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Dynamic Capabilities and Digital Business Transformation: A Sectorial Analysis

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Abstract

This study examines the relationship between dynamic capabilities and digital business transformation across different industry sectors. Despite growing recognition of dynamic capabilities' importance in enabling digital transformation, there remains limited understanding of how these capabilities vary across sectors and how such variations influence transformation outcomes. Through a mixed-methods approach combining survey data from 284 organizations across manufacturing, financial services, healthcare, and retail sectors with 42 in-depth executive interviews, this research investigates sector-specific patterns in dynamic capabilities development and their impact on digital transformation success. Findings reveal significant cross-sectoral variations in the configuration, development, and deployment of sensing, seizing, and reconfiguring capabilities. Manufacturing firms demonstrate stronger technology sensing capabilities but face challenges in organizational reconfiguration; financial services organizations excel in digital opportunity seizing but struggle with legacy system constraints; healthcare entities show robust sensing capabilities yet face regulatory and institutional barriers to reconfiguration; and retail companies exhibit strong customer-centric sensing but experience challenges in technical capability development. The research further identifies critical enablers and barriers to dynamic capability development in digital contexts across sectors, including leadership vision, organizational structure, resource allocation patterns, and external ecosystem engagement. These findings contribute to both theoretical refinement of the dynamic capabilities framework in digital settings and practical guidance for executives navigating sector-specific transformation challenges.

Keywords: - Dynamic capabilities, Digital transformation, Industry comparison, Organizational change, Strategic renewal, Technological innovation, Sectoral analysis.

I. INTRODUCTION

The intensifying digital transformation of business landscapes has fundamentally disrupted established competitive dynamics across virtually all industry sectors (Vial, 2019). Organizations face unprecedented pressure to adapt their strategies, business models, operations, and organizational structures to remain competitive in increasingly digitized markets (Bharadwaj et al., 2013; Sebastian et al., 2017). This imperative for digital transformation—defined as "the changes digital technologies can bring about in a company's business model, which result in changed products or organizational structures or in the automation of processes" (Hess et al., 2016)—transcends traditional industry boundaries but manifests in sector-specific patterns and challenges.

The dynamic capabilities framework, with its emphasis on an organization's ability to "integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516), offers a powerful theoretical lens for understanding how firms navigate digital transformation (Warner & Wäger, 2019). Dynamic capabilities are widely recognized as crucial for sustained competitive advantage in volatile environments characterized by technological disruption and market uncertainty (Eisenhardt & Martin, 2000; Teece, 2007). In digital contexts specifically, these capabilities enable organizations to sense emerging technologies and market shifts, seize digital opportunities through strategic decisions and investments, and reconfigure organizational resources and competencies to execute transformation initiatives (Yeow et al., 2018).

While substantial research has examined dynamic capabilities generally (Schilke et al., 2018) and an emerging literature explores their role in digital transformation specifically (Warner & Wäger, 2019; Vial, 2019), limited attention has been paid to how these capabilities and their effects vary across industry sectors. This gap is problematic given that digital transformation pressures, constraints, and opportunities differ markedly across industries due to varying competitive dynamics, regulatory environments, technological infrastructures, customer expectations, and institutional legacies (Bharadwaj et al., 2013; Porter & Heppelmann, 2014). Without understanding these sectoral variations, both theoretical development and practical guidance regarding dynamic capabilities in digital transformation contexts remain incomplete.

This research addresses this gap by investigating how dynamic capabilities for digital transformation manifest across four distinct sectors: manufacturing, financial services, healthcare, and retail. These sectors were selected to represent diversity in their historical relationship with technology, regulatory environments, competitive structures, and digital transformation trajectories. By examining cross-sectoral patterns in dynamic capability development, configuration, and impact, this study advances both theoretical understanding of contextual factors influencing capability effectiveness and practical knowledge for executives navigating sector-specific transformation challenges.

The research is guided by three primary questions:

- How do the development and configuration of dynamic capabilities for digital transformation vary across industry sectors?
- What sector-specific enablers and barriers influence organizations' ability to build and deploy dynamic capabilities in digital transformation contexts?
- How does the relationship between dynamic capabilities and digital transformation outcomes differ across sectors?

