Enablers of and Barriers to Digital Innovation Success: A Systematic Literature Review from 2010 to 2020

Lorna Mutegi
Jean-Paul Van Belle

Follow this and additional works at: https://aisel.aisnet.org/confirm2021
Enablers of and Barriers to Digital Innovation Success: A Systematic Literature Review from 2010 to 2020

Lorna Mutegi
University of Cape Town
Mtglor001@myuct.ac.za

Jean-Paul Van Belle
University of Cape Town
Jean-Paul.VanBelle@uct.ac.za

Abstract
In a (post-)pandemic world, digital innovation has gained relevance as an important driver of digital economies. This paper combines systematic literature review and thematic analysis to isolate enablers of and barriers to digital innovation success. The review draws on an initial set of 421 papers, sourced from Google Scholar and the Web of Science databases, selected by title, topic, abstract and keywords. Out of the 421, 38 papers were selected. Unique and similar factors that emerged from the review have been isolated and discussed in more detail. By understanding the enablers and barriers, digital entrepreneurship stakeholders in the Global South can embrace best practices towards creation of an enabling environment that supports successful implementation of digital innovations. Particularly, this research has potential to influence favorable policy formulation and the targeting of funding to support technology innovators to stimulate digital innovations that power digital economies.

Keywords: Digital Innovation, Digital Innovation Success, Enablers, Barriers

1. Introduction
In a (post-)pandemic world, information on enablers of and barriers to digital innovation success has become an important resource for building digital economies. Although current research on innovation in general has made relevant contributions, digital innovation success phenomenon continues to receive little attention. Research on digital innovation success is largely focused on top-down innovations or innovations that emanate from large firm’s research and development initiatives (Ross, Mitchell & May, 2012), digital or otherwise. In the last decade, digital start-ups have made important contributions towards the rise of ground-breaking digital innovations. There is little research on what enables or hinders the success of innovations emanating from these digital start-ups. This paper combines a systematic literature review with thematic analysis to find “relevant and quality” literature (Rowe, 2014) on enablers of and barriers to digital innovation success emanating from digital start-ups.

1.1 Background Information
Digital innovation involves the application of digital technology to improve an existing or develop a new service embedded with software-based capabilities (Yoo, Henfridsson, & Lyytinen, 2010; ITU, 2017). Fichman, Santos, and Zheng (2014) define digital innovation as “a product, process or business model that is perceived as new, requires significant changes on the part of adopters, and is embodied in or enabled by IT”. Uber, Airbnb, Amazon, Netflix, Alibaba, Facebook, Skype, Google are some of the prominent examples of global digital innovations that have caused a disruption in their sectors of influence (Demirkan, Spohrer, & Welser, 2016). Digital innovation and digital entrepreneurship continue to be used interchangeably in extant literature. Digital entrepreneurship is the economic exploitation of digital innovation. Bogdanowicz, (2015) defines digital entrepreneurship as an “economic activity that involves identification and exploitation of new ICT or ICT-enabled products,
processes and corresponding markets. Elia, Margherita, & Passiante, (2020) define it as “the convergence of entrepreneurship and digital technologies” resulting to new business ventures. They note and address a gap in entrepreneurship research on the role of digital technology and the need for new definition of entrepreneurship within the context of digital economies. Their study recommends research agendas, one being the need for further investigation on “motivating drivers” of digital entrepreneurship stakeholders.

It is important to define digital innovation success. Ross, Mitchell and May, (2012) use the terms “progression of a digital innovation” to mean success. Hirose, (2018) views digital innovation or technology entrepreneurship success as “successful commercialization and business development, often over long periods of time”. This paper combines the SLR results on digital innovation, technology innovation, digital entrepreneurship, and technology entrepreneurship success as relevant unified outcome of the study.

2. Methodology
This study follows a phased systematic approach to literature review to isolate enablers of and barriers to digital innovation success from the years 2010 to 2020. Systematic literature review (SLR) method is praised for its “transparency in data collection and synthesis that results in a higher level of objectivity and reproducibility” (Kraus et al., 2020) and capability to enable a researcher to “identify, evaluate and synthesis” existing literature on phenomenon of interest (Kitchenham et al. 2010; Massaro, 2016). The approach allows for objective and scientific account of literature, ensuring rigour, transparency, and reproducibility of results (Transfield et al, 2003). It is a “repeatable process that documents all available studies relevant to a research area or question” (Balaid, Rozan, Hikmi, & Memon, 2016). A thematic analysis approach was used to categorize relevant studies identified through SLR into themes and sub-themes as shown in Table 3. Thematic analysis (TA) is a “process of identifying patterns or themes within qualitative data” (Maguire & Delahunt, 2017). Briefly, the study summarizes available literature on enablers of and barriers to digital innovation success from the years 2010 to 2020. The following steps were followed and adapted from Oosterwyk, Brown, & Geeling, (2019).

