

Digital Leadership and Change Management in Organizational Transformation: A Mixed-Methods Study of Success Factors and Implementation Challenges

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Abstract

This study examines the critical role of leadership and change management in achieving successful digital transformation, focusing on the leadership competencies, organizational capabilities, and change management practices that enable effective transformation outcomes. Adopting a mixed-methods research design, the study integrates quantitative survey data collected from 312 organizations undergoing digital transformation with qualitative insights from in-depth case studies of 18 organizations across multiple industries. This approach allows for a comprehensive analysis of leadership practices, capability development initiatives, change management strategies, and their relationships with digital transformation success. The findings reveal that digital transformation outcomes are driven primarily by human and organizational factors rather than by technology selection alone. Effective digital leadership is characterized by the ability to balance strategic vision with operational execution, foster digital literacy across multiple leadership levels, and sustain consistent commitment throughout long-term transformation efforts. Organizations that implement structured and comprehensive change management practices achieve success rates that are 3.5 times higher than those that rely on ad hoc or informal approaches. Furthermore, the study identifies senior leadership commitment, systematic capability development, effective communication, stakeholder engagement, and robust governance structures as critical success factors. Notably, the findings indicate that approximately 70% of digital transformation failures can be attributed to insufficient attention to human dimensions, including employee resistance, capability gaps, and change fatigue. While the study primarily focuses on large and mid-sized organizations in developed economies—thereby limiting the generalizability of the results to smaller firms or emerging markets—the findings offer valuable practical implications. Specifically, the research provides actionable guidance for leaders and change practitioners, emphasizing the need to invest in change management capabilities, establish comprehensive communication strategies, implement structured learning and development programs, and ensure clear governance with executive accountability.

Keywords: - Digital transformation, digital leadership, change management, organizational capabilities, employee engagement, transformation governance, organizational change.

I. INTRODUCTION

Digital transformation has emerged as a strategic imperative for organizations across industries as they seek to leverage digital technologies to fundamentally redesign business models, operations, and customer experiences (Vial, 2019). While substantial attention has focused on the technological dimensions of digital transformation, accumulating

evidence suggests that technology represents only one component of successful transformation (Tabrizi et al., 2019). Organizations can implement sophisticated technologies and develop comprehensive digital strategies yet fail to realize expected benefits if they cannot effectively lead and manage the human dimensions of transformation (Westerman et al., 2014).

Research consistently indicates that the majority of digital transformation initiatives fail to achieve their objectives, with failure rates ranging from 70% to 95% across various studies (Forth et al., 2020; Tabrizi et al., 2019). These failures rarely stem from technological inadequacies. Rather, they typically result from insufficient leadership commitment, inadequate capability development, poor change management, resistance from employees and middle management, and failure to sustain momentum through multi-year transformation journeys (Hinings et al., 2018). As one practitioner observed, "Digital transformation is 10% technology and 90% people and culture change" (Wade, 2015).

Despite the evident importance of leadership and change management in digital transformation, these dimensions have received less scholarly attention than technological and strategic aspects (Hanelt et al., 2021). The existing literature on digital leadership remains fragmented, with limited empirical evidence on which leadership practices most strongly influence transformation outcomes (Zeike et al., 2019). Similarly, while change management has been extensively studied in other contexts, its application to digital transformation specifically requires further investigation given the unique characteristics of digital change including its scope, pace, technological complexity, and implications for business models and organizational structures (Hirsch-Kreinsen, 2016).

This research addresses these gaps through a mixed-methods investigation of digital leadership and change management in organizational transformation. The study examines three primary research questions:

- First, what leadership competencies and practices characterize successful digital transformation initiatives?
- Second, how do organizations develop the capabilities necessary for digital transformation, and what factors influence capability development effectiveness?
- Third, what change management practices most strongly associate with transformation success, and how can organizations overcome resistance and sustain momentum through extended transformation journeys?

By addressing these questions, this research makes several contributions. First, it provides empirical evidence on the relative importance of various leadership and change management factors in transformation success, helping prioritize organizational investments and attention. Second, it develops an integrated framework connecting leadership competencies, organizational capabilities, and change management practices, advancing theoretical understanding of digital transformation as a socio-technical phenomenon. Third, it offers practical guidance for leaders and change practitioners on designing and implementing effective transformation initiatives, grounded in evidence from organizations that have navigated these challenges.

The remainder of this paper proceeds as follows. Section 2 reviews relevant literature on digital transformation, digital leadership, and change management. Section 3 describes the research methodology including data collection and analysis approaches. Section 4 presents findings from the quantitative survey and qualitative case studies. Section 5 discusses implications of findings for theory and practice. Section 6 concludes with limitations and directions for future research.

II. LITERATURE REVIEW

This section reviews relevant literature across three interconnected domains: digital transformation as organizational phenomenon, leadership in digital contexts, and change management theory and practice. The review identifies key concepts, findings, and gaps that inform this research.

Digital transformation fundamentally differs from earlier waves of technology adoption in its scope, speed, and implications (Fitzgerald et al., 2014). While previous technology initiatives typically focused on automating existing processes or supporting specific functions, digital transformation involves reimagining entire business models, creating new value propositions, and fundamentally changing how organizations operate and compete (Hess et al., 2016). Digital technologies including cloud computing, big data analytics, artificial intelligence, Internet of Things, and mobile platforms enable capabilities that were previously impossible, opening new strategic possibilities while rendering traditional approaches obsolete (Sebastian et al., 2017).

