

Digital Transformation and Organizational Performance in Developing Economies: Strategy, Innovation, Governance, and Institutional Change

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Abstract

Digital technologies have spread quickly through developing economies, but the organizational and developmental returns to that spread have been uneven. This article reviews scholarship published up to 2021 on the relationship between digital transformation and organizational performance in developing economies, and on the roles that strategy, innovation, governance and institutional change play in that relationship. It brings together two literatures that have developed largely apart: research on digital transformation in management and information systems, which draws mainly on incumbent firms in advanced economies, and research on information systems in developing countries, which has long documented the gap between system designs and local realities. The review reaches four conclusions. First, much of what is described as digital transformation in developing economies is digitization or digitalization, and performance expectations should be calibrated accordingly. Second, the effect of digital investment on performance is indirect: it operates through changes in processes, business models and structures. Third, that effect is conditioned by complements that are not themselves digital, including infrastructure, skills, regulation and accountable institutions. Fourth, governance determines whether digital innovations scale beyond pilots, and successful transformation can itself alter the institutional environment. The article integrates these conclusions in a conceptual framework and a typology of transformation outcomes, states four propositions, and identifies implications for managers, policymakers and researchers.

Keywords: digital transformation; organizational performance; developing economies; digital strategy; digital innovation; IT governance; institutional change; analog complements.

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1. Introduction

Few developments have raised expectations for organizations in developing economies as much as the spread of digital technologies. The expectations are well founded in part. The World Bank (2016) documented the rapid diffusion of mobile telephony and internet access across the developing world, and at the same time observed that the wider benefits, which it termed digital dividends, had lagged behind that diffusion and were unevenly distributed. Its explanation was that digital investments pay off only alongside what it called analog complements: regulations that allow firms to connect and compete, skills that match the technology and institutions that are accountable.

Management and information systems research has meanwhile established digital transformation as a central organizational challenge. Several reviews have consolidated the field (Vial, 2019; Hanelt et al., 2021; Kraus et al., 2021; Verhoef et al., 2021). Much of the underlying evidence, however, comes from established firms in advanced economies that are adapting legacy structures to digital competition. The COVID-19 pandemic added urgency by accelerating changes in working, selling and service delivery (Dwivedi et al., 2020; Soto-Acosta, 2020), and it did so in rich and poor countries alike.

A separate tradition of research on information systems in developing countries has studied technology-enabled change in low-resource settings for considerably longer. Its recurring finding is that systems designed with one context in mind often fail in another, and that success depends on local adaptation (Heeks, 2002; Walsham and Sahay, 2006; Avgerou, 2008). The two traditions have seldom been brought together. Digital transformation research has had little to say about weak infrastructure and institutions, and research on information systems in developing countries has engaged only partially with strategy and performance.

This article reviews scholarship published up to 2021 with the aim of connecting them. It asks under what conditions digital transformation improves organizational performance in developing

economies, and what roles strategy, innovation, governance and institutional change play. Section 2 describes the review approach. Section 3 clarifies concepts and theoretical lenses. Sections 4 to 8 examine strategy, innovation, performance, governance and institutional change. Section 9 integrates the argument in a framework, a typology and four propositions, and Sections 10 and 11 set out implications and conclude.

2. Review Approach

The article is an integrative narrative review. The topic spans information systems, strategic management, development economics and public administration, and the purpose is to build a conceptual bridge between them, for which a narrative design is better suited than a protocol-driven systematic review confined to one field. Sources comprise peer-reviewed journal articles, scholarly books, one refereed conference paper and two widely cited institutional reports, all published up to and including 2021. Selection was purposive and followed three criteria: conceptual centrality to the study of digital transformation; empirical evidence from developing economies, with emphasis on sub-Saharan Africa and Asia; and relevance to one or more of the four themes named in the title. Earlier foundational studies of information technology and performance were included where recent work depends on them. The bibliographic details of every source were checked against publisher or index records.

Two limitations should be noted. Coverage is selective by design, and the firm-level evidence on digital transformation in developing economies remained thin in 2021, so several arguments rest on economy-level studies or on case research. The conclusions are accordingly presented as propositions.

