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Digital Business as a Field for Research and Education

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Abstract

Digital technologies ignite new businesses and force existing companies to restructure their business models. Various independent academic research streams discuss the potential of digital technologies for business. However, these streams' research findings are published across outlets in various communities, and an approach to bringing these streams together is missing. In this position paper, we propose to integrate these streams under the concept of *Digital Business*. We see *Digital Innovations* as the core of *Digital Business* and offer a framework for structuring the field. Using this framework, we describe the field's development to date and provide three ideas for further integrating the field in the future. Altogether, a key aim of this paper is to create a conceptual basis that structures both research and education in the field *Digital Business*.

Keywords Digital Business · Digitalization · Digital Transformation · Digital Innovations · Electronic Business

JEL classification M15

Fragmentation of a growing field as a problem

Topics related to the digital transformation of established businesses, the creation of new digital companies (e.g., software start-ups), and the change of organizational structures and processes due to digital technologies are gaining attention in information systems (IS) research. Numerous scientific journals in the IS field are developing the breadth and

depth of these topics by publishing papers and organizing special issues (e.g., MIS Quarterly Volume 37–2 (MISQ, 2013), IS Journal Volume 26–5 (ISJ, 2016), and European Journal of IS Volume 32–3 (EJIS, 2023)). Moreover, many IS conferences deal with these topics in various conference tracks. Figure 1 shows the number of tracks at leading international IS conferences (ICIS, ECIS, AMCIS, PACIS¹) where the terms “digital” or “transformation” are part of the track's title. From only ten tracks in 2017, the number soared to 30 in 2023. This trend, especially the surges in 2022 and 2023, highlights the topic's growing significance. Details on the specific names of the tracks are provided in Appendix 1 (see Supplementary Information).

A closer look at the terms in Appendix 1 reveals significant differences. The notable diversity in specific topics exposes that various conference tracks explore new approaches in business based on digital technologies, yet only within their specific topic realms. Specialization is beneficial because it ensures topics are tackled in depth, fostering detailed development. It also increases practical relevance, which is crucial for translating research results into industry-relevant applications and consolidating a topic's *raison d'être*. However, this kind of scientific focus entails two major drawbacks.

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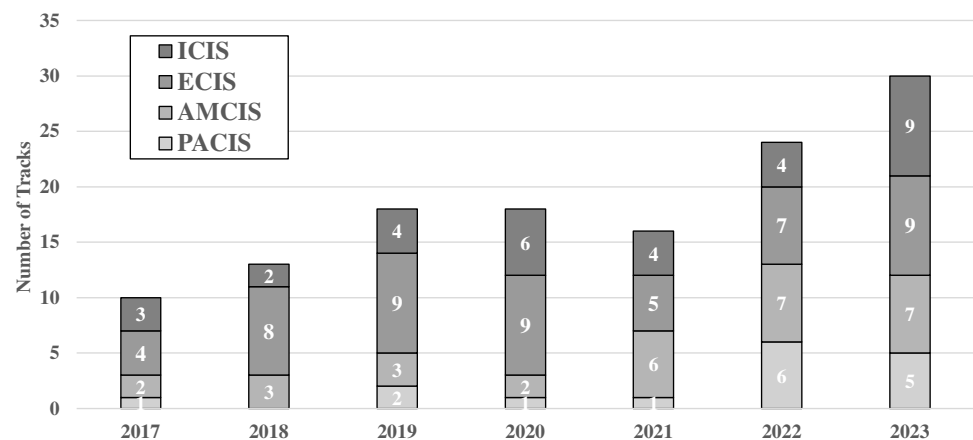
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¹ International Conference on IS (ICIS), European Conference on IS (ECIS), Americas Conference on IS (AMCIS), Pacific-Asian Conference on IS (PACIS).

Fig. 1 Number of tracks at leading IS conferences with a focus on digital transformation



First, the proliferation of specific topics increases the risk of redundant research. For instance, research on providing application services online was coined “application service providing” (ASP) in the late 1990s and early 2000s (e.g., Susarla et al. (2006)), which was followed by “software-as-a-service” (SaaS) in the late 2000s (e.g., Benlian and Hess (2011)), until the phenomenologically similar concept “cloud computing” (e.g., Kauffman et al. (2018)) took up the torch. With this in mind, we raise the question: Are similar concepts being re-examined under new terminologies, potentially neglecting previous research? Second, fragmentation may obscure overarching developments and mechanisms. For example, formulating the network effect theory in the internet economy would require a comprehensive view beyond isolated sub-markets. Considering the interconnected nature of digital platforms, focusing solely on sub-markets would not capture the full extent of network effects. Therefore, a holistic approach — rather than a fragmented one — is essential for developing insights that are formulated as theories with high predictive potential and for understanding the broader implications of these theories.

Viewed more generally, a field of research is built on common language, research orientations, and agreed-upon knowledge that creates cohesion between various stakeholders (Sarker et al., 2019). The starting point is that stakeholders — including scholars, students, and practitioners — share a common understanding of the field (Klein & Hirschheim, 2008). However, research on the potential of digital technologies for companies lacks definition and conceptualization (Riedl et al., 2023). In turn, stakeholders suffer from fragmented research, nonstandard teaching, and discontinuous connection to practice. In this position paper, we aim to tackle fragmentation and consolidate these different research streams into the unifying field of *Digital Business*.

