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Abstract

This special issue aimed to attract articles situating digital transformation in the geopolitical-organizational nexus. Unlike innovation and change panaceas (or fads) like business process reengineering (BPR) which became popular in the 1990s, digital transformation is a multi-level concept. Extending beyond the redesign of organizational and business processes, the analytical boundaries of digital transformation include ecosystems, organizational networks, business and operational processes, organizational identities, governance structures, and quality/cost dynamics. However, the extant literature on digital transformation continues to use the organization as the primary unit of analysis. Definitions of digital transformation vary widely, with some not dissimilar to the BPR era. The papers included in this special issue provide analytical and empirical examples on the pervasive effects from contemporary digital technology for society, organizations, and citizens. Future work which isolates the digital technology artefact would benefit from further refinement of the digital transformation concept. A starting point is to revisit the digital technology evolution over past decades which reveal the inflection points of technological change, specifically for mainframes, PCs, and the Internet. Such analysis will increase our understanding and contextualization of past panaceas like BPR for generating new insights on how digital technologies are front and center in debates on digital transformation.

Keywords

digital transformation, digitalization, IT artefact, computing eras, geopolitical-organizational nexus, management fads

Introduction

The proliferation of academic and practitioner content on *digital transformation* suggests an inflection point in the digital journey. In information systems, and more generally across business and management, digital transformation attracts multiple definitions, with some placing technological factors at the forefront of transformational change, and others combining diverse phenomena to unpack the concept (Baiyere et al., 2017; Wessel et al., 2021). For example, digital transformation is “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies (Vial, 2019, p. 121), or “a transformation ‘precipitated by a transformational information technology’” (Li et al., 2018). Other definitions discuss digital transformation as a form of organizational change. Thus, “an organizational change that is triggered and shaped by the widespread diffusion of digital technologies” (Hanelt et al., 2021, p.1160) or “an organizational change triggered by digital technologies”

(Nadkarni and Prugl, 2021, p.236). Further definitions include “a holistic form of business transformation enabled by information systems” which accompanies “economic and technological changes at both the organizational and industry-level” (Chanias et al., 2019: p.17), and the role played by digital technologies in enhancing the customer experience (Warner and Wager, 2019, p. 326; Nambisan et al., 2019, p.1). An institutionalist definition of digital transformation observes “the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of

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the game within organizations and fields” (Hinings et al., 2018).

The proliferation of scholarly contributions that position digital transformation front and centre rarely provide an historical dimension of the evolution of digitalization from the mid-20th century to the present day. Scant attention is given to the wider societal, policy, sectoral, and inter-organizational changes shaped by digital technology. A deeper, more nuanced understanding is needed on the causal factors in the transition from organizations and individuals in the period of no access to digital technology to its widespread application and use in the 21st century. A cursory glance at the technological inflection points over the past century shows how digital technology has penetrated all aspects of business and society. Beginning in the period between 1940 and 56, 1st generation computers entered the work environment, with the ENIAC, UNIVAC, and IBM’s 650 and 701 built using the vacuum tube, magnetic drums, and tape. Within a decade from 1956 to 63, 2nd generation computers including upgraded IBM 1401, 7090, 7094 and the UNIVAC 1107 replaced the vacuum tube with transistors. Between 1965 and 71, 3rd generation computers spearheaded the digital era, with IBM’s 360. The firm made a significant financial and reputational gamble marketing the computer to a wider potential customer base. Prior to this period, very few academic papers were published on the intersection between management practice and information technology. Indeed, most of the current leading information systems journals had yet to be launched.

Enabled by the technological innovation of the integrated circuit, computers became smaller, cheaper, and more versatile. Digital technology evolved between 1971 and 80 with 4th generation computers. The mini-computer signifies the democratization of computing since they brought many mid-range organizations into using computers at a time when mainframes were too expensive for all but large corporations and government departments. This development made dedicated computing facilities available to scientific and engineering companies, including universities.