3. Conceptual Foundations

3.1 What digital transformation is, and is not

Vial (2019, p. 118) defined digital transformation as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies”. The definition is deliberately broad: the entity may be a firm, a public agency or a society, and the emphasis falls on significant change, not on

technology adoption as such. Verhoef et al. (2021) sharpened the concept by distinguishing three stages. Digitization is the conversion of analog information into digital form. Digitalization is the use of digital technologies to alter existing business processes. Digital transformation is organization-wide change that leads to new business models. They also identified the resources, organizational structures, growth strategies and metrics that each stage requires.

Wessel et al. (2021) drew a related boundary between digital transformation and information technology-enabled organizational transformation. In the former, digital technology is central to redefining the organization's value proposition and a new organizational identity emerges; in the latter, technology supports an existing value proposition and reinforces the existing identity. For the public sector, Mergel, Edelmann and Haug (2019) concluded from interviews with experts that digital transformation is a holistic effort to revise the core processes and services of government beyond traditional digitization, resulting in changed relationships with citizens and, ultimately, in cultural change. Figure 1 summarizes these distinctions.

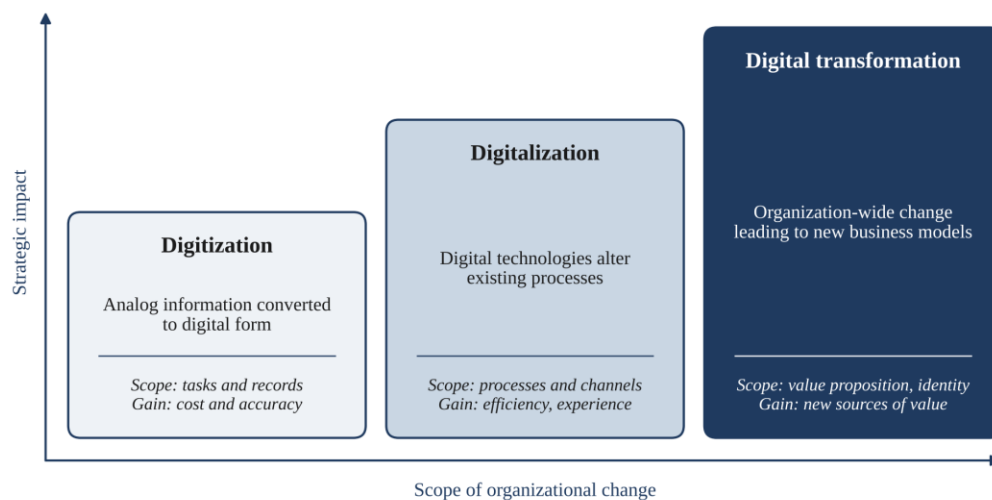


Figure 1. Three stages of digital change and their organizational scope.

Source: Authors' elaboration, adapted from Verhoef et al. (2021) and Wessel et al. (2021).

The distinctions carry a practical implication for developing economies. Many initiatives reported as digital transformation, such as replacing paper registers, automating payroll or moving payments online, are instances of digitization or digitalization. That is not a criticism. Earlier stages

may be exactly what an organization's circumstances call for, and they create capabilities on which later stages depend. But the performance gains that can reasonably be expected differ by stage, and conflating the stages invites disappointment.

3.2 Theoretical lenses

Four streams of theory inform the relationship between digital technology and performance. The first concerns the business value of information technology. Brynjolfsson and Hitt (2000) showed that complementary organizational investments, such as new business processes and work practices, have a large influence on the value of information technology, and that the resulting benefits are often intangible and difficult to measure. Bharadwaj (2000) found that firms with superior information technology capability outperformed comparable firms on profit and cost measures, and Melville, Kraemer and Gurbaxani (2004) integrated the evidence in a model in which the value obtained from information technology depends on complementary resources inside the firm and on the trading partners, industry and country environment outside it.

The second stream is dynamic capabilities. Teece (2007) described the capacity to sense opportunities, seize them and reconfigure assets. Warner and Wäger (2019) applied the idea to digital transformation, which they characterized as an ongoing process of strategic renewal built on digital sensing, digital seizing and digital transforming capabilities. Mikalef and Pateli (2017) found that information technology-enabled dynamic capabilities improve competitive performance indirectly, through their effect on organizational agility.

