*sustainability*

MDPI

*Article*

# The Role of Digital Technology within the Business Model of Sustainable Entrepreneurship

**Sascha Fuerst [1,2,*], Odille Sanchez-Dominguez [1] and Miguel Angel Rodriguez-Montes [1]**

[1] EGADE Business School, Tecnologico de Monterrey, Eugenio Garza Lagüera and Rufino Tamayo, San Pedro Garza Garcia 66269, Mexico; odille.sanchez@tec.mx (O.S.-D.); marodrigm@tec.mx (M.A.R.-M.)
[2] Turku School of Economics, University of Turku, Rehtorinpellonkatu 3, 20500 Turku, Finland
* Correspondence: sascha@tec.mx

**Abstract:** The adoption and usage of digital technologies is considered one of the most promising transformations for sustainability, and sustainable entrepreneurship is considered key for providing solutions for the grand social and environmental challenges. The purpose of our study is to shed light on the role of digital technologies in value creation, value delivery, and value capture within the business models of sustainable entrepreneurship. This is important for understanding how digital technologies leverage sustainability. In fact, we have little knowledge on the impact of digital technologies within the business models of sustainable entrepreneurship. We studied the adoption and usage of digital technologies within the business models of 10 born-sustainable new ventures in Mexico applying a comparative case study approach. We found that context matters. Extant research claims that digital technologies promote social inclusion, increase connectivity, and lead to broader stakeholder integration. Despite these claims, this is the most challenging part for entrepreneurs. Our main findings, therefore, emphasize the constraints of the implementation of digital technologies within sustainable business models. This adds to the academic discourse a cross-geographic perspective from the Global South.

**Keywords:** digitalization; digital technology; sustainable business model; sustainability; sustainable entrepreneurship



**Citation:** Fuerst, S.; Sanchez-Dominguez, O.; Rodriguez-Montes, M.A. The Role of Digital Technology within the Business Model of Sustainable Entrepreneurship. *Sustainability* **2023**, *15*, 10923. https://doi.org/10.3390/su151410923

Academic Editor: Fabrizio D'Ascenzo

Received: 5 June 2023
Revised: 3 July 2023
Accepted: 4 July 2023
Published: 12 July 2023



## 1. Introduction

Digital technologies are making an important contribution to the innovation success and financial performance of companies [1]. Digital technologies are impacting the business models of all industries, either as an outcome (i.e., the product itself in form of a digital artifact) or as a source of innovation. New technologies such as 6G networks create ecosystems that span universal architecture, technologies, and solutions [2]. For instance, artificial intelligence, edge computing, and smart energy harvesting are technologies that enable smart applications, blockchain solutions, and quantum communication. Hence, creating opportunities for innovating existing business models and for the creation of new ones. The potential for innovation through digital technologies has important implications for the entrepreneur either as a driver for digital transformation or as an agent affected by it [3]. Nambisan [4,5] calls for explicitly theorizing the digital-technology-related concepts in order to study entrepreneurship in a digitized world. In this regard, others have contributed to a better understanding of how digital technologies trigger new forms of innovation and entrepreneurial initiatives that cross traditional industry boundaries, ecosystems and communities, integrate digital and non-digital assets, and accelerate the inception, scaling and evolution of new ventures (e.g., [6–10]).

Digitalization as the adoption of digital technologies and their usage [11], is considered as one of the most promising transformations for sustainability with game-changing potential [12,13], including advances toward tackling the Sustainability Development Goals

as put forward by the United Nations [14]. In fact, the COVID-19 crisis brought a renewed interest in digitalization and sustainability [15].

It is worth mentioning, that increased digitalization can also cause a negative impact on the environment, such as through growing water and energy use [16] and waste and disposal [17]. In addition, digital technologies face the dilemma to promote, on the one hand, efficient energy usage but, on the other hand, are held responsible for their large energy consumption [18,19].

Behind the background of sustainability, entrepreneurship is considered key for contributing solutions to the grand social and environmental challenges [20–22]. In particular, sustainable entrepreneurship provides a solution rather than a cause for social inequality and environmental pollution [23]. Sustainable entrepreneurship can be defined as the discovery, creation, and exploitation of opportunities to create future goods and services that sustain the natural and/or communal environment and provide development gain for others [24].

Digitalization and sustainability are considered megatrends and the combined application of both is suggested to lead to even higher levels of sustainability [25–27]. Digital technologies give rise to new opportunities for entrepreneurs considering economic, social, and environmental sustainability [28–32]. Digital technologies promote social inclusion, fight poverty [32,33], and enhance resource optimization [34]. These studies reveal some of the combined effects of digital technologies and sustainable entrepreneurship.

However, we lack a more comprehensive understanding about the application of digital technologies and their usage within the business models of sustainable entrepreneurship. This is surprising, since innovative business models are important for accomplishing sustainability objectives [35]. Moreover, the business model perspective is considered key for researching the combined effects of digitalization and sustainable entrepreneurship [31]. Following Teece [36] "a business model defines how the enterprise creates and delivers value to customers, and then converts payments received to profits". It is a holistic description of how a firm accomplishes business [37]. Osterwalder and Pigneur [38] see the business model as comprised of different elements that include value proposition, value creation, value delivery, and value capture. It is the organizational and financial architecture of the company. Therefore, the business model emphasizes on the value creation logic from an economic or commercial perspective.

In addition to the commercial logic, sustainable business models consider the environmental and social logics [31]. Hence, different logics are at play within a sustainable business model. We follow Schaltegger et al. [39] and consider the following definition for sustainable business models: "A business model for sustainability helps describing, analyzing, managing, and communicating (i) a company's sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries."

Research on sustainable business models abound [40–43], but we lack a profound understanding about the role of digital technologies within these business models. Hence, our research tries to answer the following question: What is the role of digital technologies for value creation, value delivery, and value capture within sustainable entrepreneurship?

Similar to Parida et al. [27], we made use of a business model perspective with the aim to fully capture the different facets of the application of digital technologies for value creation, value delivery, and value capture. We studied the adoption and usage of digital technologies within the business models of 10 born-sustainable new ventures [44] in Mexico. The context of Mexico is important, since it adds a cross-geographic perspective from the Global South [45] to the current discussions that are rather focused on developed countries [31].

Born sustainables are ventures that from inception leverage sustainability at their core [44]. Sustainable entrepreneurs strive to have a positive impact on interrelated social and environmental problems, such as climate change, waste and disposal, poverty, and

unequal access to education and employment [46]. Hence, sustainable entrepreneurs contribute to solving societal and environmental problems through the realization of a successful business [47].

We found that context matters. Extant research claims that digital technologies promote community integration, social inclusion, increase connectivity, and lead to a broader stakeholder integration [15,31,34]. Despite these claims, this is the most challenging part for the entrepreneurs of our case firms. Social inclusion and stakeholder integration are an essential part of the value creation activities of these entrepreneurs. They integrate marginalized populations as key partners within their business models. However, these groups of people often lack the necessary capabilities, infrastructure, and financial means to use digital technologies. We found to some extent similar limitations regarding the value delivery activities, as not all clients make use of digital solutions for handling the purchasing process. Our main findings, therefore, emphasize the constraints of the implementation of digital technologies particularly in the value creation and value delivery components of the business model. These limitations reside outside of the venture's boundaries and are difficult to control.

Based on these findings, our research makes important contributions to the literature at the intersection of sustainable entrepreneurship and digitalization. We only have a limited understanding about how entrepreneurs leverage digital technologies in their business models, and in particular from a Global South perspective. This is where our findings contribute. On the one hand, we deliver a micro-perspective regarding the implementation of digital technologies in business models with a focus on sustainability, and, on the other hand, we elaborate on the constraints of the implementation of digital technologies in the context of the Global South.