Through addressing these questions, this study makes several contributions. First, it extends the dynamic capabilities framework by identifying sector-specific contingencies that influence capability development and effectiveness. Second, it advances understanding of digital transformation by moving beyond generic prescriptions toward more contextually embedded insights. Third, it provides executives with more nuanced, sector-relevant guidance for building organizational capabilities that enable successful digital transformation. Finally, it establishes a foundation for further research exploring the interplay between industry context, organizational capabilities, and digital transformation trajectories.

II. THEORETICAL BACKGROUND

2.1 Dynamic Capabilities and Digital Transformation

The dynamic capabilities framework, introduced by (Teece et al., 1997) and subsequently developed by numerous scholars (Eisenhardt & Martin, 2000; Teece, 2007; Helfat et al., 2007), emphasizes organizations' capacity to purposefully create, extend, or modify their resource base to address changing environments. (Teece, 2007) disaggregated dynamic capabilities into three primary categories: sensing (identifying opportunities and threats), seizing (mobilizing resources to capture value from opportunities), and reconfiguring (continuous renewal of assets and organizational structures).

In digital contexts, dynamic capabilities take on particular forms and significance. (Warner & Wäger, 2019) identified specific digital dynamic capabilities, including digital sensing (scanning and monitoring digital trends), digital seizing (strategizing and implementing digital initiatives), and digital transforming (restructuring internal resources and acquiring new competencies). Similarly, (Yeow et al., 2018) demonstrated how dynamic capabilities enable alignment between digital technologies and organizational processes, while (Vial, 2019) emphasized their role in orchestrating strategic responses to digital disruption.

The relationship between dynamic capabilities and digital transformation appears bidirectional. On one hand, dynamic capabilities enable successful digital transformation by allowing organizations to identify relevant technologies, develop appropriate strategies, and implement necessary changes (Sebastian et al., 2017). On the other hand, digital transformation processes themselves can strengthen dynamic capabilities by enhancing environmental scanning capacity, accelerating decision-making, and increasing organizational flexibility (Vial, 2019).

However, most research on dynamic capabilities in digital contexts has adopted a relatively generic approach, with limited attention to how industry context influences this relationship. This study addresses this gap by examining sector-specific patterns in dynamic capability development and deployment during digital transformation initiatives.

2.2 Sectoral Dimensions of Digital Transformation

Digital transformation manifests differently across industry sectors due to variations in competitive dynamics, technological readiness, customer expectations, and regulatory environments (Porter & Heppelmann, 2014; Sebastian et al., 2017).

In manufacturing, digital transformation typically centers on Industry 4.0 technologies—including Internet of Things (IoT), artificial intelligence (AI), and advanced robotics—that enable smart factories, connected products, and data-driven services (Kagermann, 2015). These transformations often blur boundaries between products and services while creating new revenue models and customer relationships (Porter & Heppelmann, 2015).

Financial services have experienced profound digital disruption through fintech innovations, changing customer expectations, and regulatory shifts like open banking (Alt et al., 2018). Transformation in this sector frequently focuses on customer experience enhancement, process automation, and business model innovation, while managing significant legacy technology constraints and strict regulatory requirements (Ross et al., 2016).

Healthcare digital transformation encompasses electronic health records, telemedicine, AI-assisted diagnostics, and personalized medicine, operating within highly regulated environments with complex stakeholder ecosystems including

providers, insurers, regulators, and patients (Agarwal et al., 2010). Institutional complexity and professional autonomy create distinct transformation dynamics in this sector (Davidson & Chismar, 2007).

In retail, digital transformation reflects the ongoing convergence of online and offline channels, data-driven personalization, supply chain digitization, and new business models responding to platform competition (Hagberg et al., 2016). This sector has experienced particularly visible disruption from digital-native competitors, creating existential transformation pressure for many traditional retailers (Verhoef et al., 2021).

These sectoral differences suggest that dynamic capabilities for digital transformation may require sector-specific configurations. While existing research has identified general capability requirements (Warner & Wäger, 2019), limited empirical work has systematically compared how these capabilities manifest across different industry contexts.

2.3 Theoretical Framework and Hypotheses

Building on this literature, we develop a theoretical framework examining how sensing, seizing, and reconfiguring capabilities manifest across sectors and influence digital transformation outcomes. This framework incorporates sector-specific contingencies affecting capability development and identifies relationships between specific capability configurations and transformation success.