The third stream addresses digital innovation. Yoo, Henfridsson and Lyytinen (2010) argued that pervasive digitization gives rise to a layered modular architecture of devices, networks, services and contents, whose loose coupling allows innovation by actors that the original designer did not anticipate. The fourth stream is research on information systems in developing countries. Avgerou (2008) identified three discourses within it: information systems innovation as the transfer of technology and knowledge and its adaptation to local social conditions, as socially embedded action, and as transformative techno-organizational intervention associated with global politics and economics. Heeks (2002) contributed the concept of the design–actuality gap, the match or mismatch between an information system's design and the actuality of its local users, and argued that such gaps explain why many information systems in developing countries fail wholly or in part, and that local improvisation, though constrained, can reduce them.

Although they start from different places, the four streams agree on one point: technology produces value in combination with other things. The remainder of the review examines what those other things are.

4. Digital Transformation Strategy

4.1 From alignment to fusion

For much of its history, information technology strategy was treated as a functional plan to be aligned with business strategy. Bharadwaj et al. (2013) argued that this subordinate role was no longer tenable and proposed the concept of digital business strategy: organizational strategy formulated and executed by leveraging digital resources to create differential value. They organized the concept around four themes, namely the scope, scale and speed of digital business strategy and its sources of value creation and capture. Matt, Hess and Benlian (2015) gave the idea operational form by identifying four dimensions common to digital transformation strategies: the use of technologies, changes in value creation, structural changes and financial aspects. Hess et al. (2016) translated these dimensions into eleven strategic questions for managers, on the basis of case studies of three German media companies.

4.2 Strategy in practice

Empirical work supports the primacy of strategy over technology. In a survey of more than 4,800 executives, managers and analysts, Kane et al. (2015) found that what distinguished digitally maturing organizations was a clear and coherent digital strategy, supported by leadership and a culture open to change, and not the possession of particular technologies. Sebastian et al. (2017) observed that large established companies pursue one of two digital strategies, customer engagement or digitized solutions, and that both rest on two technology-enabled assets: an operational backbone that secures efficient and reliable core operations, and a digital services platform that supports rapid innovation. In an in-depth case study of a European financial services provider, Chantias, Myers and Hess (2019) showed that digital transformation strategy is not formulated once and then implemented. It emerges through repeated cycles of learning and doing and remains continually in the making.

4.3 Strategy under developing-economy conditions

These studies presuppose reliable connectivity, deep markets for technical skills and organizations with substantial legacy systems. Conditions in developing economies differ on each count. Legacy systems are fewer, which reduces the cost of abandoning old architectures, but the operational backbone that Sebastian et al. (2017) treat as a precondition is often missing as well, and the complements identified by the World Bank (2016) are weaker.

The absence of legacy systems is often described as an opportunity to leapfrog. The evidence reviewed here counsels caution. Leapfrogging has occurred where the requirements of a technology matched local conditions, as with mobile telephony and mobile payments (Aker and Mbiti, 2010; Adeleye and Eboagu, 2019), and where a capable organization supplied the missing infrastructure. It is much less evident in applications that depend on reliable power, fixed broadband or specialized skills.

The most instructive evidence on strategy in such conditions comes from smaller firms. Li et al. (2018) studied small and medium-sized enterprises in China that lacked the capabilities and resources usually thought necessary for digital transformation and that nevertheless achieved it by operating through a third-party digital platform. Transformation was driven by the entrepreneurs themselves, through the renewal of managerial cognition, the development of managerial social capital, the building of business teams and the building of organizational capability, with the platform provider supplying support at each step. Two strategic lessons follow. Platform participation lowers the threshold of investment and expertise at which digital strategy becomes feasible, at the cost of dependence on the platform owner. And in resource-constrained organizations, digital strategy is inseparable from the learning of the person who leads it.

5. Digital Innovation and Entrepreneurship

5.1 The changed logic of innovation

Nambisan et al. (2017) argued that digital technologies undermine three assumptions of traditional innovation management: that innovations have fixed boundaries, that innovation agency is concentrated in a defined set of actors and that innovation processes and outcomes are distinct. Digital offerings remain incomplete and open to revision after launch, and contributions come

from distributed actors. Nambisan, Wright and Feldman (2019) later summarized the wider consequences for innovation and entrepreneurship under the themes of openness, affordances and generativity. For organizations in developing economies this logic is double-edged. It lowers barriers to entry, because modular components and shared infrastructure can be combined without owning them. It also shifts advantage toward whoever controls the platforms on which combination takes place.

