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# Digital Technology Affordances Reshaping Entrepreneurship Development Process: A Systematic Review

Research Paper

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## ABSTRACT

Digital technology has brought about the emergence of digital entrepreneurship, which has significantly disrupted existing products and services and the way that they are marketed. This new wave of entrepreneurship has piqued the interest of scholars from various disciplines, including Information Systems. However, in the literature, there are insufficient theoretical explanations of digital technology's role in the processes involved in digital entrepreneurship development. To address this, a systematic review was conducted to comprehensively explore digital technology affordances in digital entrepreneurship development. Such affordances are the factors that cause the digitalization of the events that characterize digital entrepreneurship development. The outcome of this review presents a conceptual framework that explains how certain affordances reshape the processes of entrepreneurship development. This framework can provide valuable insights enabling entrepreneurs and stakeholders to better understand the role of digital technology in reshaping entrepreneurship development and leveraging its affordances for profitable outcomes.

## Keywords

Digital entrepreneurship, digital new venture, digital start-up, digital start-up pivoting, business model, crowdsourcing/crowdfunding, bootstrapping.

## INTRODUCTION

Digitalization is “the integration of digital technologies into everyday life and all its activities [e.g. entrepreneurship development]” (Soltanifar et al., 2021, p. 9). Therefore, “[d]igital entrepreneurship is the development of a new economic activity that is either embodied in or enabled by digital technologies” (Foisal et al., 2023, p. 46). Today, digital technology has spurred the creation of ground-breaking products across various sectors, causing significant disruptions in traditional markets. Thus, the term “digital entrepreneurship development” describes the utilization of digital technology to facilitate the development of new ventures.

Digitalizing entrepreneurship development, taking advantage of Artificial Intelligence (AI), big data, blockchain and cloud computing, has transformed the creation of new products<sup>1</sup> and services in business (Berger et al., 2021; Kollmann et al., 2021; Paul et al., 2023; Tang et al., 2022). The advent of digital technology has become a game-changer in entrepreneurship development processes and has caused a huge change in the expectations and behavior of entrepreneurs pursuing new venture development. This encompasses the digitalization of events throughout the process and includes generating new ideas, acquiring resources, developing products and services, experimenting with prototypes of the intended products to obtain feedback, and the subsequent commercialization of the product for financial gain. This transformation of entrepreneurship development has prompted the emergence of innovative processes that offer more efficient and effective approaches to new business creation. Hence, the infusion of digital technology into entrepreneurship development has enabled and promoted market participation by entrepreneurs in numerous sectors, thereby impacting the economies of many nations (Elia et al., 2020; Ismail, 2023; Shen et al., 2018). This revolution is possible because digital technology generally creates disruptive products that are easily accessed, simplify the value chain, and offer significant value and economic returns to stakeholders (Berger et al., 2021; Griva et al., 2021; Smidt & Jokonya, 2021). A good example of digital entrepreneurship is Uber, which has created countless job opportunities across nations by enabling individuals to launch their transport businesses on the digital platform (Daramola & Etim, 2022; Soltanifar et al., 2021).

In this study, digital entrepreneurship is a concept representing a sub-field of entrepreneurship (Bullini Orlandi et al., 2021; Delacroix et al., 2019; Elia et al., 2020; Hansen, 2019; Kraus et al., 2018; Li et al., 2017; Zaheer et al., 2022). The development of this kind of entrepreneurship is driven by the affordances of an emerging, penetrative and pervasive digital technology (Ammirato et al., 2019; Antonizzi & Smuts, 2020; Autio, 2017; Bi & Liu, 2022; Delacroix et al., 2019; Hanesch & Schallmo, 2022; Li et al., 2017; Yoo et al., 2012; Zaheer et al., 2022). Such affordances are the factors that cause the digitalization of the events that characterize digital entrepreneurship development.

Digital entrepreneurship is an emerging field that has attracted many scholars, whose research provides diverse robust knowledge about the emerging phenomenon (Elia et al., 2020; Nambisan, 2016; Zaheer et al., 2022; Zhao et al., 2021). However, the role that digital technology plays in the processes that characterize digital entrepreneurship development is still conceptually and theoretically unclear (Anim-Yeboah et al., 2020). Scholars have stressed the need to advance our understanding through new studies. For instance, to drive the process of digital entrepreneurship development, it has been suggested that future studies should focus on “[w]hich affordances existing or emerging digital technologies provide” (von Briel et al., 2021, p. 289).

Earlier studies have also noted that we are yet to aggregate and understand the role of digital technology, and how it drives the behavior of entrepreneurs during the processes involved in digital entrepreneurship development (Nambisan, 2016; Shen et al., 2018). Furthermore, studies on this phenomenon across different disciplines has different perspectives, thereby presenting varied outcomes in varied views (Bi & Liu, 2022; Hanesch & Schallmo, 2022; Kraus et al.,

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<sup>1</sup> NB: Hence forth the word ‘product’ includes both the artefact and / or a service.

2018; Zaheer et al., 2018). This suggests that the existing studies are sparse (Kraus et al., 2018; Zaheer et al., 2022) and fragmented across disciplinary lines (Fernandes et al., 2022; Kraus et al., 2018; Moroz & Hindle, 2012; Zaheer et al., 2019). Consequently, the process of digital entrepreneurship development is under-theorized (Paul et al., 2023). Thus, we still lack a comprehensive understanding of how digital technology reshapes the development of entrepreneurship (Corvello et al., 2021; Elia et al., 2020; Arvind Gudi & Ravi Chinta, 2020). This suggests that scholars are yet to reach a consensus on a definitive conceptual framework for this type of entrepreneurship study, despite numerous attempts to do so. Previous research has examined a range of themes and contexts that are relevant to this field of study, but there is still much work to be done to arrive at a clear and comprehensive understanding of the subject matter (van Burg & Romme, 2014; Zaheer et al., 2019). For instance, Fernandes et al. (2022, p. 2) noted that the recent emergence of digital entrepreneurship as a field of research has created “a dynamic range of terminology and emerging vocabularies (internet entrepreneurship, cyber entrepreneurship, digital entrepreneurship, among others), making academic research difficult.” This suggests that digital entrepreneurship research needs a more holistic investigation across different disciplines and perspectives to offer the clarity that scholars and other stakeholders need to help understand the nature and role of digital technology in reshaping entrepreneurship development processes (Fernandes et al., 2022). Therefore, conducting a systematic literature review across disciplines, to investigate how underlying affordances of digital technology drive digital entrepreneurship development is critical for advancing digital entrepreneurship theorization (Elia et al., 2020; Paul et al., 2023). Hence, the study proceeds with the following research question:

**RQ:** What underlying digital technology affordances drive the characterizing events that culminate in a new digital entrepreneurship development across various markets?

To answer this research question, the study adopts a concept-centric systematic literature review (Webster & Watson, 2002). Also, the study draws from a number of scholars in adopting technology affordance theory (e.g. Blewett & Hugo, 2016; Fromm et al., 2020; Gibson et al., 2022; Leonardi, 2011; Mesgari & Faraj, 2012; Mora et al., 2021). The theory will guide the conceptualization and development of a framework that depicts the affordances of digital technology. The researcher will do this by examining how entrepreneurs (e.g. third-party application developers) interact with digital technology to accomplish their desired outcomes. This approach seeks to provide valuable insights for optimizing human-technology interaction (Anderson & Robey, 2017; Fromm et al., 2020; Gibson et al., 2022). Hence, this approach strives to attain depth in the investigation of the underlying factors responsible for the social phenomenon of interest (Danermark et al., 2019).

The concept-centric review offers a focused way to select appropriate articles for an in-depth investigation of a specific phenomenon. This study will contribute to the body of knowledge in the entrepreneurship development literature, especially in the digitalization of the processes involved in entrepreneurship, by developing a conceptual framework that explains the processes. Furthermore, as a contribution to practice, the study will identify processes that can assist digital entrepreneurs to successfully develop digital business ideas to a viable business. The structure of the remaining sections of the paper is as follows. Section 2 discusses the theoretical background of the study. Section 3 discusses the systematic literature review methodology adopted. Section 4 presents descriptive statistics of the findings of the SLR conducted. This leads to Section 5 which presents and discusses the digital technology affordances and the dimensions of events that

characterize digital entrepreneurship. Section 6 identifies gaps in the literature, while Section 7 presents a discussion on the phenomenon investigated. Section 8 presents the research agenda for future studies, and finally, Section 9 presents the conclusion and limitations of the study.

## TECHNOLOGY AFFORDANCE THEORY

Drawing from the view, “an affordance is a possibility for action,” (Bygstad et al., 2015, p. 2), we describe technology affordance theory (TAT) as a socio-technical approach that explains how people and technology interact to cause an action in a specific context. It aims to explain how certain features of technological artefacts, such as digital platform boundary resources, shape the behavior of the human actors who use them in order to achieve their goals. These include third-party application developers creating software applications (Blewett & Hugo, 2016; Fromm et al., 2020; Gibson et al., 2022; Leonardi, 2011; Mesgari & Faraj, 2012; Mora et al., 2021). TAT is a foundational theory drawn from ecological psychology (Mesgari & Faraj, 2012; Wells, 2002; Xiangming & Song, 2018); it was developed by perceptual psychologist Gibson (1977) to explain the perceived usefulness of artefacts to human agents. The theory has been adapted to the Information Systems discipline to explain why human agents use or engage with a technological artefact when organizing and conducting the actions and activities required to pursue a specific goal (Anderson & Robey, 2017; Fromm et al., 2020; Gibson et al., 2022). Thus, TAT is used in IS to explain socio-technical interaction; it explains why humans value a particular technology artefact and studies human perception of what such artefacts can offer or afford them towards achieving a given goal (Alshawmar, 2021; Anderson & Robey, 2017; Blewett & Hugo, 2016; Fromm et al., 2020). TAT is classified into two perspectives: potential affordance and actual affordance (Leonardi, 2011; Mesgari & Faraj, 2012; Mora et al., 2021). Potential affordance is a building feature, focusing on the expected usefulness, based on the technology design during the development process of an artefact. While actual affordance is the affordance experienced in practice, which serves and aligns with the individual user’s purpose and goal in a real-life setting (Mora et al., 2021; Pozzi et al., 2014).