We propose the following hypotheses:

- *H1*: The relative importance of specific dynamic capabilities (sensing, seizing, reconfiguring) for digital transformation success differs significantly across industry sectors.
- *H2*: Industry-specific regulatory environments moderate the relationship between dynamic capabilities and digital transformation outcomes.
- *H3*: Legacy technology intensity moderates the relationship between reconfiguring capabilities and digital transformation outcomes across sectors.
- *H4*: Competitive intensity moderates the relationship between sensing capabilities and digital transformation outcomes across sectors.
- *H5*: The development pathways for dynamic capabilities in digital contexts differ systematically across industry sectors.

These hypotheses guide our empirical investigation while allowing for exploratory analysis of emerging patterns and relationships.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study employed a sequential mixed-methods design combining quantitative and qualitative approaches to examine the relationship between dynamic capabilities and digital transformation across sectors. The research was conducted in two phases:

- *Phase 1*: A quantitative survey of 284 organizations across four sectors to measure dynamic capabilities, digital transformation outcomes, and contextual factors.
- *Phase 2*: Qualitative in-depth interviews with 42 senior executives involved in digital transformation initiatives to provide deeper insights into capability development processes and sectoral dynamics.

This design enabled both broad pattern identification through statistical analysis and rich contextual understanding through executive perspectives. The integration of quantitative and qualitative data allowed for more comprehensive and nuanced insights than either method alone could provide (Creswell & Clark, 2017).

3.2 Quantitative Methods

3.2.1 Sample and Data Collection

The quantitative sample comprised 284 medium and large organizations (>250 employees) distributed across four sectors: manufacturing (n=76), financial services (n=72), healthcare (n=68), and retail (n=68). Organizations were selected using stratified random sampling from industry databases to ensure representation across subsectors, size categories, and geographic regions.

Survey data were collected between September 2023 and January 2024 through an online questionnaire directed to senior executives with direct involvement in their organization's digital transformation initiatives (primarily Chief Digital Officers, Chief Information Officers, and Chief Strategy Officers). The survey achieved a response rate of 31.2% from the initial sampling frame of 911 organizations, with non-response bias tests indicating no significant differences between early and late respondents on key variables.

3.2.2 Measures

Dynamic Capabilities were measured using multi-item scales adapted from prior research (Teece, 2007; Warner & Wäger, 2019; Wilden et al., 2013) and refined through pilot testing. Three capability dimensions were assessed:

- *Sensing Capabilities* (8 items, $\alpha = 0.87$): Measuring the organization's ability to identify technological developments, market shifts, and emerging customer needs through structured scanning processes, ecosystem engagement, and data analytics capabilities.

- *Seizing Capabilities* (10 items, α = 0.89): Assessing the organization's capacity to develop digital strategies, make timely investment decisions, build business cases, secure resources, and establish appropriate governance for digital initiatives.
- *Reconfiguring Capabilities* (9 items, α = 0.91): Evaluating the organization's ability to realign organizational structures, develop new competencies, integrate digital technologies with existing systems, and manage transformation-related change processes.

Digital Transformation Outcomes were assessed through both self-reported strategic outcomes and objective performance measures:

- *Strategic Outcomes* (12 items, α = 0.88): Measuring achievement of digital transformation objectives including new digital offerings, improved customer experience, operational efficiency, business model innovation, and digital revenue growth.
- *Objective Performance Indicators*: For a subset of 173 publicly traded companies, financial metrics including digital revenue percentage, three-year revenue growth, profit margin, and market valuation multiples were collected from company reports and financial databases.

Contextual Factors were measured using industry-specific scales addressing:

- *Regulatory Intensity* (5 items, α = 0.82): Assessing regulatory constraints affecting digital innovation and organizational change.
- *Legacy Technology Intensity* (4 items, α = 0.79): Measuring the organization's dependence on legacy systems and technology debt.
- *Competitive Intensity* (6 items, α = 0.84): Evaluating the level of digital disruption, competitive pressure, and market volatility in the organization's primary industry.
- *Digital Maturity* (7 items, α = 0.86): Assessing the organization's baseline digital capabilities and technology infrastructure before major transformation initiatives.

All scale items used 7-point Likert formats from "strongly disagree" to "strongly agree" or equivalent anchors appropriate to the question context.