This position paper is structured as follows. First, we explore various existing conceptualizations of *Digital Business* and introduce our own refined definition. Second, we conceptualize *Digital Business* by anchoring it in *Digital*

Innovations and develop a framework to describe academic activities on *Digital Business*. Third, we use this framework to examine the evolution of the field. Fourth, we identify key levers in research, education, and practice that will facilitate the field’s integration in the future. We conclude the paper by reaffirming our position that *Digital Business* is a major field in IS. To highlight the significance of *Digital Innovations* and *Digital Business*, these terms are both capitalized and italicized, with all framework terms italicized.

Definition

The term *Digital Business* has been used again and again in the literature but in very different ways. Before delving into the results of an extensive search to identify definitions in (text)books, we report the observation that usually no formal definitions of the term can be found in scientific papers with the term “digital business” in their titles (presumably because most of these papers report the results of empirical studies, and thus, the provision of a formal definition is deemed unnecessary). It is interesting to note that, by far, the most frequently cited academic article with the term “digital business” in its title does not provide a formal definition either. In a seminal paper cited 4690 times (Google Scholar, March 27, 2024), Bharadwaj et al. (2013) do not directly define *Digital Business*. However, they provide a “working definition” of digital business strategy: an “*organizational strategy formulated and executed by leveraging digital resources to create differential value*” (p. 472, italics in original). Thus, it follows that *Digital Business* can be defined as “leveraging digital resources to create differential value.” Bharadwaj et al. (2013) note that their use of the term “resources” is based on the resource-based view of strategy (e.g., Barney (1991), Wernerfelt (1984)). Moreover, they emphasize that their link to creating differential business value “elevat[es] the performance implications of IT strategy beyond efficiency and productivity metrics to

Table 1 Definitions of *Digital Business* as identified in books with “digital business” in the book title

Book reference [number of citations per year (as of March 27, 2024)]	Definition of the term “digital business” and related conceptualizations
Chaffey et al. (2019) [170.80]	“How businesses apply digital technology and media to improve the competitiveness of their organization through optimising internal processes with digital and traditional channels to market and supply” (Chaffey et al., 2019, p. 612).
Wirtz (2019) [43.40]	Digital business is equated with electronic business (e-business): “Digital or e-business is one of the most significant fields of application of digital information and communication technologies.” Further, e-business comprises five major dimensions (see Fig. 3.2 in Wirtz (2019, p. 53)): e-communication, e-information/entertainment, e-education, e-commerce, and e-collaboration. E-business, and hence digital business, is defined as: “[t]he initiation as well as the partial or full support, transaction, and maintenance of service exchange processes between economic partners through information technology (electronic networks) ” (Wirtz, 2019, p. 62). Pages 61–62 summarize and discuss several e-business definitions from the literature and summarize the situation as follows: “In the context of the Internet economy, there are various terms and definitions. In general, the current literature has a heterogeneous understanding of the term e-business. Furthermore, the existing definitions frequently overlap to some extent, which is exemplary for the terminological inconsistency of the term’s application. Table 3.2 presents some important definitions of e-business” (Wirtz, 2019, p. 61).
Weill and Woerner (2018) [35.33]	No formal definition of “digital business” was found in the book
Wirtz (2021) [22.00]	If compared to Wirtz (2019), it is noteworthy that the term “digital business” is used instead of “e-business” (supporting the notion that both terms are used as synonyms; however, the newer term now seems to be replacing the older one). Digital business comprises five major dimensions (see Fig. 1.2 (Wirtz, 2019, p. 5)): digital communication, digital information/entertainment, digital education, digital commerce, and digital collaboration. Pages 16–17 summarize and discuss several “digital business” definitions from the literature. However, these definitions resemble those discussed as e-business definitions in Wirtz (2019).
Libert et al. (2016) [18.25]	Book is not available as full text (however, the term “digital business” is not indicated in the book index).
Aagaard et al. (2019) [17.80]	No formal definition of “digital business” was found in the book.
Vaz (2021) [10.00]	No formal definition of “digital business” was found in the book.
Morabito (2014) [8.60]	Book is not available as full text (however, parts of the book are available online, and no definition of the term “digital business” was found in these parts).
Milani (2019) [8.60]	No formal definition of “digital business” was found in the book.
Kaplan et al. (2015) [6.89]	Book is not available as full text (however, the term “digital business” is not indicated in the book index).
Jelassi and Martínez-López (2020) [5.50]	Chapter 1.1 summarizes key terminology. However, no formal definition of “digital business” was found, neither in this specific chapter nor in other chapters of the book. It is possible, however, that the authors use the terms “e-business” and “digital business” as synonyms, and they define “e-business” as “the use of electronic means to conduct business internally and/or externally” and it is further stated that “[i]nternal e-business activities may include production, development, maintenance of IT infrastructure, and product management. For example, it may include the linking of an organization’s employees with each other through an intranet to improve information sharing, facilitate knowledge dissemination, and support management reporting” (Jelassi & Martínez-López, 2020, p. 4). Further, external e-business activities may “include supporting after-sales service activities and collaborating with business partners. For example, virtual teams in two firms in different locations may collaborate via a secure extranet on research or new product development” (Jelassi & Martínez-López, 2020, p. 4).
Coupey (2005, 2016) [5.38]	No formal definition of “digital business” was found in the book (neither in the 2005 1st edition nor in the latest 2016 2nd edition). However, Coupey (2005) “focus[es] on the Internet as the primary force behind digital business” (p. 18). A major reason for the central role of the Internet is that “more people are familiar with the Internet than with other methods of digital transmission [...] and] this familiarity and adoption of the technology that has led to the high levels of interconnectivity , reflected in the amount of communication between people via the Internet, which makes the Internet an important component of business strategy” (p. 18, bold in original). Moreover, Coupey (2005) indicates that “[s]uccessful strategies for digital business integrate the capabilities of the Internet with aspects of the company’s resources, constraints, and objectives; and with the consumer’s needs and expectations ” (p. 20).

