

Article

# Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable “Digital”?

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**Abstract:** Digitalization plays a major role in contributing towards the United Nations Sustainable Development Goals. Without transformation of existing businesses, both economic and environmental challenges of the future cannot be solved sustainably. However, there is much confusion on interrelationships and terms dealing with digitization or digitalization: Digital business model, digital transformation, digital entrepreneurship. How do these terms interrelate with and to digitalization, and how do they support firms to grow sustainably? To answer this question, we identified seven core digital-related terms based on a structured literature search within the management and economics domain, namely: Digital, Business Model, Digital Business Model, Digital Technology, Digital Innovation, Digital Transformation, and Digital Entrepreneurship. Thereafter, we analyzed prior literature for deriving a common understanding and definition as a basis for interrelations within a conceptual framework. Definitions were presented in a case study setup with twelve innovation and research and development (R&D) managers from various business units of a German high-tech company. Based on these insights, we propose a conceptual framework on how Digital Readiness, Digital Technology, and Digital Business Models might sustainably relate to Innovation, moderated by a Digital Transformation Process. With this approach, we aim to equip practitioners and researchers alike in handling and addressing change through digitalization sustainably.

**Keywords:** digitalization; business model; digital business model; digital technology; digital innovation; digital transformation; digital entrepreneurship; sustainable business model

## 1. Introduction

As digitalization or digitization has been gaining momentum in recent years, it is here to last [1]. This is supported by impressive numbers: Around 39.1 million results on Google for the search term “digital transformation”, 818 thousand for “digital business model”, 311 thousand for “digital entrepreneurship”, and, altogether, 7.3 billion results for the search term “digital” (Google search query, performed with the respective search terms on May 10th, 2020). Apparently, digital *whatever* is not only a dominant topic in industry and academia, but especially when talking about transforming business models into a sustainable and circular economy. There is no conference, no new business model, and no political discussion that lacks a reference to “digital” or its often-used siblings, Innovation 4.0 or Industry 4.0. However, a common understanding of the various terms is lacking, especially in academia. Confusion is paramount (as with other contemporary concepts, like Artificial Intelligence), and “digital” risks deteriorating into a mere buzzword [2]. Further complicating the digital conundrum, digital terms and interrelations are not only perceived differently between the various fields of study, but also within specific research fields, like social sciences or engineering. The same applies to different

constructs of “digital”: How these can be understood if they comprise new ways of identifying and addressing consumers or if “digital” is simply about technology, or about framing a new business model—it all remains opaque.

Without a common understanding and interrelations, roots, applications, effects, and, ultimately, sustainable measures are hard to build, develop, and discuss [3]. Without these interrelations, the academic discourse lacks the basis upon which to build. Therefore, it is key to have a common understanding of these interrelations, as this is a prerequisite for exchanging and building knowledge and, ultimately, applying “digital” to sustainable economic and environmentally friendly activities [4]. This entails the necessity for a common understanding of the most prevalent terms of the digital environment and their relations.

With this paper, we aim at addressing this necessity. In a multi-method approach, based on a review of current literature, we identified seven core digital-related terms within the management and economics literature, namely: Digital, Business Model, Digital Business Model, Digital Technology, Digital Innovation, Digital Transformation, and Digital Entrepreneurship. Through the analysis of prior literature, we derived a common understanding and definition of these terms, as well as their potential interrelations. We scrutinized these interrelations in a focus group on digital business models with innovation and research and development (R&D) managers from various business units to derive a common understanding. Based on this, we developed a conceptual framework, connecting these previously unconnected digital terms. With this conceptual framework, practitioners and researchers alike are better equipped in handling and addressing change through “digital” sustainably.

## 2. Background: Mapping the Academic Confusion

The most basic forms of digital terminologies, often employed synonymously, are digitization and digitalization. Digitization refers to a technical process, i.e., “the integration of digital technologies into everyday life” [5]. Seeing this technical process through the lenses of information technology on coding and programming, digitization describes analog information that is transformed into a digital format, for example, through making physical products programmable or communicable [6,7]. Contrastingly, digitalization is depicted “... as a socio-technological process of applying digitization techniques to broader social and institutional contexts that render digital technologies’ infrastructures” [8,9].