Step 1: Planning
The literature search strategy identified studies on enablers of and barriers to sustainable innovation, with a focus on digital or technology innovation, digital entrepreneurs, user innovation, digital startups, social innovations, bottom-up innovations and grassroots innovations. This is because the aspect of sustainability was prominent in most definitions of ‘innovation success’.

Step 2: Selection
The review focused on peer reviewed journals and conference proceedings from IS, entrepreneurship and innovation, product innovation management, innovation and technology management. Google Scholar was the main source of literature. The Web of Science database was also searched to ensure all relevant studies were included. It was important to perform a search for enablers and barriers separately and together, due to heterogeneity and fragmentations in literature on the phenomenon under study. The following search terms were used over a timespan starting from 2010 to 2020: ‘enablers of digital innovation success’ OR ‘enablers of digital entrepreneurship success’ OR ‘enablers of social innovation success’ OR ‘enablers of grassroots innovation’ OR ‘enablers of bottom-up innovation’ OR ‘enablers of user innovation success’ to isolate studies on enablers. For barriers, the search strings contained one of and/or a combination of the following: ‘barriers to digital innovation success’ OR
‘barriers to digital entrepreneurship success’ OR ‘barriers to social innovation success’ OR ‘barriers to grassroots innovation’ OR ‘barriers to bottom-up innovation’ OR ‘barriers to user innovation success’.

Studies on ‘user innovation’, ‘social innovation’, ‘bottom-up innovation’, ‘grassroots innovation’ or ‘digital entrepreneurship’ were included as they had some relatable results relevant to the phenomenon under study. This is because they are not driven by the “traditional R&D and market research” (Ross, Mitchell & May, 2012). This ensured all relevant literature was included in the review. The approach however had some disadvantages as the search results yielded more studies that were out of scope, thereby consuming a lot of time. The decision to narrow the search to two databases was informed by this to ensure the emergent results were manageable. In addition, synonyms or related terms for the words ‘barrier’ and ‘enabler’ were used to widen the search. For instance, ‘inhibitor, constraints and hindrance were used in place of the word ‘barrier’. To isolate enablers, ‘motivation, supporting mechanism, success factors, driver, catalyst, proven paths, and facilitator’ were used. The asterisks truncation symbol (*) was used to capture all variations of a word or term, especially for searches done in the Web of Science. For example, ‘inhibitor*’ would retrieve studies that used either ‘inhibitor’ or ‘inhibitors’. Studies that evaluated enablers of and barriers to digital entrepreneurs or technology-based MSMEs’ innovation success were also considered.

Initial set of papers on enablers and barriers were searched by title, topic, abstract and keywords resulting to 421 papers. Table 2 shows the distribution of the 421 papers from both databases. The papers were reviewed further by content in the introduction and conclusion sections. Papers that touched on the concept of innovation success were selected resulting to 154 papers, having also eliminated papers not written in English language, citations and patents. Third and final round of selection was based on full paper review, and backward and forward reference searching, with a keen focus on the results, findings and discussions sections resulting to 38 papers, having eliminated duplicates. The 38 papers were considered adequate as they each had full text available, had rigor and relevance to the phenomenon under study. Particularly, they brought to light unique and similar enablers of and barriers to digital innovation success. Figure 1 illustrates the literature search and selection criteria employed.

### Summary of the Inclusion and Exclusion Criteria

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Published within timespan 2010 to 2020</td>
<td>Not within the search timespan</td>
</tr>
<tr>
<td>Addresses research questions</td>
<td>Research questions not addressed</td>
</tr>
<tr>
<td>Written in English</td>
<td>Not written in English</td>
</tr>
<tr>
<td>Full-text available</td>
<td>No full-text available</td>
</tr>
<tr>
<td>Peer-reviewed</td>
<td>Citations or Patents</td>
</tr>
<tr>
<td></td>
<td>Lack of credibility and rigor</td>
</tr>
<tr>
<td></td>
<td>Duplicate studies</td>
</tr>
</tbody>
</table>

Table 1: Inclusion and Exclusion Criteria Summarized.