3.2.3 Analysis Approach

Quantitative data were analyzed using multiple analytical approaches:

First, confirmatory factor analysis assessed the reliability and validity of measurement scales, with all constructs demonstrating satisfactory reliability (Cronbach's α > 0.75), convergent validity (AVE > 0.5), and discriminant validity (√AVE > inter-construct correlations).

Second, MANOVA and ANOVA analyses examined cross-sectoral differences in dynamic capability configurations, transformation outcomes, and contextual factors.

Third, hierarchical regression models tested relationships between dynamic capabilities and transformation outcomes within and across sectors, including interaction effects to assess sectoral moderations.

Fourth, structural equation modeling (SEM) using AMOS software evaluated the overall relationships between capability dimensions, contextual factors, and transformation outcomes, with multi-group analysis comparing path coefficients across sectors.

Finally, fsQCA (fuzzy-set Qualitative Comparative Analysis) identified capability configurations associated with successful transformation in different sectoral contexts.

3.3 Qualitative Methods

3.3.1 Sample and Data Collection

The qualitative phase involved in-depth interviews with 42 senior executives directly responsible for digital transformation initiatives across the four sectors (10-11 per sector). Participants were selected using theoretical sampling to ensure representation of varied transformation approaches, organizational sizes, and transformation maturity levels.

Interviews followed a semi-structured protocol addressing dynamic capability development processes, sector-specific challenges, organizational enablers and barriers, and transformation outcomes. Each interview lasted 60-90 minutes, was recorded with permission, and transcribed for analysis. Supplementary materials including transformation strategy documents, organizational charts, and investment plans were collected where available to provide additional context.

3.3.2 Analysis Approach

Interview data were analyzed using a systematic coding approach combining deductive and inductive elements. Initial coding used categories derived from the dynamic capabilities framework (sensing, seizing, reconfiguring) and digital transformation literature. Subsequent rounds of coding identified emerging themes and sector-specific patterns using constant comparative analysis techniques (Gioia et al., 2013).

NVivo software facilitated coding and analysis, with two researchers independently coding a subset of interviews to ensure coding reliability (Cohen's κ = 0.83). Data interpretation involved identifying both cross-cutting themes and sector-specific patterns, with particular attention to capability development mechanisms, contextual influences, and performance implications.

Integration of quantitative and qualitative findings followed a complementary approach, with qualitative insights helping explain quantitative patterns and statistical results adding systematic validation to themes emerging from interview data.

IV. RESULTS

4.1 Cross-Sectoral Patterns in Dynamic Capabilities

Quantitative analysis revealed significant cross-sectoral differences in dynamic capability profiles. Table 1 presents mean scores and ANOVA results for sensing, seizing, and reconfiguring capabilities across the four sectors.

Table 1: Dynamic Capability Dimensions by Sector

Capability Dimension	Manufacturing (n=76)	Financial Services (n=72)	Healthcare (n=68)	Retail (n=68)	F-value	p-value
Sensing Capabilities	5.34 (0.78)	5.19 (0.82)	4.87 (0.91)	5.41 (0.73)	7.62	<0.001
Seizing Capabilities	4.76 (0.93)	5.28 (0.79)	4.39 (0.97)	4.81 (0.88)	12.84	<0.001
Reconfiguring Capabilities	4.21 (1.03)	4.33 (0.94)	3.82 (1.11)	4.57 (0.89)	9.35	<0.001

Note: Values represent means with standard deviations in parentheses. Scale range: 1-7.

These results indicate significant cross-sectoral variations in capability configurations. Retail organizations demonstrated the strongest sensing capabilities, particularly in customer behavior monitoring and digital trend identification. Financial services firms showed the highest seizing capabilities, excelling in digital strategy development and investment prioritization. Retail companies scored highest on reconfiguring capabilities, while healthcare organizations demonstrated the lowest scores across all three dimensions.

Deeper analysis of sensing capability components revealed sector-specific emphasis: manufacturing firms focused on technology and competitor sensing; financial services organizations emphasized regulatory and competitive sensing; healthcare entities prioritized patient need sensing and technological monitoring; and retail companies concentrated on customer behavior and channel preference sensing.