Analyzing firms in terms of their respective industries and industry-specific knowledge sources, the industry taxonomy counts digital firms in the field of science-based firms [10–12]. This field covers electronics, chemicals, and related sectors. This is fostered through recent advances in integrating external knowledge, for example, through platforms [13]. Hanelt et al. [14] nonetheless refrain from a distinction of digitization on industry level. To them, digitization has to be analyzed on the product level, thereby differing between and within industries. Three archetypes are distinguished by the level of digitization, ranging from no digitization to fully digitized: (1) Purely physical products, (2) digitally enhanced physical products, and (3) fully digitized products [14]. Reflecting on the industry and product level, these differing views on “digital” in firms raise the question of if these are not affected by firms’ underlying business models or, specifically, digital business models.

Firms’ business models can be seen as “... a system of interconnected and interdependent activities that determines the way the firm “does business” with its customers, partners, and vendors” [15]. This view also accounts for the necessary activities to fulfill these needs and their interdependencies, and the benefits reaped for the firm [15,16]: It is “... the rationale of how an organization creates, delivers, and captures value” [17]. As a structural template, business models identify firms’ value proposition, the associated network, cost as well as revenue sources, and other key differentiators [18–20].

The “digital” in the digital business model can be seen as enhanced resource optimization through digital technologies, like with Uber-like mobility-sharing schemes or Software as a Service (SaaS), interacting between entities and systems [21–23]: “A business model is digital if changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated” [24]. These changes are epitomized in the distinction between place (i.e., before internet

business models) and space (i.e., digital world) [25]: “[I]t was a world that was tangible, product-based, and oriented toward customer transactions. Today, many industries—all moving at different rates—are shifting toward a digital world of ‘space’: More intangible, more service-based, and oriented toward customer experience” [25]. Weill and Woerner [25] present three components that, to them, are at the center of a digital business’s value proposition: Platform, content, and experience. Further characteristics of digital business models identified by prior literature comprise: Their intangible nature, implying a potential unlimited re-usability of data collected over multiple functional conditions [26], amendments to classical product architecture [6], increased reciprocal exchange between information and telecommunication technologies and digital business models [27], and software-based capabilities that enhance existing functionalities [6,28,29]. However, efficiency advances might come at the cost of an increased complexity beyond comprehension compared to previous product architectures [30,31].

As “digital” comprises deep technology aspects, digital technology forms the basis of innovations in platform and digital environments [13,22,32,33]. To shed light on the underlying definitions of digital technologies, the EU Commission proposes four main categories: “Mobile, social media, cloud, and data analytics” [34]. As they form technology ecosystems, new innovations supersede their predecessors by evolving from them [35]. This can be understood as a transformative change to how business is being conducted [36]. Digital technologies are highly interconnected, enabling and enhancing information processing capacities [37,38]. This integrated engineering fostered through digital technology drives adoption along all elements of the value chain, rendering existing process less important: “... all participating entities can be supplied with access to real-time information and control is distributed to the shop-floor level” [39]. In this way, digital technologies become the orchestrators of innovation, with differing effects and outcomes depending on purpose and context [31].

Applying and building upon existing, well-known technologies can lead to digital innovations like the GoPro or FitBit [40]. In the Schumpeterian thinking (e.g., [41]), digital innovations can be seen “... as the carrying out of new combinations of digital and physical components to produce novel products” [7]. These digital innovations are often characterized by radical change and their disruptive nature, thereby overcoming barriers to enter previously closed markets [7,42]. Participation in digital innovation is not limited to very few, since access to digital technology is the only hindrance [43]. Widespread deployment of digital technology, fostered through rapid price declines and ever-increasing digital performance, provided this access and opened the diffusion of unbound digital innovation to the masses [43,44]. “Given the above conceptualization, digital innovation management refers to the practices, processes, and principles that underlie the effective orchestration of digital innovation” [31]. Thereby, innovation becomes faster, with an increased lack of control [2]. “Accordingly, every digital innovation process can be viewed as a constant discovery, manifestation, and combination of one or more design patterns wherein each pattern identifies a new and different relationship between at least two components of the digital technology functions” [31].