Table 2 displays count of search results for enablers and barriers from each database before and after exclusion criteria. A search on just barriers returned over 75% of similar results as the enablers’ search query on Web of Science and Google Scholar. Therefore, the count for barriers on exclusion of duplicates includes only unique studies that had not been selected on running the query for enablers.
### Table 2: Count of Search Results before and after Exclusion Criteria.

<table>
<thead>
<tr>
<th>Database</th>
<th>Enablers</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count before exclusion</td>
<td>Count after exclusion</td>
</tr>
<tr>
<td>Web of Science</td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>Google Scholar</td>
<td>278</td>
<td>26</td>
</tr>
<tr>
<td>Total Selected</td>
<td>310</td>
<td>33</td>
</tr>
</tbody>
</table>

**Step 3 and 4: Extraction and Execution**

Thematic analysis was employed at this stage. A latent-level, top-down approach (Braun & Clarke, 2006) – where initial themes derived from research questions and additional themes included on in-depth systematic analysis of relevant literature – was followed. A total of 49 sub-themes – representing all influencing factors – were extracted. These could, in turn, be grouped in ten grouping or major themes (Table 3). These themes will be discussed in greater detail in the results section. The major themes allowed the logical classification of all the information derived from the systematic review in an orderly and coherent manner. The themes were sourced from 32 journal articles, 1 book, 3 book chapters, 1 conference paper and 1 master’s thesis. Top 5 journals reviewed include Information Systems Research, Journal of Cleaner Production, The Journal of Technology Transfer, MIS Quarterly and Journal of Business Research. Figure 2 is a chart that shows peak of publications in years.

<table>
<thead>
<tr>
<th>Major (grouping) themes</th>
<th>Sub-themes (factors)</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Technology</td>
<td>Technology, ICT, mobile penetration, internet, open-source tools and platforms, unrestricted access to information</td>
<td>([Maiolini et al.], 2016); ([von Briel, Davidsson &amp; Recker], 2018); ([Yoo, Henfridsson, &amp; Lytinen], 2010); ([Ross, Mitchell &amp; May], 2012); ([Demirkan, Spohrer, &amp; Welser], 2016); ([Ciriello, Richter, &amp; Schwabe], 2018); ([Butler, Garg &amp; Stephens], 2020);</td>
</tr>
<tr>
<td>Major (grouping) themes</td>
<td>Sub-themes (factors)</td>
<td>Citations</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Incubators and Accelerators</td>
<td>Technology hubs, research, and innovation labs, living labs, business incubation, makerspaces, hackerspaces, accelerators</td>
<td>(Sörvik, 2018); (Ester, 2017); (Mas-Verdú, Ribeiro-Soriano, &amp; Roig-Tierno, 2015); (Nielsen, Reisch &amp; Thogersen, 2016); (Schwarz, 2013); (Mas-Verdú, Ribeiro-Soriano, &amp; Roig-Tierno, 2015); (Edwards-Schachter, Matti &amp; Alcántara, 2012); Baccarne et al., 2014)</td>
</tr>
<tr>
<td>Education and Training</td>
<td>Universities, technical skills, innovation and entrepreneurship curriculum, talents, competencies</td>
<td>(Calcagnini et al., 2016); (Nielsen, Reisch &amp; Thogersen, 2016); (Xu, Wang &amp; Yang, 2020); (van Den Berg, C. L., 2018); (Manning, Engelke &amp; Klein, 2018); (O'Kane et al., 2019); (Nielsen, Reisch &amp; Thogersen, 2016); (Ester, 2017); (Ross, Mitchell &amp; May, 2012)</td>
</tr>
<tr>
<td>Capital</td>
<td>Financial capital, Venture Capital (VC) investment, Angel Investor, start-up capital, intellectual capital, human capital, social capital, psychological capital, talents, capabilities</td>
<td>Ester, (2017); (Manning, Engelke and Klein, 2018); (Ester, 2017); (Andriopoulos, 2020); (Nielsen, Reisch &amp; Thogersen, 2016); (Paschen, 2017); (Oranburg, 2020); (Bocken, 2015); (Wang et al., 2019); (Ross, Mitchell &amp; May 2012); (Rashid, Alzafari and Kratzer, 2020); (Baron &amp; Henry, 2010); (Nielsen, Reisch &amp; Thogersen, 2016); (Drencheva, 2018); (Stephan &amp; Drencheva, 2017); Ester, (2017)</td>
</tr>
<tr>
<td>Networks</td>
<td>Resilient networks, business advice, linkages, informal networks (friends and family)</td>
<td>(Dana et al., 2020); Seet et al., (2018); (Cantù, Giorgia and Tzannis, 2018); (Ross, Mitchell &amp; May, 2012); (Bocken, 2015); (Ester, 2017); (Nielsen, Reisch &amp; Thogersen, 2016)</td>
</tr>
<tr>
<td>Business model</td>
<td>Innovative business models, business model design, business model management</td>
<td>(Trimi &amp; Berbegal-Mirabent, 2012); (García-Gutiérrez &amp; Martínez-Borreguero, 2016); (Bocken, 2015)</td>
</tr>
<tr>
<td>Leadership</td>
<td>Leadership styles, transactional leadership, laissez-faire leadership and transformational leadership</td>
<td>(Zaech &amp; Baldegger, 2017); (Ester, 2017); Nielsen, Reisch and Thogersen, (2016);</td>
</tr>
<tr>
<td>Open Innovation</td>
<td>Collaboration, co-design, co-creation, co-design, co-production</td>
<td>(Teha &amp; Keeb, 2020); (Stroh, 2018); (Toros et al., 2020); (Nielsen, Reisch &amp; Thogersen, 2016); (Baccarne et al., 2014)</td>
</tr>
<tr>
<td>Government</td>
<td>Policy, ease of doing business, laws and regulations, government funding</td>
<td>(Manning, Engelke &amp; Klein, 2018);</td>
</tr>
<tr>
<td>Culture</td>
<td>Start-up culture, entrepreneurship culture</td>
<td>(Manning, Engelke &amp; Klein, 2018); Ester, (2017); (Bocken, 2015)</td>
</tr>
</tbody>
</table>