For this study, the researcher’s focus is on the actual affordance. It is important to understand how actual affordance explains the usefulness of digital technology in an entrepreneurship development. This is related to the goals of the actors (i.e. third-party application developers and digital entrepreneurs) who can perceive the value of, and interact with, digital technology to carry out their own entrepreneurial processes. For instance, third-party application developers work with a suitable digital platform because they perceive the usefulness of its boundary resources such as application programming interface, software development kit, App. stores, and platform governance. In turn these boundary resources influence the development of applications that complement the needs of application users and achieve entrepreneurship purposes. Therefore, the essence of human interaction with digital technological artefacts, platforms and infrastructures, revolves around realizable and achievable usefulness. These examples of usefulness are affordances (in this case, a set of triggered digital technology affordances) that are needed to drive and influence entrepreneurs' behavior to create new value and realize a set of actions leading to economic gain (Mora et al., 2021). Also, the theory emphasizes that the realization of the identified usefulness of a technology artefact (i.e. its affordance) manifests within the boundary created by an interdependent interaction between the human agent (i.e. third-party application developers and digital entrepreneurs) and the technology agent (i.e. digital platform boundary resources) (Leonardi, 2011; Mora et al., 2021). Therefore, digital technology affordances in the context of entrepreneurship are specific to the needs and objectives of the

individuals or groups of actors seeking to pursue entrepreneurship gain. So, the affordances derived from digital platform boundary resources are dependent on the application development motive of the third-party developers who interact with it. The third-party developers are, of course, interested in pursuing entrepreneurship by developing applications that will proffer solutions to unmet needs in a target market.

## SYSTEMATIC LITERATURE REVIEW METHODOLOGY

Drawing from Webster and Watson (2002) a concept-centric review of prior studies was conducted to identify and synthesize existing knowledge to develop a conceptual framework (Breslin & Gatrell, 2020; Leidner & Tona, 2021; Okoli, 2021). To conduct this study, a systematic literature review (SLR) methodology was adopted (Okoli & Schabram, 2010; Oosterwyk et al., 2019; Schryen, 2015; Sturm & Sunyaev, 2017; Xiao & Watson, 2017). This methodology helps to extract concepts from past studies, which are needed to theorize digital technology's role in entrepreneurship development processes (van Burg & Romme, 2014). The methodology is supported by an explanation framed around the constructivist principles of TAT. This theory posits that individuals are empowered by the technology's usefulness when making decisions and acting, and this shapes their behavior and interactions. By utilizing this theory, the study seeks to illuminate and conceptualize how people can leverage the affordances in digital technology to create positive outcomes that enhance entrepreneurship processes. In this review, the literature search considered different disciplines because digital entrepreneurship studies require an interdisciplinary approach to enable the extraction of the most valuable information from prior studies (Hanesch & Schallmo, 2022; van Burg & Romme, 2014). This helped the researchers to gather information that can deepen the understanding of the role of digital technology across different events characterizing digital entrepreneurship development (Recker & von Briel, 2019; von Briel et al., 2021; Zaheer et al., 2019). Therefore, following the guide of Paré et al. (2015), the study rigorously extracted appropriate data from selected literature and analyzed them using a thematic approach (Braun & Clarke, 2006).

### SLR Research Protocol

Figure 1 presents the different stages engaged during the literature search and the subsequent data analysis of the selected articles. This study followed the three-stage approach (Input, Processing and Output) of Levy and Ellis (2006) by first developing the research protocol.

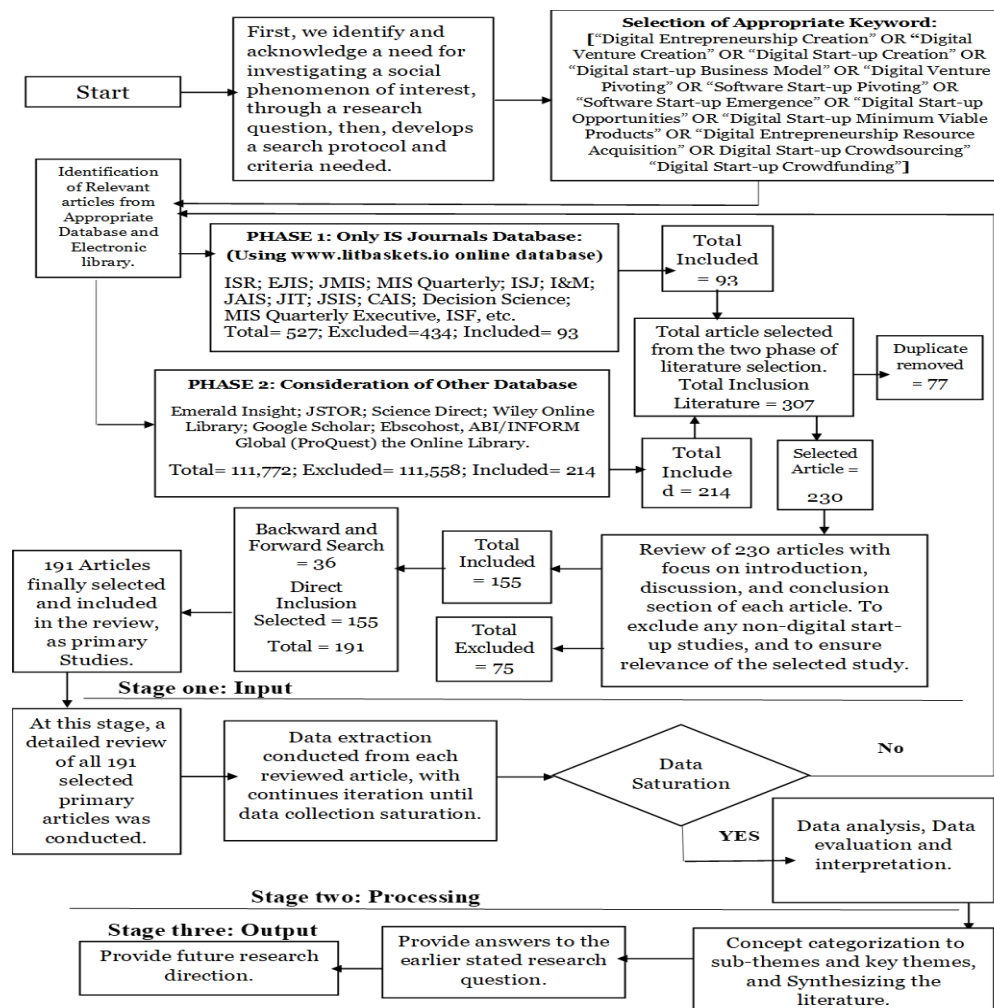
The first step of the input stage was to develop a research question and a corresponding search protocol. The research question ensures the focus is on literature that is relevant to the area of interest (Levy & Ellis, 2006). The search protocol helps to enable repeatability of the search process. It clearly states the strategies followed (i.e. keyword search, backward search and forward search), ensures rigor, prevents researchers from being biased in the process of carrying out the review, and states the inclusive and exclusive criteria needed to select relevant studies. The search protocol guides the search by setting boundary criteria within the area of interest (Levy & Ellis, 2006). This includes the choice of literature databases and keywords.

Hence, the next step undertaken was the identification of relevant literature databases comprising information systems (IS) journals, conference papers and book chapters. For IS journals, the search was conducted by engaging the [www.litbaskets.io](http://www.litbaskets.io) online database; this was considered phase one of the literature search. In the second phase, other relevant databases (not necessarily from the IS discipline) were consulted to find additional data. The search was carried out enthusiastically and included a backward and forward search (Levy & Ellis, 2006). The search

for relevant articles focused on the period between 2005 and 2021; the search stopped in 2021 because the process of searching the literature was concluded in March 2022.

The second stage (i.e. processing stage) involves reviewing the selected literature to develop foundational knowledge, which involves synthesizing, interpreting, analyzing and evaluating the selected articles. This enables the identification of key patterns of similar concepts, themes and gaps in literature. The third stage (i.e. output stage) formulates the result obtained from analyzing the selected articles; this enables the identification of practical and theoretical implications, and possible future research directions and agendas (Levy & Ellis, 2006).

**Figure 1**  
**SLR Protocol Flow Chart**



Note: Adapted from Ajah et al. (2022)

SLR = systematic literature review; ISR = Information Systems Research; EJIS = European Journal of Information Systems; JMIS = Journal of Management Information Systems; MIS = Management Information Systems; ISJ = Information Systems Journal; JAIS = Journal of Association for Information Systems; JIT = Journal of Information Technology; CAIS = Communication of the Association for Information Systems; IS = Information Systems.

The initial outcome of the search process was 527 articles extracted from various IS databases, of which 93 were selected as being relevant, having applied inclusion-exclusion criteria. The search was then extended to other databases where a total of 111,772 articles were identified, of which 214 articles were selected. The articles from both phases gave a total of 307 articles. Of these, 77 articles were duplicates giving 230 articles for further screening.

These articles were read with emphasis on the introduction, discussion and conclusion sections of each article. Consequently, 75 articles that were found to be less relevant or were not digital entrepreneurship studies were expunged leaving 155 articles, which were considered suitable and relevant to the study. Subsequently, the reference lists of each of the 155 articles were reviewed to conduct a forward and backward search, and this provided an additional 36 articles. Thus, the total number of articles selected became 191 articles, which were regarded as the primary articles available for in-depth review.

This review considered empirical studies, including quantitative, qualitative and mixed-method studies, as well as conceptual studies. The journal articles, conference papers, and book chapters considered were peer-reviewed and published in reputable journals, conferences and books; they were written in English. The review only included studies that discuss digital entrepreneurship, digital start-up creation, digital venture creation, crowdsourcing, crowdfunding, digital start-up pivoting, software start-up emergence or digital start-up emergence. Restricting the article search to the above-mentioned keywords helped to focus the collected articles on the investigated phenomenon.

### Data Analysis for Code Extraction and Theme Development

To demonstrate the process of organizing themes that arose from direct quotes extracted from reviewed literature, the researcher has presented a detailed example in Table 1 and Figure 2. This example can help readers to better understand how the researcher categorized and made sense of the data they collected, thereby facilitating the analysis process.