These new and different relationships also characterize digital transformation, however, on a different level: Digital transformation “[brings] together firms from previously unrelated industries” [7]. Data exchange, data generation, data analysis, and data adaption to processible information are seen as necessary and important competences in mastering this process of digital transformation [20,45]. With these abilities at hand, the inevitable organizational change by digital technologies and digital business models might lead to an improved business result [46]. The digital transformation does not stop at the often-referenced process level [47]: It bears profound implications for all business aspects, like business models, services, products, etc., and involves the actions of all participants, like customers [20,48]. Consequently, Kaltum et al. [49] argue that “... digital transformation is a profound change and accelerates business activities, processes, competencies, and models to fully exploit the changes and opportunities in digital technology and its impact on society in a strategic and prioritized way”.

This impact on society has not been neglected by politics, claiming the ever-growing significance of digital activities in entrepreneurship. “Digital entrepreneurship embraces all new ventures and the transformation of existing businesses by creating and using novel digital technologies” [34].

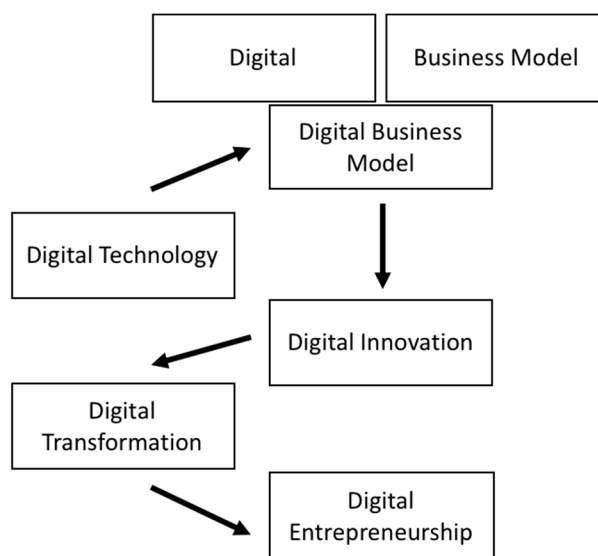
Here, digital technology and digital artifacts are distinctive characteristics of venture creation [50,51]. With new platforms, networks, and systems, further development and enhancement of existing infrastructures are the aims [8]. By means of “digital”, the pursuit of opportunities offers significant potential for previously excluded groups, enhancing the democratizing nature of entrepreneurship [52]. Within the group of digital entrepreneurs, digital technology entrepreneurs actively engage in digital technology and services to create their ventures, moving digital entrepreneurs’ borders beyond existing ecosystems [40]. Their drive to success is grounded in science and an understanding and application of technologies [40].

Reflecting on prior literature relating to “digital”, as outlined above, motivated us to derive a framework for further analysis. However, before deriving a framework of digital interrelations, the findings of our analysis of relevant literature on “digital” are presented in Table 1.

**Table 1.** Findings on digital terms.

| Term                     | Findings from Literature   |
|--------------------------|--|
| Business Model           | Firms’ interaction with suppliers, customers, and partners as rationale of firms’ value propositions                                     |
| Digital-Digitization     | A technical process where analog information is transformed into a digital format  |
| Digital-Digitalization   | Application of digitization techniques as socio-technological process  |
| Digital Business Model   | Augmented resource optimization, characterised by intangibility, and centering around experience, platform, and content                  |
| Digital Technology       | Highly interconnected orchestrator of innovation with transformative change to business  |
| Digital Innovation       | Innovation process as constant discovery through new combinations of physical and digital, opening participation for a wider access-base |
| Digital Transformation   | Enhanced (data) exchange with (unrelated) partners encompassing profound changes and implications for all business aspects               |
| Digital Entrepreneurship | Embracing new ventures and transformation in pursuit of opportunities by opening up entrepreneurship for the excluded                    |