The semi-conductor industry vastly increased the capacity for digital data storage. Microprocessors enabled thousands of transistors on a single microchip. The digital revolution which started in the 1980s and continues today is labeled 5th generation computing (Furukawa, 1992). The personal computer (PC) launched from start-up firms including Apple and Microsoft, commodified digital technology in the 1980s and paved the way for today’s more sophisticated laptops, tablets, and smartphones. The classification of the various forms of emerging digital technologies (e.g. artificial intelligence, robotic process automation, cloud computing, blockchain technology) motivates the debate on definitions and classifications for current and future computer generations. A critical

analysis of how digital technology has transitioned from 1st to 5th generation is necessary to inform our conceptualization of digital transformation in the 21st century and beyond.

Digital transformation: sectors, themes, and challenges

The past decade has spawned numerous academic and practitioner content on digital transformation. Arguably, the proliferation of this literature has resulted in greater confusion, rather than clarity of the concept (Markus and Rowe, 2021). *So why do we need another special issue on digital transformation?* The answer to this question is a mix of timing (when to commission an issue on a specific topic) and scholarly reflection (what we can learn theoretically and empirically about the phenomenon). A review of leading IS journals shows that many have already carried out a special issue on digital transformation. Emerging digital technologies provide fresh content for special and regular issues. Journals which quickly jump on the bandwagon of a new technology with a potential transformational impact benefit from *first mover advantage*. However, a novel concept like digital transformation as the nexus of geopolitical-organizational change lacks definitional clarity which undermines its analytical and explanatory power. Accordingly, there is likely to be limited shared meaning among academic and practitioner communities. We return to this point later.

For this special issue, the objective was to invite scholarly contributions (e.g. articles, commentaries, reviews) to further unpack the digital transformation concept. Since the organizational level of analysis is used extensively by IS researchers, the call was oriented to the geopolitical-organizational dimension. Rapidly developing digital technologies including (but not limited to) generative artificial intelligence (GenAI), crypto-assets, blockchain, cloud computing, metaverse, nanotechnology, and robotic process automation have widespread implications that extend far beyond the level of organizational analysis. Thus, the transformational capacity of digital technology to impact regulatory policy, business strategy, work processes, and citizens’ privacy and security rights, are just some examples geopolitical-organizational change.

To augment this special issue, we reviewed the extant literature on digital transformation. The initial steps searched all the ABS accredited 3,4, and 4* journals published since 2015,¹ that used “*digital transformation*” in the title or abstract, or title and keywords. During this period, several editorials, special issues, and scholarly articles were published, including:

- *MIS Quarterly: Management Information Systems* - Designing for digital transformation: Lessons for

AQ6

information systems research from the study of ICT and societal challenges (Majchrzak et al., 2016).

- *Journal of Management Information Systems* - Special section: The digital transformation of vertical organizational relationships (Kauffman and Weber, 2018).
- *Information Systems Frontiers* - Moving beyond smart cities: Digital nations for social innovation and sustainability (Kar et al., 2019).
- *Journal of Strategic Information Systems* - Digital work and organizational transformation: Emergent Digital/Human work configurations in modern organizations, (Baptista, J. et al., 2020).
- *Journal of the Association for Information Systems* - Guest editorial: Theories of digital transformation: A progress report (Markus and Rowe, 2021).
- *Government Information Quarterly* - What were the promises and challenges of digital government transformation (Eom and Lee, 2022).
- *European Journal of Information Systems* - Transform or be transformed: the importance of research on managing and sustaining digital transformations (Carroll et al. 2023)

Of the 75 papers matching our filter, editorials, calls for special issues, and theory articles were excluded, leaving a total of 64. Table 1 shows the ABS rank, and count of papers published by each of the nineteen 3, 4 and 4*

Table 1. Number of publications from selected journals.

| ABS rank | Journal | # |
|----------|---|----|
| 3 | Government information quarterly | 13 |
| 3 | Information systems frontiers | 8 |
| 4 | European journal of information systems | 7 |
| 4 | Journal of strategic information systems | 7 |
| 3 | Information and management | 6 |
| 4 | Information systems journal | 5 |
| 4* | MIS quarterly: Management information systems | 5 |
| 3 | Information technology and people | 3 |
| 4 | Journal of management information systems | 2 |
| 3 | Information and organization | 2 |
| 4* | Information systems research | 1 |
| 4* | Journal of the association for information systems | 1 |
| 4 | Journal of information technology | 1 |
| 3 | Decision support systems | 1 |
| 3 | International journal of electronic commerce | 1 |
| 3 | Internet research | 1 |
| 3 | Information society | 0 |
| 3 | Journal of computer-mediated communication | 0 |
| 3 | Journal of the association for information science and technology | 0 |
| Total | | 64 |

journals. Just over 20% of these papers were published by one journal, Government Information Quarterly. It is also noteworthy that four journals did not meet our selection criteria.