Table 1 (continued)

Book reference [number of citations per year (as of March 27, 2024)]	Definition of the term “digital business” and related conceptualizations
Darics (2015) [4.22]	No formal definition of “digital business” was found in the book The publisher describes the book as follows ^a : “This book provides a timely and comprehensive snapshot of the current digital communication practices of today’s organisations and workplaces , covering a wide spectrum of communication technologies, such as email, instant messaging, message boards, Twitter, corporate blogs, consumer reviews and mobile communication technologies”.
Choi (2017) [3.14]	“ [T]he value creation based on the harmonized networking management ” (p. 1). Note that Choi (2017, p. 1) uses the terms “digital business” and “web business” as synonyms. Choi (2017) further clarifies that “[w]e live in the interdependent society, and thus each one of us belongs to these interdependent networks, such as human network, information network, cooperative social network, business network, etc. Unfortunately, some networks are not working properly due to the missing links among the activities of partners. To promote sustainable performance of all these networks, therefore, we desperately need to find out the governance factors for the interoperable mechanism among the participants” (p. 1).
Jabłoński and Jabłoński (2020) [3.00]	Based on Wirtz (2019), Jabłoński and Jabłoński (2020) develop a “list of selected e-business definitions” (see Table 1.4 in Jabłoński and Jabłoński (2020, p. 14)). Based on ten definitions, they deduce the distinctive features of each definition. In essence, Jabłoński and Jabłoński (2020) use the terms “digital business” and “e-business” as synonyms because they write that the “[a]nalysis of selected e-business definitions clearly indicates the orientation of transaction theory in creating economic value ” (Jabłoński & Jabłoński, 2020, p. 14).
Hammond (1996) [2.00]	Book is not available as full text (however, the term “digital business” is not indicated in the book index).
Corallo et al. (2007)[1.12]	No formal definition of “digital business” was found in the book. However, Corallo et al. (2007) write: “The diffusion of information and communication technology (ICT) has allowed organizations within business ecosystems to use Internet-based technologies in conjunction with face-to-face interaction in order to undertake and coordinate joint tasks. Value generated in Internet-enabled business [...] can provide unique and customized solutions to individual customers. Each organization adds one or more distinct aspect of product/service value to the value generated by the ecosystem, by exchanging digital knowledge with other members: the business ecosystem evolves into the digital business ecosystem” (Corallo et al., 2007, p. 2). A digital business ecosystem is defined as “the e-business infrastructure enabling a business ecosystem with each of the ecosystem players as participants. The digital business ecosystem is the space in which digital organizations interact, compete, collaborate and co-evolve around innovation, using e-business technology ” (Corallo et al., 2007, p. 6).

^aSee section “About this Book”: <https://link.springer.com/book/https://doi.org/10.1057/9781137405579#about-this-book>

those that drive competitive advantage and strategic differentiation” (p. 472) and that “[t]he organizational ability to recognize and respond to the fast-paced nature of innovation [...] is fundamental to a firm’s competitive success and survival under digital business conditions” (p. 476). However, the lack of an explicit definition of *Digital Business*, even in such a prominent research agenda paper, is noteworthy.

Based on this observation, on March 27, 2024, we used the “Publish or Perish” tool (version 8.9.4538.8589) to search the Google Scholar database for all sources with the term “digital business” in the title. Of the top 200 sources identified, 18 were categorized as “book” in terms of source type and had an English title. We then further analyzed these 18 books, assuming that formal definitions are more likely to be found in (text)books than in scholarly articles, which primarily report empirical studies. We sorted the books by “citations per year” and searched the digital version of each book for the term “digital business.” In addition, we identified, where available, the chapter in each book that dealt

with conceptual foundations, and we checked whether the term “digital business” was included in the index of each book. The results of this analysis process are summarized in Table 1. Below, we present the key findings of our analysis. In essence, contrary to what one might expect, not all books provide a formal definition of *Digital Business*. However, we also analyzed significant statements from these books (predominantly identified in the conceptual foundations chapters) to identify the major characteristics of the *Digital Business* concept. As several definitions and descriptions are relatively comprehensive, we have highlighted what we consider to be the key aspects in bold.