Starting from the more abstract and general digitization and digitalization to digital formats incorporated within digital business models [6,7], this provides a first glance on how the digital constituents of a conceptual framework might interact and interrelate (see with Figure 1). Thereby, the enhanced resource optimization for more sustainable businesses is driven through digital technologies [21–23], forming the basis of digital innovations in platforms and digital environments [13,22,32,33]. These digital innovations inevitably result in organizational change through digital technologies and digital business models, paving their way to digital transformation of organizations, bearing profound and sustainable implications for all business aspects [20,46,48]. This also affects the way new ventures interact, laying ground for digital entrepreneurship [8], and, more specifically, by moving digital entrepreneurs’ borders beyond existing ecosystems to digital technology entrepreneurship [40]. This development is reflected in the conceptual framework, as presented in Figure 1.



**Figure 1.** Proposed basis for a conceptual framework.

This forms the basis for our empirical examination in the next step.

### 3. Materials and Methods: A Case Study Approach

For new phenomena where no prior literature is available, qualitative research can help to found patterns and propositions for future research. In this understanding, it is important to find an appropriate case that fits as a first empirical indication to derive generalizable results. Yin [53] uses the term “unique case” for that challenge. This implies that such a chosen case must be specific regarding the underlying research problem on the one hand, and generic to be applicable for many other research subjects on the other hand.

Hence, our single-case analysis was conducted at a high-technology firm that was affected by the process of digitalization in a special way. Predominately active in business-to-business (B2B) ventures, the firm is a so-called traditional German Mittelstand hidden champion (<20.000 employees), active in various business fields (see the main business activities in Table 2). The industry is rather traditional, but major changes were also observed in recent years in terms of digitalization, both in internal and production processes, as well as in external customer demand. “Digital” became a constituent of nearly every meeting and initiative. Even though our level of analysis is a single firm, the business fields are diverse, stemming from the firm’s development over time (see with Table 2), and enable a broader view and varied insights.

**Table 2.** Characteristics of the case study firm.

| Industry/Branch       | Employees | No Participants |
|-----------------------|-----------|-----------------|
| Aviation              | 5500      | 2               |
| Controls/Appliances   | 3600      | 1               |
| Corporate Departments | 200       | 1               |
| Defence               | 2500      | 1               |
| Metal                 | 3500      | 5               |
| Metering              | 1700      | 1               |

We conducted a twofold analysis (see with Figure 2): First, before the focus group, we conducted a pre-assessment of digital taxonomies through an online questionnaire. We then presented and discussed the results from the preliminary online questionnaire and the interrelated digital literature derivation in a focus group workshop onsite. Focus group workshops are appropriate to further reflect

on and challenge the findings from literature and the questionnaire-based pre-assessment of digital taxonomies, as opportunities for different views of participants and clarification of responses emerge, which enables one to evaluate and value opinions and positions [54–56]. Thereby, the literature-based findings on “digital” were presented as a starting point. Based on that, a moderated discussion took place about if and how the suggested relationships are perceived in the individual firm branch setup.

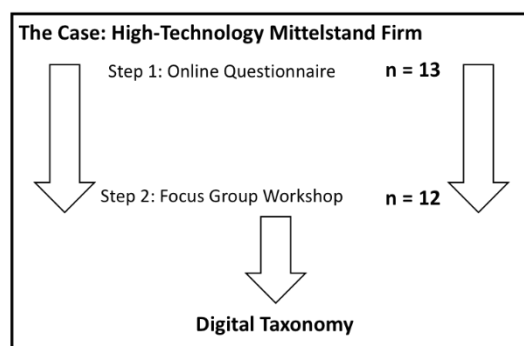


Figure 2. Methodology.