## 2. Theoretical Background

### *2.1. The Role of Digitalization in Sustainable Entrepreneurship*

The COVID-19 pandemic has underscored the strategic relevance of digitalization and sustainability. Many firms have responded to these developments by initiating strategic and operational measures [48,49]. Therefore, digital technologies have strongly influenced the entrepreneurial process through the digitalization of existing businesses and the creation of digital firms [4,29].

Digitalization forms part of a digital change process and precedes digital transformation [50]. Digitalization implies the application of digital technologies with the aim to change existing business processes, such as distribution [51], communication [52], and relationship management [53]. It focuses on process improvement that enhances customer experience.

The digitalization of businesses creates several opportunities and enables higher levels of sustainability, as confirmed by the positive interdependencies among these two megatrends [26]. On the one hand, digital solutions that enable digital entrepreneurship improve connectivity and accessibility, lower costs and carbon footprint, and promote the inclusion and participation of users [26,28,31]. On the other hand, stakeholders' sustainability concerns encourage the adoption of sustainable solutions, such as digital technologies.

As pointed out by Szalavetz [54], digital technologies do not only have the potential to contribute to cost-efficiency but also eco-efficiency. For instance, the adoption of advanced manufacturing technologies does not only improve the firm's competitiveness but also its environmental performance. It is particularly the side-effect of resource efficiency that contributes to improved environmental performance caused by process efficiency of such technology.

The development and use of digital technologies not only creates new opportunities for entrepreneurs [29], it also enables new business development and business improvement to ensure economic, environmental, and social sustainability [28,30–32]. These technologies support digitalization and digital transformation, which breaks with the past and leads to new sustainable growth business models [55]. Sustainable business models go beyond

simple financial profit, including also environmental and social values and goals. Entrepreneurs are seen as agents of change who are committed to seeking a balance between the three pillars of sustainability [29].

Sustainability integrates economic, environmental, and social purposes [34,56]. In business, sustainability refers to finding solutions and making decisions grounded in the relationship among profit, planet, and people. Digital entrepreneurship plays a major role in contributing to sustainability, as it not only creates financial value, but also enhances resource optimization and promotes social inclusion and poverty alleviation [33,34]. Moreover, digital technologies enable business model innovation for sustainability [31,57].

### *2.2. The Role of Digitalization in Business Models*

Changes in society needs, in terms of digital products and services, is the main reason why companies must adapt their value creation, value delivery and value capture processes, fostering innovative transformation and digitalization of business models [3].

Digital transformation goes beyond digitalization and focuses on the development of new business models [50]. It affects the whole company and the way it delivers, creates, and captures value. Hence, digital transformation is the most complete digital change process and inherently linked to strategic change [58]. While digitalization implies an addition of digital components to the firm's product or service offering, digital transformation introduces new business models, such as digital platforms and data-driven models, that require big data analytics capabilities.

Digital technologies enhance the interaction between entities and systems to create, deliver, and capture value, changing the way businesses are run and generate revenues. The proliferation of new digital business models and the switch from traditional to digital business models has developed an intangible and service-based customer experience, putting new elements like platforms, content, and experience in the center of the value creation, delivery and capture [59].

Digitalization of business models offers new possibilities like openness, affordance, generativity, editability and expansibility to the value chain [4,5]. These characteristics allow the development of new tools and infrastructure to facilitate innovation for the re-design of business models, enable businesses to co-create and experiment with their business models, validate and develop different solutions, and addressing new business opportunities in a cost-effective way.

In order to create or to switch to a digital business model it is necessary to implement a digital infrastructure, tools and systems (e.g., cloud computing, data analytics, online communities, social media) that offer communication, collaboration, and computing capabilities to support innovation in the business model and value chain [4].

Technological disruption and the acceptance of the use of digital technologies and platforms have great impact on how existing traditional business models are adapting to a new economy that delivers the tools to digitalize primary and support activities of their business models [60].

The challenge of digitalization is the application of these technologies to business models that already work in an analogical way and to promote, provide and correctly select the necessary digital tools and knowledge to empower not only entrepreneurs but stakeholders to switch the business model into a digital one, adapting to the architecture of value creation, delivery and capture [27].

Digitalization of business models also contribute to increase the effective and efficient use of resources in value creation, delivery and capture, which increases profitability and contributes to a sustainable resource management and alignment to sustainability goals, creating more social and environmental value [61]. Sustainable entrepreneurship founders find an opportunity of resource optimization in their business models' digitalization, minimizing negative environmental impact and seeking competitive advantage with a successful financial return. At the same time, these sustainable and digital business models

propose a way to rescale and minimize industrial infrastructure through digital innovation and systems [39,62].

Technology has been employed by entrepreneurs to redesign their business models not only for internal activities, but also for relationship management with external stakeholders, increasing the innovation of business models [37], and contributing to redefine work structures and industrial boundaries, to shape local and regional economies, to reshape industry competition, and to rethink policies for economic development [3,5].

## 3. Methodology

### *3.1. Research Approach*

Like others that applied a business model perspective to sustainable entrepreneurship [31,63,64], we made use of a qualitative approach to understand the use of digital technologies within business models. The explorative, qualitative approach seemed to be the most appropriate due to the scarcity of previous studies on the intersection of digital technologies and sustainable business models. The case approach is able to deliver rich qualitative data useful for gaining a holistic understanding about the phenomenon [65]. Our comparative case study approach followed the deductive logic of Yin [66], who regards case studies as natural experiments [67]. The analytical approach started from a deductively derived analytical framework of business model design [37] focusing on the three elements of value creation, value delivery, and value capture [27].

### *3.2. Sample*

We applied a purposeful sampling approach [68] selecting new ventures with a business model focused on sustainability (see Table 1). In fact, these ventures were originally conceived to develop a new business model leveraging sustainability at their core, which some term 'born sustainable' new ventures [44]. This approach allowed us to put together a coherent sample, rich in information, and therefore able to provide an in-depth understanding as related to our research question.

**Table 1.** Cases and data collected.

| Company | Activity | Founding Year | Interview Date | Interview Duration | Interviewee | Documents |
|---|---|---|---|---|---|---|
| Alpha | Manufacturing of electric scooters made of recycled plastic. | 2018 | 4 April 2022 | 60 min | 3 co-founders | Company promotional video<br>Internal document |
| Beta | Production and distribution of nanocellulose from bio waste for different uses in the food, packaging, and cosmetic industries. | 2019 | 20 April 2022 | 52 min | Founder | LinkedIn profile<br>Company website<br>Internal document |
| Gamma | Production and distribution of natural sweetener from bio waste. | 2017 | 27 April 2022 | 50 min | Founder | Company website<br>Internal document |
| Delta | Manufacturing of bamboo boards for furniture and different household uses. | 2016 | 21 April 2022 | 56 min | 2 co-founders | Company website<br>Internal document |
| Epsilon | Production of cloths made of residues from the textile industry. | 2010 | 21 April 2022 | 46 min | Founder | Company YouTube channel<br>LinkedIn profile<br>Internal document |

**Table 1.** *Cont.*

| Company | Activity | Founding Year | Interview Date | Interview Duration | Interviewee | Documents |
|---|---|---|---|---|---|---|
| Zeta | Production and distribution of cricket-related food products for human and animal consumption. | 2018 | 21 April 2022 | 49 min | Founder | LinkedIn profile<br>News articles<br>Internal document |
| Kappa | Production and distribution of biodiesel made of used cooking oil from hotels and restaurants. | 2019 | 28 April 2022 | 67 min | 1 co-founder | Company website<br>Internal document |
| Omicron | Extraction of fucoidan from sargassum seaweed, which is used as an ingredient in the cosmetic industry. | 2018 | 03 May 2022 | 46 min | Founder | LinkedIn profile<br>Internal document |
| Sigma | Production and distribution of bio fertilizers for soil regeneration. | 2010 | 17 May 2022 | 63 min | Founder | LinkedIn profile<br>Company YouTube channel<br>Facebook<br>News article<br>Internal document |
| Tau | Production and distribution of a post-harvest solution that enables longer life for fruits. | 2018 | 18 May 2022 | 46 min | Founder | Company website<br>News article<br>Internal document |

We screened and selected the participants of an entrepreneurship competition focusing on sustainability. This competition takes place annually and is open to entrepreneurs from all over Mexico.