The theoretical and empirical content of each article was reviewed. Six business sectors were identified across all the articles: Healthcare, Software Vendors, Financial Services, Government, small and medium sized enterprises (SME), and Energy. Numerous illustrations of digital transformation were given across the sectors, organized by thematic content. For example, digital twins featured in research on the energy sector to illustrate a virtual representation of an object or system designed to reflect a physical object (Korotkova et al., 2023; VanDerHorn and Mahadevan, 2021). The analytical focus on digital transformation is the nexus (link) between the energy sector and the technological object or artefact. Accordingly, the topic of digital twins is not a distinct feature of the energy sector. Neither is the phenomenon of digital transformation. Similar observations were made looking at other studies which attribute digital transformation as a causal factor in sectoral change.

Figure 1 shows the six sectors and the broad themes from the extant literature on digital transformation. From the title, abstract, and keywords, papers were segmented into their primary sectors, with themes abstracted from the content. For example, papers on financial services relate to theme 2, improvement in quality versus increased cost, theme 5, relationship between IT and society, and theme 6, government and investment costs. A description of the eight themes is given below.

For this special issue, we grouped the digital transformation papers into themes and focal research topics. Thematic analysis is used extensively in qualitative research to identify themes or patterns of meaning within a dataset (Silverman, 2011). This method can produce rich description of the data set and theoretically informed interpretation of the findings. The method is usually applied to a set of texts, including interviews or transcripts. Closely examining the data enables the identification of common themes—topics, ideas and patterns of meaning. We observed the literature on digital transformation was highly diverse, so using a thematic approach helped to organize the various papers into themes and topics while recognizing the distinctiveness of each paper even within the same thematic label or research topic of interest.

The eight themes presented in Figure 1 are derived from the review of the 64 papers. Definitions of themes will vary based on the interpretation of the dataset, or 1st order concepts (Gioia et al., 2013). Themes and topics also emerge and fade as research interests and priorities shift over time. Below is the list of themes with a descriptive illustration in relation to digital transformation.

Theme 1: *Artificial intelligence*. AI is a catalyst for digital transformation which alters how organizations