The online questionnaire was distributed anonymously to fifteen innovation managers from seven different business divisions of the above case-study firm. In the questionnaire, we presented participants with the following: In addition to assessing personal and firm-related information, two questions, each with seven sub-categories, were asked: (1) “Please define the following terms in your own understanding” (terms: Digital, Business Model, Digital Business Model, Digital Technology, Digital Innovation, Digital Transformation, Digital Entrepreneurship), and (2) “Does your firm provide a definition of the following terms and, if so, please include the respective definition” (terms: Digital, Business Model, Digital Business Model, Digital Technology, Digital Innovation, Digital Transformation, Digital Entrepreneurship). Thirteen managers participated, whereof eight managers answered all questions presented.

During a half-day workshop, the focus group workshop was performed with twelve innovation managers from eleven different business divisions of this firm, following the steps outlined by [56]. All participants were male, predominantly aged between forty and fifty years, and with an average firm tenure of between two and twenty-seven years.

## 4. Results

### 4.1. Online Questionnaire

The preliminary online questionnaire revealed unconcise answers: Participants did not reveal a common understanding of the different digital terms, understanding the digital terms in various ways. To present an overview of and graphically depict the understanding of the different terms asked during this pre-assessment, we created a summarizing word-cloud, highlighting the key words from the most commonly mentioned answers, as seen in Figure 3:

As can be seen, identified key topics were related to financial terms (“earn”, “money”, “value”), as well as terms commonly used to represent the antagonism of the digital and the pre-digital business landscapes, like “platform”, analog, or “x...”. Other key terms were distributed evenly, both digital-related (like “processing”) and unspecified (like “innovations”).

In detail, “digital” was described by one respondent as “IT-based, acquired and transmitted via electronic systems”. The opposite of analog, computer-based, or the combination of “0” and “1” were also named commonly, grounding the overall definition in machine-applied settings. Contrarily, the business model itself was more compatible in the economic and business realm: “Concept to generate economic value out of a solution.” It was mainly described as a (business-related) process to generate revenues by investing





Technologies rapidly and increasingly change industries through Digital Transformation, with one respondent claiming that each transformation is digital in the future. In this wake, digitalization increases up to every firm being digital in the future, with Digital Entrepreneurship harming existing businesses. This is fostered by enlarging the business bases through its digital potential.

4.2. Focus Group Workshop

The results from our literature review and the responses from the preliminary online questionnaire formed the basis for the focus group workshop, revealing the following results: First, different frameworks were discussed, starting from the original derived framework (Figure 1). As with the results of the preliminary online questionnaire, no common definitions and understandings could be agreed upon. The following two figures (Figures 4 and 5) condensed the different variants of relationships being discussed.

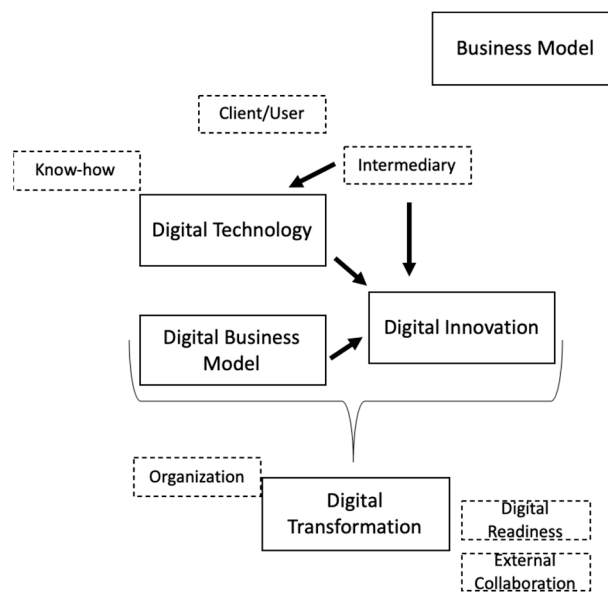


Figure 4. Framework development part 1.

