

# The Future of Digital Entrepreneurship Research: Existing and Emerging Opportunities

*Professional Development Workshop*

**Jan Recker**  
University of Cologne  
50923 Cologne, Germany  
[jan.recker@wiso.uni-koeln.de](mailto:jan.recker@wiso.uni-koeln.de)

**Frederik von Briel**  
UQ Business School  
St. Lucia, QLD 4067, Australia  
[f.vonbriel@uq.edu.au](mailto:f.vonbriel@uq.edu.au)

## Abstract

*Digital entrepreneurship—the intersection of digital technologies and entrepreneurship—is gaining increasing importance in the global economy and scholarly community. This PDW set out to establish a community platform for and shared understanding amongst information systems researchers who are interested in shaping the future of digital entrepreneurship research within and beyond the discipline’s boundaries. The simple framework presented in this short paper represents the first step of this endeavor and served as the foundation to structure thinking and discussions at the PDW. The framework identifies three fundamental dimensions of the digital entrepreneurship phenomenon—digital technologies as enablers, outcomes, or contexts of entrepreneurship processes—that form distinct sub-themes of digital entrepreneurship research and illustrates potential research topics that flow from each of them and their intersections.*

**Keywords:** digital entrepreneurship, digital ventures, entrepreneurship processes,

## Introduction

Digital entrepreneurship—the intersection of digital technologies and entrepreneurship—is gaining increasing importance in the global economy and scholarly community. For example, the majority of global unicorns—start-ups that are valued at more than \$1 billion—are digital start-ups (CB Insights 2019) and 4 of the world’s 5 most valuable companies (Badenhausen 2016)—Apple, Google, Microsoft, and Amazon—started as digital start-ups—new ventures that had at the core of their market offering a product or service either embodied in or enabled by information and communication technologies (von Briel, Recker, et al. 2018). Similarly, researchers both within and beyond the information systems (IS) discipline are increasingly investigating digital entrepreneurship as evidenced for example, by the increasing number of papers and special issues on the phenomenon that are published in leading journals across disciplines (e.g., Berger et al. 2018; Fang et al. 2018; Nambisan et al. 2019; Shen et al. 2018).

In IS, digital entrepreneurship as a phenomenon came to the forefront as a potential future research area around 2011 (Del Giudice and Straub 2011). Several subsequent papers demonstrated its value to the IS discipline and beyond (e.g., to the literatures on innovation management and new product development) (Nambisan 2013; Yoo 2013) because digital entrepreneurship as a phenomenon is inter-disciplinary by its fundamental nature (Autio et al. 2018; von Briel, Davidsson, et al. 2018; Nambisan 2017).

Digital entrepreneurship focuses on the design, use, and commercialization of digital technologies in the context of creating new economic activities and, importantly, how both digital technologies and entrepreneurial processes interact and shape each other. The fundamental argument for scholars’ calls to focus on the “digital” in entrepreneurship is the assumption that digital technologies upend traditional

entrepreneurship processes and outcomes (cf. Nambisan 2017; Nambisan et al. 2017; Yoo et al. 2010). For example, digital technologies are portrayed as being re-combinable, editable, and distributable (Kallinikos et al. 2013; Tiwana et al. 2010; Yoo et al. 2010)—traits that allow them to evolve their identity over time and generate new forms of agency both within and across entrepreneurial processes (Nambisan 2017). Hence, a rich opportunity exists for IS researchers to revisit and revise existing theories of entrepreneurship in the light of digital technologies and to develop new theories of entrepreneurship in the digital age. For example, studies show that digital technologies have sparked entrepreneurial initiatives that cross traditional sectoral boundaries, unlocked previously inaccessible networks, ecosystems and communities, digitized previously analog assets and economic goods, and accelerated the inception, scaling and evolution of new ventures (e.g., Huang et al. 2017; Reuber and Fischer 2011; Younkin and Kashkooli 2016).