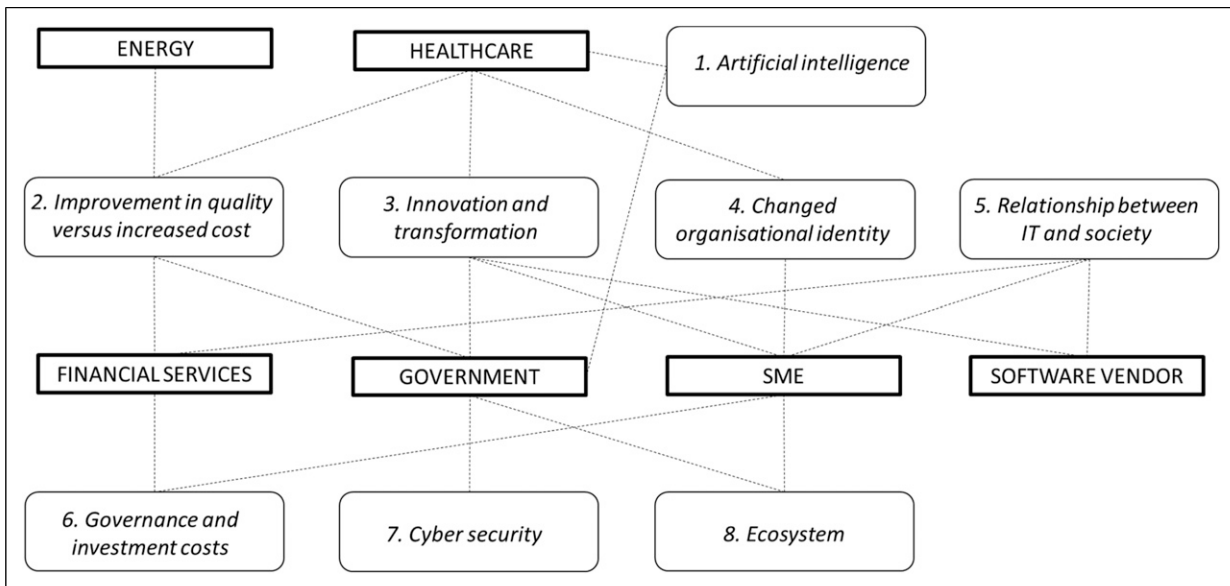


Figure 1. Themes shared between sectors at the abstract level.

engage with citizens and customers. From the potential to enhance decision-making and performance, to improving customer experience and analytics, the impact of AI is profound and far-reaching.

Theme 2: *Improvement in quality versus increased cost.* Digital transformation relies on accurate data, enabled by effective data quality management solutions. This is crucial for achieving strategic and operational goals in digital transformation. Potential quality improvements need to be evaluated alongside the cost of implementing digital transformation projects.

Theme 3: *Innovation and transformation.* Innovation is the practical implementation of ideas that result in new goods or services or improvement in offering goods or services. Digital technology as a form of innovation may redefine (transform) business sectors, models, functions, operations, processes, and activities.

Theme 4: *Changed organisational identity.* The interrelation between digital transformation and organizational identity. Digital technology induced transformation may lead to a change in organizational identity. One of the most familiar examples is Amazon. Originally promoting itself as an online book retailer (e.g. “the world’s biggest bookstore”) it is now one of the most dominant eCommerce and cloud computing companies.

Theme 5: *Relationship between IT and society.* Digital technology brings opportunities and challenges for society, including improved efficiency, connectivity, and access to information and services. Digital transformation raises concerns about the impact on traditional industries, employment, and the future of work.

Theme 6: *Governance and investment costs.* Governance is the set of policies, procedures, and guidelines that oversee the process of digital transformation within an organization. Monitoring and control of digital technology attracts new funding models. Traditional sources now run alongside social media and crowd funding platforms.

Theme 7: *Cyber security.* A major risk to businesses on their digital transformation journey is inadequate cybersecurity. The core function of cyber security is to protect the devices used by organizations and individuals (smartphones, laptops, tablets, and computers). Developing digital literacy among citizens is critical.

Theme 8: *Ecosystem.* Digital transformation and the creation of a digital ecosystem have the capacity to improve workflow efficiency, and relationships with, customers, partners, and suppliers. There are five elements of the digital ecosystem: strategy, operations, culture, technology, and data.

The referenced literature was sub-divided into the primary sector and the type of transformation challenge (see [Table 2](#)). Some papers framed digital transformation challenges in only one sector, with others using a cross-sectoral analysis. For example, a paper which compares digital transformation with IT-enabled organizational transformation frames the analysis in two sectors, healthcare, and a manufacturing SME ([Wessel et al., 2021](#)). The study finds digital transformation and IT-enabled organizational transformation differ by how digital technology is used either to *re-define* or *support* the value proposition, and how digital transformation *creates* a new organizational identify or *enhances* an existing one. A combining feature of the extant literature on digital transformation is the

transformation challenge, which can take many forms and expressions.

Articles in the special issue

Segmenting the extant literature on digital transformation under sectors provides a simplified classification structure, albeit offering limited analytical scope for problematizing the concept. For example, labeling a digital technology project in the energy sector, digital transformation, requires further analytical deconstruction. Generating themes and interpreting patterns of meaning across a data set is likely to uncover nuances and subtleties. The process facilitates a deeper understanding of informants' experiences,

interpretations, perspectives, and potentially, influences and pressures from the geopolitical-organizational context.