### *3.3. Data Collection*

We collected comprehensive primary and secondary data (see Table 1). According to Laasch [69], business models are represented in different forms of tangible and visual-textual artifacts and are expressed through narratives. Hence, we conducted interviews with founders and co-founders, screened internal documents that were submitted to the entrepreneurship competition describing their business model, and additional secondary data we identified through Internet searches. The triangulation of data improved the construct validity of our research design [66].

Conducting interviews is prone to bias, in particular researcher bias, and threatens the validity of the study [70]. Researcher bias relates to the effect of the researcher on the participant and the effect of the participant on the researchers [71]. Following Miles et al. [72], we introduced several measures to reduce researcher bias. One of the researchers was engaged in previous relationships with our focal entrepreneurs, which created trust and openness among the interviewers and the interviewees. We also made the researchers intentions clear regarding the purpose of the research and the anonymity of the information. In addition, we triangulated the responses obtained with the companies' webpages, social media presence, and internal documents regarding the ventures' business models. The triangulation helped us to validate, for instance, the usage of digital sales channels, social media communications, and the usage of payment portals.

Interviewing the founders was important, since they are the principal decision-makers that impact the design and shape of the business model. The interviews lasted between 45–60 min. We made use of a semi-structured interview guide. This format left room for flexibility regarding storytelling on behalf of the interviewees but also ensured consistency among the cases. Applying a formal interview guide improved the internal validity of our

study [73]. We encouraged the interviewees to engage in narrative storytelling to elicit information rich statements. The interview guide comprised three sections (see Appendix A). The first section focused on the profile of the entrepreneur and his or her motivation to start the business. The second section elicited information about the new venture itself—aspects of its business model, the activities, and future plans. The third section inquired about the use of digital technologies for value creation, value delivery, and value capture. All three researchers participated in the interviews, took extensive notes, and documented the observations in a shared document.

### *3.4. Data Analysis*

We engaged in qualitative content analysis [74]. In contrast to inductive qualitative studies [75], we applied a deductive approach based on analytical categories that we derived beforehand from the business model literature in the context of digitalization and sustainability with a focus on value creation, value delivery, and value capture [27]. Besides these predefined constructed codes [76], we also considered in vivo codes that gradually emerged while going through the interview data. In vivo codes were particularly important since they revealed the particularities of the usage of digital technologies within the business models of our focal ventures. For instance, it allowed us to categorize the usage of digital technologies for value creation (e.g., technology for product creation and technology for productivity improvement), to uncover the limitations of their application for particular stakeholders, and to highlight their important role for communicating the value proposition. All three researchers were engaged in the coding process to reduce personal biases, which contributed further to the reliability of the study.

We followed Miles et al. [72] for the larger analytical approach, applying a process of (1) data condensation, (2) data displays, and (3) drawing of conclusions. Condensation was accomplished through coding of the data focusing on the most relevant insights. Data display consisted of the visualization of data which we accomplished by consolidating the different means of digital technology, first in a business model canvas for each case and subsequently in an overarching representation of a business model for all cases combined (see Appendix B, Figures A1–A3). Such an approach allowed us to gain an in-depth understanding about the type of digital technology applied, for which value activity, the function to fulfill, and the frequency of their usage. Other insights such as the particular challenges related to the usage of digital technologies were captured through the coding process, between-case comparisons, and discussions among the three researchers.

## 4. Findings

In this section we provide a description of the findings related to each of the three value creation activities accomplished by the ventures we interviewed.

### *4.1. Use of Digital Technology for Value Creation*

For some of our ventures, value creation takes place in laboratories often making use of a university infrastructure (Beta, Omicrons). Others use their own facilities (Alpha, Zeta, Kappa, Sigma) or make use of external laboratory services (Delta, Gamma, Tau). In the case of Epsilon, "sewing work is given to single mothers, housewives, and senior citizens", as the entrepreneur commented. Value creation, therefore, partially takes place in the homes of this economically and socially more vulnerable group of people. Similar is the case for Delta that works with a cooperative for bamboo of about 3000 individual producers that live in a remote, rural area in Mexico.

Although many of these ventures require cutting-edge technology to produce their products, they lack the necessary financial resources for the acquisition of technology. Alpha requires electronic hardware boards for manufacturing their e-bikes, that are not available in Mexico. Producing these boards is a viable option but requires investment. Omicron too that currently makes use of a university laboratory lacks financial resources to acquire the bioreactors needed for the extraction process from sargassum seaweed. These financial

limitations impact the use of digital technology for production. As the entrepreneur from Gamma commented:

> *In logistics and production, we are still working in a very traditional way. The way we manage logistics, supply chain, inventories, and production is being done in Excel.*

Gamma is interested in employing more technology, but they currently do not have the necessary financial resources for these investments.

For the process of value creation, most entrepreneurs make use of productivity software for internal communication, collaboration, and project management, such as Trello, Slack, Discord, ClickUp, Miro, Zoom, and Teams. Despite its widespread use, the application of this software can come with difficulties for some.

> *It wasn't easy at all to learn how to use [Zoom, Teams, Discord, Miro]. I prefer face-to-face communication.*
>
> (Founder Beta)

> *My technicians are very good at what they do, but this digital part, they really struggle.*
>
> (Founder Sigma)

> *We wanted to use collaborative work applications like ClickUp, which I really like, but it does require a lot from the whole team to get involved. It is not easy, but as the team adopts these tools, I think it is a great advantage. I really like it but I can't make the workshop manager use ClickUp, for example. It would be one more task that he couldn't keep up with besides what he's doing now. The limitation is the time to learn to use it and a stable Internet connection to upload the reports.*
>
> (Co-founder Delta)

Key partners on the supply side also experience difficulties with the application of digital technologies. Such is the case of Delta that works with a bamboo cooperative. The remote location of these farmers comes with difficulties regarding access to the Internet and frequent energy interruptions due to heavy rains. So, communicating with the cooperative and the farmers becomes a challenge.

> *Working with the cooperative is complicated, the region often suffers from infrastructure problems when storms hit. Telephone and Internet connection is needed. They only have low-quality Internet. For us it is a challenge to be connected to our peers in Coetzala [a region within Mexico] and it is impossible with 3000 producers.*
>
> (Co-founder Delta)

Gamma faces a similar situation. The venture relies on the supply side on the collaboration with farmers that do not have the necessary skills and resources to employ digital technology in their work, as the founder of Gamma commented:

> *We work with 52 farmers—all of them in a situation of poverty or extreme poverty—who are dedicated to planting and selling. Once the corn is harvested in Puebla [a region in Mexico] and the corn is shelled, we purchase the cob.*

Epsilon too involves a vast network of suppliers comprised of elderly people, housewives, and single mothers that work from home in cutting and sewing work for cloths. Their skills and resources are very limited regarding the use of digital technologies for production, collaboration, and communication with Epsilon.