**Table 1**

*Direct Quotes Extraction and Coding of Themes from the Reviewed Literature*

Direct Quotes	Initial Codes	Sub-Themes	Themes
<p>“Digital technologies are platforms, infrastructures or artefacts that use the power of computing on a ubiquitous public network” (Zaheer et al., 2019, p. 2).</p> <p>“Social networks are a crucial success factor for entrepreneurs as they provide them with essential support, such as resources for their businesses, information, and emotional aid” (Meurer et al., 2021, p. 638).</p> <p>“Digital entrepreneurship is a phenomenon which arose through technological assets like internet and information and communications technology” (Kraus et al., 2018, p. 2).</p> <p>“Digital trends such as social media, Big Data, mobile services, cloud computing, the Internet of things, and robotics have changed the ways of collaborating,</p>	<p>Websites, smartphone apps, Internet of Things (IoT) devices (drones, home automation devices, robots, smart appliances), Apple iOS, Android, Atlassian developer</p>	<p>Digital Artifacts, Digital Platforms, Digital Infrastructure s.</p>	<p>Digital Technology</p>

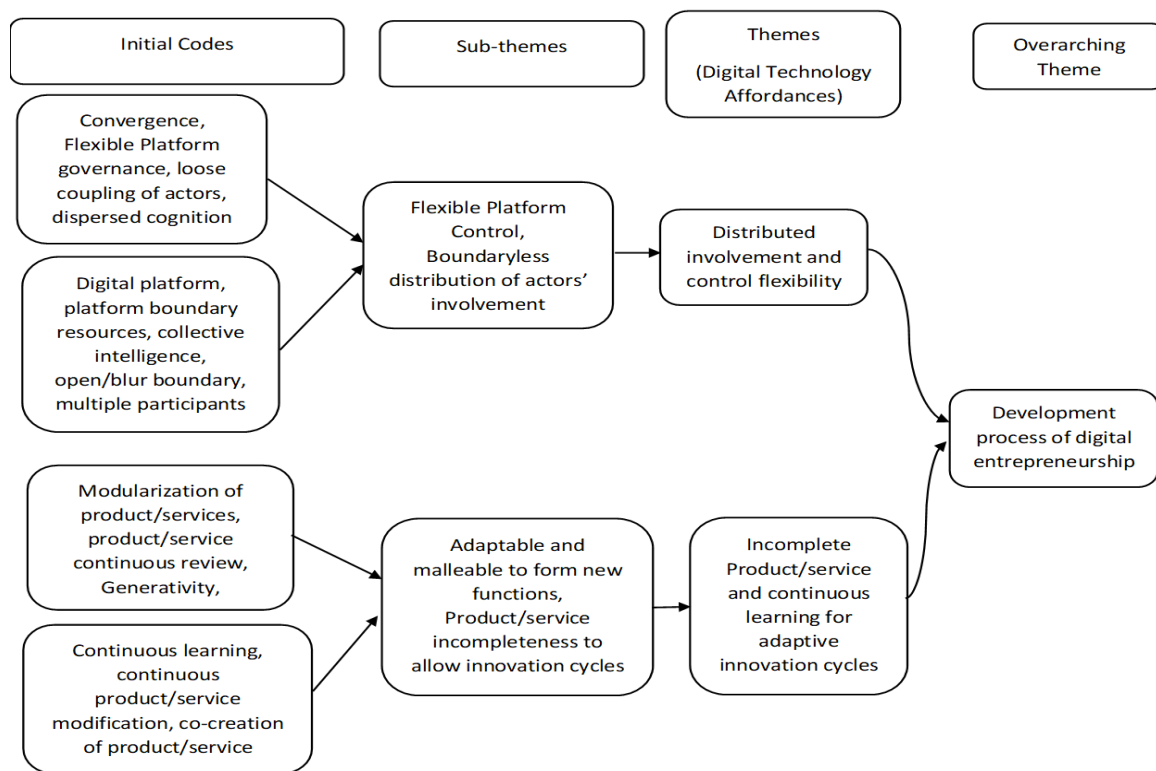


Direct Quotes	Initial Codes	Sub-Themes	Themes
organizing resources, designing products, matching complex demands and supplies, standards, and procedures” (Garrigos-Simon et al., 2021, p. 2) “[D]igital technologies as the core of ... business models, such as Google, Amazon, Facebook, Apple” (Kollmann et al., 2021, p. 15).	ecosystems, Amazon Web Services, social media, 3D printing, and AI.		
“[T]hey provide an environment of open and flexible affordances that are used in creating innovations characterized by convergence and generativity” (Yoo et al., 2012, p. 1398). “Depending on the autonomy of complementors, the platform owner must cope with varying levels of control, scalability, and flexibility” (Hein et al., 2020, p. 92) “[T]he principle rationale is collective intelligence, which helps leverage the “wisdom of crowds” to have aggregate evaluations rather than an individual evaluation” (Garrigos-Simon et al., 2021, p. 6) “[D]igital technologies have rendered entrepreneurial outcomes and processes less bounded” (Nambisan, 2016, p. 1). “[D]igital technology has democratized entry into entrepreneurship where a diverse set of people irrespective of their social and personal identity can start their ventures” (Mir et al., 2022, p. 4) “[I]nnovation platforms indicate technological openness through the provision of application programming interfaces that complementors can use to co-create value-adding complements. Examples are application stores, where the platform provides boundary resources that an ecosystem of autonomous complementors can use to create new applications” (Hein et al., 2019, p. 6).	Convergence, flexible platform governance, open/blurred boundary, multiple participation.	Flexible platform control, Boundaryless distribution of actors' involvement.	Distributed Involvement and Control Flexibility of the Participating Actors
“Digitization of product allows for greater flexibility by separating function from form and contents from medium ... making entrepreneurial outcomes “intentionally incomplete” (Nambisan, 2016, p. 2) “Digitalization has rendered entrepreneurial processes less bounded i.e. there has been a shift from discrete and steady boundaries to highly porous and fluid boundaries which enables the product to continuously evolve even after they have been introduced in the market” (Nassar & Malik, 2021, p. 230). “[O]fferings are themselves ever-incomplete and perpetually in the making” (Lehmann & Recker, 2021, p. 69).	Modularization of product /services, product continuous review, Generativity, Continuous learning, continuous product modification, co-creation of product /service.	Adaptable and malleable to form new functions, Product incompleteness to allow innovation cycles.	Incomplete Product and Continuous Learning for Adaptive Innovation Cycles

Direct Quotes	Initial Codes	Sub-Themes	Themes
<p>“[D]igital artefacts as being intentionally unfinished technologies to be redeemed by use” (Kallinikos et al., 2013, p. 358).</p>			
<p>“[D]igital technology as the decisive construct that enables resource- as well as a market-related recognition of opportunities in digital contexts” (Kreuzer et al., 2022, p. 56).</p> <p>“[A]n opportunity is continuously re-evaluated in the light of the nascent entrepreneur’s actions and their outcomes. Therefore, its appeal to the nascent entrepreneur represents a continuous and evolving judgment that is an indelible part of the entrepreneurial process and, as such, needs to be explicitly articulated in it” (Dimov, 2010, p. 1124).</p>	<p>Digital opportunity evaluation, Opportunity recognition, Opportunity sense-making and Idea emergence.</p>	<p>Business Idea formation, Business idea discovery and evaluation, Venture idea.</p>	<p>New Venture Idea and Opportunity Confidence Evaluation</p>
<p>“[B]usiness model design is found to significantly impact the performance of entrepreneurial firms, with specific reference to existing tensions between novelty and efficiency” (Ghezzi, 2020).</p> <p>“[Business model] respectively enable customer discovery, and provide the basis for the formulation of assumptions and hypotheses on the start-up’s viability” (Ghezzi, 2020, p. 4).</p>	<p>Formulation of assumptions and hypotheses on the start-up’s viability.</p>	<p>Business model innovation, Business model design, Business plan.</p>	<p>Innovative Business Model Configuration</p>
<p>“[T]he principle rationale is collective intelligence, which helps leverage the “wisdom of crowds” to have aggregate evaluations rather than an individual evaluation” (Garrigos-Simon et al., 2021, p. 6)</p> <p>“[E]ntrepreneurial agency has become fluidic where a diverse set of actors with diverse goals work as a team and complement each other while carrying out entrepreneurship-related activities” (Mir et al., 2022, p. 4)</p> <p>“[T]he affordances and generativity of digital technologies and platforms drastically reduce the costs of open collaboration and at the same time, increase the benefits of sharing and cocreation” (Lin &amp; Maruping, 2022, p. 212).</p> <p>“[L]oosely coupled relationship in which the complementor is independent and separate from the digital platform” (Hein et al., 2020, p. 92)</p> <p>“[C]rowdsourcing as one kind of digital technology-enabled phenomenon facilitated the distribution of entrepreneurial actions across a diverse set of actors” (Lehmann &amp; Rosenkranz, 2017, p. 4)</p>	<p>Sharing and co-creation, acquiring ideas/skills from the crowd, open collaboration, loosely coordinated participation for the creation of Products/service s.</p>	<p>Expertise, Knowledge, and skill acquisition from an accessible community. Collective intelligence from an accessible crowd.</p>	<p>Crowdsourcing Platform</p>
<p>“Crowdfunding represents an alternate source of venture financing ... importantly, the crowdfunding context also has sociological underpinnings as crowd behavior can shape both the processes and the outcomes” (Nambisan et al., 2019, p. 2)</p>	<p>Acquire capital from the crowd, community funding,</p>	<p>Digital community funding, community</p>	<p>Crowdfunding Platform</p>

