Journal of Economics, Finance and Management Studies

ISSN (print): 2644-0490, ISSN (online): 2644-0504

Volume 09 Issue 10 October 2026

Article DOI: 10.47191/jefms/v9-i10-49, Impact Factor: 8.735

Page No: 5747-5751

Organizational Culture as a Mediator Between Leadership and Employee Digital Adaptation in SMEs: A Conceptual Review and Research Agenda

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ABSTRACT: Small and medium-sized enterprises (SMEs) are under growing pressure to adopt digital tools, yet technology adoption alone does not guarantee that employees change how they work. This review examines how leadership influences employee digital adaptation and why organizational culture is a plausible mediating mechanism in that relationship. Drawing on the leadership, organizational culture, technology acceptance and change literatures, the paper (1) clarifies the three core constructs, (2) synthesizes evidence on the leadership–adaptation, leadership–culture and culture–adaptation links, (3) explains why SMEs are a distinctive setting, and (4) proposes a mediation framework with four testable propositions. The review argues that leaders shape the shared values, norms and routines that employees draw on when they decide whether to learn and use digital tools, so that culture transmits much of the leader's influence. The paper closes with a research agenda covering design, measurement and context, and with practical implications for SME owners and managers.

KEYWORDS: organizational culture, leadership, digital adaptation, SMEs, mediation, digital transformation

1. INTRODUCTION

Digital technologies, including cloud software, mobile payments, e-commerce platforms, collaboration tools and data analytics, have lowered the cost of digitalization for small firms. For SMEs, which often operate with thin margins and limited specialist staff, digital tools can improve efficiency, widen market reach and strengthen resilience. Yet the practical experience of many firms is that buying a system is the easy part. The harder part is getting people to change routines, learn new skills and accept new ways of working. A widely cited argument in the practitioner literature is that strategy, people and culture, rather than technology itself, determine whether digital transformation succeeds (Kane et al., 2015; Westerman et al., 2014).

This shifts attention to the employee level. Digital transformation is ultimately enacted by individuals who must decide whether and how to use new tools. Two bodies of work help explain what shapes those decisions. The first is leadership research, which shows that leaders influence employee attitudes and behavior through vision, support and role modeling (Bass, 1985; Judge & Piccolo, 2004). The second is organizational culture research, which holds that shared assumptions and values guide what employees regard as appropriate behavior (Schein, 2010). Leadership and culture are closely connected: founders and leaders create culture, and culture in turn constrains and enables leaders (Schein, 2010). It is therefore natural to ask whether culture is the channel through which leadership affects digital adaptation.

This question matters especially in SMEs. In a small firm the owner-manager is highly visible, formal HR systems are thin, and culture is often a direct reflection of the leader's personality and habits. At the same time, SMEs have fewer resources to absorb failed change efforts. Understanding the leadership– culture–adaptation chain can therefore offer cost-effective guidance.

The purpose of this paper is to review and integrate the relevant literature and to propose a conceptual framework in which organizational culture mediates the relationship between leadership and employee digital adaptation in SMEs. The paper makes three contributions. It defines employee digital adaptation as a distinct outcome construct, it brings together streams of research that are usually studied separately, and it sets out propositions and a research agenda to guide empirical testing.

2. REVIEW APPROACH

This is a narrative, conceptual review. It is built on foundational and widely cited works in leadership, organizational culture, technology acceptance, organizational change and digital transformation, selected for their theoretical relevance to the proposed framework. It is not a systematic review and makes no claim to cover all published studies. [Authors to complete before submission: if a systematic search is carried out, report the databases searched, search strings, date range, inclusion and exclusion criteria, and the number of records screened and retained, ideally following PRISMA guidance.

3. CONCEPTUAL FOUNDATIONS

3.1 Leadership

Leadership is the process by which an individual influences others to pursue shared goals. Within the many theories available, transformational leadership is the most relevant to change settings. Building on Burns (1978), Bass (1985) described transformational leaders as those who articulate an inspiring vision, stimulate intellectual curiosity, give individual attention and act as role models. Transactional leadership, by contrast, rests on exchanges such as rewards for performance. A meta-analysis by Judge and Piccolo (2004) found that transformational leadership is positively related to follower satisfaction, motivation and leader effectiveness, and that its relationships with outcomes are generally stronger than those of transactional leadership. Because digital change demands experimentation and learning rather than routine compliance, transformational and other change-oriented, supportive styles are the most commonly proposed antecedents of digital adaptation. Other relevant styles include servant, participative and entrepreneurial leadership, the last being especially pertinent to owner-managed firms.