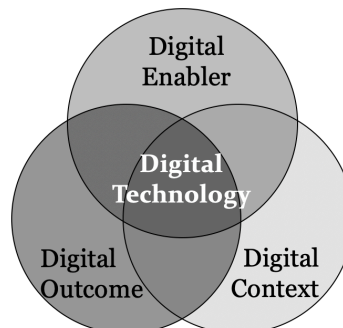
In alignment with the newly formed AIS Special Interest Group on Digital Innovation, Transformation and Entrepreneurship (SIGDITE), this PDW sets out to establish a community platform with a coherent understanding among IS researchers of how they can shape the future of digital entrepreneurship research both within and beyond the discipline's boundaries. Specifically, the goal of the PDW is to create a coherent understanding among researchers of how digital entrepreneurship differs from closely related phenomena such as traditional entrepreneurship, new product development, technology and innovation management, and organization science, and how these differences create opportunities for IS researchers to make substantial contributions both within and beyond the IS discipline.

To structure thinking and discussions at the PDW, we developed a simple framework that identifies three fundamental dimensions of the digital entrepreneurship phenomenon and form distinct sub-themes of digital entrepreneurship research. Our framework serves as a community platform and forms the first step towards creating a coherent understanding of digital entrepreneurship as a phenomenon and research area among IS researchers. We introduce it in the following section.

## A Simple Framework for Digital Entrepreneurship

Digital entrepreneurship and respective research can be assigned to at least one but potentially more of the following dimensions: digital technologies as enabler, outcome, or context of entrepreneurial pursuits. Figure 1 illustrates this three-dimensional framework of digital entrepreneurship research as a Venn diagram. Core to digital entrepreneurship are **digital technologies**, which we consider as digital, man-made technological objects (Kallinikos et al. 2013) such as artefacts, infrastructure, or tools (Nambisan 2017) that have non-material, computed components (Baskerville et al. 2019).

Digital technologies feature prominently in digital entrepreneurship in at least three ways: as **digital enablers** of entrepreneurial processes (i.e., activities such as prospecting, developing, scaling or exploiting), as **digital outcomes** of entrepreneurial processes (i.e., the intended or realized market offering of new ventures), as **digital contexts** in which entrepreneurial processes take place (i.e., the sectoral and regulatory environment such as the FinTech or Biotech sectors), or within any combination of the three. We will elaborate each of the three dimensions and their intersections in the following and briefly discuss potential research topics that flow from them.



**Figure 1. Digital entrepreneurship framework**

**Digital technology as enabler of entrepreneurial pursuits.** The first dimension of our framework recognizes digital technologies as *enablers* of entrepreneurship (von Briel, Davidsson, et al. 2018; Davidsson et al. 2018; Nambisan 2017). On a macro-level, enablers manifest as disequilibrating forces such as technological advances, regulatory changes, demographic trends, and changes to the socio-cultural,

economic, political, and natural environments that influence entrepreneurial action and outcomes (Davidsson et al. 2018). Digital technologies that act as enablers potentially shape, upend and blur venture creation processes and outcomes (von Briel, Davidsson, et al. 2018; Huang et al. 2017; Nambisan 2017). For example, app stores can enable the commercialization and distribution of software offerings (Karhu et al. 2018), 3D printers and electronics development platforms can enable faster and cheaper prototyping of physical artefacts (von Briel, Davidsson, et al. 2018), online repositories can provide artefacts to build on (Kyriakou et al. 2017), online open source communities can enable the development of new software offerings (Mollick 2016), and crowdfunding platforms can enable access to funding from large crowds of potentially unknown individuals (Thies et al. 2018).

Focusing on digital technologies as enablers raises important research questions such as whether and how digital technologies can substitute or enhance the traditional benefits derived from spatial ecosystems like the Silicon Valley and Zhongguancun (Du et al. 2018), what role actors such as makerspaces play in providing access to and educating entrepreneurs about how to use digital technologies (Browder et al. 2019), and whether and how the enabling potential of digital technologies differs across process stages, industry sectors, or geographical regions (Davidsson et al. 2018).