Table 1 and the subsequent analysis reveal that most books do not formally define *Digital Business*. Instead, various conceptualizations of *Digital Business*, including definitions and conceptualizations of related phenomena such as e-business, exist. Thus, there is a heterogeneous understanding of what *Digital Business* is and there is a lack of a clear and broadly accepted definition.

To define *Digital Business*, we draw upon the working definition from Bharadwaj et al. (2013), where *Digital Business* means “leveraging digital resources to create differential value [for companies]” (Bharadwaj et al., 2013, p. 472). Additionally, we add Bradley et al.’s (2016) perspective that “[t]he most significant characteristic of digital business is that the mutual interaction between the creative application of innovative ICT [Information and Communication Technology] and the digital business model” (Bradley et al., 2016, p. 13), which emphasizes the innovation aspect. Against this background, we propose that *Digital Business* should be understood as follows:

Digital Business refers to an organization’s innovative use of digital resources to generate value that contributes to gaining and/or sustaining competitive advantage.

Structure

In the previous section, we conceptualized *Digital Business*. Next, we propose a structure for the field. For a long time, IS research focused on how digital technologies are used to create value (e.g., Agarwal & Lucas (2005) and Melville et al. (2004)). The emphasis was placed on process alterations prompted by new business requirements. When it comes to new products, new business models, or new organizational structures, the core issue is always the question of the interplay between new technical possibilities and new business concepts. And this is hardly addressed by the established concepts.

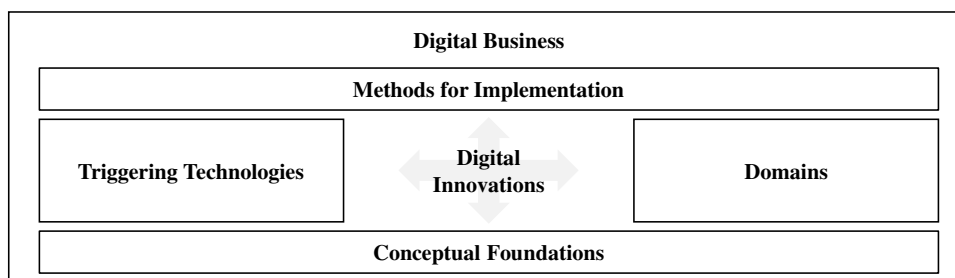
The concept of *Digital Innovations* offers a solution to this problem (Yoo et al., 2010a). *Digital Innovations* refers to “the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology” (Nambisan et al., 2017, p. 224). There are two distinct ways to this creation. Traditionally, new business requirements initiated the search for and development of innovative technological artifacts (“technology push”). In recent times, emerging digital technologies such as cloud computing, big data analytics, or generative artificial intelligence have provided opportunities for the development

of novel technological artifacts (“technology push”) (Wiesböck & Hess, 2020). So, we understand *Digital Innovations* as a combination of two distinct artifacts: an innovative digital (technical) solution and a complementary business concept. Scholars have agreed that the concept of *Digital Innovations* goes beyond a mere technical artifact and has gained tremendous popularity among researchers (Fichman et al., 2014; Hund et al., 2021; Kohli & Melville, 2019; Yoo et al., 2010a, b). The sociotechnical character shapes and challenges firms regarding organizational topics, e.g., structures, processes, and cultural aspects, as well as the technical side, e.g., information technology (IT) architecture. Thus, *Digital Innovations* as a framework mutually combining business and technology components can serve as a reference point for the concept of *Digital Business*.

We propose four fundamental perspectives on *Digital Business* (see Fig. 2). First, we emphasize that our framework is based on the sociotechnical perspective, which is essential to the IS discipline (Sarker et al., 2019). The technological perspective allows us to examine *triggering technologies*, such as technological advances in sensors, data storage, data processing, and connectivity, which enable the development of innovative digital solutions (e.g., predictive maintenance of industrial machines). The social perspective (which includes the business perspective) enables us to examine how organizations apply *Digital Innovations* to various *domains*, improving their business concepts, creating complementary market offerings, or changing value-creating and supporting processes (e.g., new electronic payment services based on blockchain technology). Second, we adopt both a practice-oriented and research-oriented perspective. Underlying *conceptual foundations* help to theorize companies’ understanding of digital technologies, *Digital Innovations*, and application *domains*, while *methods for implementation* describe how companies adopt digital technologies in practice.