Direct Quotes	Initial Codes	Sub-Themes	Themes
<p>“[O]pportunities to develop the venture without taking on additional debt that may drain the venture’s working capital and cash flow ... driven by the entrepreneurs, as it involves the entrepreneurs’ creativity, decisions, and actions to address their venture’s resource needs” (Malmström, 2014, p. 29).</p> <p>“Cash-increasing techniques include continuing to work for others while starting a new venture; obtaining funding from spouses, friends, family, and current employers; obtaining a second mortgage; utilizing credit cards and personal financing; and founders investing their own money in a venture” (Perry et al., 2011, p. 36)</p> <p>“Cost-decreasing techniques include delaying payments to suppliers, deferring salaries, utilizing used machinery, and obtaining professional services for free. Cost-decreasing techniques add value to a venture by reducing the need for cash” (Perry et al., 2011, p. 36).</p> <p>“Activities such as billing a credit card, borrowing someone else’s equipment, working weekends or part-time and selling personal assets” (Patel et al., 2011, p. 422).</p>	Cash-increasing techniques, Cost-decreasing techniques.	Equity Contribution.	
		Bootstrapping	Bootstrapping
<p>“MVP, can be quickly created to communicate the product proposals to the public” (Nguyen-Duc &amp; Abrahamsson, 2016, p. 119).</p> <p>“[L]earning experience is always associated with the construction of Minimum Viable Product (MVP), a representative proxy of the final product , to validate either new technology or to elicit customer requirements” (Nguyen-Duc et al., 2019, p. 4)</p>	Value creation, prototype development, Market testing, feedback gathering, commercialization.		Value Proposition Prototyping and Experimentation
<p>“[T]he business model heuristics evidently push digital start-ups to adopt a value-centric and customer-centric perspective, providing simple rules or reminders to always put customer value at the center of the entrepreneurial equation from its very beginning” (Ghezzi, 2020, p. 13)</p> <p>“The fundamental properties of digital technology are re-programmability and data homogenization” (Yoo et al., 2012, p. 1398).</p> <p>“[P]roducts and services are characterized by fluid and extendable boundaries, and are continually in the making” (Lehmann &amp; Rosenkranz, 2017, p. 4).</p> <p>“The starting point for the pivotal influence of digital technologies is rooted in advances in software ... and hardware ... which have opened up opportunities to</p>	Business model adjustment, continuously evolving the product after launch, pivoting business model to achieve product -market fit.	Business model modification, Pivoting, Business model pivoting.	Pivoting and Innovative Business Model Reconfiguration

Direct Quotes	Initial Codes	Sub-Themes	Themes
add new functionalities and capabilities to traditional economic goods” (Lehmann & Recker, 2021, p. 70).			
“[E]xperiments are meant to understand whether the BM is suitable for scaling, or should instead be modified, pivoted or even dropped altogether according to the results of the experiments and customer feedback” (Ghezzi, 2020, p. 2).			

**Figure 2***Thematic Data Analysis Process***DESCRIPTIVE STATISTICS OF THE RESULT**

Having conducted a SLR, the result was first presented using descriptive statistics. Descriptive statistics are used to help clarify existing studies at first glance; they demonstrate some of the findings in numerical form and validate the essence of the study. Thus, descriptive statistics help to “provide an overview and help clarify the main characteristics and methodology used by selected studies” (Bansal et al., 2019, p. 4). Table 2 depicts the distribution of the selected studies across countries and continents of focus. Table 2 also makes it clear that the highest number of published articles in the period reviewed focused on Europe and America with 95 and 57 articles respectively. Africa had the least with only 10 articles, with 2 articles focusing on South Africa, 2 referring to Tanzania, 1 from Cameroun, 1 from Ghana, and 4 articles referring to Nigeria, (see Table 4). This emphasizes the need for future studies to consider the African

context. Asia recorded 16 articles, and Oceania recorded 13 articles. Hence, considering emerging economies, this distribution of relevant published papers demonstrates a paucity of knowledge, most particularly regarding the African continent. Europe and Africa have the highest and lowest counts for the selected publications respectively: Europe has 95 and Africa has 10.

**Table 2***Publication by Country and Continent*

S/N	Country	Number of Articles	Continent	Number of Articles/ Continent
1	USA	47	Americas	57
2	Brazil	3		
3	Canada	7		
4	Nigeria	4	Africa	10
5	Ghana	1		
6	Cameroun	1		
7	South Africa	2		
8	Tanzania	2		
9	Germany	16	Europe	95
10	UK	23		
11	Italy	19		
12	Sweden	10		
13	Ireland	2		
14	Finland	3		
15	Poland	4		
16	Greece	2		
17	Norway	6		
18	Belgium	4		
19	Netherlands	4		
20	Denmark	2		
21	India	6	Asia	16
22	Philippines	2		
23	China	8		
24	Australia	9	Oceania	13
25	New Zealand	4		
TOTAL		191		191

**Table 3***Publication by Database*

Databases	Number of Articles
Springer	16
Emerald insight	28
Wiley Online Library	12
Elsevier (Science Direct)	52
Google Scholar	39
Sage Publication	13
Informa	8
Routledge: Taylor and Francis	10
Conference Proceedings	13

Table 3 depicts the distribution of the selected studies from various databases and conference proceedings. Thus, the investigation reveals that Elsevier (Science Direct) published the highest number of studies selected with 52 articles, while the Informa database, with 8 articles, has the lowest number of selected articles.

**Table 4***The List of Articles Focusing on Sub-Saharan Africa Countries*

S/N	Country	Article
1	Nigeria	Abubakre et al. (2020): "The impact of information technology culture and personal innovativeness in information technology on digital entrepreneurship success".
2	Nigeria	Ajah & Ononiwu (2021): "Mechanisms fostering tech start-up emergence in the Nigerian digital ecosystem".
3	Nigeria	Ajah & Chidi Ononiwu (2021): "Exploring multi-dimensional events characterizing tech start-up emergence in the Nigerian entrepreneurial ecosystem".
4	Nigeria	Daramola & Etim (2022): "Affordances of digital platforms in sub-Saharan Africa: An analytical review".
5	Ghana	Afutu-Kotey et al. (2017): "Young entrepreneurs in the mobile telephony sector in Ghana: From necessities to aspirations".
6	Cameroun	Ngoasong (2017): "Digital entrepreneurship in a resource-scarce context".
7	South Africa	Abubakre et al. (2021): "Digital entrepreneurship and indigenous value systems: An Ubuntu perspective".
8	South Africa	Smidt & Jokonya (2021): "Factors affecting digital technology adoption by small-scale farmers in agriculture value chains (AVCs) in South Africa".
9	Tanzania	Makame et al. (2014): "Factors influencing electronic commerce adoption in developing countries: The case of Tanzania".
10	Tanzania	Kapinga et al. (2017): "Mobile technology for women entrepreneurs in Iringa, Tanzania: User requirements and architectural design".

## **THEMES UNDERPINNING THE PROCESS OF DIGITAL ENTREPRENEURSHIP DEVELOPMENT**

Entrepreneurship development is a fascinating process; it is characterized by entrepreneurs' actions and practices and creates new kinds of ventures that have economic value for both the entrepreneurs and their target customers (Corvello et al., 2021). In the following sub-sections, the study discusses each theme discovered in literature, starting with digital technology.

### **Digital Technology**

Digital technology has had a major impact on entrepreneurship processes, especially in the development of digital businesses. It can simplify new product development by opening industry boundaries and facilitating collaboration and partnerships and revitalizing socio-technical ecologies (Lyytinen et al., 2016). Today, digital technology is considered to operate in three fundamental dimensions that drive entrepreneurship development. These dimensions are “enablers, outcomes, or contexts of entrepreneurship processes” (Recker & von Briel, 2019, p. 1). Many scholars have investigated these dimensions and they continue to drive different entrepreneurship research perspectives (Kreuzer et al., 2022; Nambisan, 2016; von Briel et al., 2021). However, the dimensions sometimes become evident in combinations that foster entrepreneurship processes (Recker & von Briel, 2019). The three dimensions working together may trigger affordances that are pivotal to the digitalization of different events in entrepreneurship development (Antonizzi & Smuts, 2020; Arvidsson & Mønsted, 2018; Elia et al., 2020). This is demonstrated in the significant changes made in business strategies, processes and operations, and in the development of product as traditional approaches are being deconstructed (Hansen, 2019). In simplifying the role of digital technology on entrepreneurship development, extant studies identified three distinct but associated elements in digital technology, namely digital artefacts, digital platforms, and digital infrastructures (Garrigos-Simon et al., 2021; Nambisan, 2016). These elements are the consequences of the capabilities of digital technology (Garrigos-Simon et al., 2021). The intertwined, embedded elements shape the functionalities and operating capabilities of the digital technology (for example, the software developed by 3<sup>rd</sup> party software developers) that are in turn responsible for the digitalization of the process of entrepreneurship development (for example, UBER, Airbnb, or a Bike Share company) (Bi & Liu, 2022; Delacroix et al., 2019; Elia et al., 2020; Garrigos-Simon et al., 2021; Kollmann et al., 2021; Kreuzer et al., 2022; Mir et al., 2022).

In describing these three elements, one has to first note that digital technology acts as a digital *artefact* that becomes part of entrepreneurship development outcome (i.e. an application, media content, or a stand-alone product offering specific functionality/use). It is developed by engaging the power of computing technology, through the digitalization of exciting ideas or proposed business models (Elia et al., 2020; Garrigos-Simon et al., 2021; Kallinikos et al., 2013; Naudé & Liebrechts, 2020; Zaheer et al., 2019). Digital artefacts are designed to drive and support innovation cycles through their properties that make them expansible, malleable, re-combinable and reprogrammable to suit the needs and interests of customers in a dynamic market. Digital artefacts is usually developed by a group of participating and distributed innovative actors called complementors, whose intent and interest is to create an application that can meet the immediate needs of target customers in a specific market (Kallinikos et al., 2013; Lyytinen et al., 2016; Nambisan, 2016; Naudé & Liebrechts, 2020; Yoo et al., 2012). Secondly, in digital platforms (e.g. Apple iOS, Google Android, Atlassian developer ecosystem), digital technology operates as a launching pad, a development platform, where complementors develop product that are

potentially disruptive in a given market (Naudé & Liebrechts, 2020; Soltanifar et al., 2021). Digital platforms are a building block, a force and a central focus of creativity and innovation (Acs et al., 2021; Baig et al., 2022; Nassar & Malik, 2021; Naudé & Liebrechts, 2020; Yoo et al., 2012; Zaheer et al., 2019). They are set up to enable entrepreneurship development democratization (Taylor-Wesselink & Teulon, 2021) by serving as self-organizing hosts that provide boundary resources to dispersed multiple actors who are known as complementors (Bonina et al., 2021; Eaton et al., 2015; Engert et al., 2022; Farshchian & Thomassen, 2019; Ghazawneh & Henfridsson, 2012; Karhu et al., 2018). Most importantly, they are characterized by allowing flexible coordination and control by participating third-party developers (the complementors) who have appreciable freedom to complement each other in the development of new market offerings (Elia et al., 2020; Nambisan & Baron, 2021; Yoo et al., 2012).

Digital platforms act as digital *ecosystems* or socio-technical forums, interconnecting stakeholders (both the complementors and the entrepreneurs using the software developed by the complementors), different sectors, and industries, thereby forming a community that is open to application developers for new firm development (Corvello et al., 2021; Yoo et al., 2012). Therefore, it is true that digital technology has “shifted the locus of value creation from inside the firm to an ecosystem of complementors” (Hein et al., 2019, p. 1). This suggests that digital technology influences and controls the activities of multiple autonomous actors (i.e. applications developers), who engage in knowledge-sharing, and co-creation processes for the creation of new disruptive market offerings (Battisti et al., 2022; Bi & Liu, 2022; Gomez-Morantes et al., 2021; Hein et al., 2019; Nambisan, 2016; Nambisan et al., 2019; Parker et al., 2016; Taylor, 2020).