3.2 Organizational Culture

Schein (2010) defines organizational culture as a pattern of shared basic assumptions that a group has learned while solving problems of external adaptation and internal integration, and that is taught to new members as the correct way to perceive, think and feel. He distinguishes three levels: visible artifacts, espoused values, and deeper underlying assumptions. Other influential frameworks treat culture in more measurable terms. Denison (1990) links culture traits such as involvement, consistency, adaptability and mission to effectiveness. Cameron and Quinn (2011) propose the Competing Values Framework, which sorts cultures into clan, adhocracy, market and hierarchy types along two dimensions: flexibility versus control, and internal versus external focus. A meta-analysis by Hartnell et al. (2011) found that culture types in this framework are related to organizational effectiveness, with the pattern of relationships depending on the outcome examined.

For digital adaptation, the most relevant cultural features are an orientation toward learning, openness to experimentation, tolerance of mistakes, collaboration and psychological safety. Adhocracy and clan cultures, and cultures that score high on adaptability in Denison's terms, are the most frequently argued to support technology-driven change, whereas rigid hierarchy cultures are expected to resist it, although hierarchy can help during implementation phases that require discipline and standardization.

3.3 Employee Digital Adaptation

Employee digital adaptation has no single agreed definition. In this paper it refers to the extent to which employees learn, accept and effectively integrate digital technologies and digitally enabled processes into their everyday work, including adjusting their skills, routines and attitudes as tools change. This definition draws on and goes beyond three related literatures: technology acceptance, which focuses on perceived usefulness and ease of use (Davis, 1989) and on the broader drivers of use in the unified model of Venkatesh et al. (2003); change recipient reactions, which examine cognitive, affective and behavioral responses to change (Oreg et al., 2011); and the digital transformation literature, which treats the digitization of organizations as a multi-level process of strategic, structural and human change (Vial, 2019). Digital adaptation can be treated as a multidimensional construct with at least an attitudinal component (openness and willingness), a capability component (digital skills and learning) and a behavioral component (actual and effective use). Researchers should state clearly which component they measure.

4. THE DISTINCTIVE CONTEXT OF SMES

SMEs differ from large firms in ways that affect all three constructs. Leadership is concentrated: the owner-manager often makes most strategic decisions and personally shapes daily routines, so the leader's attitude toward technology has an outsized effect. Culture tends to be informal, personal and strongly tied to the founder, so that artifacts and values are closely visible to employees. Resources for training, specialist IT staff and formal change management are limited, which makes employees rely more heavily on peers and on the manager for support. Employees in SMEs also often perform several roles and so encounter digital tools across many tasks. Finally, in developing economies, SMEs face additional constraints such as variable infrastructure, uneven digital skills

and, in many cases, familybased management traditions. The conclusions of studies carried out in large firms in advanced economies cannot be assumed to hold in this setting, which supports the need for SME-specific investigation.

5. RELATIONSHIPS AMONG THE CONSTRUCTS

5.1 Leadership and Employee Digital Adaptation

Leaders affect digital adaptation in several ways. They communicate why change is needed and what it means for employees, which reduces uncertainty. They allocate time and resources for training. They model the use of new tools, signaling that the change is genuine. They also provide emotional support, which lowers anxiety about unfamiliar technology. The change literature shows that employee reactions to change are shaped by the change process, context and leadership, as well as by individual differences (Oreg et al., 2011). In technology acceptance terms, leaders influence perceived usefulness and social influence, two factors that Venkatesh et al. (2003) identify as important for use. Practitioner research reaches a similar conclusion, stressing visible leadership commitment to a digital vision (Kane et al., 2015; Westerman et al., 2014).

5.2 Leadership and Organizational Culture

The link between leadership and culture is among the oldest propositions in culture research. Schein (2010) argues that leaders embed culture through what they pay attention to, measure and control, how they react to crises, how they allocate rewards and how they recruit and select. Bass and Avolio (1993) argued that transformational leaders can change culture and that culture, in turn, can shape the type of leadership that emerges. In an SME, where a leader's actions are directly visible, these embedding mechanisms operate with little organizational buffering. A leader who encourages questions and tolerates early mistakes will tend to build a learning-oriented culture, while a leader who punishes errors will tend to build a cautious, compliance-oriented one.

5.3 Organizational Culture and Employee Digital Adaptation

Culture shapes digital adaptation by defining which behaviors are normal and rewarded. In a culture that values learning and collaboration, employees are more likely to experiment, ask for help and share new skills. In a culture that values stability and control, employees may treat new tools as a threat or as an additional burden. Culture also affects the interpretation of change: the same new system may be read as an opportunity in one firm and as surveillance in another. The practitioner literature repeatedly identifies culture as a leading barrier to or enabler of digital transformation (Kane et al., 2015; Westerman et al., 2014), and the culture–effectiveness research provides a general basis for expecting adaptive cultures to support adaptive outcomes (Denison, 1990; Hartnell et al., 2011). Direct, SMEspecific empirical evidence using validated measures of digital adaptation remains limited and should be examined carefully by researchers.