Table 3: Emergent Major Themes and Sub-themes (factors)

Figure 2: Number of Publications in Years
3. Results
An enabler can be defined as that which contributes to or favors innovation success (Camps & Marques, 2014). A barrier on the other hand slows down or completely hinders success. The reviewed literature brought to light forty-nine factors that could pose as enablers and/or barriers to digital innovation success. It is possible that a factor could pose as either an enabler or a barrier. For instance, a disengaged government that fails to create an enabling environment for digital innovations to thrive, could pose as a barrier. A government that provides such an environment could pose as an enabler.

3.1 Digital Technology
Digital technology is an important enabler of digital innovation success (Maiolini et al., 2016; von Briel, Davidsson & Recker, 2018). By definition, digital innovation involves application of digital technology to improve an existing or develop a new service embedded with software-based capabilities (Yoo, Henfridsson, & Lyytinen, 2010; ITU, 2017). Researchers attribute the rise of digital innovations to increased access to digital technologies (Ross, Mitchell & May, 2012) and connectivity between people through mobile devices (Demirkan, Spohrer, & Welser, 2016). Ciriello, Richter, and Schwabe, (2018) posit that “digital technology is both the result of and the basis for developing digital innovations, enabling high scalability and low entry barriers that lead to wide participation and democratized innovation”. Butler, Garg & Stephens, (2020) note that digital technologies have reduced start-up costs tremendously. Ease of access to digital resources, such as open data, open sources tools, platforms and communities (Nielsen, Reisch, & Thogersen, 2016) enables digital entrepreneurship success. Fichman, Santos, and Zheng (2014) conclude that digital innovations can be embodied in or enabled by technology.