Finally, digital technology acts as digital *infrastructure* where the various technologies operate as structures with scalable and dynamic characteristics and are regarded as digital tools (Nzembayie & Buckley, 2022). These technologies have been designed to allow multiple actors to interact digitally and engage in actions that drive entrepreneurship development processes (Baig et al., 2022; Corvello et al., 2021; Garrigos-Simon et al., 2021; Lehmann & Rosenkranz, 2017; Mir et al., 2022; Nassar & Malik, 2021; Zaheer et al., 2019). Digital infrastructures are the third leg of digital technology elements upon which digital artefacts and digital platforms are created and cultivated (Nzembayie & Buckley, 2022). The view of digital technology as digital *infrastructure* helps to highlight its fluid boundaries, and its ability to interconnect distributed agents, to offer computational capabilities, and to encourage collaborative endeavors (Acs et al., 2021; Chalmers et al., 2021; Elia et al., 2020; Lin & Maruping, 2022). Digital infrastructures are designed to enable the digitalization of the business model thereby transforming the output to tangible digital products that are introduced to a specific market. For instance, digital infrastructures include cloud computing, maker spaces, artificial intelligence, 3D printing, blockchain, and mobile networking (Baig et al., 2022; Garrigos-Simon et al., 2021; Lehmann & Rosenkranz, 2017; Nambisan, 2016).

### **Digital Technology Affordances**

Entrepreneurs in the modern digital age have access to a range of benefits and opportunities that arise from the use of digital technology. These benefits, known as digital technology affordances, are identified in this study by analyzing data related to the development of digital entrepreneurship. By examining the core themes and relationships that describe how digital technology influences the behavior of entrepreneurs during the process of entrepreneurship development, we were able to conceptualize a set of affordances that are responsible for



entrepreneurs' behavior towards achieving their goals more effectively. These affordances provide a range of benefits that go beyond traditional methods of entrepreneurship development. They allow entrepreneurs to engage with digital technology in ways that reshape their traditional activities and make them more efficient, effective and collaborative. By leveraging these affordances, entrepreneurs can interact with digital technology to exercise their skills and expertise in a way that offers an easy and collective capability for the development of digital entrepreneurship. By identifying and leveraging digital technology affordances, entrepreneurs can unlock new opportunities for growth and success in the digital age. The ability to understand and utilize these affordances effectively is an essential skill for anyone looking to develop a successful digital business today. Two digital technology affordances were discovered in literature; they are represented by the themes discussed in the following sub-sections.

### ***Distributed Involvement and Control Flexibility of the Participating Actors***

Digital technology has significantly revolutionized the world of entrepreneurship by allowing digital entrepreneurs from different parts of the world to connect and collaborate to explore business opportunities. One of the key benefits of digital technology is that it provides a digital platform that enables diverse actors to sign up and contribute via a development platform that is dedicated to promoting a common interest. In this context, the common interest is the creation of applications as new digital products for a specific market. The beauty of digital technology lies in its ability to facilitate distributed involvement and control flexibility. This allows people with different skills and expertise to work together seamlessly for a common goal and is made possible through digital connectivity, which enables entrepreneurs to connect and collaborate with other entrepreneurs, investors and customers from different parts of the world. Digital platforms offer a solid foundation for entrepreneurship development through their accessibility and convergence of resources across sectors and industries. As a result, digital entrepreneurs can leverage this technology to explore new business opportunities, drive entrepreneurship in various stages of development, and ultimately create new and innovative product that meet the needs of consumers in various markets. The infusion of digital technology in entrepreneurship has led to “the reduction of communication and coordination cost ... [and] a geographical dispersion of innovation activities” (Yoo et al., 2012, p. 1401). Distributed involvement and control flexibility have generated knowledge and expertise through the “constellation of actors with a wide variety of goals and stimuli interact[ing] dynamically to embark on business and innovation processes” (Garrigos-Simon et al., 2021, p. 2). This affordance drives the diffusion of agencies, allowing different actors to interact and collaborate in solving problems and ensuring that entrepreneurship development tasks are realized easily (Corvello et al., 2021; Elia et al., 2020; Garrigos-Simon et al., 2021).

Hence, distributed involvement and control flexibility empower self-organizing actors by offering a wide variety of possibilities regarding the coordination and control of dispersed actors' activities, as they participate and contribute their skills and resources in executing tasks. As a consequence, this affordance enables participating actors to experience entrepreneurship development process democratization (Yoo et al., 2012). This is so because their activities are “mostly autonomous and are not governed by any formal authority ... activities are not coordinated by bureaucracy but rather by emergence, and decisions are not driven by hierarchy but rather by collective interaction and mutual adjustment” (Elia et al., 2020, p. 4). Thus, this affordance helps to attract and integrate the resources required to perform product development activities, including dynamic choice of customers participating in the process (Acs et al., 2021;

Kallinikos et al., 2013; Kraus et al., 2018; Yoo et al., 2012). A major benefit of this affordance is access to wisdom drawn from dispersed meta-cognition and collective intelligence that is realized through the aggregate evaluation of multiple actors' views, competencies, aspirations and purposes (Antonizzi & Smuts, 2020; Garrigos-Simon et al., 2021). The larger the number of actors involved in the development process, the greater the value and assurance of innovative digital product to be developed (Zaheer et al., 2019). This explains why “[d]igital entrepreneurs have a reliance on digital media tools and information technology (IT) in the pursuit of entrepreneurial prospects” (Antonizzi & Smuts, 2020, p. 239). This, in turn, suggests that digital entrepreneurs use digital technology to access critical expertise, exchange knowledge and skills, and drive open innovation and collaborative creativity, which is sustainable and progressive, as a means to place disruptive product in a target market (Elia et al., 2020; Fernandes et al., 2022; Lin & Maruping, 2022; Lyytinen et al., 2016; Naudé & Liebrechts, 2020; Nigam et al., 2020; Nzembayie & Buckley, 2022).

### ***Incomplete Product and Continuous Learning for Adaptive Innovation Cycles***

After analyzing the data collected from reviewed studies, it was observed that digital technology is the driving force behind the emergence of products that are also designed to be easily modified and reprogrammed. This dynamic nature of the digital product opens up possibilities for adaptation and innovation cycles, enabling businesses to customize their offerings according to the changing preferences and demands of their target audience. The inherent incompleteness of these digital products makes them both highly customer-centric, and disruptive, in the market. This means that they not only cater to the unique needs of individual customers but also create new opportunities for businesses to stand out from their competitors. The continuous evolution of digital technology drives the need for fluid adjustments and expansion of product offerings, so as to align with customer needs and ensure product-market fit (Edison et al., 2018; Lehmann & Recker, 2021; Paternoster et al., 2014). Hence, digital technology has brought about a unique characteristic where products can never be considered finished. This trait is known as "incompleteness" and arises from the adaptability and malleability of digital technology (Lehmann & Recker, 2021; Lyytinen et al., 2016; von Briel et al., 2018; Yoo et al., 2012; Yoo et al., 2010). Unlike traditional products and services, digital ones can be changed, updated and improved at any time. This trait has made the digital world dynamic, fast-paced and constantly evolving. This characteristic keeps products tweakable and reprogrammable all through their life cycle in the market. Consequently, digital entrepreneurs involved in entrepreneurship development processes also keep learning what customers need by testing prototypes of the proposed market offering in the market to validate market confidence and acceptance (Bajwa et al., 2016; Paternoster et al., 2014). The possibility of innovation cycles keeps entrepreneurs competitive in the market because the products developed as market offerings remain unfinished (Yoo et al., 2012). Therefore, digitalization drives entrepreneurship development by keeping the market offering infinitely expandable. Thus, the market offering remains in a state of continuous development and adjustment, as customer needs and choices continue to change, and this helps to maintain disruption and competition (Kallinikos et al., 2013; Lehmann & Recker, 2021). The infusion of digital technology in entrepreneurship development makes product-customer-oriented activities possible, and motivates entrepreneurs' behavior to focus on learning customers' concerns through experimentation and analysis of customer feedback, in order to enrich and validate the acceptability of a market offering (Lehmann & Recker, 2021; Lehmann & Rosenkranz, 2017; Nguyen-Duc & Abrahamsson, 2016; Yoo et al., 2012).

## Digital Entrepreneurship Development and Characterizing Events

The emergence of digital technology has revolutionized the way businesses operate. This has led to the rise of digital entrepreneurship. In this new era, digital entrepreneurs leverage the latest technology to create innovative products that disrupt traditional market offerings (Lehmann & Rosenkranz, 2017). The impact of digital entrepreneurship is profound, with businesses facing new challenges and opportunities as they adapt to this rapidly evolving landscape. The ability to embrace digital entrepreneurship is becoming increasingly essential for businesses to remain competitive and relevant in today's market (Giones & Brem, 2017; Kraus et al., 2018; Nambisan et al., 2017; Nambisan et al., 2019; von Briel et al., 2021). Therefore, the process of developing digital entrepreneurship is worth studying as a phenomenon in its own right (Kraus et al., 2018; Mir et al., 2022). Past studies show that the traditional entrepreneurship development process is powered by business ideas and opportunities, and human agents who are entrepreneurs (Ammirato et al., 2019; Shane & Venkataraman, 2000; van Burg & Romme, 2014). However, the digitalization of the process of entrepreneurship development has triggered a new wave of development processes, where digital technology is a driver that actively influences both the business opportunities and the entrepreneurs' behavior (Davidsson, 2015; Davidsson et al., 2020). In this respect, entrepreneurs focus on digital technology resources to pursue opportunities that can generate economic value by developing applications as product and trading and operating on digital technology platforms and digital artefacts (Naudé & Liebrechts, 2020). For instance, a bike-sharing digital platform is a new venture, developed using digital technology, to offer a disruptive service that is innovative and easily accessed. Digital technology influences the development of bike-sharing entrepreneurship. Here, a new biking venture is developed to offer services that give customers access to bikes quickly and easily for a fee, without any opportunity for ownership of such bikes (Yao & Xu, 2020). Uber and Airbnb are some examples of entrepreneurship ventures developed to offer digital technology-driven mobility and hospitality services respectively (Constantinides et al., 2018; Yao & Xu, 2020). Therefore, digital technology has altered the behavior and traditional approaches of entrepreneurs, and this has created a new wave of events enacted at different stages of entrepreneurship development. These events are further described in the following subsections.