**Digital technology as outcome of entrepreneurial pursuits.** The second dimension of our framework focuses on entrepreneurial ventures that *create* digital technologies as the core of their ventures' market offerings (von Briel, Recker, et al. 2018; Lyytinen et al. 2016). Similar to digital technologies as enablers of entrepreneurship, also digital technologies that form the core of market offerings have the potential to shape, upend and blur venture creation processes and outcomes (von Briel, Recker, et al. 2018; Nambisan 2017). The infusion of digital technologies into traditional products and services has created vast opportunities for entrepreneurs to create novel market offerings. For example, an increasing number of start-ups create digitized hardware such as activity trackers, smart home devices, drones, and robots (von Briel, Recker, et al. 2018), whereas other start-ups create and commercialize the digital tools and infrastructure such as 3D printers and online repositories that enable digital hardware start-ups in the first place (West and Kuk 2016). The decoupling of the material form from logical function and the potential to decouple and recombine digital technologies (Yoo et al. 2010) has also given rise to start-ups realizing innovative new business models and purely non-material market offerings around digital technologies such as artificial intelligence, augmented reality, blockchain, cloud computing, online platforms, and many more (e.g., Ingram Bogusz et al. 2018; Muñoz and Cohen 2018; Snihur et al. 2018).

Focusing on digital technologies as outcomes raises important research questions, for example, about the generativity of market offerings and its impact on emerging ventures' evolution (Jarvenpaa and Standaert 2018), whether and how institutional fields shape the processes and outcomes of digital ventures (Tumbas et al. 2017), or how the digital artefacts constituting emerging ventures' market offerings influence pivots during emergence (McDonald and Gao 2019).

**Entrepreneurial pursuits in digital contexts.** The third dimension of our framework focuses on digital technologies that shape and disequilibrate broader *contexts* of entrepreneurship such as in the automotive, healthcare, or financial industries, or which establish novel digital ecosystems for entrepreneurship to take place in (Autio et al. 2018; von Briel, Davidsson, et al. 2018). For example, digital platforms such as Apple CarPlay and Google Auto can provide virtual ecosystems for software developers (Boudreau 2012) and open up traditional industry sectors such as the automotive industry to entrepreneurial activity from the outside. Other industry sectors such as biotech create vast amounts of data that need to be stored, processed, analyzed, and made sense of (Southan and Cameron 2009), thereby creating opportunities for digital ventures to fill gaps in and improve the overall process. A specific example is genome sequencing that has led to humongous amounts of data, which in turn enable complementors to exploit new market opportunities based on this data (Rothe et al. 2019). Again other industry sectors such as the traditionally highly regulated financial industry provide vast opportunities for disruption by agile ventures that employ digital technologies to challenge the status quo (de Reuver et al. 2017).

Focusing on digital technologies as contexts raises research questions such as whether and how digital technologies foster the decomposition of traditional sectoral value chains, how regulations influence and shape sectors and entrepreneurial pursuits in them, how governance in digitalized sectors can be upended or modified, and how larger entrepreneurial ecosystems emerge and evolve.

**The intersection between digital technologies as enablers and outcomes.** Digital technologies are by their fundamental nature self-referential (Yoo et al. 2010). As a result, to create new digital technologies as their market offerings, digital ventures have to use existing digital technologies. For example, to develop software applications, digital ventures have to use computers including their operating systems, development environments, etc. This means that a digital technology created by one digital venture can become an enabler for other digital ventures. Think electronics development platforms such as Arduino, Raspberry Pi, or Electric Imp that are often developed as market offerings by digital ventures. Subsequently, these market offerings are then used by other digital ventures to enable their prototyping activities (von Briel, Davidsson, et al. 2018) and sometimes even form an integral part of their market offerings (von Briel, Recker, et al. 2018).

The intersection between digital technologies as enablers and outcomes raises fundamental questions about interdependencies, path dependencies and patterning (Goh and Pentland 2019). For example, since digital technologies can evolve over time, how does the evolution of enabling digital technologies influence the evolution of digital technologies as outcomes of venture creation processes and vice versa?

**The intersection between digital technologies as enablers and context.** Digital technologies can enable the establishment and transformation of entrepreneurship contexts. For examples, emergent ventures that operate in digital contexts and are enabled by digital technologies do not necessarily have digital technologies as their market offerings. Think artisan entrepreneurs that sell their products on online market places such as Etsy (Kuhn and Galloway 2015): the digital technology might enable their entrepreneurial endeavors and provide them with a context to operate in, but the offerings themselves are of non-digital nature.

Research at the intersection of digital technologies as enablers and contexts is often closely aligned with research on entrepreneurial ecosystems and imposes questions such as which affordances digital technologies provide to ventures that operate in a specific context (Autio et al. 2018) or how ecosystems that foster digital entrepreneurship emerge (Du et al. 2018).