The seven articles in this special issue are presented under the themes outlined in Figure 2. The paper by Hughes, Seddon and Dwivedi, "Disruptive change within financial technology – a methodological analysis of digital transformation challenges" is situated within the FinTech industry and extends the discussion to the geopolitical-organizational context of regulatory challenges spearheaded by disruptive digital change. The next three articles under the theme of innovation and transformation provide a combination of studies which relate to several sectors including, healthcare, government, SMEs, and software vendors. Mühlburger and Krummy, "Towards a context-sensitive conceptualization of digital transformation" uses

Table 2. Industry sectors and transformation challenges.

| Sector | Transformation challenge | Reference |
|--------------------|--|--|
| Healthcare | Reviews of potential improvements in quality and reduction of cost. Problems and challenges with competing logics | Bernardi and Exworthy (2020). Øvrelid and Bygstad (2019). Bunduchi et al. (2020). Burton-Jones et al., (2020) |
| | Innovation for telemedicine | Steinhauser et al. (2020). Klinker et al. (2020) |
| | Transformation involves new organizational identity Adoption of artificial intelligence (AI) to compliment humans | Wessel et al. (2021) Piccialli et al. (2021) |
| SME | Evolution for success in the new world of digital business and process management. Study of most important IT concerns. Company transformation | Baiyere et al. (2020). Baygi et al. (2021). Kappelman et al. (2019). Lanamäki et al. (2020). Oberländer et al. (2021). Soluk and Kammerlander (2021). Van Looy (2021). Scott and Orlikowski (2022). Wessel et al. (2021) |
| | Relationship between IT and society. Influence of platform providers | Faik et al. (2020). Li et al. (2018). Rahrovani (2020). Nosrati and Detlor (2021) |
| | Governance and investment control | Koch et al. (2021). Joshi et al. (2022) |
| | Success or failure from disruptive innovations, project control and expertise issues | Karimi and Walter (2015). Syed et al. (2021). Fischer et al. (2020). Manfreda and Indihar Štemberger (2019). Soto Setzke et al. (2021). Mandviwalla and Flanagan (2021) |
| | Formation and transformation of ecosystems and distributed knowledge | Tan et al., (2020). Trantopoulos et al., (2017). Wimelius et al., (2021). Bacon et al. (2021). Mann et al. (2022) |
| Software vendor | Developing benefits from innovation, web portal tools, cloud, and contribution from transformation | Chen and Wu (2016). Cui et al. (2021). El-Haddadeh (2020). Nasiri et al. (2020). Wiesböck et al. (2020) |
| | Employee tension management using an ERP tool | Rossi et al. (2020) |
| Financial services | Platforms to help innovation within intrapreneurs | Reibenspiess et al., (2022). Schneckenberg et al. (2021) |
| | Continuous change required for iterations of complex transformation and system dependency | Chanas et al. (2019). Lauterbach et al. (2020). Willems and Hafermalz (2021). Wilson and Mergel (2022) |
| Government | IT governance, influenced by consumerization | Gregory et al. (2018) |
| | Crowd funding for digital start-ups | Gupta and Bose (2022) |
| | Implementation disruption from complexity, tradeoffs from conflicting value-based goals. Failure management. Legacy systems | Goh and Arenas (2020). Gong et al. (2020). Mergel (2019). Irani et al. (2023) |
| | Perception of AI enhancing task efficiency. Development of smart cities and e-services | Ahn and Chen (2021). Allen et al. (2020). Plegler et al. (2020). Scupola and Mergel (2022). Upadhyay et al., 2022 |
| Energy | Internet of things (IoT) and cyber security | Chatfield and Reddick (2019). Hofmann et al. (2019), Horita et al. (2020) |
| | Expectation management and implementation know-how. Eco system data exchange | Mergel et al. (2019). Pittaway and Montazemi (2020). Van Donge et al. (2022) |
| Energy | Increased benefit by developing digital twin | Osmundsen et al. (2022) |