### *New Venture Idea and Opportunity Confidence Evaluation*

This is a critical and well-studied dimension in entrepreneurship research. Opportunity creation and discovery has attracted the interest of many scholars across a variety of disciplines (Davidsson, 2015). First, “entrepreneurial opportunity” (Davidsson, 2015), is a construct created from entrepreneurs' ideas or discovered opportunities recognizing customers' unmet needs. The process of securing entrepreneurial opportunity is usually regarded as a key event that is fundamental and foundational to the entrepreneurship development process (Mainela & Puhakka, 2008; Naudé & Liebrechts, 2020; Sanz-Velasco, 2006; Standing & Mattsson, 2016). This is because entrepreneurial opportunity presents reasons and needs for pursuing entrepreneurship (Leong et al., 2016). Therefore, digital technology helps to create or identify a viable opportunity and subsequently brings together the capabilities, skills, and expertise of collective digital entrepreneurs to develop innovative product to satisfy the needs of a target market (Berger et al., 2021; Chanas et al., 2019; Standing & Mattsson, 2016).

From the literature, two philosophical assumptions were identified as dimensions of an argument that most scholars engaged in when conducting entrepreneurial opportunity investigation. These reflect assumptions based on objective phenomenon (i.e. opportunity is independent of

entrepreneurs' knowledge of it) and assumptions based on subjective constructs (i.e. opportunity is dependent on, and enacted or created by entrepreneurs) (Nzembayie & Buckley, 2022). Consequently, some groups of scholars consider entrepreneurial opportunity as an enactment of an economic idea (Hu, 2018). Other groups of scholars describe entrepreneurial opportunity as originating from the identification or recognition of unmet needs in a specific market of interest (Kreuzer et al., 2022). In both perspectives, entrepreneurial opportunities are usually evaluated to determine the degree of confidence that the target market will be interested in the opportunities, before transforming the opportunities into a value-based product (Denoo & Yli-Renko, 2019; Mainela & Puhakka, 2008; Naudé & Liebrechts, 2020).

However, this study seeks to investigate opportunities empowered by digital technology for new venture ideas whose potentiality, affordances and advancement influence digital entrepreneurs to engage and exercise their cognitive abilities to create a viable product. This event (new venture idea and opportunity confidence evaluation) is well-orchestrated and well-articulated, as the digital venture idea is enacted and evaluated by dispersed actors who are interacting on digital platforms. The actors use the platforms to validate the ideas' potency in addressing issues in the market and to guarantee market fit for economic viability (Davidsson, 2015; Dimov, 2010; Kreuzer et al., 2022; Leong et al., 2016). Therefore, in digital entrepreneurship development, a new venture idea is developed from the collective intelligence of distributed participants (i.e. digital entrepreneurs), who evaluate feedback from the market to judge the ideas' merit and build market opportunity confidence in the business ideas (Davidsson et al., 2019). This confidence encourages the pursuit of new entrepreneurship development and new product commercialization in a target market (Davidsson, 2015; Dimov, 2010; Nzembayie & Buckley, 2022).

### ***Innovative Business Model Configuration***

In the realm of digital entrepreneurship, savvy business owners and entrepreneurs utilize creative configurations of business models to drive the successful development of new businesses. The innovative business model represents a core logic expected to guide the open innovation activity of the entrepreneurs, which is triggered by digital technology openness, in a network-centric context that connects multiple actors (Nzembayie & Buckley, 2022). These models are carefully crafted to generate value for customers, encourage payment, and ultimately translate those transactions into profitable returns (Ghezzi & Cavallo, 2020). It is an event, influenced by digital technology affordances, to generate fundamental assumptions that guide and ensure the digitalization of the process of entrepreneurship development from a viable opportunity to a market-disruptive product or service (Baig et al., 2022). The model demonstrates the steps involved in obtaining and optimizing resources, including bootstrapping, crowdsourcing, and crowdfunding. It also emphasizes the importance of customer involvement in creating a valuable market offering. As digital technology advances, and customer feedback is received during prototype experimentation, the value propositions may change to satisfy the needs and expectations of target customers (Baig et al., 2022; Bican & Brem, 2020; Garrigos-Simon et al., 2021). In practice the model plays a critical role in entrepreneurship development. Thus, actors and other stakeholders work together to develop an overall value architecture that guides entrepreneurs in creating a new digital venture. This architecture describes the essential foundational elements necessary for developing and operating a viable market offering that addresses the needs of a specific market. The market needs are addressed by implementing the orchestrated model for productive activities that facilitate entrepreneurship development (Bican & Brem, 2020; Ghezzi & Cavallo, 2020; Nzembayie & Buckley, 2022). The foundational

elements include the generated value proposition, customer segment, critical resources and capabilities, accessible networks, and possible collaborations and partnerships (Bican & Brem, 2020; Garrigos-Simon et al., 2021; Kraus et al., 2018; Steininger, 2018). Thus, an innovative business model is a “holistic perspective on the overall setup of the business and includes every process along the value chain” (Soltanifar et al., 2021, p. 72). Therefore, digital technology’s openness and generative characteristics enable digital entrepreneurs to engage in cognitive and imaginative collaborations with other actors; this allows them to frame views and ideas by exercising skills and expertise, while interacting with prospective customers to design an innovative business model (Garrigos-Simon et al., 2021; Nambisan, 2013).

### ***Entrepreneurial Resource Acquisition***

Securing necessary resources is a pivotal aspect of cultivating digital entrepreneurship. This encompasses acquiring human and financial capital as well as access to digital infrastructure to capture, customize, and assess fresh ideas for new ventures. This establishes the validation of market opportunities and bolsters the confidence needed to pursue new digital business endeavors. In today's age, digital platforms and social networking sites (such as Facebook, Twitter, and LinkedIn) offer an efficient and intelligent means of obtaining resources (Smith & Smith, 2021). More specifically, digital technology platforms (e.g. crowdfunding and crowdsourcing platforms) have created a community of collaborators or partners, thereby reducing the scarcity of key resources usually experienced during digital entrepreneurship development (Steininger et al., 2022). Consequently, digital technology has had a significant impact on the activities of securing key resources in digital entrepreneurship development; making it faster and easier for digital entrepreneurs to carry out entrepreneurship activities. This is done by providing access to the different critical resources needed to execute activities that influence faster resolution of challenges and contingencies during the development process (Garrigos-Simon et al., 2021; Nambisan et al., 2019; Smith & Smith, 2021). Good examples of digital technologies that have promoted and simplified access to critical resources include Amazon Web Services, 3D printing, social media, artificial intelligence and web data analytics (Garrigos-Simon et al., 2021; Lehmann & Rosenkranz, 2017; Nambisan, 2016; Smith & Smith, 2021). Many studies in literature focused on platforms that provide access to communities of resource providers. These studies are discussed below:

**Crowdsourcing Platform:** A crowdsourcing platform is a digital platform that helps in the creation of new digital products. It allows people with different skills and expertise to come together and work on tasks from different locations to co-create digital products. MakerBot Thingiverse is an excellent example of how a crowdsourcing platform can bring people together to create an innovative market offering (Lehmann & Rosenkranz, 2017; Lin & Maruping, 2022; Nambisan et al., 2019; Naudé & Liebrechts, 2020; Rayna et al., 2015; Zhao et al., 2021). A crowdsourcing platform is a “digital technology-enabled phenomenon facilitate[ing] the distribution of entrepreneurial actions across a diverse set of actors” (Lehmann & Rosenkranz, 2017, p. 4). Such a platform takes advantage of loose coupling and the modular properties of a digital platform's boundary resources to allow product to be co-created independently in modular units. Hence, digital platforms allow different developers, who have expertise in different tasks that are required, to develop unit components that are then used to develop different modules; these are further combined to form the whole product (Nzembayie & Buckley, 2022). Consequently, crowdsourcing reduces the cost of development by empowering digital entrepreneurs, through collaboration with other actors, to have access to diverse knowledge,

skills and expertise that are necessary for a specific user-application development (Cavallo et al., 2019; Garrigos-Simon et al., 2021; Lin & Maruping, 2022; Rayna & Striukova, 2021).

**Crowdfunding Platform:** Crowdfunding is a digital platform that represents a medium for funding digital entrepreneurship development. It exhibits unique technological characteristics that provide an interactive structure supporting dispersed participants, and offers them the opportunity to invest funds in new entrepreneurship projects (Nambisan et al., 2019). It is a fundraising digital platform (e.g. Kickstarter) that is extensively used by digital entrepreneurs (von Briel et al., 2018; Wessel et al., 2017); it is used to source, obtain and access funds needed to drive the development of digital entrepreneurship (Delacroix et al., 2019; Fernandes et al., 2022; Fossen & Sorgner, 2021; Lin & Maruping, 2022; Nambisan et al., 2019; Naudé & Liebrechts, 2020). Having access to finance is critical for entrepreneurs' activities across different stages of digital entrepreneurship development; any form of scarcity of such funds exposes digital entrepreneurs to failure-threatening challenges (Nigam et al., 2020; Rayna & Striukova, 2021). Thus, crowdfunding platforms present a rare opportunity to digital entrepreneurs by enabling them to have access to people who are willing to contribute personal funds (Steininger et al., 2022). Digital technology offers this platform as a medium to help digital entrepreneurs access a community of investors across locations. These investors are willing to fund any viable business idea to achieve entrepreneurship gain (Butler et al., 2020; Cavallo et al., 2019; Fossen & Sorgner, 2021; Nambisan, 2016). Aside from crowdsourcing and crowdfunding, another common technique that has dominated entrepreneurship resource acquisition in literature is the bootstrapping technique. Digital entrepreneurs adopt bootstrapping techniques as an easy way to acquire needed resources locally by taking advantage of personal funds and accessible social networks (Mir et al., 2022). The following paragraph discusses bootstrapping techniques as an event locally engaged by digital entrepreneurs.