In summary, the entrepreneurs acknowledge the importance of digital technology for value creation. Their application is twofold. On the one hand, digital technology is used for the process of production or manufacturing of the end product, and, on the other hand, digital technologies are employed as a means for internal communication, collaboration, and project management (see Appendix B, Figure A3). Despite the potential for a more efficient process of value creation, including collaboration and communication with suppliers and key partners, many limitations remain. These obstacles relate to the lack of financial resources for the acquisition of digital technologies, the missing skills for their

usage, and their limited application on behalf of the suppliers and key partners due to their marginalized, economic and social conditions.

### *4.2. Use of Digital Technology for Value Delivery*

Entrepreneurs use digital technologies during the process of value delivery in two ways. On the one hand, for the sales process and, on the other hand, for establishing and maintaining customer relationship (see Appendix B, Figure A3). Digital marketplaces such as Amazon and Mercado Libre are important sales channels. In addition, Facebook, Instagram, and WhatsApp are also used for handling orders. Google Ads and Facebook Ads help promote the ventures' offers in the digital world. Sales and communication for business-to-business transactions, however, are often done via phone. Gamma and Tau employ Hubspot as a customer relationship management tool.

Contrary to the process of product creation, the use of digital technology for communication with current and potential customers stands out. The creation of textual, visual, and audiovisual material is an important activity for these ventures.

> *For our designs, it is important to create a high-quality and clean image. Using digital platforms, such as Canva Professional, we can do this by ourselves [the design and creation of visuals].*
>
> (Co-founder Delta)

> *To attract customers, social networks work for us, for communicating a culture of caring for the environment.*
>
> (Founder Epsilon)

The creation of impactful visual material is a priority and mainly done in-house. Gamma, for instance, started to work with an advertising agency and later hired a community manager for digital media and the creation of visuals.

The creation of visuals and videos is also used for educating potential customers about the environmental and/or social benefits of the product. As in the case of the founder from Sigma who is dedicated to environmental education visiting schools, as she commented:

> *We can innovate in the way we deliver the content to our audiences, to have more reach. Nowadays the use of social networks has not had as much impact. We are more dedicated to creating presentations and content with digital tools rather than using digital platforms to create value for our customers.*

Despite the more frequent application of digital technologies for value delivery, some limitations remain. If the customer is not familiar with or does not use digital purchasing platforms, the use of digital sales channels and platforms is limited. The entrepreneur of Sigma explained:

> *The use of technologies has been a challenge for [our customers] as some of them don't know how to handle it. Besides, most of our customers—farmers and government officials—don't use digital tools.*

Kappa faces a similar situation. The clients for their biodiesel are local, artisan fishermen that do not make use of digital platforms for their purchases nor do they use social media such as Facebook. Therefore, the promotional and sales activities rather consisted of mouth-to-mouth communication.

Altogether, digital technology is more readily applied for value delivery. The communication of the social or environmental benefit and impact is a priority for these entrepreneurs making use of textual, visual, and audiovisual material. Digital marketplaces are an important sales channel, particularly for business-to-consumer sales. Traditional phone calls, however, still seem to be the preferred business-to-business sales channel. This limitation also extends to other group of clients such as farmers and government entities that often do not make use of digital purchasing platforms.

### *4.3. Use of Digital Technology for Value Capture*

Digital technologies are least employed for value capture. Most ventures make use of direct bank transfers for handling purchases and sales. Only two (Gamma and Tau) make use of payment platforms such as Conekta, PayPal, Mercury, Prex, and Wise. The latter two are used for receiving payments from international customers. Epsilon and Tau use QuickBooks as an accounting software package for invoicing. The application of this software, however, is not easy to use by all team members, as the founder of Epsilon commented:

> *In terms of billing customers and sales, we use platforms such as Quickbooks. Using this platform is a challenge since part of the team only have received primary education.*

## 5. Discussion

Digital technologies are considered to be game changers for sustainability [12]. The combined application of both megatrends, sustainability and digitalization, enable higher levels of sustainability [26]. Innovative business models are important for taking advantage of both megatrends [35]. Similar to Parida et al. [27], we applied a business model perspective with the aim to fully capture the different facets of the application of digital technologies for value creation, value delivery, and value capture. The business model shows to be a particularly useful perspective for gaining a holistic understanding about the combined effect of digitalization and sustainable entrepreneurship [31]. In the following, we discuss our findings considering extant literature.

Small enterprises face important hurdles for the implementation of digital technologies due to the lack of knowledge and financial resources available [77]. This is particularly salient for the ventures we investigated. The lack of financial resources impedes the acquisition of technology, especially for production and manufacturing as part of the value creation process. This leads to the implementation of more manual processes or low-technology usage. The situation is further exacerbated in the context of Mexico where access to financial resources for entrepreneurs or investments in sustainability projects is more difficult to obtain compared to other regions in the world [78].

The lack of knowledge and capabilities for the application of digital technologies is particularly pronounced for internal productivity tools that contribute to more efficient communication, collaboration, and project management as part of the value creation process. Technicians and engineers face more difficulties applying internal productivity tools than the entrepreneurs themselves. In addition, elderly people struggle more with their usage than younger generations. This is contrary to the use of technology for value delivery, where most of the entrepreneurs reported ample knowledge and capabilities for their application.

The literature suggest that stakeholders' sustainability concerns encourage the adoption of digital technologies [29]. Our cases indicate the opposite. Entrepreneurs are rather pioneers in promoting sustainability solutions. They are considered born sustainable, that relate to startups leveraging sustainability in their business model from inception [44]. These entrepreneurs push their sustainability efforts towards their stakeholders, including the application of digital technologies, and not vice versa from the stakeholder towards the new venture. This phenomenon is important for the context of Mexico where the awareness of sustainability is rather limited among businesses [79]. The role of awareness creation and education about sustainability issues to the wider public in Mexico, is an important part of the entrepreneurs' communication activities. This confirms earlier findings by Gregori and Holzmann [31] who introduced the term of value spillover. In their cases as well as in our cases, the entrepreneurs made use of social media, blogs, and online communities for additional socioenvironmental value capture.

We know that digital technologies promote community integration, social inclusion, increase connectivity, and lead to a broader stakeholder integration [29,63,64]. Despite these claims, this is most challenging for the entrepreneurs. Social inclusion and stakeholder integration is an essential part of the value creation activities of the case firms. Delta,

Gamma, and Epsilon integrate marginalized populations as key partners within their business models. However, this group of people lack the necessary capabilities, infrastructure, and financial means to work with digital technologies. We found to some extent similar limitations regarding the value delivery activities, as not all target groups and clients make use of digital solutions for purchasing, such as farmers and even the government in the cases of Kappa and Sigma. Others argued that digitally enabled practices, aid sustainable entrepreneurs to manage the boundaries of their business models, rendering them more dynamic and open [80]. Similar restrictions exist due to the limitations mentioned above.

The socio-cultural and economic context of countries differ. Sustainable entrepreneurship and its linkage to digital technologies need to be contextualized. While digital technologies are able to contribute to regional development [27], our research shows that there are important limitations that hinder the implementation in rural and remote regions in Mexico.

Consequently, our research is able to make the following contributions to the emerging literatures on sustainable entrepreneurship and digitalization [30,31].

First and most importantly, empirical studies at the intersection of digital technology and sustainable entrepreneurship are scarce apart from Gregori and Holzmann [31] who research how entrepreneurs leverage digital technologies in their business models. The authors researched new ventures in Austria. More research is needed that focuses on digital technologies in sustainability business models and on cross-geographic comparisons, as a recent literature review by Guandalini [25] confirmed. Our study contributes to this emerging stream of research adding a perspective from the Global South [45].