**The intersection between digital technologies as outcomes and context.** Digital technologies are by their fundamental nature interoperable (Ceccagnoli et al. 2012) and characterized by their potential for infinite expansibility (Faulkner and Runde 2011, 2019). This means that digital ventures can potentially operate across contexts and scale rapidly. Moreover, the sensibility of digital technologies allows them to create vast amounts of contextual data (Yoo 2010) which can create the context for and enable novel entrepreneurial endeavors to take place. Ubiquitous sensors and open data repositories are examples of such digital technologies that create contexts for and have led to the establishment of novel digital ventures. Related research focusing on the intersection of digital technologies as outcomes and contexts often focuses on digital platforms. For example, focusing on competition between app developers on a digital platform, Tiwana (2015) identifies that input control of the platform operator and the modularization of apps influence the apps evolution and their resulting performance.

Hence, the intersection between digital technologies as outcomes and context imposes research questions, for example, about how the success of digital ventures is linked to their environment and to other ventures operating in the same environment or across environments (Srinivasan and Venkatraman 2018).

**The intersection between digital technologies as enablers, outcomes, and context.** Lastly, digital technologies can be enablers, outcomes, and contexts of digital entrepreneurship at the same time. Think crowdfunding platforms such as Kickstarter and Indiegogo that are the market offerings and *outcomes* of some digital ventures' venture creation processes, the *enablers* of other digital and non-digital ventures', and they establish and shape broader venture creation *contexts* across multiple industry sectors.

Focusing on the intersection between all three framework dimensions requires researchers to broaden their focus and adopt a holistic perspectives and approaches such as multi-level theorizing (Hitt et al. 2007), and systems thinking (Alter 2008).

## Opportunities for Interdisciplinary Conversations

As our simple framework illustrates, digital entrepreneurship as a phenomenon provides a fertile ground for novel research topics that have digital technologies at their core. Our framework also illustrates opportunities for digital entrepreneurship researchers to reach out to phenomena, concepts and knowledge

from other disciplines such as organization studies (how do digital technologies enable collaboration within or between emergent ventures?), new product development (how do digital technologies change processes related to ideating, prototyping, production or distribution), and entrepreneurship (how do digital technologies assist with the discovery or creation of opportunities?). In the following we will briefly discuss a few out of the many opportunities for interdisciplinary investigation of these research topics that naturally emerge from the phenomenon's interdisciplinary nature.

### ***Choice of Theoretical Perspectives***

Because of its interdisciplinary nature, digital entrepreneurship research provides vast opportunities to bring together theoretical perspectives of multiple disciplines. In particular, the IS discipline with its artefact focus provides distinct theoretical perspectives that can help to advance the understanding of digital entrepreneurship not only in the IS discipline but also beyond. For example, design science perspectives can potentially provide important insights into the digital artefacts that ventures create, which in turn can help to understand the very processes through which ventures emerge and exploit business opportunities (Dimov 2016; Nambisan 2017). Similarly, theoretical perspectives from entrepreneurship and related disciplines that have an actor focus such as effectuation (Sarasvathy 2001), pivoting (McDonald and Gao 2019), or bricolage (Baker and Nelson 2005) might provide IS researchers with a valuable toolbox to look at the digital in digital entrepreneurship from fresh perspectives. An illustrative example of the latter is the article of Spiegel et al. (2016) who shed light on success factors of early stage internet ventures by using social capital theory from sociology, the business model perspective from strategic management, and digital entrepreneurship as the context.

### ***Choice of Research Collaborators and Outlets***

Because of its interdisciplinary nature, another important opportunity for digital entrepreneurship researchers is to look beyond the IS discipline's boundaries when searching for collaborators and publication outlets. Working with colleagues from other disciplines such as entrepreneurship, management, and strategy who are also interested in the phenomenon but might have different foci and perspectives can result not only in more integrative research but also increase its impact. Similarly, targeting publication outlets in related disciplines can help to stimulate inter-disciplinary conversations and allow digital entrepreneurship researchers from the IS discipline to contribute to and advance the ongoing conversations of other disciplines. After all, one of the prospects of digital entrepreneurship as a phenomenon is exactly that it provides researchers from different disciplines and backgrounds with a shared interest that allows them to draw on and combine each other's' strength to advance our joint understanding of the phenomenon at large. For example, in our own work we found it tremendously valuable to collaborate with colleagues from the entrepreneurship discipline to integrate theoretical perspectives from and disseminate findings in the entrepreneurship, IS, and management disciplines (von Briel, Davidsson, et al. 2018; von Briel, Recker, et al. 2018; Davidsson et al. 2018).