5.4 Culture as a Mediator

A mediator is a variable that accounts for the relation between a predictor and an outcome (Baron & Kenny, 1986). Three conditions make culture a plausible mediator here. First, leadership must affect culture, which is supported by the theoretical argument in Section 5.2. Second, culture must affect digital adaptation, as discussed in Section 5.3. Third, the effect of leadership on adaptation should fall, or become indirect, once culture is taken into account. The underlying logic is that a leader's behavior reaches employees mainly through the shared climate of norms and expectations that the leader helps create. A single announcement or training program has a limited effect if the surrounding culture does not support the change, whereas a leader who has built a culture of learning has already created the conditions in which adaptation can occur.

Partial mediation is probably more realistic than full mediation, because leaders also influence adaptation directly through resources, coaching and individual attention. Culture is also not the only possible mediator. Psychological safety, digital self-efficacy, perceived organizational support and employee engagement are plausible parallel or sequential mediators that future work should consider. Finally, causality may run in both directions over time, since culture also shapes which leaders are selected and how they behave (Schein, 2010).

6. CONCEPTUAL FRAMEWORK AND PROPOSITIONS

The framework proposes that leadership (independent variable) influences employee digital adaptation (dependent variable) both directly and indirectly through organizational culture (mediator). Firm-level and individual-level factors such as firm size, age, sector, digital infrastructure, employee age, education and prior digital experience are treated as control variables. The following propositions are offered for empirical testing.

Proposition 1. Change-oriented, supportive leadership (for example, transformational leadership) is positively related to employee digital adaptation in SMEs.

Proposition 2. Change-oriented, supportive leadership is positively related to a culture of learning, openness and collaboration in SMEs.

Proposition 3. A culture of learning, openness and collaboration is positively related to employee digital adaptation in SMEs.

Proposition 4. Organizational culture partially mediates the relationship between leadership and employee digital adaptation in SMEs, so that the indirect effect of leadership through culture is positive and significant.

A useful extension is to ask whether the strength of the mediated pathway depends on conditions such as firm size, owner-manager involvement, industry digital intensity or country context, which would lead to moderated mediation models.

7. RESEARCH AGENDA

Design: Most existing work on the relevant relationships relies on cross-sectional surveys, which cannot establish the causal ordering that mediation implies. Longitudinal designs, multi-wave surveys and, where feasible, field experiments or intervention studies would provide stronger evidence. Qualitative case studies of SMEs undergoing digital change can help explain how culture is built and how it affects employee behavior.

Measurement: Researchers need validated, SME-appropriate scales for digital adaptation that separate attitudes, skills and behavior. Culture should be measured with established instruments, for example those based on the Competing Values Framework (Cameron & Quinn, 2011) or Denison's model, rather than ad hoc items. Common method bias is a concern when the same employees report on leadership, culture and adaptation, so procedural and statistical remedies should be used (Podsakoff et al., 2003), and objective or multi-source data on technology use should be collected wherever possible.

Analysis: Modern mediation analysis based on bootstrapped indirect effects, as described by Hayes (2018), is preferable to the causal-steps approach alone. Multilevel models are needed when employees are nested within firms, and structural equation modeling can handle latent constructs and multiple mediators.

Context: More research is needed in under-studied settings, including SMEs in developing and emerging economies, different industries, family-owned firms and firms at different stages of digital maturity. National culture may also shape how leadership and organizational culture operate (Hofstede, 2001), so cross-country comparisons would be valuable.

Boundary conditions and alternative mechanisms: Future studies should test whether the mediating role of culture holds once psychological safety, self-efficacy, training and perceived organizational support are included, and should examine possible negative effects such as technostress and digital overload.

8. IMPLICATIONS FOR PRACTICE

SME owners and managers should recognize that digital adaptation is a people and culture issue as well as a technology issue. Leaders can begin by communicating a clear and honest reason for digital change and by using the tools themselves so that their behavior matches their words. They can build a learningoriented culture by allowing time for practice, treating early errors as part of learning, encouraging peer teaching and recognizing employees who help others adapt. Because SMEs have limited training budgets, low-cost measures such as internal champions, short peer-led sessions and open channels for feedback may be especially valuable. Finally, leaders should monitor culture and employee reactions as the change proceeds and adjust their approach, rather than assuming that a successful technology rollout means successful adaptation.

9. LIMITATIONS

This paper is conceptual and narrative in nature. It does not report primary data, and its selection of literature is not exhaustive. The proposed definition of employee digital adaptation is a working one that needs further validation. The framework centers on a single mediator, and the propositions are theoretical expectations rather than established findings. Much of the foundational literature originates in large firms and Western contexts, so transfer to SMEs in other settings must be tested.

10. CONCLUSION

This review has argued that organizational culture is a plausible mediating mechanism between leadership and employee digital adaptation in SMEs. Leaders in small firms shape culture closely and visibly, and culture in turn shapes whether employees embrace or resist digital change. The proposed framework and propositions offer a basis for empirical testing and a way to integrate the leadership, culture, technology acceptance and change literatures. Testing the framework with rigorous designs in diverse SME contexts would advance both theory and practice.

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