Second, we emphasize the constraints of the implementation of digital technologies, particularly in the value creation and value delivery components of the business model. These limitations often reside outside of the venture's boundaries and are difficult to control. We therefore concur with Zott and Amitt [37] and acknowledge the business model as situated between the venture and the network integrating stakeholders into value creation and value delivery.

Third, we focus on concrete activities and add the much needed micro-perspective regarding the implementation of digital technology in business models with a focus on sustainability [31].

Our research also holds important implications from a practice perspective. Digital technologies are readily available, particularly as productivity tools for internal communication, collaboration, and project management. They offer important functionalities for value creation. A primary task for the entrepreneur with a sustainability intention consists of the impactful communication of the product or service offer to the wider group of stakeholders, such as existing and potential customers, government, key partners, and civil society. These communication and public relation efforts are effectively accomplished through digital technology. In fact, we found that digital technologies are frequently and more easily applied for value delivery.

More problematic seems to be the integration of key partners into the digital value chain for sustainability entrepreneurs, particularly for value creation. This is an important limitation the entrepreneur needs to be aware of. The cooperation with socially and economically vulnerable groups of society hinders in many cases the usage of digital technologies due to infrastructure challenges in remote, rural regions, the lack of capabilities for their application, and missing financial resources for the purchase of these technologies on behalf of their key partners.

Our research is not without limitations. We researched business models at a specific point in time at an early stage of venture development. The business models and the technology, however, evolve. Longitudinal studies could provide interesting insights into the application of digital technologies during different development stages of these ventures.

For the entrepreneurs in our study sustainability is at the core of the value proposition of their business model. However, we only look at the direct impact of their actions. We do not consider the indirect negative effect on the environment and society by the usage of

these technologies, particularly for value delivery. Future studies should take this effect into account and consider the overall balance of direct and indirect effects.

In addition, we focus on Mexico with its particular context for sustainability entrepreneurship. Our findings can be transferred to other contexts with similar socio-economic conditions, but this requires further research. Our data collection has a predominant focus on the focal entrepreneurs. Future research should consider the perspective of the stakeholder regarding the application of digital technologies as part of the wider ecosystem of the focal sustainability venture.

## 6. Conclusions

We researched the role of digital technology in value creation, value delivery, and value capture within the business models of sustainable entrepreneurship. Hence, we contribute to an emerging stream of research that combines digitalization and sustainability from a business model perspective. The few studies on the topic are either conceptual or focus on developed countries. We add an important perspective from the Global South highlighting the limitations that exist regarding the adoption and usage of digital technologies. These limitations stem from the business ecosystem where the new venture is embedded (e.g., interaction with vulnerable groups of stakeholders). Hence, context matters for the successful adoption and usage of digital technologies.

**Author Contributions:** Conceptualization, S.F.; methodology, S.F.; formal analysis, S.F., O.S.-D. and M.A.R.-M.; writing—original draft preparation, S.F., O.S.-D. and M.A.R.-M.; writing—review and editing, S.F.; project administration, S.F. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Interview guide**

Profile of the interviewee:

- What is your current role in the company?
- Tell us about your educational and professional background.
- What motivated you to start your project focusing on sustainability?

Details of company:

- What does your company do?
- When was your company founded?
- How many people do you employ?
- Who are your key partners?
- In what markets do you operate?
- What are your plans for the company?

Use of digital technology:

- Tell us about how you use digital technology within your company:
  - For creating/producing your product (value creation)
  - For delivering it to your customers (value delivery)
  - For communicating with your customers (value delivery)
  - For receiving payments and manage your costs/expenses (value capture).