5.2 Mobile-led innovation

The clearest developing-economy illustrations are mobile-based. Aker and Mbiti (2010) identified the channels through which mobile telephony affects economic activity in Africa: lower search costs and better-functioning markets, improved coordination within and between firms, new employment, stronger social networks for managing risk, and a platform for services such as mobile money. Kenya's mobile money service has been studied with particular rigor. Jack and Suri (2014) showed that by reducing the cost of transferring money over distance, the service improved risk sharing: households that used it were able to absorb negative income shocks without reducing consumption, whereas households that did not use it could not. Suri and Jack (2016) estimated that access to the service raised long-run consumption and lifted 194,000 Kenyan households, around 2 percent of the total, out of poverty, with larger effects for female-headed households and a shift of women from farming into business occupations.

From an organizational standpoint, mobile money is a case of digital transformation in the strict sense set out in Section 3. A telecommunications operator redefined its value proposition, and the resulting payments infrastructure became a layer on which other firms, public agencies and non-profit organizations could build services of their own.

5.3 The limits of digital entrepreneurship

A balanced reading must also register the limits. In their study of digital entrepreneurship across African cities, Friederici, Wahome and Graham (2020) found that digital enterprises were real and consequential but predominantly local in reach, adapted to the particular conditions of their markets and seldom able to scale in the manner assumed by narratives borrowed from Silicon Valley. Foster et al. (2018) examined East African firms in the tea, tourism and business process outsourcing sectors and found that improved connectivity did not straightforwardly enable them to upgrade their position in global value chains. Connectivity instead enabled forms of digital

control exercised through value chains, and most local firms were only thinly integrated. Digital innovation, in other words, redistributes opportunity; it does not guarantee that the opportunity accrues locally.

6. Digital Transformation and Organizational Performance

6.1 Firm-level evidence

Direct evidence on digital transformation and firm performance was still limited in 2021, but its direction is consistent. Using survey data from chief information officers, Nwankpa and Roumani (2016) found that information technology capability positively influenced digital transformation, that digital transformation was positively associated with firm performance and that it mediated the relationship between capability and performance. The finding accords with the indirect path through agility reported by Mikalef and Pateli (2017) and with the older evidence on complementary investments (Brynjolfsson and Hitt, 2000). Technology does not raise performance by being acquired; it does so by enabling the organization to work differently.

The corollary is that investment can outrun returns. Gebauer et al. (2020) described a digitalization paradox in which companies invest substantially in digital offerings yet struggle to achieve the revenue growth they expected, and they traced three growth paths out of the paradox, each of which requires changes to the business model and not simply further investment. The paradox was identified among industrial companies. It is likely to be sharper where complementary capabilities are scarcer.

6.2 Economy-level evidence from developing regions

Evidence at the level of the economy is stronger. Exploiting the staggered arrival of submarine internet cables on the African coast, Hjort and Poulsen (2019) found that fast internet had large positive effects on employment rates, including for less-educated workers, and they linked the effect to increased firm entry, higher productivity in existing manufacturing firms and greater exporting. Comparing sub-Saharan African and OECD economies, Myovella, Karacuka and Haucap (2020) found that digitalization contributed positively to economic growth in both groups, with a larger effect of mobile telecommunications in sub-Saharan Africa and a smaller effect of broadband internet there than in the OECD. Adeleye and Eboagu (2019) likewise reported a

positive and statistically significant relationship between information and communication technology development and economic growth across African countries, with mobile subscriptions showing the largest effect. The pattern suggests that returns are greatest for technologies whose infrastructure and skill requirements match local conditions, which is the organizational argument about complements restated at national scale.

6.3 The pandemic as an accelerant

The COVID-19 pandemic altered the pace of change. Soto-Acosta (2020) described it as shifting digital transformation into a high-speed gear, and the expert contributions assembled by Dwivedi et al. (2020) documented abrupt moves to online work, education and service delivery, together with concern about the widening of digital divides. Papadopoulos, Baltas and Balta (2020) highlighted the use of digital technologies by small and medium-sized enterprises to secure business continuity and outlined avenues for research. Among the open questions is the extent to which such emergency adoption yields lasting capability. For developing economies the episode was a natural test of readiness. Organizations with digital channels, connected staff and connected customers adapted, and those without them were exposed.