Multiple frameworks have been proposed to conceptualize digital transformation. Matt et al. (2015) identify four dimensions: use of technologies, changes in value creation, structural changes, and financial aspects. Vial (2019), through a comprehensive literature review, develops a process model depicting digital transformation as a process triggered by digital technologies, which organizations respond to through strategic responses and organizational changes, leading to impacts on value creation and organizational performance, moderated by environmental and organizational factors. These frameworks emphasize that digital transformation extends far beyond technology implementation to encompass fundamental strategic and organizational change.

The strategic dimensions of digital transformation have received substantial scholarly attention. Research has examined how organizations develop digital business strategies (Bharadwaj et al., 2013), how digital technologies enable new business models (Gassmann et al., 2014), and how established organizations can compete with digital disruptors (Chaniyas et al., 2019). However, strategy formulation represents only the beginning of transformation. Organizations must also execute their strategies effectively, requiring leadership and change management capabilities that have received less systematic investigation (Hanelt et al., 2021).

Leadership in digital transformation contexts requires competencies and approaches that extend beyond traditional leadership models (Westerman et al., 2014). Digital leaders must possess sufficient digital literacy to understand technological possibilities and implications, enabling informed strategic decisions about technology investments and initiatives (Schwarzmueller et al., 2018). They must embrace ambiguity and uncertainty inherent in transformative change, making decisions with incomplete information rather than waiting for certainty that may never arrive (Schoemaker et al., 2013). They must balance short-term performance pressures with long-term transformation imperatives, maintaining operational excellence while building new capabilities (O'Reilly & Tushman, 2008).

Recent research has begun to identify specific leadership practices associated with digital transformation success. Transformational leadership, characterized by inspirational motivation, intellectual stimulation, individualized consideration, and idealized influence, positively relates to digital transformation outcomes (Sainger, 2018). Ambidextrous leadership, balancing exploitation of existing capabilities with exploration of new possibilities, enables organizations to maintain current performance while building future capabilities (Andriopoulos & Lewis, 2009). Servant leadership, emphasizing employee development and empowerment, facilitates the capability building and cultural change necessary for transformation (van Dierendonck & Patterson, 2015).

However, the digital leadership literature remains relatively nascent and fragmented (Zeike et al., 2019). Much existing research focuses on senior executive leadership, with less attention to leadership at other organizational levels despite evidence that middle managers and front-line supervisors play critical roles in transformation implementation (Battilana & Casciaro, 2012). Additionally, much research is conceptual or based on limited case studies, with relatively few large-sample empirical investigations of leadership practices and transformation outcomes (Klein, 2020). This research addresses these gaps through systematic investigation of leadership practices across organizational levels and their associations with transformation success.

Organizational capabilities represent critical enablers of digital transformation. The resource-based view of the firm emphasizes that sustained competitive advantage stems from valuable, rare, inimitable, and non-substitutable resources and capabilities (Barney, 1991). In digital transformation contexts, critical capabilities include technical skills in areas such as data science, software development, and cybersecurity; digital business capabilities combining technological understanding with business domain knowledge; and change management capabilities enabling effective implementation of transformation initiatives (Dremel et al., 2017).

Organizations face significant challenges in developing these capabilities. Global talent shortages in technical areas create intense competition for skilled professionals (Prifti et al., 2017). Digital business capabilities require combinations of technological understanding and domain expertise that are rare in labor markets (Singh & Hess, 2017). Change management capabilities, while perhaps more widely available, must be adapted to the unique characteristics of digital transformation including its scope, complexity, and technological nature (Stieglitz & Rothlauf, 2018).

Organizations employ multiple approaches to address capability gaps including aggressive recruitment, partnerships with educational institutions and training providers, development of internal training programs, and engagement of consultants and system integrators (Benlian & Haffke, 2016). However, the relative effectiveness of these approaches remains understudied, as does the question of how organizations can create cultures of continuous learning necessary given the rapid pace of technological change (Kane et al., 2019). This research investigates capability development approaches and their effectiveness, providing evidence to inform organizational strategies.

Change management theory provides frameworks for understanding and facilitating organizational change. Lewin's (1947) three-stage model of unfreezing, changing, and refreezing emphasizes the need to overcome status quo inertia, implement desired changes, and stabilize new approaches. Kotter's (1996) eight-stage process elaborates this framework, emphasizing creation of urgency, coalition building, vision development, communication, empowerment, quick wins, consolidation, and institutionalization. More recent perspectives emphasize continuous change rather than episodic change, recognizing that contemporary organizations face ongoing adaptation requirements rather than discrete change events (Weick & Quinn, 1999).

Resistance to change represents a central concern in change management. Resistance can stem from rational concerns about personal impacts, psychological discomfort with uncertainty and new demands, and political concerns about shifts in power and status (Piderit, 2000). Effective change management requires understanding sources of resistance and addressing them through appropriate interventions including communication, participation, facilitation and support, negotiation, manipulation and co-optation, and explicit or implicit coercion, with the appropriate approach depending on situational factors (Kotter & Schlesinger, 2008).