Qualitative findings elaborated these patterns. Manufacturing executives described extensive technology scouting functions but acknowledged limitations in customer insight generation:

"We're exceptional at tracking technology developments—dedicated teams monitoring advancements in IoT, AI, and automation. Where we're weaker is translating these technologies into customer value propositions." (Chief Digital Officer, Manufacturing)

Retail executives, conversely, emphasized customer-centric sensing capabilities:

"Our advantage is closeness to consumers—we've built robust systems to capture shifting preferences across channels. We've invested heavily in consumer analytics that feed directly into our digital roadmap." (SVP Digital Transformation, Retail)

Healthcare organizations described institutionalized barriers to sensing capability development:

"We track innovations rigorously, but our governance structures and clinical integration requirements mean we process this information more slowly than other sectors. Regulatory compliance considerations filter everything we evaluate." (CIO, Healthcare)

These findings support H1, confirming significant cross-sectoral differences in the relative development and importance of specific dynamic capabilities.

4.2 Contextual Factors and Capability Effectiveness

Regression analyses examining the relationship between capabilities and transformation outcomes revealed significant sectoral contingencies. Table 2 presents standardized regression coefficients showing capability-outcome relationships across sectors.

Table 2: Standardized Regression Coefficients for Capability-Outcome Relationships

Predictor	Manufacturing	Financial Services	Healthcare	Retail
Sensing Capabilities	0.32***	0.28**	0.41***	0.37***
Seizing Capabilities	0.29**	0.45***	0.32**	0.29**
Reconfiguring Capabilities	0.35***	0.31**	0.19*	0.42***
R^2	0.43	0.47	0.39	0.51

Note: Dependent variable is Digital Transformation Outcomes composite measure.
*p < 0.05, ** p < 0.01, *** p < 0.001

These results show that different capability dimensions had varying effects across sectors. Sensing capabilities had the strongest effect in healthcare, seizing capabilities were most impactful in financial services, and reconfiguring capabilities showed the strongest relationship with outcomes in retail.

Further analysis incorporated interaction effects between capabilities and contextual factors. Regulatory intensity significantly moderated capability-outcome relationships across sectors ($\beta = -0.24$, $p < 0.01$), with higher regulatory intensity

weakening the effectiveness of reconfiguring capabilities particularly in healthcare and financial services. Legacy technology intensity similarly moderated the relationship between reconfiguring capabilities and transformation outcomes ($\beta = -0.29$, $p < 0.001$), with the strongest negative effect in financial services. Competitive intensity positively moderated the relationship between sensing capabilities and outcomes ($\beta = 0.21$, $p < 0.01$), with the effect strongest in retail.

These findings support H2, H3, and H4, confirming that regulatory environment, legacy technology intensity, and competitive intensity moderate capability-outcome relationships in sector-specific patterns.

Interview data provided deeper insights into these contextual dynamics. Financial services executives emphasized how regulatory requirements shaped their transformation approaches:

"Banking regulations create a dual effect—they slow implementation cycles but also create 'forced transformation' moments. Our sensing and seizing capabilities have developed to navigate this unique regulatory landscape." (Head of Digital Banking, Financial Services)

Manufacturing executives highlighted legacy technology challenges of a different nature:

"Our legacy constraints aren't just IT systems but physical assets with 20-30-year lifecycles. Reconfiguring capabilities in manufacturing requires synchronizing digital with physical transformation—a unique challenge." (CTO, Manufacturing)