Following this approach, we can distinguish *Digital Business* from other fields. First, the *Digital Business* field sits between the narrow-scoped *Digital Innovations* literature and the broad economic perspective of the *Digital Economy*. The *Digital Economy* takes a broad view of economic activities, yet *Digital Innovations* can encompass broader concepts from the *Digital Economy*. For example, blockchain technology has

Fig. 2 Structuring the field of *Digital Business*



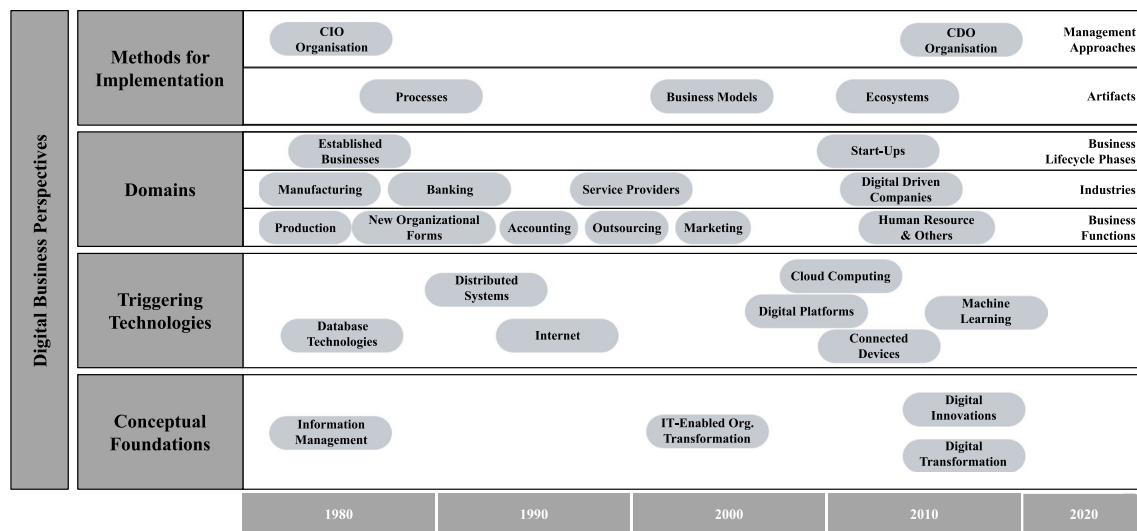


Fig. 3 Time when major topics related to *Digital Business* were discussed for the first time

evolved beyond its cryptocurrency origins and is now central to discussions on the digital economy. However, exploring concrete technological solutions is essential to understanding digital technologies' opportunities and risks for businesses. We argue that the *Digital Economy*'s broad view has (unfortunately) only been selectively adopted in academia — likely due to the heightened practical relevance of the *Digital Business* view. Second, the term e-business was widely used prior to the era of *Digital Business*. For instance, the terms are related as Wirtz (2019) initially defined e-business in an earlier work and later updated the term to *Digital Business* (Wirtz, 2021). E-business typically encompasses all processes that a company carries out via the Internet. However, *Digital Business* covers a broader range of digital technologies beyond the Internet. From a business standpoint, e-business uses technology and software to support business activities (e.g., Customer Relationship Management Software, Supply Chain Management Software, and Enterprise Resource Planning Software) (Markus, 2000). In contrast, in *Digital Business*, organizations use all forms of digital resources — including those related to actuator and sensor technologies, for example, which go beyond the traditional software applications and the Internet in general — to create value and compete in the market. In Appendix 2, we summarize major differences between e-business and *Digital Business* (see Supplementary Information). The elaboration of the differences is based on the works cited in this paper, in particular those works that we summarize in Table 1. Finally, we are currently witnessing the emergence of “digital work.” However, these and similar terms such as “digital leadership” typically address specific topics related to technology use in a business context, making them narrower in scope than *Digital Business*.

Major topics

We discussed how *Digital Innovations* serve as an anchor to *Digital Business* and developed a framework to structure the field. Using the perspectives in this framework, we identify major topics in *Digital Business*. In Fig. 3, we position these topics within the four perspectives according to when they first emerged, therefore providing a historical view. We then discuss each topic within its respective perspective, noting that while some topics have diminished in relevance, others have remained highly significant. Moreover, we emphasize that the discussed topics are key examples, and we do *not* claim that the topics in Fig. 3 and the corresponding discussions constitute an exhaustive list.

Conceptual foundations

First, observing the *conceptual foundations* of *Digital Business* helps us understand how companies have historically understood digital technologies. During the 1980s, the focus was on how digital technologies enable enterprises to structure data and organize information, known as *information management*.² Information management ensures a company's optimal use of information for business goals (Riedl et al., 2017). Until the late 1990s, digital technologies were predominantly IT-centric. In this phase, the IT department was the organization's primary maintainer and driver for digital technologies. Transitioning into the 2000s, the

² Notably, information management serves as a foundation for both *Digital Business* and IT management (Hess and Barthel (2017); Riedl et al. (2017)), while *Digital Innovations* serve as an anchor point for *Digital Business*.

IT-enabled organizational transformation (ITOT) concept emerged, marking a significant shift in perspective. ITOT explored the interplay between IT and organizational structures, aiming to understand the success factors behind IT-based transformation, focusing on the digital transformation of processes. *Digital transformation* research, unlike ITOT, extends beyond observing processes and focuses on the impact of digital technologies on various economic aspects of organizations (Carroll et al., 2023; Markus & Rowe, 2023). In a different vein, *Digital Innovations* research has emerged, concentrating on creating and implementing organizational solutions based on new digital technologies (Yoo et al., 2010a). This approach was used in the previous section as a conceptual basis.

Triggering technologies

Second, we observe that there are *triggering technologies* for new forms of *Digital Business*. In the 1980s, *database technologies* laid the groundwork for information management, representing the first major stride in digital technologies. The 1990s saw a shift from the centralized mainframe architecture to *distributed systems*. This transition included the adoption of distributed computing architectures (Hirschheim & Klein, 2012) and distributed processes (Markus & Rowe, 2023), challenging the previously dominant mainframe paradigm.