Research on change management in digital transformation contexts has begun to emerge but remains limited. Tabrizi et al. (2019) identify poor change management as the primary cause of digital transformation failure, with successful transformations characterized by systematic attention to change management including executive sponsorship, clear communication, employee engagement, and capability building. Forth et al. (2020) find that organizations with dedicated transformation management offices achieve higher success rates. However, more systematic investigation of change management practices and their relationships with transformation outcomes is needed (Hanelt et al., 2021).

This literature review reveals several gaps that this research addresses. First, while the importance of leadership is widely acknowledged, systematic empirical evidence on specific leadership practices and their relationships with transformation outcomes remains limited. Second, capability development represents a critical challenge, but research on effective approaches to building transformation capabilities is sparse. Third, while change management is recognized as important, its application to digital transformation specifically requires further investigation. This research addresses these gaps through systematic investigation of leadership practices, capability development approaches, and change management strategies in digital transformation contexts.

III. METHODOLOGY

This research employs a mixed-methods approach combining quantitative survey research with qualitative case study analysis (Creswell & Plano Clark, 2017). This approach enables both breadth through large-sample survey analysis and depth through detailed examination of specific organizational experiences. The combination of quantitative and qualitative methods provides more comprehensive understanding than either method alone (Johnson et al., 2007).

The quantitative component consisted of a survey administered to senior executives and transformation leaders in organizations undergoing digital transformation. The survey instrument was developed through literature review, expert consultation, and pilot testing with 15 executives to ensure clarity and relevance. The final instrument included 87 items measuring leadership practices, organizational capabilities, change management approaches, transformation characteristics, and outcomes.

Leadership practices were assessed through multi-item scales measuring digital literacy (6 items, $\alpha = 0.89$), transformational leadership (12 items, $\alpha = 0.93$), change orientation (5 items, $\alpha = 0.87$), and stakeholder engagement (7 items, $\alpha = 0.91$). Organizational capabilities were measured through scales assessing technical capabilities (8 items, $\alpha = 0.90$), digital business capabilities (6 items, $\alpha = 0.88$), and change management capabilities (7 items, $\alpha = 0.92$). Change management practices were evaluated through items measuring communication effectiveness (9 items, $\alpha = 0.94$), employee participation (6 items, $\alpha = 0.89$), resistance management (5 items, $\alpha = 0.86$), and momentum maintenance (6 items, $\alpha = 0.88$).

Transformation outcomes were assessed through multiple measures including self-reported transformation success (single item on 7-point scale), achievement of transformation objectives (5 items measuring extent to which various objectives were achieved, $\alpha = 0.91$), and transformation maturity (7 items assessing progress across transformation dimensions, $\alpha = 0.93$). While self-reported measures have limitations, they represent the most practical approach for assessing transformation outcomes given the diversity of objectives across organizations and the proprietary nature of objective performance data (Podsakoff et al., 2003).

The sampling frame consisted of organizations with revenues exceeding \$100 million that had initiated digital transformation efforts within the previous five years. Organizations were identified through multiple sources including industry databases, conference attendee lists, and professional networks. Survey invitations were distributed via email to 2,847 potential respondents, resulting in 312 complete responses (11% response rate). While relatively low, this response rate is typical for executive surveys and compares favorably with similar research (Cycyota & Harrison, 2006).

Respondents represented diverse industries including manufacturing (23%), financial services (19%), retail and consumer goods (15%), healthcare (12%), technology (11%), professional services (9%), and other sectors (11%). Organizations ranged from \$100 million to over \$10 billion in revenue, with median revenue of \$1.2 billion. Most respondents held senior positions including CEO/President (12%), CIO/CTO (28%), Chief Digital Officer (15%), VP/Director of Transformation (23%), and other senior executive roles (22%).

Data analysis employed multiple techniques. Descriptive statistics characterized sample composition and variable distributions. Correlation analysis examined bivariate relationships between variables. Multiple regression analysis assessed relationships between leadership practices, capabilities, change management approaches, and transformation outcomes, controlling for organizational characteristics including size, industry, and transformation scope. Structural equation modeling evaluated the integrated framework connecting leadership, capabilities, change management, and outcomes.

The qualitative component consisted of in-depth case studies of 18 organizations selected to represent diverse industries, transformation approaches, and outcome levels. Case selection employed purposive sampling to ensure variation across key dimensions (Patton, 2002). Six cases represented highly successful transformations, six represented moderately successful transformations, and six represented less successful or failed transformations. This variation enabled comparison across success levels to identify factors distinguishing successful from unsuccessful transformations.

Data collection for case studies included semi-structured interviews with multiple informants per organization (typically 5-8 individuals including executives, transformation leaders, middle managers, and front-line employees), review of internal documents including transformation strategies, communication materials, and progress reports, and observation of transformation governance meetings when possible. Interviews followed a protocol addressing transformation objectives and approach, leadership practices and effectiveness, capability development strategies, change management approaches, resistance encountered and how addressed, and outcomes achieved.

Interview data were recorded, transcribed, and analyzed using thematic analysis (Braun & Clarke, 2006). Initial coding employed both deductive codes derived from literature and inductive codes emerging from data. Cross-case analysis identified patterns and themes distinguishing successful from less successful transformations. Case study findings were integrated with quantitative results to develop comprehensive understanding of factors influencing transformation success.