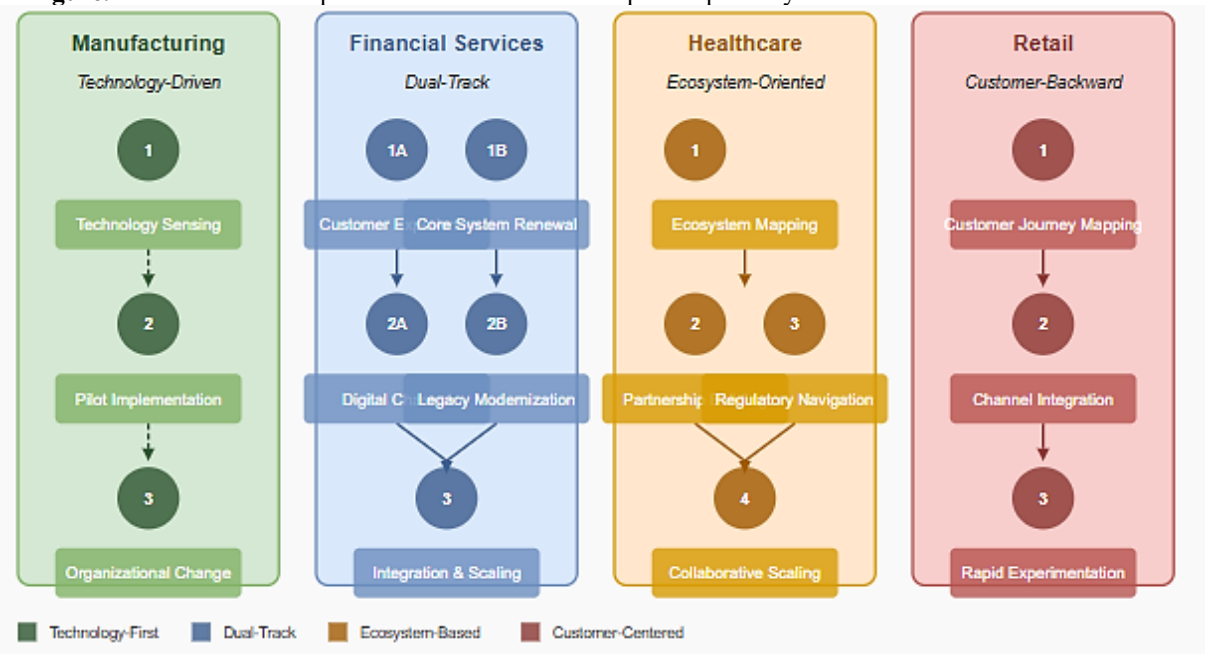
Healthcare executives described distinctive regulatory barriers to reconfiguration:

"Healthcare's regulatory complexity creates a capability requirement we call 'compliance innovation'—finding transformation pathways that navigate strict patient data rules, reimbursement constraints, and clinical validation requirements." (Chief Innovation Officer, Healthcare)

4.3 Capability Development Pathways

Qualitative analysis identified differentiated development pathways for dynamic capabilities across sectors, supporting H5.

Figure. 1: Presents a conceptual model of these sector-specific pathways derived from interview data.



Note: Figure 1 would show a visual representation of different sectoral capability development pathways

In manufacturing, capability development typically followed a technology-driven pathway, beginning with intensive technology sensing, followed by pilot implementations, and culminating in broader organizational change. This "technology-first" approach leveraged existing R&D capabilities but sometimes created challenges in organizational acceptance:

"Our capability building started with technology centers of excellence, then created digital proof points through pilots. The hardest part came last—driving organizational change beyond the digital pioneers." (Chief Digital Officer, Manufacturing)

Financial services organizations more commonly followed a dual-track approach, developing customer-facing digital capabilities separately from core system transformation:

"We built our capabilities in two parallel streams—a fast-moving front-end focused on customer experience, and a more methodical modernization of core banking systems. Different capability requirements, different timelines, different teams." (CIO, Financial Services)

Healthcare organizations typically adopted an ecosystem-oriented approach, developing capabilities through partnerships and networks rather than purely internal development:

"Our most effective capabilities have developed through partnerships—with technology companies, startups, academic medical centers. The complexity of healthcare transformation exceeds what any single organization can develop internally." (SVP Strategy, Healthcare)

Retail companies more frequently followed a customer-backward approach, with capability development guided by evolving consumer expectations:

"We build capabilities by working backward from customer journeys. Channel integration capability became priority number one because customers demanded seamless experiences across physical and digital touchpoints." (Chief Digital Officer, Retail)

These differentiated pathways reflected not only sectoral constraints but also capability interdependence patterns. fsQCA analysis identified sector-specific capability configurations associated with successful transformation. In manufacturing, the combination of strong sensing and moderate reconfiguring capabilities proved sufficient for success even with moderate seizing capabilities. In financial services, strong seizing capabilities emerged as nearly necessary for successful transformation. Healthcare organizations required strong sensing capabilities combined with ecosystem integration capabilities (a sub-element of reconfiguring) for success.

4.4 Leadership and Organizational Enablers

Both quantitative and qualitative analyses highlighted the importance of organizational enablers in developing dynamic capabilities for digital transformation. Regression analysis identified significant relationships between transformation outcomes and specific organizational factors, with some cross-sectoral variations (Table 3).