## Appendix B

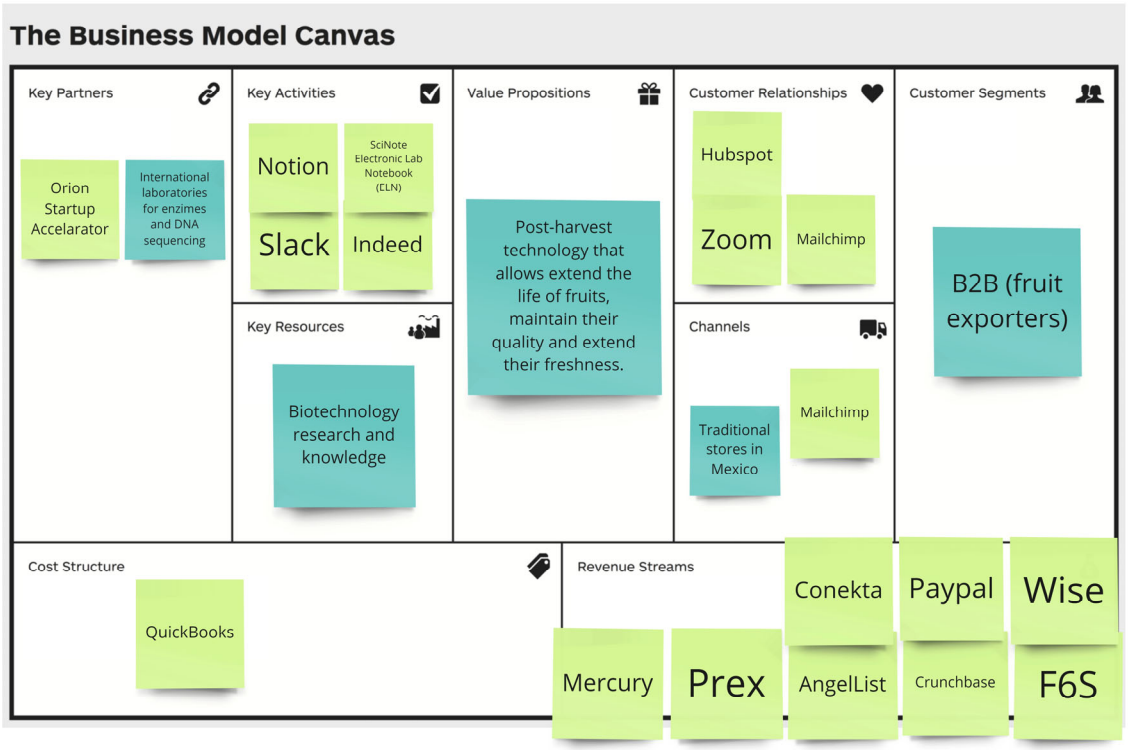


**Figure A1.** Example of a business model canvas: Tau.

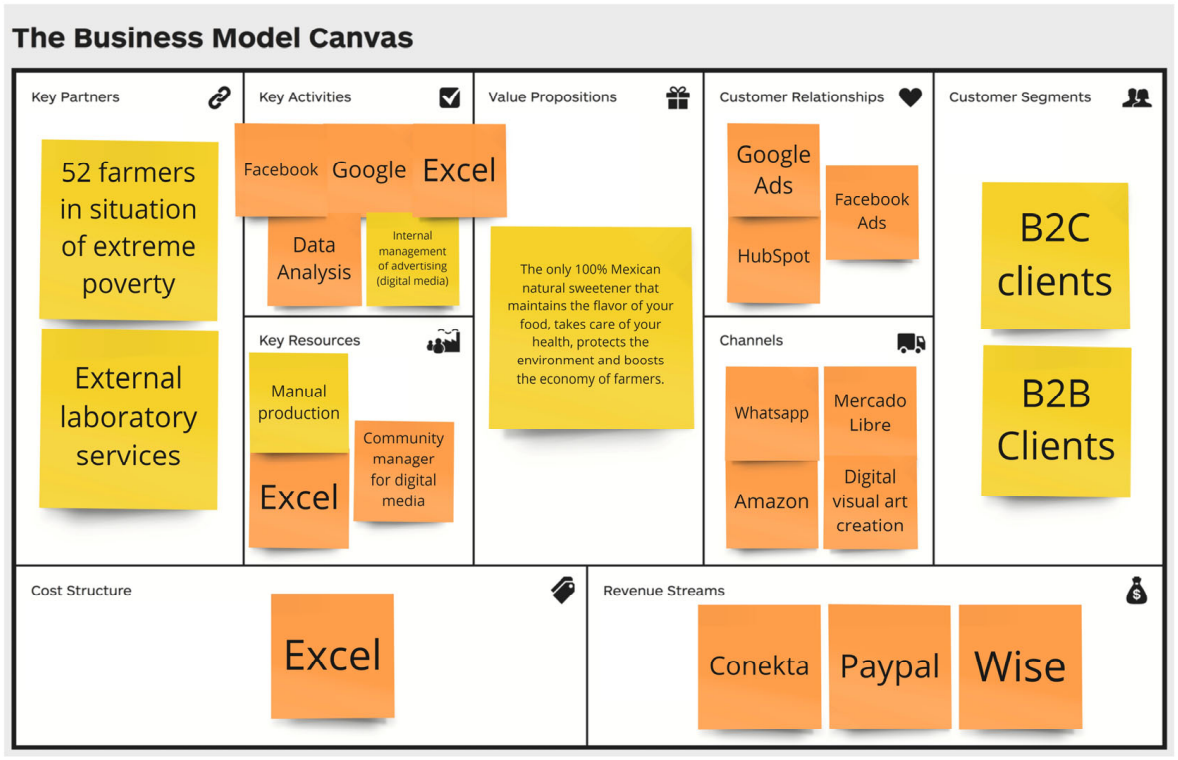


**Figure A2.** Example of a business model canvas: Gamma.

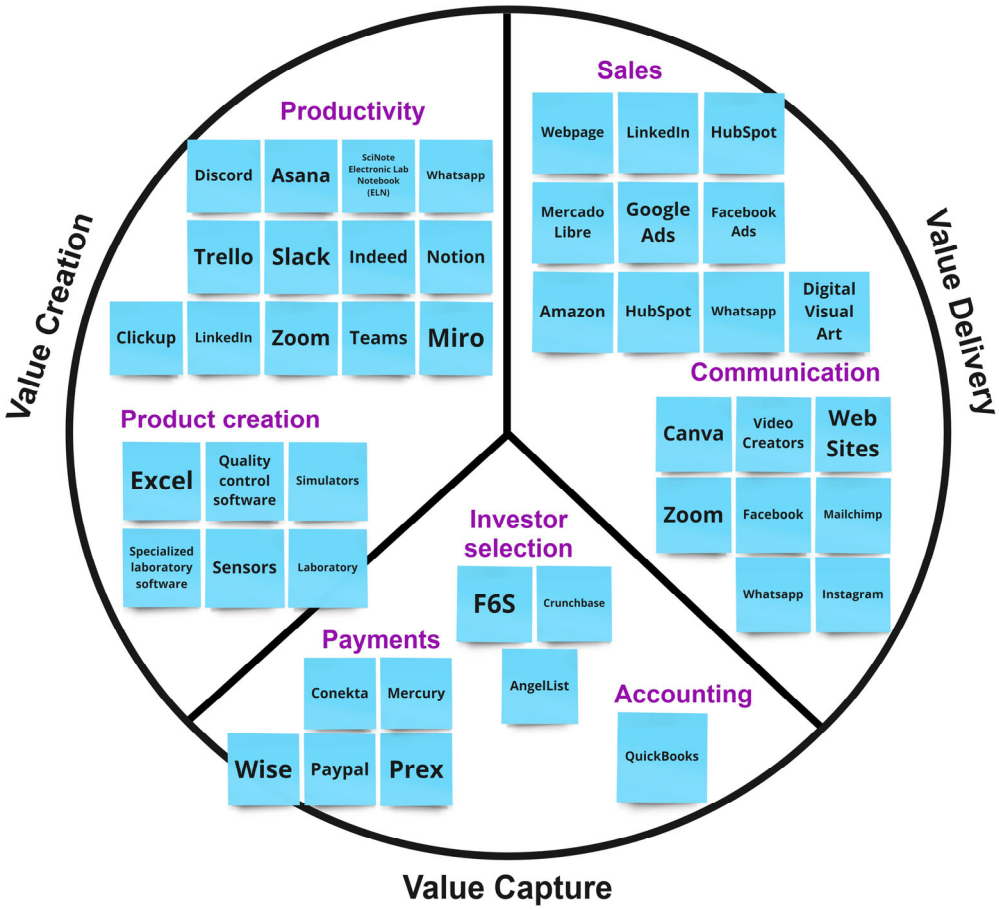


**Figure A3.** Digital technology within the business models of the case firms.

## References


1. König, M.; Ungerer, C.; Baltes, G.; Terzidis, O. Different Patterns in the Evolution of Digital and Non-Digital Ventures' Business Models. *Technol. Forecast. Soc. Chang.* **2019**, *146*, 844–852. [CrossRef]
2. Khanh, Q.V.; Chehri, A.; Quy, N.M.; Han, N.D.; Ban, N.T. Innovative Trends in the 6G Era: A Comprehensive Survey of Architecture, Applications, Technologies, and Challenges. *IEEE Access* **2023**, *11*, 39824–39844. [CrossRef]
3. Satalkina, L.; Steiner, G. Digital Entrepreneurship and Its Role in Innovation Systems: A Systematic Literature Review as a Basis for Future Research Avenues for Sustainable Transitions. *Sustainability* **2020**, *12*, 2764. [CrossRef]
4. Nambisan, S. Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship. *Entrep. Theory Pract.* **2017**, *41*, 1029–1055. [CrossRef]
5. Nambisan, S.; Wright, M.; Feldman, M. The Digital Transformation of Innovation and Entrepreneurship: Progress, Challenges and Key Themes. *Res. Policy* **2019**, *48*, 103773. [CrossRef]
6. Huang, J.; Henfridsson, O.; Liu, M.J.; Newell, S. Growing on Steroids: Rapidly Scaling the User Base of Digital Ventures Through Digital Innovation. *MIS Q.* **2017**, *41*, 301–314. [CrossRef]
7. Rayna, T.; Striukova, L.; Darlington, J. Co-Creation and User Innovation: The Role of Online 3D Printing Platforms. *J. Eng. Technol. Manag.* **2015**, *37*, 90–102. [CrossRef]
8. Srinivasan, A.; Venkatraman, N. Entrepreneurship in Digital Platforms: A Network-Centric View. *Strateg. Entrep. J.* **2018**, *12*, 54–71. [CrossRef]
9. Von Briel, F.; Recker, J.; Davidsson, P. Not All Digital Venture Ideas Are Created Equal: Implications for Venture Creation Processes. *J. Strateg. Inf. Syst.* **2018**, *27*, 278–295. [CrossRef]
10. Von Briel, F.; Davidsson, P.; Recker, J. Digital Technologies as External Enablers of New Venture Creation in the IT Hardware Sector. *Entrep. Theory Pract.* **2017**, *42*, 47–69. [CrossRef]
11. Parviainen, P.; Tihinen, M.; Kääriäinen, J.; Teppola, S. Tackling the Digitalization Challenge: How to Benefit from Digitalization in Practice. *Int. J. Inf. Syst. Proj. Manag.* **2022**, *5*, 63–77. [CrossRef]
12. Gouvea, R.; Kapelianis, D.; Kassicieh, S. Assessing the Nexus of Sustainability and Information & Communications Technology. *Technol. Forecast. Soc. Chang.* **2018**, *130*, 39–44. [CrossRef]
13. Seele, P.; Lock, I. The Game-Changing Potential of Digitalization for Sustainability: Possibilities, Perils, and Pathways. *Sustain. Sci.* **2017**, *12*, 183–185. [CrossRef]