Several steps were taken to enhance research quality and rigor. Survey instrument development included expert review and pilot testing to enhance content validity. Multiple-item scales with acceptable reliability (all $\alpha > 0.85$) reduced measurement error. Statistical analyses controlled for common method bias concerns through Harman's single-factor test and marker variable techniques (Podsakoff et al., 2012). Case study quality was enhanced through multiple informants per case, triangulation of interview data with documentary evidence, and member checking where case descriptions were shared with key informants for validation (Lincoln & Guba, 1985).

IV. RESULTS AND DISCUSSION

This section presents findings from the quantitative survey and qualitative case studies, integrating results to provide comprehensive understanding of leadership and change management in digital transformation.

Descriptive statistics revealed that surveyed organizations were at various stages in their transformation journeys. The mean transformation maturity score was 4.2 (SD = 1.3) on a 7-point scale, suggesting most organizations were in middle stages of transformation with substantial progress remaining. The mean transformation success rating was 4.6 (SD = 1.5), indicating moderate success levels overall with considerable variation across organizations. Only 32% of organizations rated their transformations as highly successful (6 or 7 on 7-point scale), while 41% reported moderate success (4-5) and 27% indicated limited success (1-3).

Leadership emerged as a critical factor distinguishing successful from less successful transformations. Digital literacy among senior leaders showed strong positive association with transformation success ($r = 0.52$, $p < 0.001$). Organizations where senior leaders possessed strong understanding of digital technologies and their business implications achieved significantly higher success than those where leaders lacked such understanding. As one case study participant explained, "When our CEO really understood what was possible with data and analytics, everything changed. She could articulate a compelling vision and make smart decisions about where to invest."

However, digital literacy alone proved insufficient. Transformational leadership behaviors including inspirational motivation, intellectual stimulation, and individualized consideration also significantly predicted transformation success ($\beta = 0.38$, $p < 0.001$) even after controlling for digital literacy and organizational characteristics. Leaders who inspired commitment to transformation visions, challenged conventional thinking, and demonstrated concern for individual development created conditions more conducive to transformation success. These findings align with broader leadership research emphasizing the importance of transformational leadership in change contexts (Bass & Riggio, 2006).

Senior leadership commitment represented another critical factor. Survey results indicated that only 11% of organizations cited lack of senior support as a significant challenge, down from 13% in 2024 and 21% in 2023, suggesting growing executive recognition of digital transformation's strategic importance. However, case study evidence revealed that nominal support differed substantially from genuine, sustained commitment. As one transformation leader observed, "Our CEO said all the right things about digital transformation being a priority, but when budget decisions were made, transformation initiatives were always the first to be cut." Successful transformations were characterized by consistent senior leadership commitment demonstrated through resource allocation, personal involvement, and decision-making that reinforced transformation priorities even when faced with competing pressures.

Leadership consistency across organizational levels proved equally important. While senior executive commitment is necessary, middle managers and front-line supervisors play critical roles in transformation implementation (Huy, 2002). Case study evidence suggested that middle manager resistance or ambivalence represented a primary cause of implementation failures even when senior leaders strongly supported transformation. Organizations that invested in building leadership capability and commitment throughout the management hierarchy achieved more consistent implementation and higher success rates.

Organizational capabilities showed strong relationships with transformation outcomes. Technical capabilities in areas such as data science, software development, cloud architecture, and cybersecurity positively associated with transformation success ($r = 0.44$, $p < 0.001$). Organizations lacking these capabilities struggled to implement digital technologies effectively, experienced quality problems and delays, and often failed to realize expected benefits. However, technical capabilities alone proved insufficient, as evidenced by cases where technically sophisticated implementations failed due to poor alignment with business needs or inadequate user adoption.

Digital business capabilities, combining technological understanding with business domain knowledge, showed even stronger relationships with success ($r = 0.58$, $p < 0.001$). Professionals possessing these hybrid capabilities could identify high-value opportunities, design solutions aligned with business needs, and drive adoption. However, these capabilities proved scarce, with 90% of surveyed organizations reporting significant talent gaps. One executive noted, "We can hire data scientists and we can hire business analysts, but finding people who really understand both the business and the technology is incredibly difficult."

Change management capabilities emerged as particularly critical, showing the strongest relationship with transformation success among all capability dimensions ($r = 0.61$, $p < 0.001$). Organizations with strong change management capabilities achieved substantially higher success rates than those lacking such capabilities. Regression analysis indicated that change management capabilities predicted transformation success ($\beta = 0.42$, $p < 0.001$) even after controlling for technical capabilities, digital business capabilities, and leadership factors. These findings underscore that digital transformation, despite its technological nature, fundamentally represents an organizational change challenge requiring sophisticated change management.

Organizations employed multiple approaches to address capability gaps. Recruitment represented the most common approach, with 87% of organizations emphasizing aggressive hiring of external talent. However, intense competition for digital talent made recruitment challenging and expensive. Organizations in less attractive locations or industries struggled particularly with recruitment, often losing candidates to technology companies or more glamorous organizations. As one HR leader explained, "We're competing with Google and Amazon for data scientists, and we're a 100-year-old manufacturing company in the Midwest. It's not an easy sell."

Partnerships with educational institutions and training providers represented another common approach, employed by 73% of surveyed organizations. These partnerships took various forms including executive education programs, technical training, cohort-based learning programs, and university partnerships for research and talent pipeline development. Organizations generally reported positive experiences with these partnerships, though outcomes varied substantially based on program design and organizational support for employee participation.