3.2 Technology or Innovation Hubs, Business Incubators, Accelerators and Living Labs
Technology hubs, digital innovation hubs (Sörvik, 2018), business incubators and accelerators are seen to provide an enabling environment that steer digital innovations to success. It is common in literature for these terms to be used interchangeably though they are heterogenous. For instance, incubators defer from accelerators in that the former “focuses on very early-stage business ideas, whereas the primary goal of accelerators is to grow new ventures that already have a product, a business model, and even some traction” (Ester, 2017). The concept of business incubation has been around for decades. The first World’s business incubator is said to have been set up in the year 1959 in Batavia Industrial Center, Batavia, New York (Hackett & Dilts, 2004). Business incubators are institutions set up to provide support services needed for “creation and development” of a company or “to accelerate the creation of successful firms” (Mas-Verdú, Ribeiro-Soriano, & Roig-Tierno, 2015). Hackett and Dilts (2004) define a business incubator as “a shared office space facility that provides its incubatees (i.e. ‘portfolio-’ or ‘client-’ or ‘tenant-companies’) with a strategic, value-adding intervention system (i.e. business incubation) of monitoring and business assistance”. Business incubators can be affiliated to a university, government, civil society, a private company, a non-profit institution, or hybrid. They can be physical spaces or virtual or both (Hackett & Dilts, 2004). They provide support services such as affordable working space (co-location) (Nielsen et al., 2016), access to capital, training, mentoring and coaching among other services (Schwartz, 2013; Mas-Verdú, Ribeiro-Soriano, & Roig-Tierno, 2015; British Council, 2016). Other similar initiatives that have come up in the last decade include accelerators, co-working spaces, fab labs, tech hubs, makerspaces, hackerspaces (Söderberg & Delfanti, 2015), research parks, science parks and living labs. The concept of a “living lab” (Edwards-Schachter, Matti, & Alcántara, 2012) is also seen as an important enabler of success especially for bottom-up digital innovations. The Labs provide a platform for “open innovation between innovators, encourage
user engagement, private and public partnerships leading to development of inclusive and sustainable innovations” (Baccarne, Mechant, Schuurman, Colpaert, & De Marez, 2014).

3.3 Universities and Research Centres
The “geographical proximity” of startups to universities and research centres could have a positive implication on performance (Calcagnini, Favaretto, Giombini, Perugini, & Rombaldoni, 2016). Education has been addressed by a myriad of studies as an important enabler of innovation where accessible or a barrier where access is limited (Nielsen et al., 2016). Formal Entrepreneurship education in the Global North dates back to the late 1940s, with pioneer programs such as “new venture enterprise management” by Havard University. The program has been praised for its contribution to “development of the American economy” (Xu, Wang, & Yang, 2020). Initiatives such as incorporation of innovation and entrepreneurship curriculum (van Den Berg, C. L., 2018) in institutions of higher learning may increase competency in running digital innovations successfully. STEM education (Manning, Engelke, & Klein, 2018) in particular has potential to build technical competencies that can be applied in building resilient technology innovations. Ultimately, universities churn out competent talent that contribute to a sustainable pipeline of skills (O’Kane, Zhang, Daellenbach, & Davenport, 2019), which digital startups can employ or source for volunteers from. Informal education initiatives can also enable innovation success. For instance “do-it-yourself” training bootcamps and “self-led self-paced” learning are important competency building platforms on digital innovation success (Nielsen et al., 2016). Business incubators and accelerators also do inculcate training programs geared towards developing requisite skills and competencies that enable the successful implementation of an incubatee’s technology innovation venture during incubation (Ester, 2017). Research centres on the other hand can release empirical research, information and technology, which digital startups can leverage on. Briefly, “possessing the right technical skills” (Ross, Mitchell & May, 2012) and knowledge is seen as an important enabler of success for digital startups.

3.4 Financial Capital
Financial capital is a key enabler of digital startup success (Ester, 2017). Manning, Engelke and Klein, (2018) report a national investment of $4.8 billion into Israel’s technology innovation ecosystem, thereby contributing to the success of technology innovations witnessed in Israel. They note that the lack of technology giants in Europe, which are prominent in United States of America and China, can be attributed to the “chronic shortage of investment capital” because of the risk aversion of most private investors. Research confirms startup financing in the Global North is well structured. Venture capital funding leads in Silicon Valley with established sources such as “public and private pension funds, university endowments, and foundations” (Ester, 2017). Funding from venture philathropists could also enable the successful implementation of digital innovations that “pursue social impact” (Andrikopoulos, 2020). Other financing options include microloans (Nielsen et al., 2016), crowdfunding among others. Crowdfunding not only provides financial capital but also “crowd capital” (Paschen, 2017), an important enabler of success. Literature confirms that some financing options may bar innovation success, especially where a funding source imposes unfavourable contractual obligations or leaves the digital startup in debt (Oranburg, 2020). Ester, (2017) advocates on sourcing financing from angel and venture capitalists as opposed to “family, friends and fools”, which he considers a “vulnerable source”. A “short-term investor mind-set” and lack of “suitable investors” (Bocken, 2015) could also hinder digital innovation success.
3.5 Intellectual Capital