Table 3: Organizational Enablers of Dynamic Capabilities (Standardized β Coefficients)

Enabler	Manufacturing	Financial Services	Healthcare	Retail
Digital Leadership Commitment	0.38***	0.42***	0.46***	0.39***
Dedicated Innovation Structures	0.29**	0.32**	0.27**	0.24**
Cross-Functional Integration	0.34***	0.29**	0.33**	0.37***
Technology Investment	0.31**	0.36***	0.26**	0.31**
Agile Work Methods	0.22*	0.31**	0.17*	0.34***
Digital Talent Development	0.36***	0.35***	0.31**	0.33**

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Leadership commitment emerged as the strongest enabler across all sectors, though its influence was particularly pronounced in healthcare. Cross-functional integration showed the strongest effect in retail and manufacturing, while agile work methods demonstrated greater impact in retail and financial services than in healthcare.

Interview data provided rich context for these findings. Leadership approaches showed some sectoral patterns, with manufacturing executives emphasizing technology-informed leadership, financial services focusing on customer-oriented digital vision, healthcare leaders stressing mission alignment with digital initiatives, and retail executives highlighting omnichannel experience leadership.

Organizational structure solutions also varied by sector. Manufacturing firms more frequently adopted bimodal structures separating digital innovation from core operations. Financial services organizations often established digital business units with significant autonomy. Healthcare entities typically embedded digital capabilities within existing clinical and administrative structures. Retail companies more commonly reorganized around customer journeys rather than creating separate digital units.

Resource allocation approaches reflected sectoral characteristics as well. Manufacturing emphasized staged investment with clear ROI criteria; financial services adopted portfolio approaches balancing defensive and offensive investments; healthcare organizations relied more heavily on partnership-based resourcing; and retail companies demonstrated greater willingness to cannibalize existing business to fund digital initiatives.

V. DISCUSSION AND THEORETICAL IMPLICATIONS

This study advances understanding of dynamic capabilities in digital transformation contexts in several important ways. First, it demonstrates empirically that dynamic capability configurations differ systematically across industry sectors, moving beyond generic capability frameworks to reveal sector-specific patterns. This finding extends prior research by (Teece, 2007) and (Warner & Wäger, 2019) by establishing that the relative importance and development pathways of sensing, seizing, and reconfiguring capabilities vary according to sectoral conditions.

Second, the research identifies specific contextual factors that moderate capability-outcome relationships, including regulatory intensity, legacy technology constraints, and competitive pressure. These findings refine our understanding of when and how dynamic capabilities create value (Schilke et al., 2018; Wilden et al., 2016) by specifying industry-level contingencies that shape capability effectiveness. The strong moderating effect of regulatory intensity particularly extends prior work on dynamic capabilities in regulated environments (Teece, 2018).

Third, the identification of sector-specific capability development pathways contributes to understanding capability formation processes in digital contexts. While prior research has explored capability development generally (Helfat & Peteraf, 2015), this study reveals how digital capability building follows different trajectories across sectors—technology-driven in manufacturing, dual-track in financial services, ecosystem-oriented in healthcare, and customer-backward in retail. These distinctive pathways suggest that capability development theories should incorporate industry context more explicitly.

Fourth, the findings regarding organizational enablers extend recent work on microfoundations of dynamic capabilities (Teece, 2007; Felin et al., 2012) by demonstrating how leadership approaches, organizational structures, and resource

allocation mechanisms influence capability development in sector-specific patterns. The consistent importance of leadership commitment across sectors aligns with prior research (Warner & Wäger, 2019), while variations in structural enablers highlight how capability microfoundations are contextually embedded.

Finally, by examining both capability development and transformation outcomes, this research advances understanding of the capability-performance relationship in digital contexts. The findings support (Teece, 2018) proposition that dynamic capabilities are increasingly essential in digitally disrupted environments, while demonstrating that capability-performance relationships are contingent upon sector-specific factors.

Theoretically, these findings suggest refinements to the dynamic capabilities framework when applied to digital transformation contexts. Rather than treating dynamic capabilities as universal constructs with generic effects, researchers should develop more contextualized frameworks that account for industry-specific capability configurations, enablers, and effectiveness conditions. This study provides an initial foundation for such contextually embedded capability theory.