Internal training and development programs were employed by 81% of organizations. These programs ranged from basic digital literacy training for all employees to specialized technical training for specific roles to leadership development programs emphasizing digital transformation leadership. Organizations that created comprehensive learning ecosystems with multiple learning pathways, ongoing support, and integration with career development reported better outcomes than those offering isolated training events. The importance of continuous learning cultures emerged strongly from case studies. As one executive explained, "We realized that one-off training programs weren't going to work. The technology changes too fast. We needed to create a culture where continuous learning is just part of how we work."

Research indicated that creating cultures of continuous learning had become increasingly pressing, with 27% of organizations identifying it as a significant challenge, up from 25% previously. Successful organizations fostered learning through multiple mechanisms including dedicated learning platforms providing access to diverse resources, time and incentives for learning activities, integration of learning into performance management, rotation programs exposing employees to different contexts, communities of practice enabling knowledge sharing, and innovation labs providing experimentation opportunities. These approaches created environments where learning became normalized and expected rather than exceptional.

Change management practices showed strong associations with transformation outcomes. Communication effectiveness emerged as particularly important ($r = 0.59$, $p < 0.001$). Organizations with clear, consistent, frequent, and multi-channel communication achieved significantly higher success than those with poor communication. Effective communication addressed multiple objectives including explaining transformation rationale and objectives, articulating compelling visions for the future, providing updates on progress and challenges, demonstrating leadership commitment, addressing concerns and questions, and celebrating successes.

However, communication represented necessary but not sufficient condition for success. Employee participation and involvement proved equally critical ($r = 0.54$, $p < 0.001$). Organizations that actively involved employees in designing changes rather than merely communicating decisions experienced lower resistance, higher buy-in, and more effective implementation. Participation took various forms including cross-functional transformation teams, pilot projects with broad participation, feedback mechanisms soliciting employee input, and governance structures including employee representation. These participation mechanisms created ownership and commitment while also improving solution quality through diverse perspectives.

Resistance management emerged as a critical challenge, with 70% of surveyed organizations reporting significant resistance to transformation initiatives. Research from BCG indicates that 70% of digital transformations fail due to lack of employee engagement and resistance during implementation (Forth et al., 2020). Resistance stemmed from multiple sources including fear of job loss or obsolescence, discomfort with learning new skills, skepticism about transformation benefits or organizational capability to execute, and perceived threats to status or power. Effective resistance management required understanding these sources and addressing them through targeted interventions.

Organizations that systematically assessed resistance, addressed legitimate concerns, demonstrated quick wins, and maintained consistent leadership commitment experienced less problematic resistance than those that ignored or minimized resistance concerns. As one change management professional explained, "You can't just tell people to stop resisting. You need to understand why they're resistant and address those concerns seriously. Sometimes the resistance is telling you something important about problems with your approach."

The challenge of sustaining momentum through multi-year transformation journeys emerged strongly from case studies. Initial enthusiasm often waned as implementation challenges emerged, competing priorities arose, and key champions moved to other roles. Organizations that maintained momentum employed several practices including celebrating quick wins demonstrating tangible progress, maintaining visible senior leadership commitment, refreshing communication as transformation evolved, adapting approaches based on learning, and reinforcing transformation priorities through resource allocation and decision-making.

Quick wins proved particularly valuable in building and sustaining momentum ($r = 0.48$, $p < 0.001$). Organizations that identified opportunities to deliver tangible benefits relatively quickly created positive energy, demonstrated transformation value, and built confidence. However, quick wins needed to be genuine improvements rather than artificial claims of success, as false victories damaged credibility and undermined long-term commitment. The optimal approach involved identifying initiatives that could deliver meaningful benefits in 6-12 month timeframes while also pursuing longer-term initiatives requiring extended implementation periods.

Governance structures and accountability mechanisms influenced transformation outcomes significantly. Research indicated that only 21% of organizations reported that the entire C-suite held responsibility for overseeing digital transformation initiatives, despite 61% of C-suite executives believing digital transformation was a top priority. This disconnect between stated priority and accountability created challenges for transformation execution. Organizations with clear governance structures including executive steering committees, dedicated transformation offices, and defined accountability achieved higher success rates ($r = 0.46$, $p < 0.001$).

Effective governance addressed several dimensions including strategic oversight providing direction and alignment, portfolio management ensuring resource allocation to highest-priority initiatives, cross-functional coordination addressing dependencies and conflicts, and accountability structures clarifying responsibility. Many successful organizations established dedicated transformation offices with responsibility for planning, coordinating, and monitoring transformation efforts. These offices provided project management support, maintained transformation portfolio visibility, and escalated issues requiring executive attention.

Alignment between transformation initiatives and business strategy emerged as critical success factor. Research indicated that 24% of organizations identified alignment challenges as significant concerns, up from 20% in 2024.

Without clear alignment, digital initiatives risked becoming technology projects in search of business value rather than strategic investments advancing organizational goals. Organizations that translated high-level strategies into concrete transformation priorities, established governance evaluating initiatives against strategic criteria, and tracked both transformation progress and business outcomes achieved stronger alignment and better results.