6.4 Dimensions of performance

Taken together, the studies reviewed in this section show that performance is not a single quantity.

Table 1. Performance effects of digital technologies: dimensions, mechanisms and illustrative evidence.

Performance dimension	Principal mechanism	Illustrative evidence
Operational efficiency	Lower search, coordination and transaction costs.	Aker and Mbiti (2010); Jack and Suri (2014)
Financial and market performance	IT capability enables transformation and agility, which in turn affect performance.	Bharadwaj (2000); Nwankpa and Roumani (2016); Mikalef and Pateli (2017)
Innovation and growth	Generative architectures and platform-supported capability building.	Yoo, Henfridsson and Lyytinen (2010); Li et al. (2018)
Employment and productivity at economy level	Firm entry, productivity gains and exporting following connectivity.	Hjort and Poulsen (2019); Myovella, Karacuka and Haucap (2020)
Public value and accountability	Service redesign, transparency and information diffusion.	Bertot, Jaeger and Grimes (2010); Asongu and Nwachukwu (2016); Mergel, Edelmann and Haug (2019)
Limits and risks	Returns that lag investment; design–actuality gaps; control by lead firms.	Heeks (2002); Foster et al. (2018); Gebauer et al. (2020)

Source: Authors' compilation from the sources cited.

Table 1 distinguishes the dimensions on which effects have been reported, the mechanisms proposed and representative sources. It also records the principal limits and risks, since a review that listed only benefits would misstate the evidence.

7. Governance of Digital Transformation

7.1 Governance within organizations

Weill and Ross (2004) defined information technology governance as specifying the decision rights and accountability framework that encourages desirable behavior in the use of information technology, and reported that firms with superior governance were more profitable than firms with poor governance pursuing similar strategic objectives. Tiwana, Konsynski and Venkatraman (2013) broadened the concept with a governance cube whose dimensions are who is governed, what is governed and how governance is exercised, and whose scope extends from projects and firms to ecosystems. The extension matters for the platform-dependent strategies described in Section 4: an organization that transforms through another party's platform must govern a relationship as well as a system.

In developing-economy organizations, governance failures commonly take three forms. Digital initiatives are funded and owned by a technical unit or an external donor, with no senior line manager accountable for outcomes. Pilots multiply without a mechanism for deciding which will be scaled and which stopped. And data are generated without rules on ownership, quality and use. Each is a problem of decision rights, and none is solved by technology.

7.2 Governance in the public sector

Dunleavy et al. (2006) argued that the New Public Management had been superseded by digital-era governance, characterized by the reintegration of functions into the governmental sphere, needs-based holism in service design and the thoroughgoing digitization of administrative processes. Cordella and Tempini (2015) qualified the more radical versions of this claim. Drawing on a case study of a municipal administration, they argued that information and communication technologies can be used to support bureaucracy and need not eliminate it, so that e-government should preserve and enhance bureaucratic coordination, not bypass it. This is consistent with the

conclusion of Mergel, Edelmann and Haug (2019) that public-sector digital transformation is at root a matter of changed processes, relationships and culture.

7.3 Digital technology and the quality of governance

Digital technologies also affect governance as an outcome. Bertot, Jaeger and Grimes (2010) reviewed the use of e-government and social media to promote transparency and reduce corruption and concluded that these tools have the potential to foster openness, while their effect depends on cultural, social and technology access factors. For sub-Saharan Africa, Asongu and Nwachukwu (2016) found that mobile phone penetration, in interaction with the diffusion of knowledge, was associated with improvements in governance indicators. The design–actuality gap identified by Heeks (2002) sets the boundary on such effects. Systems that assume reliable power, literate users or cooperative officials will underperform where those assumptions do not hold.

8. Institutional Change

Digital transformation is a form of institutional change as well as organizational change. In their systematic review, Hanelt et al. (2021) identified two overarching patterns: organizations are moving toward malleable designs that permit continuous adaptation, and this movement is embedded in, and driven by, digital business ecosystems. The identity shift emphasized by Wessel et al. (2021) is an institutional phenomenon in the same sense, because it changes what an organization is understood to be and to owe to its stakeholders.