14. Sachs, J.D.; Schmidt-Traub, G.; Mazzucato, M.; Messner, D.; Nakicenovic, N.; Rockström, J. Six Transformations to Achieve the Sustainable Development Goals. *Nat. Sustain.* **2019**, *2*, 805–814. [CrossRef]
15. Del Río Castro, G.; González Fernández, M.C.; Uruburu Colsa, Á. Unleashing the Convergence amid Digitalization and Sustainability towards Pursuing the Sustainable Development Goals (SDGs): A Holistic Review. *J. Clean. Prod.* **2021**, *280*, 122204. [CrossRef]
16. Tjoa, A.M.; Tjoa, S. The Role of ICT to Achieve the UN Sustainable Development Goals (SDG). In *IFIP Advances in Information and Communication Technology*; Mata, F.J., Pont, A., Eds.; Springer: New York, NY, USA, 2016; Volume 481, pp. 3–13. ISBN 9783319444468.
17. Aksin-Sivrikaya, S.; Bhattacharya, C.B. Where Digitalization Meets Sustainability: Opportunities and Challenges. In *CSR, Sustainability, Ethics and Governance*; Osburg, T., Lohrmann, C., Eds.; Springer Nature: Berlin, Germany, 2017; pp. 37–49.
18. Schulte, P.; Welsch, H.; Rexhäuser, S. ICT and the Demand for Energy: Evidence from OECD Countries. *Environ. Resour. Econ.* **2016**, *63*, 119–146. [CrossRef]
19. Wang, Y.; Chen, Y.; Benitez-Amado, J. How Information Technology Influences Environmental Performance: Empirical Evidence from China. *Int. J. Inf. Manag.* **2015**, *35*, 160–170. [CrossRef]
20. Gast, J.; Gundolf, K.; Cesinger, B. Doing Business in a Green Way: A Systematic Review of the Ecological Sustainability Entrepreneurship Literature and Future Research Directions. *J. Clean. Prod.* **2017**, *147*, 44–56. [CrossRef]
21. Howard-Grenville, G.E.J.; Davis, J.; Dyllick, T.; Joshi, A.; Miller, C.; Thau, S.; Tsui, A.S. Sustainable Development for a Better World: Contributions of Leadership, Management and Organizations. *Acad. Manag. Discov.* **2017**, *3*, 107–110. [CrossRef]
22. Muñoz, P.; Cohen, B. Towards a Social-Ecological Understanding of Sustainable Venturing. *J. Bus. Ventur. Insights* **2017**, *7*, 1–8. [CrossRef]
23. Muñoz, P.; Cohen, B. Sustainable Entrepreneurship Research: Taking Stock and Looking Ahead. *Bus. Strateg. Environ.* **2018**, *27*, 300–322. [CrossRef]
24. Patzelt, H.; Shepherd, D.A. Recognizing Opportunities for Sustainable Development. *Entrep. Theory Pract.* **2011**, *35*, 631–652. [CrossRef]
25. Guandalini, I. Sustainability through Digital Transformation: A Systematic Literature Review for Research Guidance. *J. Bus. Res.* **2022**, *148*, 456–471. [CrossRef]
26. Lichtenthaler, U. Digitainability: The Combined Effects of the Megatrends Digitalization and Sustainability. *J. Innov. Manag.* **2021**, *9*, 64–80. [CrossRef]
27. Parida, V.; Sjödin, D.; Reim, W. Reviewing Literature on Digitalization, Business Model Innovation, and Sustainable Industry: Past Achievements and Future Promises. *Sustainability* **2019**, *11*, 391. [CrossRef]
28. Baran, G.; Berkowicz, A. Digital Platform Ecosystems as Living Labs for Sustainable Entrepreneurship and Innovation: A Conceptual Model Proposal. *Sustainability* **2021**, *13*, 6494. [CrossRef]
29. Fernandes, C.; Pires, R.; Gaspar Alves, M.-C. Digital Entrepreneurship and Sustainability: The State of the Art and Research Agenda. *Economies* **2022**, *11*, 3. [CrossRef]
30. George, G.; Merrill, R.K.; Schillebeeckx, S.J.D. Digital Sustainability and Entrepreneurship: How Digital Innovations Are Helping Tackle Climate Change and Sustainable Development. *Entrep. Theory Pract.* **2021**, *45*, 999–1027. [CrossRef]
31. Gregori, P.; Holzmann, P. Digital Sustainable Entrepreneurship: A Business Model Perspective on Embedding Digital Technologies for Social and Environmental Value Creation. *J. Clean. Prod.* **2020**, *272*, 122817. [CrossRef]
32. Tim, Y.; Cui, L.; Sheng, Z. Digital Resilience: How Rural Communities Leapfrogged into Sustainable Development. *Inf. Syst. J.* **2021**, *31*, 323–345. [CrossRef]
33. Srivastava, S.C.; Shainesh, G. Bridging the Service Divide through Digitally Enabled Service Innovations: Evidence from Indian Healthcare Service Providers. *MIS Q. Manag. Inf. Syst.* **2015**, *39*, 245–267. [CrossRef]
34. Manea, D.I.; Istudor, N.; Dinu, V.; Paraschiv, D.M. Circular Economy and Innovative Entrepreneurship, Prerequisites for Social Progress. *J. Bus. Econ. Manag.* **2021**, *22*, 1342–1359. [CrossRef]
35. Arnold, M.G. Sustainability Value Creation in Frugal Contexts to Foster Sustainable Development Goals. *Bus. Strateg. Dev.* **2018**, *1*, 265–275. [CrossRef]
36. Teece, D.J. Business Models, Business Strategy and Innovation. *Long Range Plann.* **2010**, *43*, 172–194. [CrossRef]
37. Zott, C.; Amit, R. The Business Model: A Theoretically Anchored Robust Construct for Strategic Analysis. *Strateg. Organ.* **2013**, *11*, 403–411. [CrossRef]
38. Osterwalder, A.; Pigneur, Y.; Tucci, C.L.; Osterwalder, A.; Pigneur, Y. Clarifying Business Models: Origins, Present, and Future of the Concept. *Commun. Assoc. Inf. Syst.* **2005**, *16*, 1. [CrossRef]
39. Schaltegger, S.; Hansen, E.G.; Lüdeke-Freund, F. Business Models for Sustainability: Origins, Present Research, and Future Avenues. *Organ. Environ.* **2016**, *29*, 3–10. [CrossRef]
40. Bocken, N.M.P.; Short, S.W.; Rana, P.; Evans, S. A Literature and Practice Review to Develop Sustainable Business Model Archetypes. *J. Clean. Prod.* **2014**, *65*, 42–56. [CrossRef]
41. Dembek, K.; York, J.; Singh, P.J. Creating Value for Multiple Stakeholders: Sustainable Business Models at the Base of the Pyramid. *J. Clean. Prod.* **2018**, *196*, 1600–1612. [CrossRef]
42. Lüdeke-Freund, F.; Dembek, K. Sustainable Business Model Research and Practice: Emerging Field or Passing Fancy? *J. Clean. Prod.* **2017**, *168*, 1668–1678. [CrossRef]