VI. PRACTICAL IMPLICATIONS

For executives leading digital transformation initiatives, this research offers several practical implications. First, it highlights the importance of developing capability configurations aligned with industry-specific transformation challenges rather than adopting generic capability prescriptions. Manufacturing leaders should prioritize reconfiguring capabilities to overcome structural and asset-related rigidities. Financial services executives should emphasize balanced capability development addressing both customer experience innovation and core system modernization. Healthcare leaders should focus on ecosystem integration capabilities that enable transformation within complex stakeholder networks. Retail executives should prioritize rapid sensing and reconfiguring capabilities to respond to shifting consumer behaviors.

Second, the findings demonstrate the critical role of organizational enablers in supporting capability development. While leadership commitment is universally important, the specific leadership approaches and organizational structures that enable capability development vary by sector. Executives should align leadership styles, organizational designs, and resource allocation approaches with industry-specific capability requirements rather than adopting generic digital organization models.

Third, the identification of sectoral contingencies affecting capability effectiveness provides guidance for managing transformation constraints. Organizations in highly regulated sectors should develop specialized capabilities for compliance-compatible innovation. Those with significant legacy technology constraints should consider architectural approaches that enable capability development despite infrastructure limitations. Organizations facing intense competitive pressure should prioritize quick-response sensing and seizing capabilities.

Fourth, the varied capability development pathways identified suggest different transformation roadmaps for different sectors. Manufacturing organizations may benefit from a staged approach beginning with technology-focused capabilities before addressing broader organizational change. Financial services firms should consider separate but coordinated capability development streams for customer-facing and core operational domains. Healthcare organizations should emphasize partnership capabilities that leverage external expertise. Retail companies should organize capability development around evolving customer journeys.

Finally, the research highlights the importance of cross-functional integration in building effective dynamic capabilities for digital transformation. While specific collaboration patterns vary by sector, the general principle of connecting technology expertise with domain knowledge and customer insight applies across contexts. Executives should prioritize mechanisms that bridge traditional organizational silos to enable effective digital transformation capabilities.

VII. LIMITATIONS AND FUTURE RESEARCH

Several limitations of this study suggest avenues for future research. First, while including four diverse sectors provides broader insights than single-industry studies, it cannot capture the full range of sectoral differences. Future research should extend this comparative approach to additional sectors, particularly those with distinctive digital transformation characteristics such as media, telecommunications, and professional services.

Second, the cross-sectional research design limits causal inference regarding capability development and transformation outcomes. Longitudinal studies tracking capability evolution and transformation processes over time would strengthen understanding of developmental pathways and performance effects.

Third, while the mixed-methods approach provides both breadth and depth, the relatively small number of organizations per sector in the qualitative sample constrains generalizability. Larger-scale qualitative investigations could identify more nuanced sectoral patterns in capability development and deployment.

Fourth, this study focused primarily on established organizations undergoing digital transformation rather than digital-native companies. Comparative research examining capability configurations in traditional versus digital-native organizations across sectors would further advance understanding of digital capability development.

Finally, while examining multiple sectors provides valuable comparative insights, deeper investigation of within-sector variations would further refine understanding of capability-context relationships. Future research should explore how factors such as organizational size, global reach, and competitive positioning influence capability requirements and effectiveness within specific industry contexts.

VIII. CONCLUSION

This study has examined how dynamic capabilities for digital transformation manifest across four diverse industry sectors, revealing significant variations in capability configurations, development pathways, and effectiveness conditions. The findings demonstrate that while dynamic capabilities are universally important for digital transformation, their specific forms,

enablers, and effects are shaped by sectoral contexts including regulatory environments, legacy constraints, competitive dynamics, and institutional characteristics.

By illuminating these sectoral patterns, this research contributes to both theoretical refinement of the dynamic capabilities framework in digital settings and practical guidance for executives navigating sector-specific transformation challenges. The identification of differentiated capability development pathways and contingent effectiveness factors helps move beyond generic digital transformation prescriptions toward more contextually embedded understanding.

As organizations across sectors continue navigating digital disruption and transformation imperatives, developing appropriate dynamic capabilities remains crucial for competitive survival and success. This research suggests that such capability development should be guided by nuanced understanding of sector-specific requirements rather than universal prescriptions. By aligning capability development approaches with industry context, organizations can more effectively build the dynamic capabilities needed to thrive in increasingly digital competitive landscapes.

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