a multi-method approach to develop a conceptual meta-structure to capture manifestations of digital transformation in an uniform and structured manner across domains and contexts. Cipriano and Za, “Non-profit organizations in the digital age: a research agenda for supporting the development of a digital transformation strategy.” The study provides a meta-synthesis of digital transformation processes comparing taxonomies of non-profit organizations (NPOs) and those which are industry-independent. Hoblos, Sandeep and Pan, “Digital Transformation as an operational response: a frame transformation perspective” develops a process model to show how framing leads to interactions between frames which align stakeholder interests to achieve digital transformation goals. The next article covers the theme of changed organizational identify, which is gaining traction in IS research. Brünker, Marx, Mirbabaie and Stieglitz “Proactive digital workplace transformation: unpacking identity change mechanisms in remote-first organisations” is an empirical study focusing on proactive rather than reactive digital change. Case analysis suggest new forms of work are the consequence of identity change as a precondition for introducing digital technology. An article by Li, Cui, Wu, Lowry, Kumar and Tan, “Digitization and network capability as enablers of business model innovation (BMI) and sustainability performance: The moderating effect of environmental dynamism,” investigates the influence of digitization and network capability on firms’ sustainability performance. The authors propose that BMI plays a mediating role alongside the moderating role of environmental

dynamism. The final paper is by Li, Du, Zhang and Mao, “Empowering digital transformation: The roles and platforms” which investigates how platforms drive the digital transformation of participant firms in business ecosystems. The results highlight the importance of empowerment in platform-driven digital transformation.

Discussion and conclusion

This special issue on “*Digital transformation: the geopolitical-organizational nexus*” contributes to the body of scholarly work under the umbrella label of digital transformation. The special issue editors offer three observations from the completion of this project.

First, the review of 64 previously published journal articles reveals a high level of diversity in the theoretical lenses used to analyze empirical data, including (but not limited to) institutional theory, dynamic capabilities, organizational identity theory, technology acceptance models, framing theory, resource-based view, complexity theory, socio-technical theory. Theoretical pluralism offers advantages and disadvantages. Practical value is increased as different theoretical lenses enable many interpretations, elucidations, and inferences on the phenomena under scrutiny. However, as we have seen with the concept of digital transformation, theoretical pluralism, even in the same study, blurs the boundaries between digital transformation, digital innovation, digital technology, and IT-enabled organizational change. Thus, a priority for IS scholars is to clearly differentiate digital transformation

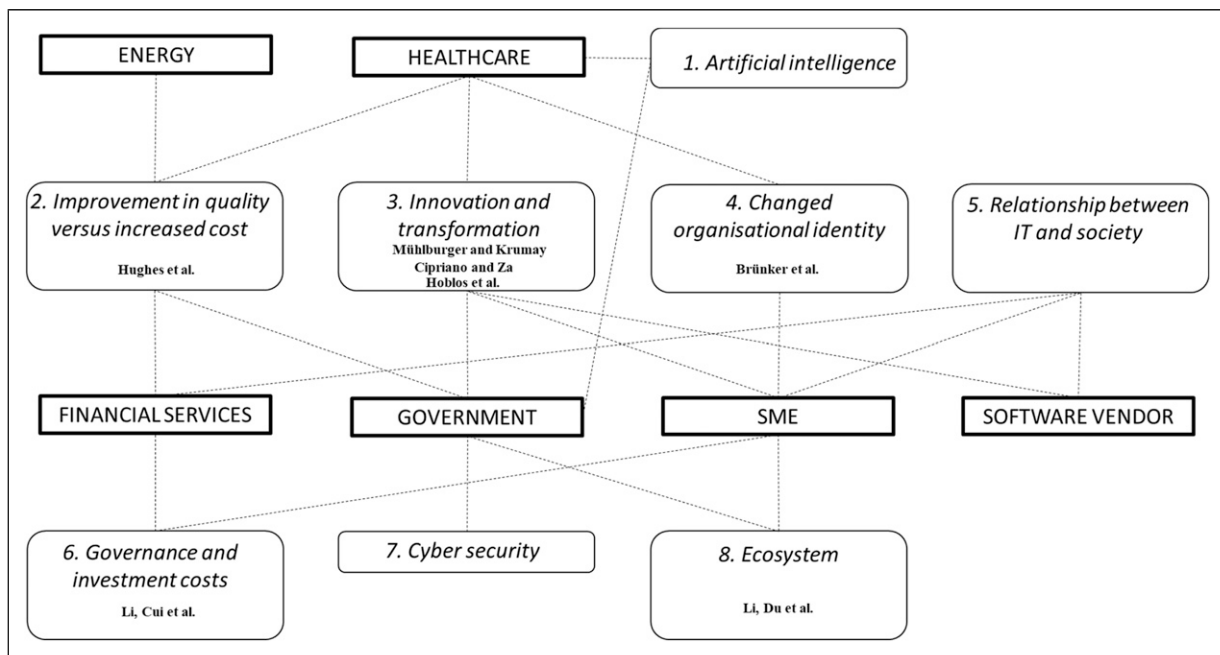


Figure 2. Special issue papers added to themes shared between sectors at the abstract level.