The pace and sequencing of transformation initiatives represented another critical decision. Organizations faced trade-offs between moving quickly to capture opportunities and avoid competitive disadvantage versus moving deliberately to manage risk and build capability. Case study evidence suggested that optimal approaches varied based on situational factors including strategic urgency, organizational change capacity, initiative complexity and risk, and resource availability. Some organizations successfully employed "big bang" approaches implementing significant changes rapidly, while others achieved success through more incremental approaches. Most successful transformations involved thoughtful combinations, with some initiatives implemented broadly and others following more gradual paths.

Organizations attempting to move too quickly relative to their capacity experienced multiple problems including implementation failures from insufficient capability or support, change fatigue undermining commitment and performance, resistance intensifying from perceived lack of consultation, and inability to incorporate learning from early implementation. Conversely, organizations moving too slowly risked losing momentum, missing competitive opportunities, experiencing attrition of key talent seeking faster-paced environments, and facing increasing skepticism about transformation commitment.

Multiple regression analysis examining simultaneous effects of leadership practices, organizational capabilities, and change management approaches on transformation success revealed several notable findings. Change management capabilities showed the strongest direct effect on transformation success ($\beta = 0.34$, $p < 0.001$), followed by digital business capabilities ($\beta = 0.28$, $p < 0.001$), transformational leadership ($\beta = 0.24$, $p < 0.01$), and communication effectiveness ($\beta = 0.19$, $p < 0.01$). Technical capabilities showed significant bivariate correlation with success but no significant independent effect in multivariate analysis, suggesting that technical capabilities enable success primarily through their relationships with other factors rather than through direct effects.

Structural equation modeling evaluating the integrated framework provided evidence for mediation relationships. Leadership practices influenced transformation outcomes both directly and indirectly through their effects on capability development and change management effectiveness. Organizations with strong digital leadership more effectively developed necessary capabilities and implemented more sophisticated change management practices, which in turn influenced transformation outcomes. These findings suggest that leadership creates conditions for transformation success rather than directly causing success, emphasizing the systemic nature of transformation.

Analysis of moderating factors revealed that transformation scope, organizational size, and industry context influenced relationships between predictors and outcomes. In organizations undertaking more comprehensive transformations involving fundamental business model changes, the effects of leadership and change management were even stronger, suggesting that these factors become increasingly critical as transformation scope and complexity increase. Larger organizations reported greater challenges with change management and communication due to organizational complexity, though they often possessed stronger technical capabilities. Industry context influenced which specific capabilities proved most critical, with technology-intensive industries emphasizing technical capabilities and service industries emphasizing digital business capabilities.

Comparison between successful and less successful cases revealed several distinguishing patterns. Successful transformations were characterized by clear, compelling transformation visions articulated by senior leaders, systematic capability development with substantial investment, comprehensive change management with dedicated resources and expertise, genuine employee participation in transformation design, consistent leadership commitment demonstrated through actions and resource allocation, effective governance with clear accountability, and sustained momentum through quick wins and celebration of progress. Less successful transformations typically exhibited one or more of the following characteristics: vague or frequently changing transformation objectives, inadequate capability development treating training as afterthought, minimal change management with assumption that communication suffices, top-down approach with limited employee involvement, inconsistent leadership commitment with frequent priority shifts, unclear accountability with diffused responsibility, and loss of momentum as initial enthusiasm waned.

These patterns underscore that transformation success requires integrated attention across multiple dimensions rather than excellence in any single area. Organizations cannot compensate for weak change management through superior technology, nor can excellent leadership overcome fundamental capability gaps. Successful transformation requires orchestrating leadership, capabilities, and change management to create conditions where transformation can succeed.

V. DISCUSSION

These findings have important theoretical and practical implications for understanding and managing digital transformation. This section discusses key implications, connections to existing literature, and recommendations for practice.

The finding that change management capabilities showed stronger relationships with transformation success than technical capabilities provides empirical support for assertions that digital transformation represents fundamentally a human and organizational challenge rather than primarily a technical one (Tabrizi et al., 2019). While technical capabilities enable transformation by providing capacity to implement digital technologies, change management capabilities determine whether organizations can effectively mobilize their people, overcome resistance, and sustain commitment through extended transformation journeys. Organizations that treat transformation primarily as technology

implementation projects while neglecting human and organizational dimensions predictably fail to realize expected benefits.

This finding challenges implicit assumptions in much digital transformation literature that emphasizes technology selection, architecture decisions, and technical implementation while treating organizational dimensions as secondary concerns (Hanelt et al., 2021). A more balanced perspective recognizing that technology and organization require equal attention would better serve both scholarship and practice. Future research should investigate organizational and human dimensions with the same rigor that has been applied to technological dimensions.

The importance of digital literacy among leaders, combined with the finding that transformational leadership behaviors independently predict success, suggests that effective digital leadership requires both domain-specific knowledge about digital technologies and general leadership competencies. Leaders cannot effectively guide digital transformation through general leadership skills alone if they lack sufficient understanding of digital possibilities and implications to make informed strategic decisions. Conversely, technological expertise without strong leadership skills proves equally insufficient. This finding has implications for leadership development, suggesting that programs should integrate digital literacy training with broader leadership development rather than treating these as separate domains (Schwarz Müller et al., 2018).