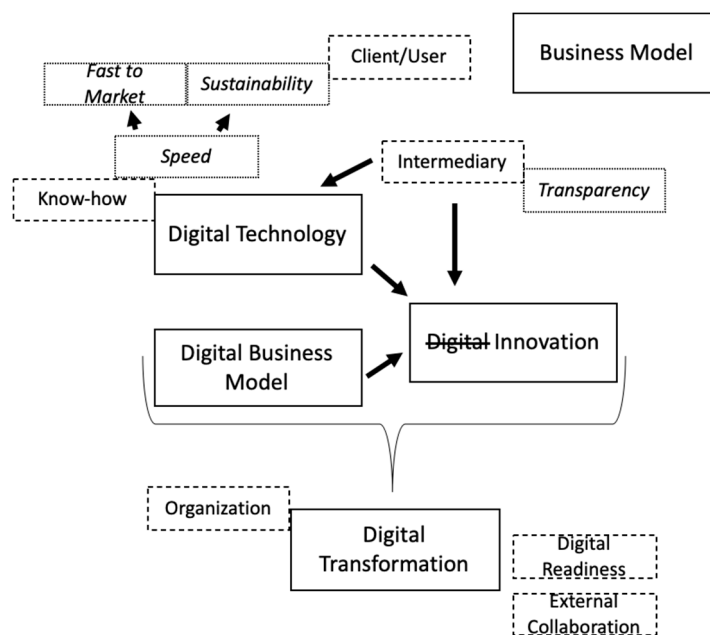


Figure 5. Framework development part 2.



As a first step of the focus group workshop, participants eliminated the terminologies of Digital and Digital Entrepreneurship presented before. As one participant framed it, these terminologies are already included within the remaining terminologies and lack any inherent distinction. Furthermore, the Business Model was shifted aside as the top term. Then, the framework was extended by the following mitigating factors: Client/user influence, know-how, intermediary, organization, digital readiness, and external collaboration. Digital Technology, grounded in know-how, and Digital Business Model directly influence Digital Innovation, whereas intermediaries affect Digital Technology (direct effect) and Digital Innovation (direct and indirect effect).

Digital Transformation is not only seen as the outcome of the interplay between Digital Technology, Digital Business Model, and Digital Innovation, but is also influenced by the organization, its digital readiness, and external collaborations to foster the Digital Transformation. “External collaborations are a crucial factor in managing the digital transformation”, as one participant noted. “Without digital readiness, implementing digital technologies, digital business models, or mastering digital transformation is impossible”, mentioned another participant, reflecting one of the main concerns that surfaced during the focus group workshop. However, discussions within the focus group workshop led participants to further adjustments of their redefined framework, leading to Figure 5.

“Which innovations aren’t digital anymore and why should digital innovation be different from innovation itself?” one participant asked, leading the focus group to strip the Digital Innovation of the Digital. Furthermore, some of the above newly included factors were extended to success-enabling components: The factor of know-how, influencing Digital Technology, is reliant on speed, which, in turn, is reliant on being sustainable and fast to market, to eventually influence Digital Technology’s success. Transparency is a major component, both of chance and concern, in enabling successful intermediary roles in Digital Technology and Innovation. Client and user involvement is important to eventually foster the Digital Transformation, especially as these digital solutions need to be implemented with speed, but still provide a sustainable future for the respective business.

Finally, the following key factors were revealed: Everyone is affected by “digital”, though not everyone needs to act. (Digital) Innovation is double-edged: Even though most processes need to be digitalized, a platform conversion of businesses and clients does not always provide a viable option and does not make economic sense for all applicable cases. This is advanced by the constant need to innovate and to keep track of novel developments, which are required by constant change in business activities and pressure to innovate.

Business activities most threatened by “digital” are those of low-margin and commodity businesses. Successful business lines should be continued as before, and should not be amended to “digital” per se. For example, one of the participants mentioned a fully functional, non-digital ecosystem between suppliers, customers, and the firm itself. Shifting to a platform-based digital business model might not only render the old business model obsolete within the functioning ecosystem, but also open the gates for new competition that previously had no viable market access in the existing ecosystem, driving down margins with no additional value to the firm. Throughout the focus group workshop, participants understood Digital Transformation overwhelmingly as an underlying process affecting all other instances and terminologies of “digital”. The Business Model itself encompasses all terminologies of “digital”, leading eventually to Digital Transformation.