With the widespread accessibility of the *internet* in the late 1990s, the research focus pivoted to understanding communication and connectivity. In the 2010s, *digital platforms* allowed the connection of multiple groups, such as producers and consumers, enabling transactions at a large scale, and *cloud computing* technology changed companies' and researchers' perceptions of computing power and storage. This era also witnessed the rise of value offerings such as SaaS, transforming how businesses utilized software (Benlian & Hess, 2011). Later in the 2010s, advances in hardware technology led to the proliferation of compact and powerful *connected devices*. Smartphones dominated customer markets, while the internet of things (IoT) became integral to business operations. Currently, *machine learning* is a pivotal technology, profoundly influencing numerous research streams. Globally, it is a key enabler for *Digital Innovations* in digitally supported companies (Padmanabhan et al., 2022). This technology even challenges our understanding of human and computer capabilities (Schuetz & Venkatesh, 2020).

Domains

Third, *Digital Innovations* in distinct business *domains* constitute another *Digital Business* perspective. This perspective was once termed "IT-based organizations" and concentrated on process redesign (Markus & Benjamin, 1997). However, its scope has expanded to include changes in products, services, and business models. It has thus widened into "digital transformation" (Carroll et al., 2023; Riedl et al., 2023), and we thus categorize *domains* into the *business lifecycle phase*, the *industry* in which the innovation is used, and the *business functions* that have adopted *Digital Innovations* over time.

In the *domain* of *business lifecycle phases*, *Digital Innovations* were initially adopted by *established businesses* in the 1980s. These businesses are considered digitally supported companies because digital technologies were typically not central to their value creation. These businesses neither sell software nor hardware, and their options for deviating from their core value proposition are limited (Matt et al., 2015). Their core service processes, however, are based on digital solutions, allowing them to be more efficient and provide better value to customers than competitors. Research on an earlier *business lifecycle phase* — *start-ups* — has recently gained importance. IT plays a substantial role in supporting entrepreneurial actions in this context, highlighting the deep intertwinement of digital technologies and business (Steininger et al., 2022). Research on start-ups primarily focuses on the specifics of digital ventures at the intersection of change research and venturing, often referred to as "digital entrepreneurship."

Our second *domain*, *industries*, shows how approaches to applying *Digital Innovations* differ. Workflow management systems deeply impacted the *manufacturing* industry because they allowed for efficient and data-driven processes. Today, this industry applies *Digital Innovations* in "smart" manufacturing systems that use sensor, network, and database technologies to run their operations (Van Der Aalst et al., 2016). In *banking*, the innovative use of IT has been playing a significant role since the early 1990s (Bebbington et al., 1991; Ho & Mallick, 2010). *Service providers* were next to adopt *Digital Innovations* into their value creation and internal processes, digitizing their service offerings and rendering them more accessible to customers. *Digital-driven companies* have digital solutions embedded in their core value creation, production, and culture. The first examples emerged in the media industry. These are closely followed by financial (Fin-Tech) and insurance technology companies with fully digital operations (Chanias et al., 2019) and retailing (Stieninger et al., 2019), where Amazon and Alibaba are market leaders.

Our third *domain* concerns *business functions*. *Production* divisions were among the first to adopt IS in the 1980s, when many companies introduced computer-integrated production (Scheer, 1986). *New organizational forms*, known as new management systems (Picot et al., 2023), represent one of the earliest research streams focusing on structures. These systems have evolved using digital technologies to address spatial, temporal, and resource-based constraints. Often starting with *accounting*, spreadsheet programs were adopted company-wide in many organizations in the 1990s due to their high usability (Granlund & Mouritsen, 2003). The interoperability of spreadsheets and businesses' emphasis shift to core processes led to *outsourcing* becoming a prevalent business practice (Dibbern et al., 2004). On the customer side, *marketing* and consumer behavior research were fundamentally changed by IT use (Stone et al., 2007). Finally, novel capabilities of machine learning and process management have given way to adopting *Digital Innovations* in *human resource* processes as well as other functions of business (e.g., Florkowski and Olivas-Luján (2006)).

Methods for implementation

Finally, *Digital Business* can be viewed from the perspective of *methods for implementation*. We differentiate this perspective into *management approaches* and *artifacts* for implementing *Digital Innovations* in businesses. Although implementing these is inherently interdisciplinary, our discussion focuses on changes relevant to the sociotechnical lens of information systems.

CxOs mostly drove *management approaches*. The *chief information officer* (CIO) *organization* emerged when IT shifted from its supporting role to becoming a competitive advantage. CIOs led organizations to adopt business-driven approaches to utilize information and IT (Peppard et al., 2011), and reviews indicate that CIOs have operated in different roles, such as technology provider or integration advisor (Hütter & Riedl, 2017). However, as requirements evolved from gaining competitive advantages to strategically implementing changes to processes, products, and business models, the role of a chief digital officer (CDO) emerged (Singh & Hess, 2017). The *CDO organization* focuses on driving "business value from digital technologies" (Tumbas et al., 2020, p. 122).