**Bootstrapping:** Funds and other key resources continue to remain a major challenge to digital entrepreneurs, most especially in emerging economies (Rayna & Striukova, 2021). Digital entrepreneurs are always looking for ways to overcome the scarcity of resources to enable them to ultimately function profitably. Also, they seek ways to avoid problematic angel or seed investors during new venture development. Thus, they devise informal ways to source resources. For instance, digital entrepreneurs may employ a persuasive approach to convince family, friends and support organizations to release the resources (i.e. finance, expertise, skills, and infrastructure) needed to fund and carry out tasks during entrepreneurship development (Maitlo et al., 2020). So, entrepreneurs develop strategies to access resources needed for survival. A common model adopted by nascent entrepreneurs to finance the process of digital entrepreneurship development is the bootstrapping technique (Nguyen-Duc et al., 2021; Rayna & Striukova, 2021). The bootstrapping technique is a practice that enables digital entrepreneurs to access resources that they do not own nor control (Harrison et al., 2004). Such resources help digital entrepreneurs conduct entrepreneurship development activities and pursue the realization of viable opportunities to create digital product that can be viable in a target market (Marion et al., 2015; Perry et al., 2011; Waleczek et al., 2018; Winborg, 2009). Previous studies have described bootstrapping as a technique for accessing funds and other resources; this could be through personal funds, funds from family and friends, or through cutting down on development costs (e.g. Mac an Bhaird & Lynn, 2015; Maitlo et al., 2020; Patel et al., 2011; Perry et al., 2011). This technique provides access to credible resources needed, without any form of dependence on formal financing. Consequently, the practice minimizes intrusion by investors, and borrowing which requires collateral (Harrison et al., 2004; Malmström, 2014; Patel et al.,

2011; Winborg, 2009). Another example includes the easy and cheap adoption of cloud computing infrastructure and other digital infrastructures provided by technology hubs. Digital entrepreneurs' adoption of cloud services provides an opportunity to overcome infrastructural challenges that confront them during entrepreneurship development. Also, it offers them the opportunity to launch their product cheaply, thus, reducing the funds' required to a minimum (Harrison et al., 2004; Mac an Bhaird & Lynn, 2015). Having studied the bootstrapping technique, our findings suggest that crowdsourcing and crowdfunding are a digital form of bootstrapping because their use is informally motivated and enabled by technology as a way to easily provide resources to digital entrepreneurs at a low cost and without any form of stringent and controlling condition from participating actors.

### ***Value Proposition Prototyping and Experimentation***

A growing interest in digital entrepreneurship development has attracted the attention of many scholars in the IS domain and other disciplines (Anim-Yeboah et al., 2020). Most especially, many IS scholars have focused their interest on investigating the role of digital technology in application development (e.g. Ghezzi & Cavallo, 2020; Hassan et al., 2018; Lehmann & Recker, 2021; Nambisan, 2013; Nguyen-Duc & Abrahamsson, 2016; Nguyen-Duc et al., 2021; Zaheer et al., 2019). The scholars focus on digital technology-induced activities that have changed the traditional approach to entrepreneurship, especially in product development. The studies have sought to understand the role played by digital technology during prototyping, experimentation and learning that significantly increases validation of the product in the market. Since digitalization keeps the developed market offerings in an incomplete state, it creates opportunities for modifications. The offerings are usually tested by making them available in the market for target customers to evaluate and provide feedback; this keeps the market offerings perpetually under development (Lehmann & Recker, 2021). An incomplete market offering (i.e. prototype) is the outcome of the initial product development task undertaken by digital entrepreneurs. During experimentation, the performance of the market offering informs digital entrepreneurs on what they can do to improve it. Entrepreneurs focus on feedback they continuously gather from customers and other stakeholders who are directly involved in the market they are targeting (Ghezzi & Cavallo, 2020). Hence, digital entrepreneurs make decisions relating to enhancement of the proposed product based on feedback from prototype experimentation. Many studies have emphasized that digital entrepreneurs who engage in digital entrepreneurship development follow a lean start-up approach or agile methodology, because these methods can guide customer-centered entrepreneurial actions and the practices required during the development of and experimentation with new market offerings (Edison et al., 2018; Ghezzi, 2019; Ghezzi & Cavallo, 2020).

The lean start-up approach is a new business development method adopted by digital entrepreneurs to achieve a successful, cost-effective and customer-centric implementation of an innovative business model thereby improving product-market fit (Ghezzi, 2020; Ghezzi & Cavallo, 2020). The approach influences digital entrepreneurs' efforts to satisfy customers' needs; it aims for customer-centered value creation. It directs entrepreneurs to build a feasible customer base while the product is under development. More importantly, it helps digital entrepreneurs to reduce wasteful use of resources during product development (Bajwa et al., 2016). A digitally developed prototype is referred to as a minimum viable product (MVP). It is usually developed specifically for market experimentation and validation purposes (Lee & Geum, 2020; Tripathi et al., 2019). MVP represents a usable proxy of the actual intended product

(Nguyen-Duc et al., 2019; Nzembayie & Buckley, 2022). Its design has the basic features of the intended final product so that it can identify and evaluate a set of falsifiable assumptions made in the proposed business model (Bajwa et al., 2016; Edison et al., 2018; Nguyen-Duc & Abrahamsson, 2016). Many studies (Adamczyk, 2017; Carmine et al., 2014; Corner & Wu, 2011; Ganesaraman, 2018; Lee & Geum, 2020; Marion et al., 2015; Nguyen-Duc & Abrahamsson, 2016; Nguyen-Duc et al., 2019) focus on this dimension of the digital entrepreneurship development process event, because many digital products introduced to the market have failed to survive. The high failure rates experienced in digital entrepreneurship in the market are found to largely have been caused by poor problem-solution fit, arising from inadequate market surveys, poor MVP experimentation, and unreliable information about the market needs (Tripathi et al., 2019). Therefore, digital entrepreneurs intending to engage in a new digital entrepreneurship development need to develop an MVP that requires minimal resource expenditure but has the major features of the intended product (Tripathi et al., 2019).

### ***Pivoting and Innovative Business Model Reconfiguration***

The introduction of digital technology into entrepreneurship development has simplified the process of developing and testing new products that are expected to meet specific market needs. Digital technology enables the continuous reconfiguration of a business model until it meets the needs of the market and can generate an acceptable profit for participating entrepreneurs. This is a critical process in digital entrepreneurship development and is intended to ensure new business viability as well as to satisfy the expectations of customers in a target market. This event focuses on adjusting business models until they can work in a specific context by carrying out continuous experimentation with developed MVPs in the target market. This allows the learning needed to validate customers' views on the hypothesized assumptions of the proposed product (Tripathi et al., 2019). Therefore, digital entrepreneurs conduct these influential pivoting activities to help modify the business model, such that it addresses the desired needs by implementing recommendations from customers about a proposed market offering (Bajwa et al., 2016; Lee & Geum, 2020). Business model reconfiguration is a pivoting event, a critical process that enables digital entrepreneurs to adjust their strategies and adapt to changing market conditions. It involves a careful analysis of different elements of the business model, such as revenue streams, customer segments and distribution channels, to determine what changes are necessary to achieve the desired outcome. This process is particularly important for digital entrepreneurs who are constantly experimenting with new ideas and conducting market research to achieve product-market fit. By prototyping value propositions and experimenting with different market strategies, these entrepreneurs can adjust their business models until they find the right formula for success. This iterative process of pivoting and innovation is a key aspect of modern business, and it requires a deep understanding of the market and the needs of the customer. This is an event that leverages digital technology to strengthen offerings intended for a specific market (Sala et al., 2022). The event is usually driven by the applicability of digital technology's generative characteristics, which drives MVP pivoting and innovative business model reconfiguration. This is a digital entrepreneurial activity that helps to ensure that necessary changes, triggered by customers' feedback, are implemented to guarantee customers' desires and ensure a competitive product in the market (Sala et al., 2022). Therefore, pivoting can be described as a strategic change, an adjustment of the existing business concept, which may include a change in participating actors, a change in technology design or any necessary modification of the product, or modification of other elements of a business model to improve market acceptance (Bajwa et



al., 2016). Therefore, digital entrepreneurs implement pivoting by changing strategy and reconfiguring any aspect of a business model (Edison et al., 2018).

## KNOWLEDGE GAPS IDENTIFIED WITHIN PRIOR LITERATURE

Following the SLR conducted across IS and other related disciplines, the researcher identified gaps in the existing body of knowledge. The gaps include:

1. Only a few studies focus on sub-Saharan Africa countries (David-West et al., 2018; Lingelbach et al., 2015). Most of the studies in the literature review focused on global northern countries (mainly in America and Europe and some rich Asian countries like China and India (Davidsson & Gruenhagen, 2020; Lingelbach et al., 2015)). Considerably fewer studies focused on the global south, where digital exclusion is experienced - digital exclusion is a context in which many citizens and potential customers have limited access to digital infrastructure and other resources. Therefore, new empirical studies are needed to focus on countries in the global south, like sub-Saharan Africa countries (e.g. Nigeria), to help understand the African story regarding the process of digital entrepreneurship development. This will help scholars and other stakeholders to understand how less privileged digital entrepreneurs overcome persistent challenges and uncertainties common to the region to achieve success and create sustainable innovative digital business models.
2. Many digital entrepreneurship studies have been conducted; however, scholars continue to lament the paucity of depth in existing knowledge. They emphasize that literature still lacks comprehensive studies that can elucidate and conceptualize the role that digital technology plays in transforming entrepreneurship development (Anim-Yeboah et al., 2020; Shen et al., 2018). Most especially, the existing literature lacks studies that investigate how digital technology changes traditional entrepreneurial activities (von Briel et al., 2021). In addition, literature continues to show “limited clarification of the concept from different perspectives and conceptualizations” (Anim-Yeboah et al., 2020, p. 193). For instance, there is limited empirical knowledge of how changes in entrepreneurs' behavior are triggered by digital technology affordances and the associated dimensions of events during digital entrepreneurship development (Fernandes et al., 2022; Nambisan, 2016; Zaheer et al., 2019). Confirming this gap, Elia et al. (Elia et al., 2020, p. 1). noted that “despite the relevance of the trend, there is still limited discussion in the literature on how these technologies, and the collaborative dynamics enabled by the same, are changing and transforming the overall entrepreneurial process”. Therefore, it is necessary to investigate the “how” and “why” questions to gain a holistic understanding of the phenomenon (Bi & Liu, 2022).
3. There is “widespread confusion and frustration among entrepreneurship researchers regarding the lack of convergence toward a single paradigm and the continuing lack of definitional clarity” (van Burg & Romme, 2014, p. 370), especially amongst scholars who have lamented that the digital entrepreneurship development process is under-theorized (e.g. Dimov, 2010; Arvind Gudi & Ravi Chinta, 2020; Hein et al., 2019; Leary et al., 2009; Lehmann & Rosenkranz, 2017; Lyytinen et al., 2016; Middleton & Nowell, 2018; Nambisan, 2013, 2016; Nguyen-Duc et al., 2021; Zaheer et al., 2019; Zhao et al., 2021; Zhu et al., 2022). Many published studies have developed theoretical explanations in parts (Fernandes et al., 2022; Kraus et al., 2018), but this suggests that existing literature only presents fragmented views, thereby offering limited knowledge. Consequently, these studies present different but limited perspectives of the phenomenon being investigated. Therefore, there is a need to conduct an empirical investigation that will lead to the development of a