## 5. Discussion: A Conceptual Framework for Research and Practice

Not only in academia, as was posited in the introduction, is confusion paramount when it comes to addressing a common understanding of the various “digital” terms. As introduced earlier, it is key to have a common understanding as a prerequisite for exchanging and building knowledge sustainably [4]. Our literature review, the results from the questionnaire, and the focus group workshop revealed that a common understanding is not prevalent, but needs to be developed. In particular, the answers to the questionnaire revealed that even though the respondents had their personal views

on the different digital terminologies, only four could reply and provide answers with regards to their employers’ view.

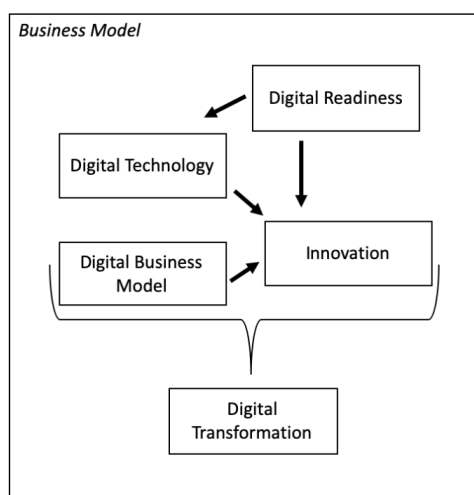
This uncertainty and confusion indicates that definitions of digital terminologies are necessary, but might be sufficiently defined if centered on a limited number of key terms. However, the difficulty persists in universally agreeing on common definitions: Digital Innovations might not be a term necessary to be defined, since the way of deciding between a “digital” or “normal” innovation seems unclear and unreasonable. Is not any innovation being characterized by similar preconditions and “digital” just a result of constant innovative developments? Digital Business Models, however, depend on the underlying business and core values [57] and would need to be defined individually, depending on each firm’s unique value propositions and leadership character [58,59]. Digital Transformation is influenced by various factors like customer focus, customer proximity, margin pressure, speed of change within respective business activities, or—as put by our focus group—by Digital Readiness and external collaboration.

Even though no common understanding of “digital” could be agreed upon, the above findings are condensed in Table 3 to offer a proposition of the definitions and interrelations of the different digital terms for future discussions.

**Table 3.** Proposed definitions and interrelations.

| Term                   | Proposed Definitions and Interrelations   |
|------------------------|---|
| Business Model         | Top term encompassing all terminologies of Digital interacting the pathway to Digital Transformation of firms’ value propositions                                       |
| Innovation             | Constant discovery through new combinations and interdependent on economic viability, while opening participation for a wider access-base                               |
| Digital Readiness      | Basis as organizational necessity for implementation of anything Digital  |
| Digital Technology     | Highly interconnected orchestrator of know-how-influenced innovation, enabling transformative change through speed and sustainable market activities                    |
| Digital Business Model | Enhanced resource optimization, characterised by intangibility, businesses’ uniqueness, and core values, centering around experience, platform, and content             |
| Digital Transformation | Outcome of Digital interplay as underlying process, contingent internally (organization) and externally (cooperation), while embracing profound change and implications |

The results helped to reshape the interrelation of digital terms that was first derived from the literature and the proposition for a conceptual framework (as in Figure 1). Incorporating these thoughts and results from the questionnaire and the focus group workshop led to a refinement of the proposed conceptual framework (Figure 6).



**Figure 6.** The conceptual framework of “digital”.

Embedded within the firm's overall business model, the different digital terms and innovations thrive to eventually master the Digital Transformation [20,60] sustainably. Rather than being a step-in-process to Digital Entrepreneurship, Digital Transformation spans all relations within the digital framework. In the same view, Kaltum et al. [49] argue that Digital Transformation is the means to capitalize on everything related to "digital". This extends the work of Yoo et al. [7] in that Digital Transformation does not only enable distinct firms to come together, but also all activities within firms relating to digitalization and, eventually, innovation within their respective business models, transcending previously defined inner-firm organizational boundaries, as agile methods upended previously fixed innovation approaches [61]. Innovation in itself lies at the center of Digital Technology and Digital Business Models [62], with Digital Readiness surfacing as an organizational enabler within the conceptual framework of "digital". The results also demonstrate that, independent of any "digital"-related activities, activities need to be closely aligned and adjusted according to each firm's individual business model [2,15,17,63]. In this way, it is ensured that digitalization and, ultimately, Digital Transformation are sustainable and not only for digitalization's sake and without any effect or reasoning for firms' underlying (Digital) Business Models.