Methods for implementation also encompass *artifacts*. In the mid-1980s, businesses began employing *process* management methods to align internal operations (Hirschheim & Klein, 2012). These methods evolved from workflow management to business process redesign, business process management, and process mining (van der Aalst, 2016). By the early 2000s, the advent of the internet sparked research into methodological artifacts for developing *business models* and market offerings, a key aspect of *Digital Business*.

Seminal methodologies, such as the Business Model Canvas (Osterwalder & Pigneur, 2011), facilitated the development or adaptation of value propositions and business models. Consequently, a paradigm centered around value propositions emerged: combining digital technologies and business concepts into *Digital Innovations* to create market offerings (Wiesböck & Hess, 2020). Subsequently, software-based and product-centric *ecosystems* emerged (Benlian et al., 2015; Tiwana et al., 2010). Ecosystems should be distinguished from *digital platforms*, which are conceptualized as *triggering technologies* (see Fig. 3). Digital platforms are technological frameworks that connect multiple groups, such as producers and consumers, enabling interactions and transactions. Digital platforms are characterized by intermediation, network effects, scalability, and data-driven operations, with common revenue models including transaction fees and other forms of payment (Ceccagnoli et al., 2012; Parker et al., 2017). Prominent examples include Uber and Airbnb. In contrast, digital ecosystems are interconnected networks of platforms, technologies, services, and stakeholders that collaborate to create and capture value (Tan et al., 2015). They emphasize interconnectedness, co-creation, innovation, adaptability, and complexity, exemplified by Apple's ecosystem, which includes hardware (iPhone, iPad), software (iOS, macOS), services (iCloud, Apple Music), and third-party app developers.

Both platforms and ecosystems rely on digital infrastructure, aim to create value, benefit from network effects, and use various monetization strategies. However, platforms are usually single entities with specific focuses (e.g., Uber, Airbnb), while ecosystems encompass broader services, involving multiple independent entities (e.g., Apple's ecosystem). Platforms typically innovate internally, whereas ecosystems leverage open innovation from diverse participants. Understanding these nuances helps businesses effectively use platforms and ecosystems to enhance competitiveness and drive growth. Moreover, while software is central to economic activity in ecosystems and platforms, research has shown that their governance is critical to their proper functioning (Benlian et al., 2015).

Three levers for promoting the integrated view

Conceptualizing and defining are only initial steps toward integrating an academic field. While the fragmentation and diverging understanding of topics can threaten the cohesion of scientific disciplines and fields (Sarker et al., 2019), cohesion must also translate into research, teaching, and practice. Therefore, we present three starting points that could support the integration of the *Digital Business* field.

Table 2 Number of *Digital Business* programs in selected European countries

Countries	Programs containing the term “digital business” in the title	
	Bachelor	Master
Austria	4	2
Belgium	0	1
Denmark	0	1
France	2	10
Germany	25	23
Netherlands	1	3
Spain	0	1
Sweden	0	1
Switzerland	1	1
UK	3	17
Sum	36	60

Merging conference tracks into *Digital Business*

To analyze the state of research on *Digital Business*, we analyzed all IS conference tracks containing the keywords “digital” or “transformation.” Our analysis (see Fig. 1) revealed that the *Digital Business* field is fragmented. We conclude this from the facts that the number of tracks dealing with *Digital Business* has tripled since 2017 and that none of the 129 identified tracks contains the keyword “digital business.”

To address the field’s apparent fragmentation, we advocate for research consolidation in *Digital Business*. For the field to thrive, it needs a dedicated incubator. We recommend establishing a dedicated *Digital Business* track at academic IS conferences (e.g., ICIS, ECIS, AMCIS, PACIS, Internationale Tagung Wirtschaftsinformatik) to unify research efforts under a common theme. Additionally, *Digital Business* should feature as a prominent topic in IS journals or a journal could even be dedicated to this field. These approaches would provide a common platform for researchers in *Digital Business* to engage in discussions and position their research work with high precision, fostering a more cohesive and integrated research community, ultimately leading to a more cumulative research tradition (Keen, 1980).

Defining an agenda for education in *Digital Business*

Student education is an important factor in an academic field, and a field is actively shaped by scholars who define curricula built on research (Heinrich & Riedl, 2013; Hirschheim & Klein, 2012). Scholars aim to create cohesion within the field at two levels: courses and programs. Courses are developed to meet the economy’s demand for skilled professionals

(Hirschheim & Klein, 2012), covering fundamental topics such as *Digital Innovations* (Fichman et al., 2014) or artificial intelligence (Chen, 2022). Conversely, programs are developed based on guidelines and curricula that emerged from the fields (Hirschheim & Klein, 2012), catering either to fields such as IS (Yang, 2012) or topics such as e-business (Etheridge et al., 2001).