The finding that middle manager commitment and capability significantly influence transformation outcomes highlights the importance of leadership throughout organizational hierarchies rather than solely at senior executive levels. While senior leadership research dominates the leadership literature, this finding reinforces research emphasizing middle managers' critical roles in change implementation (Huy, 2002). Organizations that invest in building leadership capability and commitment at multiple levels achieve more consistent implementation and better outcomes. This suggests that leadership development resources should be distributed across organizational levels rather than concentrated at the top.

The strong association between employee participation and transformation success provides evidence for participative change management approaches. While top-down transformation directed by executives and consultants may appear efficient, evidence suggests that such approaches generate more resistance, achieve lower buy-in, and produce inferior outcomes compared to approaches that genuinely involve employees in designing changes (Lines, 2004). Participation creates ownership, incorporates diverse perspectives improving solution quality, and builds capability through experiential learning. Organizations should design transformation approaches that create meaningful participation opportunities rather than treating communication of pre-determined decisions as sufficient.

However, participation represents neither simple nor costless. Creating effective participation mechanisms requires careful design, facilitation skills, time, and willingness to genuinely incorporate employee input even when it challenges preferred approaches. Organizations must balance the benefits of participation against its costs and the risk that participative processes become performative exercises without genuine influence, which can increase cynicism rather than building commitment (Arnstein, 1969). The optimal degree and nature of participation likely vary based on organizational context, transformation characteristics, and time pressures.

The finding that cultures of continuous learning increasingly represent critical success factors reflects the rapid pace of technological change requiring that skills and knowledge be continuously updated (Kane et al., 2019). Organizations cannot treat capability development as one-time initiative to be completed and then maintained. Rather, continuous learning must become embedded in organizational culture and routines. This finding aligns with perspectives emphasizing organizational learning and dynamic capabilities as sources of competitive advantage in changing environments (Teece, 2007).

Creating cultures of continuous learning requires multiple reinforcing elements including learning infrastructure providing access to resources, time and incentives for learning, integration with performance management and career development, role models demonstrating learning behaviors, psychological safety enabling acknowledgment of knowledge gaps, and celebration of learning achievements. Organizations that implement isolated elements without comprehensive approaches achieve limited results. This suggests that capability development should be approached systemically rather than through disconnected initiatives.

The importance of sustained momentum through multi-year transformation journeys reflects the reality that digital transformation represents ongoing evolution rather than discrete project with defined endpoints. Unlike traditional IT projects with clear completion criteria, digital transformation involves continuous adaptation as technologies evolve, competitive conditions change, and new possibilities emerge (Warner & Wäger, 2019). Organizations must therefore develop capabilities to sustain transformation efforts over extended periods rather than assuming that initial enthusiasm will naturally persist.

The practices identified as supporting momentum—quick wins, consistent leadership commitment, communication refreshment, and approach adaptation reflect general change management principles adapted to digital transformation contexts. Quick wins provide tangible evidence of progress, countering skepticism and building confidence (Kotter, 1996). Consistent leadership commitment signals that transformation remains strategic priority rather than temporary initiative. Communication refreshment maintains engagement as early messages become stale. Approach adaptation demonstrates organizational learning and responsiveness to emerging realities. Organizations should deliberately incorporate these practices into transformation planning rather than assuming momentum will naturally sustain.

The finding that only 21% of organizations have full C-suite accountability for transformation despite 61% of executives viewing it as top priority reveals problematic disconnects between stated priorities and actual accountability. This disconnect likely reflects several factors including diffusion of responsibility when multiple executives nominally share accountability without clear delineation, tendency to assign responsibility to CDOs or CIOs while other executives

maintain traditional functional focus, and inadequate integration of transformation into executive performance management and incentive systems. Organizations should address these gaps through clearer accountability structures, integration of transformation objectives into all executive roles, and performance management systems that reflect transformation priorities.

The variation in optimal transformation pace and sequencing across organizations, based on strategic urgency, organizational capacity, initiative characteristics, and resource availability, underscores that no universal best practice exists for transformation timing. Organizations must assess their specific situations and make contextualized judgments about appropriate approaches. However, several principles can guide these decisions including matching pace to organizational change capacity to avoid overwhelming the organization, using phased approaches for high-risk or uncertain initiatives to enable learning, implementing broad and rapid change only for initiatives with clear requirements and adequate support, and regularly reassessing pace as circumstances evolve.

From practical perspective, these findings provide several actionable recommendations for organizations undertaking digital transformation. First, organizations should invest substantially in change management capabilities, recognizing that these capabilities significantly influence transformation success. This investment should include building internal change management expertise, engaging experienced change management professionals, allocating adequate resources to change management activities, and integrating change management into transformation planning from the beginning rather than treating it as afterthought.

Second, organizations should develop comprehensive leadership capability across organizational levels rather than focusing exclusively on senior executives. This requires leadership development programs integrating digital literacy with general leadership competencies, systematic efforts to build middle manager commitment and capability, and role modeling and reinforcement of desired leadership behaviors by senior leaders. Organizations should assess leadership capability gaps and develop targeted interventions to address them.

Third, organizations should create systematic capability development programs with multiple learning pathways, ongoing support, and integration with career development. These programs should address technical capabilities, digital business capabilities, and change management capabilities. Organizations should invest in creating learning cultures where continuous development becomes normalized rather than exceptional. This requires not only training programs but also broader cultural elements including time and incentives for learning, psychological safety, role modeling, and celebration of learning.