In this way, Figure 6 supports managers in understanding and navigating the digital terminology by handling the intensity of customer interaction, the intensity of the respective competitive environment, and the level of digital technologies present within each respective industry. One key factor revealed by the focus group was that the loss of direct access to clients should be avoided by all means and not handed over to intermediaries inconsiderately. Digitalization should not be ignored, but also not be approached with panic or blind rushes into things—it is not a revolution [64]. For instance, if your current non-digital business is performing, it might make sense to continue with it if this is a special market area where no one else is expected to enter. If you make it digital too early, this might lead to cannibalizing your own business, in case the margins in the new setup are lower.

This refers back to the established discussion about the innovator's dilemma [65]. An example in this context is the publishing industry. With the changing ecosystem, it becomes apparent that a new business model is needed, but the question is of when it will be the right time to move from print to digital [66]. With the new digital approach of emerging technology companies, it might leapfrog a whole business in a short period of time, which will be challenging for companies that are not prepared for it [67].

Business models need to be analyzed as to their future readiness and sustainability impact, as both economic and environmental sustainability are an intertwined challenge for businesses that cannot be tackled in isolation [68,69]. In doing so, "digital" plays a vital role in contributing towards the goals of the United Nations Sustainable Development Goals, where economic and environmental issues are at the heart of solving the challenges of the future [70]. For firms to be able to navigate these complex challenges, transforming their existing business models into Digital Business Models, with short- and long-term effects for resource allocation and reduced resource utilization towards a circular economy, becomes paramount for sustainable market activities [69,71]. The concept of a circular economy supports firms in operationalizing sustainable developments, which can be fostered through "digital" [72,73]: Through digital business models, potentially alongside intermediary integration where unavoidable, supply chains are enabled to reduce parts needed and to avoid waste, as well as to digitally transform the business model for sustainable value capture and value creation beyond mere resource consumption, while also being able to strengthen and deepen customer interaction [72,74,75]. Businesses can grow sustainably without increasing their environmental footprint. In other words: "I don't think digital is very different from other stuff, in that we still think the brick and the play system is at the core of what we do [ . . . ] But digital is an opportunity for us to enhance that"—Niels Christiansen, CEO of The Lego Group [76].

So overall, is there a sustainable digital after all? The answer is, as in many cases, it depends; apparently, there is no automatism. So for instance, if a new digital approach saves resources like in cases of virtual conferences instead of onsite conferences with participants from all over the world,

the answer would be a straight yes. However, in other contexts, the answer might even be a straight no; for example, if a new digital offer leads to high negative effects on the environment, like in the case of cryptocurrencies with a very high energy demand all over the world.

## 6. Limitations/Further Research

This research is based on a case study of a single firm in Germany. Further research might want to expand this to other European companies. Beyond that, results might differ in the Asian or US contexts. Another limitation is the fact that this firm was an established traditional Mittelstand firm with a certain size. An analysis of SMEs (small and medium-sized enterprises) in this context will offer further interesting insights and differences. We chose a multi-method approach primarily grounded in qualitative research. Our online questionnaire and the focus group workshop have limitations of their own, which are inherent within the respective research methods. However, at this exploratory stage, the findings revealed should also spur future discussions and research on this topic. Building on these preliminary findings, a longitudinal study with different employee levels would pose an interesting option to gain more detailed and validated insights, preferably towards a taxonomy of “digital”. Future research on digital might operationalize sustainability even further, for instance in the context of different individual sustainability levels and actions [77]. Finally, it would also be interesting to analyze failure cases of digital strategies, e.g., in terms of bad timing. This would also offer key insights into the dynamics of digitalization.

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