Digital Business education is present in today’s landscape, yet it appears to be heterogeneous. We could not find any existing research on *Digital Business* education, so we conducted an explorative search for *Digital Business* programs to provide first insights. We queried various databases³ and collected European study programs when their names contained “digital business.” Table 2 provides an overview of 96 *Digital Business* programs across ten countries (the complete list is provided in Appendix 3), highlighting the international scale (see Supplementary Information). Analyzing the names reveals heterogeneity among programs as we identify 47 unique names. Our analysis provides a first look at *Digital Business* education but does not allow for generalizability. *Digital Business* education appears scattered as various programs focus on specific aspects of *Digital Business*, such as digital technologies, digital entrepreneurship, or digital transformation. Especially at the undergraduate level, this fragmentation is problematic as contents may not be aligned to form a comprehensive foundation of knowledge on *Digital Business*.

Systematic development of curricula and program frameworks is necessary to advance the field. We advocate for *Digital Business* to adopt a structured approach similar to

³ bachelorsportal.com, campusfrance.org, daad.de, letudiant.fr, mastersportal.com, study-uk.britishcouncil.org, studyinnl.org, studienwahl.at, www.studyprogrammes.ch

other fields by establishing educational standards through guidelines (Gorgone et al., 2000; Jung & Lehrer, 2017; Kurbel, 2009; Yang, 2012). We suggest a clear distinction between mandatory and elective content in *Digital Business*. Mandatory content should include all perspectives of *Digital Business*, as presented in Fig. 2, including the anchor of *Digital Innovations* and the historical evolution of the field, as depicted in Fig. 3. In contrast, elective content should allow for in-depth exploration of specific topics within *Digital Business* (see Fig. 3). These proposed guidelines provide a foundation for the structured and productive debate that will shape the future design and direction of *Digital Business* education.

Establishing practice contacts beyond the IT departments

While research and education are crucial to an academic field, transferring knowledge to practitioners and gaining knowledge from practitioners are fundamental to an applied field such as IS. This can be done by defining stakeholders and exchange methods. However, neither has been defined for *Digital Business*.

Identifying the right partners is crucial. Historically, IS has predominantly partnered with IT departments because digital technologies are central to their operations. Yet, this approach may not be most effective for *Digital Business*, which is better aligned with digital business units, digital innovation units, the CDO, or even the chief executive officer. This shift in stakeholder focus is driven by the strategic role of *Digital Business* in strengthening a company's competitive advantage and market position. Thus, we motivate researchers to re-evaluate the stakeholders in the *Digital Business* field to ensure that theoretical advances are practically applicable and that the field thus remains relevant. This will enhance the long-term impact of research in the dynamic field of *Digital Business*.

Furthermore, it is essential for *Digital Business* to effectively transfer its research to the right practitioners and learn from their real-world problems. Therefore, scholars must identify effective approaches for long-term and continuous cooperation between research and practice. Providing frameworks, such as the one we propose in this paper, is one approach to enhancing the connection to managers and practitioners, offering them a structured view of past, present, and future research (Wiesböck & Hess, 2020). However, this approach is intermittent. Consequently, we encourage fellow researchers to develop further approaches for continuous cooperation with practitioners in the field of *Digital Business*.

Conclusion

With this position paper, we address four issues. First, we examine the diverse definitions of *Digital Business* in literature and propose a unified definition highlighting the role of an organization's innovative use of digital resources. Second, we define the conceptual foundations of *Digital Business*, placing *Digital Innovations* at the concept's core. Using *Digital Innovations*, we present a framework consolidating fragmented research streams and structuring education approaches to *Digital Business*. The framework encompasses four perspectives: *conceptual foundations, triggering technologies, domains, and methods for implementation*. Third, we illustrate how our framework maps the evolution of *Digital Business* topics over time. Fourth, we discuss the field's fragmentation in research and education and address the necessary re-evaluation of stakeholders.

We propose recognizing *Digital Business* as a major field of IS research. Topics such as digital transformation, *Digital Innovations*, digital platforms, entrepreneurial opportunities, blockchain technology, or machine learning are often treated separately in research. While the detailed investigation of topics has advantages, it can lead to re-examining existing topics under new terminologies potentially neglecting past research. To counter this, we propose a unifying framework conceptualizing *Digital Business*. This framework provides researchers with a holistic understanding of the field and offers universities and other teaching institutions a basis for standardizing *Digital Business* education.

Thus, the paper provides three major contributions. First, it advances the development of the IS discipline by proposing a new field, fostering consolidated advancements in knowledge. Although the term *Digital Business* is widely used, there is hardly any conceptual work on it. By defining *Digital Business* and presenting a unifying framework, it consolidates existing knowledge and addresses the fragmentation in the field of *Digital Business*. Second, the paper provides initial input to *Digital Business* education, kick-starting research and efforts to create guidelines. Providing scholars and institutions with an overview of existing programs establishes a platform and instigates further discussion, facilitating standardization. Third, it informs practitioners about the broad and consolidated conceptualization of the field.

Fundamental research on the genesis of scientific fields has proven substantial to a discipline's developments (e.g., Hirschheim and Klein (2012)). With this paper, we aim to consolidate the ubiquitous but hidden field of *Digital Business*. We encourage researchers to use our conceptual framework for validation purposes or to expand the dimensions through both theoretical and empirical work. Furthermore, we urge fellow researchers to position their research in light

of this proposed perspective, thereby advancing *Digital Business* as a new field of IS.

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