### ***Choice of Unit of Analysis***

Another opportunity that emerges from digital entrepreneurship's interdisciplinary nature lies in choosing different units of analysis for investigation. As different disciplines have different foci, varying the unit of analysis allows digital entrepreneurship researchers to bridge connections between IS and other disciplines through the joint application of different analysis methodologies and theories at different levels of abstraction. The three dimensions we introduced in Figure 1 reside on three particular levels of analysis: the ecosystem (digital technology as context), the venture (digital technology as enabler) and the offering (digital technology as outcome). However, other units of analysis such as the entrepreneurial agent are implicated through digital entrepreneurship as well. The entrepreneurial agent has been a core focus of investigation in entrepreneurship (e.g., Grégoire and Shepherd 2012; McMullen and Shepherd 2006; Wood and Williams 2014), which offers opportunities to extend, challenge or redefine this body of knowledge through a digital entrepreneurship lens. Increasingly digital work contexts impose questions such as whether entrepreneurs behave differently in digital contexts and, if so, what the implications are? For example, does a digital context redefine who can (or cannot) be an entrepreneur or in what ways prospective agents can pursue an entrepreneurial initiative? Emergent research suggests that digital contexts not only offer "upsides" in terms of value creation and value appropriation infrastructures for entrepreneurs, thereby

mitigating their liabilities of newness, but also have “downsides” for them such as through associated costs of role conflict (Nambisan and Barrons 2019). Likewise, digital entrepreneurship proffers opportunities to level out traditional privileges and disadvantages owing to perceived lower barriers to entry, disembodiment of the entrepreneurial actor, and the absence of visible markers of disadvantage online. However, emergent research on gender equality (Sundermeier et al. 2018) suggests that the purportedly “neutral” internet may not be free from offline inequalities that affect new venture emergence (Dy et al. 2017).

## Conclusion

The key takeaways of the simple framework discussed in this short paper and the PDW that builds on it are a better understanding of the distinct potential of digital entrepreneurship research, opportunities for future theoretical and empirical development in this emerging area, and a shared lexical vocabulary honing in on concepts such as context, enablement, and outcome.

As such, the framework and the PDW contribute to ICIS and the IS discipline at large for at least three reasons. First, the framework and the PDW provide a complementary perspective from a different angle on the conference theme of “innovation ecosystems.” The innovation ecosystems of established firms often create entrepreneurship ecosystems for emerging firms. Think of app stores from firms such as Amazon, Apple, Facebook, and Google—many of the app developers that make these platforms become innovation ecosystems in the first place are digital entrepreneurs.

Second, as evidenced by the increasing number of digital entrepreneurship focused papers and special issues in leading IS journals (e.g., the *Journal of Strategic Information Systems* or the *Information Systems Journal*), the phenomenon is of high contemporary relevance for the IS discipline. Further, the inter-disciplinary nature of the phenomenon together with digital technologies at its core presents a rich opportunity for IS researchers to make important contributions both within and beyond the discipline as for example special issues on digital entrepreneurship in related disciplines demonstrate (e.g., *Research Policy* or the *Journal of Business Research*).

Third, the framework and PDW serve as an important part of the broader agenda to create a foundation for and establish the newly formed AIS Special Interest Group on Digital Innovation, Transformation and Entrepreneurship (SIGDITE). They bring together researchers from the IS discipline that share a focus on digital entrepreneurship research, create a coherent understanding of the phenomenon, and nurture the emergence of new networks and collaborations among them.

In sum, we hope the simple framework presented in this short paper and the PDW building on it will contribute to the establishment of digital entrepreneurship research as a fruitful stream in the IS discipline and provide useful guidance for digital entrepreneurship researchers.

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