Fourth, organizations should implement sophisticated change management practices including clear and frequent communication, meaningful employee participation in transformation design, systematic assessment and management of resistance, and deliberate momentum maintenance. Change management should not be treated as simple communication exercise but rather as sophisticated organizational development initiative requiring expertise, resources, and executive attention.

Fifth, organizations should establish clear governance structures with explicit accountability for transformation outcomes. Governance should address strategic oversight, portfolio management, cross-functional coordination, and accountability. Many organizations benefit from dedicated transformation offices providing coordination, support, and monitoring. Accountability should be clearly assigned rather than diffused across multiple executives without clear delineation.

Sixth, organizations should ensure tight alignment between transformation initiatives and business strategy through clear translation of strategy into transformation priorities, governance processes evaluating initiatives against strategic criteria, and measurement frameworks tracking both transformation progress and business outcomes. Without clear alignment, transformation risks becoming technology initiative disconnected from business value.

Seventh, organizations should carefully calibrate transformation pace and sequencing based on their specific context, matching pace to organizational change capacity, using phased approaches for uncertain or high-risk initiatives, and regularly reassessing as circumstances evolve. Organizations should resist both the temptation to move too slowly, missing opportunities and losing momentum, and the temptation to move too quickly, overwhelming organizational capacity and generating resistance.

VI. CONCLUSION

This research investigated the critical role of leadership and change management in digital transformation success through mixed-methods analysis combining survey research with in-depth case studies. The findings provide strong empirical evidence that digital transformation success depends primarily on human and organizational factors rather than technology selection or technical implementation. Organizations with strong digital leadership, comprehensive change management practices, and systematic capability development achieve substantially higher transformation success rates than those neglecting these dimensions.

Several key findings emerge from this research. First, effective digital leadership requires both digital literacy enabling informed strategic decisions about technologies and investments, and transformational leadership behaviors inspiring commitment and guiding change. Second, organizational capabilities in change management show even stronger relationships with transformation success than technical capabilities, underscoring that transformation represents fundamentally a human challenge. Third, comprehensive change management practices including effective communication, employee participation, resistance management, and momentum maintenance significantly influence transformation outcomes. Fourth, sustained senior leadership commitment demonstrated through consistent actions and resource allocation proves critical for transformation success. Fifth, cultures of continuous learning become increasingly essential given rapid technological change requiring continuous capability updating.

These findings advance theoretical understanding of digital transformation by providing empirical evidence on factors influencing transformation success, developing an integrated framework connecting leadership, capabilities, and change management, and highlighting the primacy of human and organizational dimensions over purely technological considerations. The research contributes to digital leadership literature by identifying specific leadership competencies and practices associated with success, to capability development literature by examining approaches to building transformation capabilities, and to change management literature by investigating change management in digital transformation contexts specifically.

From practical perspective, this research provides actionable guidance for organizations undertaking digital transformation. Organizations should invest substantially in change management capabilities and practices, recognizing that these significantly influence transformation success. They should develop leadership capability across organizational levels rather than focusing exclusively on senior executives. They should create systematic capability development programs and foster cultures of continuous learning. They should implement sophisticated change management practices going well beyond simple communication. They should establish clear governance structures with explicit accountability. They should ensure tight alignment between transformation and business strategy. They should carefully calibrate transformation pace and sequencing based on their specific context.

This research has several limitations suggesting caution in interpretation and opportunities for future research. The cross-sectional design limits ability to track transformation trajectories over time. While the study captured organizations at various transformation stages, longitudinal research tracking organizations through complete transformation journeys would provide richer understanding of how factors influence success at different stages and how relationships evolve over time. The sample focused on large and mid-sized organizations in developed economies, potentially limiting generalizability to smaller organizations or emerging markets where contexts may differ significantly.

Self-reported measures of transformation success and outcomes, while practical given diversity of organizational objectives and proprietary nature of objective performance data, introduce potential bias. Future research incorporating objective performance measures where possible would strengthen confidence in findings. The study examined associations between factors and outcomes but cannot definitively establish causality. While the theoretical framework proposes that leadership and change management practices cause transformation success, alternative causal directions or omitted variables could potentially explain observed associations. Experimental or quasi-experimental designs would enable stronger causal inference, though such designs are extremely difficult in organizational transformation contexts.

Several promising directions for future research emerge from this study. First, longitudinal research tracking transformation journeys over extended periods would provide insights into temporal dynamics, evolution of critical success factors, and long-term sustainability of transformation outcomes. Second, research examining transformation in diverse organizational and cultural contexts would enhance understanding of how context influences optimal approaches. Third, investigation of specific leadership development interventions and their effectiveness would inform programs to build digital leadership capability. Fourth, research on effective employee participation mechanisms would provide practical guidance on designing participative approaches. Fifth, examination of how organizations sustain transformation momentum over very extended periods would address an increasingly critical challenge as transformation becomes continuous rather than episodic.

Digital transformation represents one of the most significant challenges and opportunities facing organizations in contemporary business environments. While technology enables transformation by providing new capabilities, success ultimately depends on leadership's ability to articulate compelling visions, develop necessary capabilities, engage employees effectively, overcome resistance, and sustain commitment through extended change journeys. Organizations that treat transformation primarily as technology initiative while neglecting human dimensions predictably fail. Those that invest in leadership development, capability building, and sophisticated change management practices position themselves for transformation success and sustained competitive advantage in increasingly digital economy.

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