In developing economies the institutional dimension is especially visible, in three ways. First, digital services can supply functions that market-supporting institutions have not provided. Mobile money created a low-cost, widely trusted means of payment where bank branches were sparse, and in doing so it changed the options open to households and small enterprises (Jack and Suri, 2014; Suri and Jack, 2016). Second, the transformative discourse that Avgerou (2008) identified treats information systems innovation as an intervention bound up with wider politics and economics, which places organizations that deploy such systems in a quasi-institutional role and exposes them to public expectations beyond their commercial remit. Third, institutional change is contested. Digital infrastructures embed rules about who may participate and on what terms, and

the evidence on digital control in value chains shows that these rules can entrench existing hierarchies as readily as they disrupt them (Foster et al., 2018).

Institutional change is also slow in comparison with technological change. Regulations, professional norms and habits of trust adjust over years, which is one reason why returns to digital investment appear with a lag. It is also a reason to take seriously the gaps that Walsham and Sahay (2006) identified in their survey of research on information systems in developing countries, since effects of this kind are visible only to studies that follow systems in their settings over time.

9. An Integrative Framework

Figure 2 assembles the argument. Digital technologies are the starting resource. They affect performance only by way of organizational transformation, which is shaped by three organizational levers: digital strategy, digital innovation and digital governance. Transformation is expressed in changed processes, business models, structures and, at the limit, identity, and it affects performance on operational, financial, innovation and public value dimensions. Analog complements, comprising infrastructure and affordability, skills, regulation and accountable institutions, condition every link in the chain. A feedback path runs from performance to the institutional environment, because successful transformations create shared digital infrastructure and alter rules and expectations.

Four propositions summarize the framework.

Proposition 1. The effect of digital investment on organizational performance is mediated by organizational transformation; investment that is not accompanied by changes in processes, business models or structures yields the gains of digitization only.

Proposition 2. Analog complements moderate the relationship between digital transformation and performance: the weaker the infrastructure, skills, regulation and institutional accountability, the smaller the performance return to a given digital investment.

Proposition 3. Digital governance, understood as clarity of decision rights and accountability for digital initiatives, determines whether digital innovations scale beyond pilots.

Proposition 4. Successful digital transformation feeds back into the institutional environment by creating shared infrastructure and new rules, which lowers the cost of transformation for other organizations.

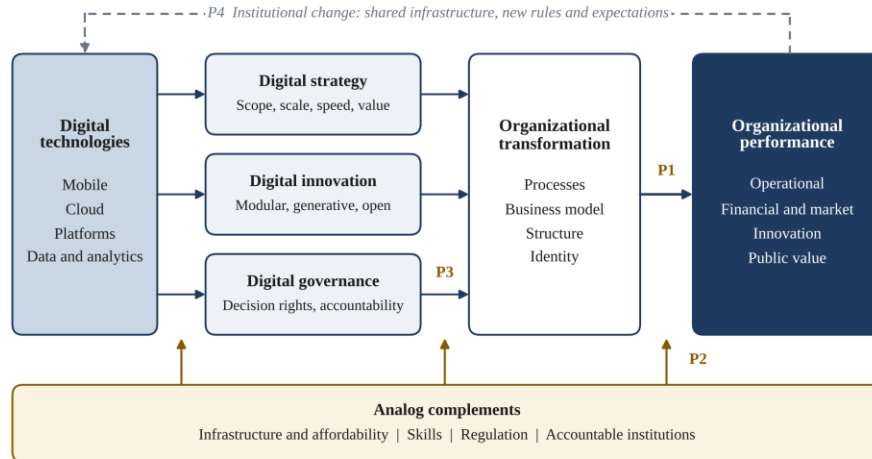


Figure 2. Conceptual framework of digital transformation and organizational performance in developing economies (P1–P4 denote the propositions).

Source: Authors' synthesis of the literature reviewed.