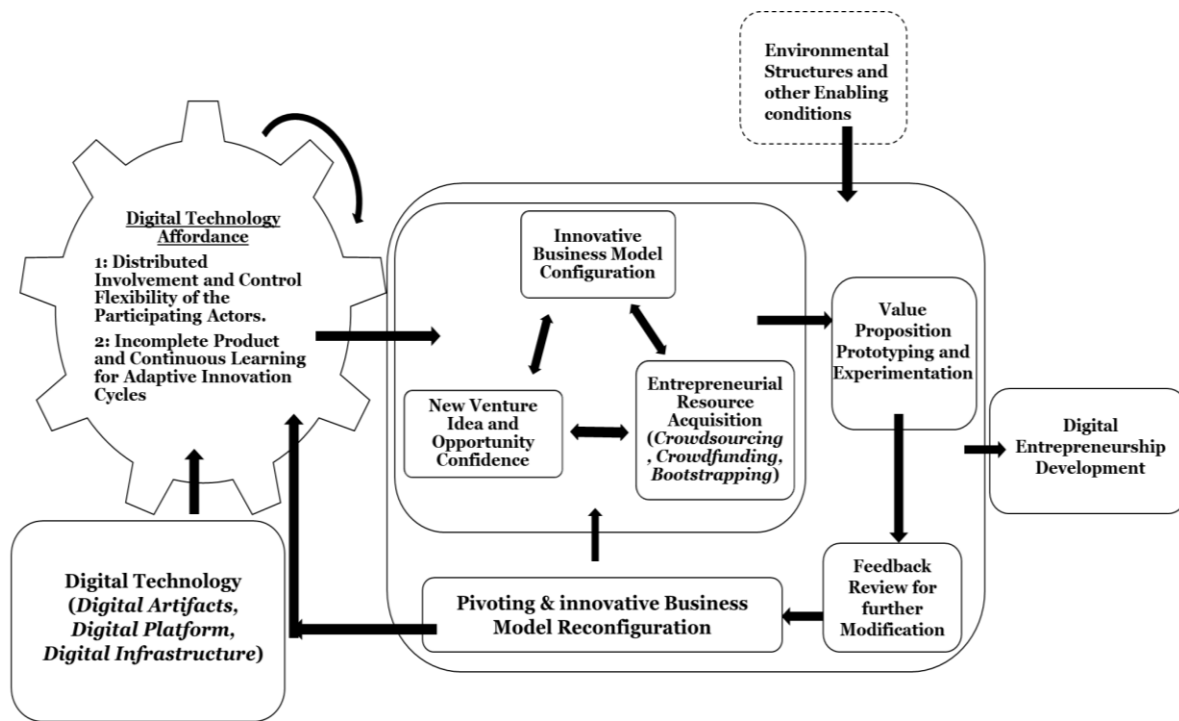
theoretical framework that will combine different perspectives (van Burg & Romme, 2014). Such a comprehensive or unified theory would provide a harmonized explanation of how digital technology, as an external enabler, influences the different dimensions of the events that characterize the development of digital entrepreneurship (e.g. Moroz & Hindle, 2012; Paul et al., 2023).

4. Finally, there is a paucity of knowledge in the literature on the impact of environmental structures and conditions on the process of developing digital entrepreneurship, especially when engaging digital platform boundary resources. These environmental structures impinge some effect, though digital platforms act as enabling contexts that weaken or totally remove spatial boundaries, especially given that inclusion of the resources beyond existing boundaries expands the entrepreneurial ecosystem to accommodate actors from different geographical locations. It is, therefore, critical to investigate the effect of environmental structures in digital entrepreneurship, especially when the environment is characterized by resource constraints, rigid government policies and regulations, and resultant uncertainties.

## DISCUSSION

Following the arguments of some IS scholars (e.g. Cram et al., 2017; Roberts et al., 2012), the study draws from the conceptual themes extracted from the literature to develop a conceptual framework that is anchored in affordance theory. This framework aims to explain how digital technology influences the behavior of digital entrepreneurs and drive the different dimensions of events that characterize digital entrepreneurship development. Figure 3 explains how digital technology triggers certain affordances that then reshape traditional entrepreneurial processes by providing opportunities to create, evaluate and reshape new business ideas in order to create new product that are viable in a target market. through their relationship. Figure 3 extends existing knowledge by providing a clear explanation of how digital technology's affordances influence behavior, contributions and interaction among digital entrepreneurs, who are recognized as participating actors in the development process.

Digital technology affordances are the underlying factors that influence the behavior of digital entrepreneurs and hence cause different dimension events to occur. However, the researcher became aware that there are environmental contexts (i.e. environmental structures and other conditions) that may play a critical role in the decision-making of entrepreneurs during the development processes of digital entrepreneurship. The framework shows how digital technology enables digital entrepreneurship by facilitating three key activities each associated with a component: new venture idea and opportunity confidence, innovative business model configuration, and entrepreneurial resource acquisition. These activities are followed by prototype development, experimentation, feedback review for further modification. After that, pivoting and innovative business model reconfiguration takes place. Hence, digital technology transforms traditional practices and activities to form a new wave of events in the development process.

**Figure 3***Conceptual Framework for the Process of Digital Entrepreneurship Development*

This is explained in greater detail. The framework is a meta-theoretical framework that integrates themes and depicts the relevant propositions. The iterative process of digital entrepreneurship is a complex and dynamic cycle that involves various stages. It starts with the use of digital technology to trigger the perceived affordances that can influence entrepreneurs. This technology provides digital connectivity that allows participants to conduct three entrepreneurial activities on a digital platform. The *first* of these activities involves identifying, evaluating, and confirming the confidence of a new venture idea in the market. This evaluation creates a viable opportunity that represents customers' unmet needs or wants in a specific market of interest. In the *second* activity, the digital entrepreneur develops an innovative business model through the collective intelligence of participating actors. The business model represents a feasible hypothesized assumption of the value proposition to be experimented with in the target market. In the *third* activity, the model guides the actions and practices of digital entrepreneurs as they engage with other actors through crowdsourcing and crowdfunding platforms within and outside the entrepreneurship ecosystem for resource acquisition. Digital entrepreneurs seek and secure the right resources digitally to ensure the development of the right product needed to meet market demand.

This is followed by prototype development, and iterative experimentation with prototypes which is usually also carried out with the actors who assisted with resource acquisition. Having acquired key entrepreneurial resources and an innovative business model, the team engages with the development platform for the development of an MVP (e.g. digital artefacts/software applications as intended product /service). The developed MVP is then introduced to the target market through app stores for testing and learning to validate the MVP. The validation process is

critical to ensure that the hypothesized assumptions of the value proposition are valid and that the intended digital product satisfies the unmet needs of the market. The process involves experimenting with MVPs in a target market and gathering feedback from customers. These processes are recursive and interwoven, and engaging in market experimentation helps digital entrepreneurs repeat the processes and improve the existing business model.

This feedback drives pivoting, which helps to modify the initial innovative business model developed. Pivoting leads to a reconfiguration of the innovative business model and continuous modification of the MVP. This process cycles repeatedly until acceptable digital products are ready for first sale in the target market.

## **RESEARCH AGENDA FOR FUTURE STUDIES**

Scholars (e.g., Rowe, 2014; Schryen, 2013; Watson & Webster, 2020) opined that the essence of conducting a SLR is to propose some research directions and attract researchers for further studies in a specific domain. Such research directions can be seen in the gaps that were discovered in the review conducted. Hence, the gaps identified in this study will assist in guiding future investigations on the process of digital entrepreneurship development in a given empirical situation. For instance, findings from the review reveal that further empirical study to understand the role of digital technology on entrepreneurship development in sub-Saharan Africa is necessary. Also, we discovered that further empirical studies are required to identify how digital platform boundary resources trigger entrepreneurs' behavior as complementors of the platform in a resource-constrained environment. This future study will help influence digitalization and access to resources for entrepreneurship development. Such a study will validate the outcome of this study, and further explain the underlying dynamics of the various actions and activities digital entrepreneurs engage in during entrepreneurship development. Further, studies are needed to help understand how digital technology as an enabler of entrepreneurship is affected by environmental structures and conditions (e.g. government policies and regulations, competitions, limited infrastructures) that are existential within a given research context like sub-Saharan Africa. Finally, the conceptual framework developed in this study offers propositions that can inspire and drive researchers' interest in further research that will lead to developing new theories for digital entrepreneurship development.

## **CONCLUSION AND LIMITATIONS**

This research study delves into the process of developing digital entrepreneurship by conducting a thorough systematic review of relevant existing literature. The study aims to identify and explain the underlying digital technology affordances that contribute to the development of entrepreneurship through digitalization. The study focuses on developing a framework that explains how to create new economic value through digital business in a specific market. However, to validate the outcome of this study, further empirical studies are required in a given environmental context, such as Nigeria's digital start-up ecosystem. By doing so, we can gain a better understanding of the behavior of entrepreneurs who are influenced by digital technology and the environmental structures that exist within the given research context. The conceptual framework developed in this study contributes to the digital entrepreneurship literature by offering a fresh perspective and a new framework that can guide future research and practice. In practice, the study will enlighten digital entrepreneurs about the specific steps and practices needed to be successful in digital entrepreneurship development. However, the researcher did face certain limitations such as not being able to include all relevant articles due to access

restrictions or fees. Therefore, future studies may explore other articles beyond the databases and journals mentioned in this study. Overall, this research study offers valuable insights into the process of digital entrepreneurship development and can be a valuable resource for anyone interested in exploring this phenomenon further.

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