43. Evans, S.; Vladimirova, D.; Holgado, M.; Van Fossen, K.; Yang, M.; Silva, E.A.; Barlow, C.Y. Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models. *Bus. Strateg. Environ.* **2017**, *26*, 597–608. [CrossRef]
44. Todeschini, B.V.; Cortimiglia, M.N.; Callegaro-de-Menezes, D.; Ghezzi, A. Innovative and Sustainable Business Models in the Fashion Industry: Entrepreneurial Drivers, Opportunities, and Challenges. *Bus. Horiz.* **2017**, *60*, 759–770. [CrossRef]
45. Contreras, F.; Dornberger, U. Sustainable Entrepreneurship as a Field of Knowledge: Analyzing the Global South. *Sustainability* **2022**, *15*, 31. [CrossRef]
46. Hoogendoorn, B.; van der Zwan, P.; Thurik, R. Sustainable Entrepreneurship: The Role of Perceived Barriers and Risk. *J. Bus. Ethics* **2019**, *157*, 1133–1154. [CrossRef]
47. Lüdeke-Freund, F. Sustainable Entrepreneurship, Innovation, and Business Models: Integrative Framework and Propositions for Future Research. *Bus. Strateg. Environ.* **2020**, *29*, 665–681. [CrossRef]
48. Çokçetin, G. Digital Sustainability in the Banking and Finance Sector. In *CSR, Sustainability, Ethics and Governance*; Springer Nature: Berlin, Germany, 2017; pp. 181–187.
49. Bradley, K. Defining Digital Sustainability. *Libr. Trends* **2007**, *56*, 148–163. [CrossRef]
50. Verhoef, P.C.; Broekhuizen, T.; Bart, Y.; Bhattacharya, A.; Qi Dong, J.; Fabian, N.; Haenlein, M. Digital Transformation: A Multidisciplinary Reflection and Research Agenda. *J. Bus. Res.* **2021**, *122*, 889–901. [CrossRef]
51. Leviäkangas, P. Digitalisation of Finland's Transport Sector. *Technol. Soc.* **2016**, *47*, 1–15. [CrossRef]
52. Ramaswamy, V.; Ozcan, K. Brand Value Co-Creation in a Digitalized World: An Integrative Framework and Research Implications. *Int. J. Res. Mark.* **2016**, *33*, 93–106. [CrossRef]
53. Baraldi, E.; Nadin, G. The Challenges in Digitalising Business Relationships. The Construction of an IT Infrastructure for a Textile-Related Business Network. *Technovation* **2006**, *26*, 1111–1126. [CrossRef]
54. Szalavetz, A. The Environmental Impact of Advanced Manufacturing Technologies: Examples from Hungary. *Cent. Eur. Bus. Rev.* **2017**, *6*, 18–29. [CrossRef]
55. Gavrila Gavrila, S.; De Lucas Ancillo, A. Entrepreneurship, Innovation, Digitization and Digital Transformation toward a Sustainable Growth within the Pandemic Environment. *Int. J. Entrep. Behav. Res.* **2022**, *28*, 45–66. [CrossRef]
56. Anand, A.; Argade, P.; Barkemeyer, R.; Salignac, F. Trends and Patterns in Sustainable Entrepreneurship Research: A Bibliometric Review and Research Agenda. *J. Bus. Ventur.* **2021**, *36*, 106092. [CrossRef]
57. Gössling, S.; Michael Hall, C. Sharing versus Collaborative Economy: How to Align ICT Developments and the SDGs in Tourism? *J. Sustain. Tour.* **2019**, *27*, 74–96. [CrossRef]
58. Sebastian, I.; Ross, J.; Beath, C.; Mocker, M.; Moloney, K.; Fonstad, N. How Big Old Companies Navigate Digital Transformation. *MIS Q. Exec.* **2017**, *16*, 197–213.
59. Bican, P.M.; Brem, A. Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable "Digital"? *Sustainability* **2020**, *12*, 5239. [CrossRef]
60. Paul, J.; Alhassan, I.; Binsaif, N.; Singh, P. Digital Entrepreneurship Research: A Systematic Review. *J. Bus. Res.* **2023**, *156*, 113507. [CrossRef]
61. Bencsik, B.; Palmié, M.; Parida, V.; Wincent, J.; Gassmann, O. Business Models for Digital Sustainability: Framework, Microfoundations of Value Capture, and Empirical Evidence from 130 Smart City Services. *J. Bus. Res.* **2023**, *160*, 113757. [CrossRef]
62. Kraus, S.; Burtscher, J.; Vallaster, C.; Angerer, M. Sustainable Entrepreneurship Orientation: A Reflection on Status-Quo Research on Factors Facilitating Responsible Managerial Practices. *Sustainability* **2018**, *10*, 444. [CrossRef]
63. Hahn, R.; Spieth, P.; Ince, I. Business Model Design in Sustainable Entrepreneurship: Illuminating the Commercial Logic of Hybrid Businesses. *J. Clean. Prod.* **2018**, *176*, 439–451. [CrossRef]
64. Spieth, P.; Schneider, S.; Clauß, T.; Eichenberg, D. Value Drivers of Social Businesses: A Business Model Perspective. *Long Range Plann.* **2019**, *52*, 427–444. [CrossRef]
65. Lincoln, Y.; Guba, E. *Naturalistic Inquiry*; SAGE Publications: Beverly Hills, CA, USA, 1985.
66. Yin, R.K. *Case Study Research and Applications*, 6th ed.; SAGE Publications: Thousand Oaks, CA, USA, 2017.
67. Welch, C.; Piekkari, R.; Plakoyiannaki, E.; Paavilainen-Mäntymäki, E. Theorising from Case Studies: Towards a Pluralist Future for International Business Research. *J. Int. Bus. Stud.* **2010**, *42*, 740–762. [CrossRef]
68. Patton, M.Q. *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*, 4th ed.; SAGE Publications: Thousand Oaks, CA, USA, 2015.
69. Laasch, O. Beyond the Purely Commercial Business Model: Organizational Value Logics and the Heterogeneity of Sustainability Business Models. *Long Range Plann.* **2018**, *51*, 158–183. [CrossRef]
70. Creswell, J.W.; Miller, D.L. Determining Validity in Qualitative Inquiry. *Theory Pract.* **2000**, *39*, 124–130. [CrossRef]
71. Onwuegbuzie, A.J.; Leech, N.L. Validity and Qualitative Research: An Oxymoron? *Qual. Quant.* **2007**, *41*, 233–249. [CrossRef]
72. Miles, M.B.; Huberman, M.A.; Saldaña, J. *Qualitative Data Analysis*; SAGE Publications Inc.: Thousand Oaks, CA, USA, 2014.
73. Gibbert, M.; Ruigrok, W.; Wicki, B. What Passes as a Rigorous Case Study? *Strateg. Manag. J.* **2008**, *29*, 1465–1474. [CrossRef]
74. Duriau, V.J.; Reger, R.K.; Pfarrer, M.D. A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements. *Organ. Res. Methods* **2007**, *10*, 5–34. [CrossRef]
75. Strauss, A.L.; Corbin, J.M. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*; SAGE Publications: Los Angeles, CA, USA, 1990.

76. Strauss, A. *Qualitative Analysis for Social Scientists*; Cambridge University Press: Cambridge, UK, 1987.
77. Irimiás, A.; Mitev, A. Change Management, Digital Maturity, and Green Development: Are Successful Firms Leveraging on Sustainability? *Sustainability* **2020**, *12*, 4019. [CrossRef]
78. Global Entrepreneurship Monitor (GEM) Economy Profile Mexico: Entrepreneurial Framework Conditions. Available online: https://gemconsortium.org/economy-profiles/mexico-2#cp (accessed on 3 June 2023).
79. GEM (Global Entrepreneurship Monitor). *Global Entrepreneurship Monitor/2023 Global Report: Adapting to a "New Normal"*; GEM: London, UK, 2023.
80. Caputo, A.; Fiorentino, R.; Garzella, S. From the Boundaries of Management to the Management of Boundaries: Business Processes, Capabilities and Negotiations. *Bus. Process Manag. J.* **2019**, *25*, 391–413. [CrossRef]