from other concepts (Markus and Rowe, 2021). More specifically, what is distinctive about digital transformation? The papers published in this issue each describe how digital technology transforms one or more areas including, ecosystems, organizational networks, business and operational processes, organizational identities, governance structures, and quality/cost dynamics. The contributions offer insights across different dimensions of the geopolitical-organizational nexus of digital transformation. Their value does not derive simply from labeling them digital transformation papers, but in their empirical focus, analytical framing, research design, and contribution to the current literature.

Second, it is noteworthy that few scholars writing on digital transformation focus on an historical dimension of how digital technology evolves over time. The special issue editors identify several inflection points in digital technology over the decades which spearheaded the growth of information systems research. Revisiting scholarly work from previous decades raises questions about digital transformation as a new and distinctive idea, or simply another label used by academics and practitioners for teaching and consultancy. For example, in the 1990s, the publication of two influential books on business process reengineering (BPR) paved the way for a new topic in management research. Definitions of reengineering included, "... the fundamental rethinking and radical redesign of business processes to achieve ... improvements in critical contemporary modern measures of performance, such as cost, quality, service, and speed." (Hammer and Champy, 1993) and "encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions" (Davenport, 1993). At first glance, these definitions are not dissimilar from those applied to digital transformation (see above). A contemporary definition of digital transformation from a leading software vendor suggests, "Digital transformation is the process of using digital technologies to create new—or modify existing—business processes, culture, and customer experiences to meet changing business and market requirements. This reimagining of business in the digital age is digital transformation" (Salesforce.com, 2024).

Third, like the growing body of work on digital transformation today, previous management and technology "fads" quickly gained traction from academic and practitioner communities. Many provide cautionary lessons for promoting new organizing visions which fail to become widely adopted, or institutionalized. For example, the BPR bandwagon grew quickly in the 1990s (Hammer and Champy, 1993). Studies focused on specific sectors, including public administration. This sector witnessed BPR

policies and practices introduced across national and local government departments with varying outcomes (Willcocks and Currie, 1997). Others looked at implementation challenges for firms (Clemons et al., 1995) agile business using BPR methods and techniques (Broadbent et al., 1999) and stages of business transformation beyond reengineering (Davidson, 1993). By the end of the 1990s, the BPR concept faded as the Internet ushered in new opportunities for scholarly research. Research began to surface which likened BPR and other ideas as management "fads" or "fashions" (Abrahamson, 1996). Critics of BPR suggested "process reengineering is in the debunking phase of its life cycle—an evolutionary pattern in which management ideas and techniques are first presented as panaceas for business success and subsequently debunked as worthless. This cycle has operated on many topics before—from Program Evaluation and Review Technique (PERT) to Total Quality Management (TQM)—so it is not surprising that process reengineering is not immune" (King, 2007, 71). Others observed "considerable overlap exists in the scope, style, content, aims and objectives" of management innovation and change programs (e.g. TQM, BPR, Just-In-Time (JIT) production management, Activity Based Costing (ABC) and Process Innovation). As a previous paper by one of the special issue authors concluded, "instead of re-inventing the wheel every few years with a new management innovation and change panacea or fad, a broader, inter-disciplinary perspective should be adopted which seeks to understand the wider ideological, historical and empirical perspective which underpins these ideas" (Currie, 1999, 647). In conclusion, the geopolitical-organizational nexus of digital transformation extends beyond the linear inflection points of the digital eras mentioned above. Interrogating the digital transformation concept requires combining the inter-generational lens on the evolution of digital technology with a geopolitical-organizational lens to deepen our understanding of how emerging digital technologies shape policymaking, business practices, and work organization among other socio-economic and political issues and concerns.

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1. It is likely some scholarly contributions are not included if published at the end of 2023 and in 2024.

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Author biographies

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