology-centric perspective. They must instead be designed around business requirements and user experience, with strong emphasis on testing, refinement, and adaptability. As noted by Wattanakomol and Silpcharu (2022), changes are universal in organizations and

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may occur incrementally or radically. This finding is also consistent with Design Thinking, Agile Development, and Platform-Based Development (Brown, 2020; Zhao et al., 2022).Third, Data Analytics emerged as a central mechanism for strategic decision-making. The results confirm that organizations that prioritize Data Governance, data structuring, data cleansing, and dashboards or real-time analytics are better positioned for business planning and rapid customer response. This aligns with Dubey et al. (2022) and Mikalef et al. (2022), who found that analytics capability strengthens organizational agility and performance.Fourth, although Digital Technology had the lowest mean among the four dimensions, it still remained at the highest level overall and served as the foundational base for interoperability, security, flexibility, and collaborative functionality. The causal finding that Digital Technology directly affects Cooperation Network indicates that connection and collaboration cannot be achieved effectively unless digital infrastructure is ready and interoperable with external systems.Fifth, the finding that organizational values and culture were among the most important success conditions extends the digital transformation literature, which often emphasizes technological factors more than behavioral dimensions. The results confirm that employee acceptance, leadership support, and a collaborative learning climate are critical conditions for platform success.Finally, the absence of a statistically significant difference between medium-sized and large-sized firms suggests that platform-era competition can create opportunities for organizations of different sizes, provided that they design platform management systems systematically. This finding extends prior knowledge that tends to emphasize the superior resource readiness of large organizations by proposing that the quality of cross-dimensional integration may be even more important than organizational size.

7. New Body of Knowledge

The new body of knowledge generated by this study is an integrated four-dimensional framework for building digital platforms to create competitive opportunities in the industrial business sector. It explains that competitive advantage does not arise solely from possessing modern technology, but from systematically linking four dimensions: (1) Digital Technology as infrastructure, (2) Cooperation Network as the mechanism connecting resources and stakeholders, (3) Data Analytics as the mechanism that transforms data into knowledge for decision-making, and (4) Design and Development as the mechanism that converts business requirements into usable platforms.The study's theoretical contribution lies in conceptualizing digital platforms in industrial contexts as a form of Systemic Capability rather than as isolated information-system projects or stand-alone technological tools. Its practical contribution is the recommendation that organizations should develop indicators and action plans that explicitly connect all four dimensions so that digital investment does not produce fragmented or discontinuous outcomes. In other words, this study proposes that executives should view digital platforms as an organizational systemic capability that requires coordinated operation among technology architecture, cooperation structures, data governance, and innovation design processes. If any one of these dimensions is missing, competitive outcomes will be difficult to achieve or sustain.

8. Recommendations

8.1 Industrial organizations should formulate enterprise-level digital platform strategies that integrate business goals, data goals, and interdepartmental cooperation goals into a single plan.

8.2 Executives should act as change leaders by fostering participation, acceptance, and digital learning at all levels, especially among operational staff, who are the main target group for capability development in many organizations.

8.3 Organizations should seriously strengthen data governance, including data standards, privacy, access rights, data cleansing, and the use of data for real-time decision-making.

8.4 Platforms should be designed on the basis of real users and real business contexts, with continuous usability testing and secure external connectivity for partners and allies.

8.5 Government agencies and educational institutions should support the industrial platform ecosystem through standards development, training, and collaborative research with the private sector.

8.6 Future research should examine the model in specific industries such as food, automotive, energy, or electronics, and should also develop indicators for innovation, revenue, and sustainability outcomes directly attributable to digital platforms.

9. Research Limitations

Although this study provides clear structural and practical findings, several limitations remain. The data were collected primarily from organizations that had already succeeded in using digital platforms, which may underrepresent the perspectives of firms that are still at an early stage or have not yet achieved success.Moreover, the study focuses mainly on the context of Thai industrial businesses. Therefore, applying the findings to international contexts or to sectors with different market characteristics should be undertaken with careful adjustment to the institutional and competitive conditions of those settings.

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