Figure 3 derives a typology from the first two propositions by crossing an organization's digital capability with the strength of the analog complements available to it. Where both are low, the organization remains in analog inertia. Where capability is high but complements are weak, investment is stranded: systems are in place but the design–actuality gap and the digitalization paradox suppress returns. Where complements are strong but capability is low, the organization is in a state of latent readiness and is the most promising candidate for investment. Only where both are high are digital dividends realized. The typology implies that the appropriate strategy depends on the starting quadrant. Stranded organizations need complements more than they need further technology, and organizations in latent readiness need the reverse.

The framework has boundary conditions. It is stated for organizations in general, although the balance of levers differs by type: governance carries more weight in public agencies, where decision rights are dispersed across ministries and tiers of government, and strategy carries more weight in firms exposed to competition. Developing economies are themselves diverse, and the

strength of complements varies within countries, between cities and rural areas, as much as between them. The framework also describes effects that accumulate over years, so that short evaluation windows will understate the returns to transformation and overstate the returns to digitization.

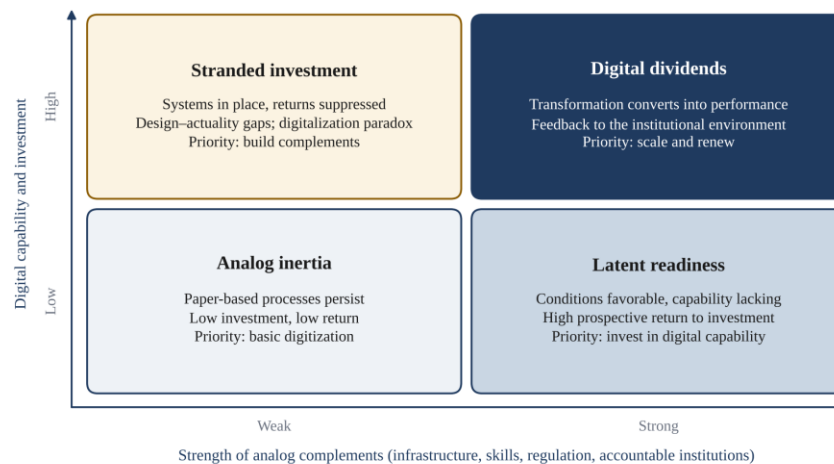


Figure 3. A typology of digital transformation outcomes by digital capability and strength of analog complements.

Source: Authors' synthesis, drawing on Heeks (2002), World Bank (2016) and Gebauer et al. (2020).

10. Implications and Research Agenda

For managers, the review suggests four practices. The first is to name the stage honestly. An organization that is digitizing records should set efficiency targets, not business-model targets, and should treat the exercise as a foundation. The second is to invest in complements in step with technology, particularly staff skills and process redesign, since these determine returns. The third is to settle governance early by assigning a senior line owner to each initiative, defining rules for data and establishing an explicit process for scaling or stopping pilots. The fourth is to use platforms deliberately, taking advantage of the lower threshold they offer while monitoring dependence on their owners.

For policymakers, the central message is that connectivity is necessary and insufficient. The economy-level evidence justifies continued investment in infrastructure, and mobile infrastructure above all. The organizational evidence indicates that the returns depend on competition-friendly

regulation, on skills and on the accountability of the institutions that deploy digital systems. Public-sector digital programs should be designed around the redesign of administrative processes and tested against local conditions before they are scaled.

For researchers, the most pressing need is firm-level and agency-level evidence from developing economies, where studies of digital transformation and performance remain scarce in comparison with economy-level studies. Longitudinal designs are needed to capture lagged and institutional effects. Measures of digital transformation should distinguish its stages, so that digitization is not counted as transformation. And the emergency adoption prompted by the pandemic offers an unusual opportunity to observe which changes persist and why.

11. Conclusion

Digital transformation in developing economies is neither the automatic leap that its advocates sometimes promise nor the predictable failure that a long record of stalled systems might suggest. The literature to 2021 supports a conditional account. Digital technologies improve organizational performance when they are embedded in a strategy, when they change how the organization works, when decision rights and accountability are clear and when the surrounding infrastructure, skills and institutions are adequate. Where these conditions are absent, investment yields digitized versions of existing practice and, at worst, stranded systems. Where they are present, the gains extend beyond the organization, because successful transformations build infrastructure and rules on which others can draw. The task for managers and policymakers is therefore to pair every digital investment with investment in its complements, and the task for researchers is to produce the organization-level evidence from developing economies that this account still lacks.

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