Intellectual capital (Wang, Tsai, Lin, Enkhbuyant, & Cai, 2019) is an emerging area of research in entrepreneurship with important theoretical and practical contributions on digital innovation or digital entrepreneurship success. As an “intangible capital”, literature argues that it cannot be ignored, especially in studies related to startup performance. Wang et al., (2019) posit that three types of intellectual capital that is, “psychological capital (intra-personal attributes such as hope, optimism), human capital (personal attributes such as age or education) and relational capital (interpersonal attributes such as trustworthiness) cannot be neglected for new venture success”. Tang and Shao, (2019) report “positive psychological foundation, that is hope, optimism, self-efficacy and resilience” as potential enablers of success. Other literature refer to the “individual characteristics” of an innovator (Ross et al., 2012) as an enabler. Rashid, Alzafari and Kratzer, (2020) research on “entrepreneurial success from a behavioral lens” depicts human behaviour as a potential enabler of or barrier to digital innovation or entrepreneurship success. Seet et al., (2018) research (conducted in a startup accelerator in Malaysia) further emphasizes on the importance of human and social capital. The study reports that the “processes of ‘know-what’, ‘know-how’ and ‘know-who’ are interrelated – by knowing ‘who’, innovators learnt ‘what’ and ‘how to’ through social learning”. Social capital is reported as an enabler where used to support commercialisation of resultant innovation (Ross, Mitchell & May, 2012). Other behavioural studies discuss the concept of “deliberate practice” (Baron & Henry, 2010) as an enabler where digital startups or innovators dedicate their time and effort in building resilient and successful digital innovations. Also, the level of “personal investment” or commitment (Nielsen et al., 2016) to the innovation process could contribute to success. “Self-interests motivation” (Drencheva, 2018) could also be an enabler. Briefly, the innovator personality or “social traits’ and identities” that are pro-success (Stephan & Drencheva, 2017) could have positive impact on resultant digital innovations. In summary, as an enabler, Ester, (2017) views intellectual capital as “outstanding soft skills such as creativity, flexibility, curiosity, passion, an orientation towards achievement, the ability to work in teams, openness, a willingness to share, an entrepreneurial mindset, a pro-customer attitude, being good at networking, being willing to learn, and being focused on personal development”.

3.6 Networks

Networked digital startups have capability to birth and sustain successful technology innovations. Research found informal networks comprising of family and close friends to be a great enabler of success (Dana et al., 2020). Cantù, Giorgia and Tzannis, (2018) study identifies four key types of networks relevant at each stage of startup creation as “social networks comprising of family and friends, business networks, reputational networks and co-opetition networks”. Ben White, (2020) advocates on building “resilient networks for digital innovation”, especially in “times of crisis” such as the COVID-19 pandemic. Briefly, access to “business advice and network support” (Bocken, 2015) for digital innovators could steer them to success. Incubated digital startups are at a better advantage concerning ease of access to reliable networks (Schmitt & Muyoya, 2020). This is because the incubators or technology hubs or accelerators already have set structures and mechanisms of engagement that expose their incubatees (digital startups or technology innovators) to networking opportunities (Ester, 2017). A good example is access to a network of mentors with expertise in various subject matter areas such as technology (Woodley, Burgess, Paguio, & Bingley, 2015). Ester, (2017) notes that “mentorship by experienced serial entrepreneurs can prevent startup founders from making the most common business development mistakes”. In this case, accelerators are seen as instrumental in providing requisite support and technical advice to enable
commercialization of promising digital innovations. Briefly, “supportive intermediaries” (Nielsen et al., 2016) could be important enablers of digital innovation success.

3.7 Business Model
Literature presents an innovative business model as a critical success factor for startups (Trimi & Berbegal-Mirabent, 2012), especially for technology-based startups that operate in “extreme uncertainties” due to the “volatility and unpredictable nature” of new technologies (García-Gutiérrez & Martínez-Borreguero, 2016). They report business model innovation as a “more important” enabler of success compared to product or service innovation. They note that for digital innovators, building innovative business models might be a challenge as they are “specialists in technical innovation” and not “business design or management”. In the long run, this could pose as a barrier to innovation success especially for technology innovators who fail to “target and pursue” the right market or rather build commercialisable digital innovations. Briefly, “failed business model” (Bocken, 2015) may result to digital innovation failure.

3.8 Leadership
Reviewed literature links leadership as highly relevant to a entrepreneurial venture success, digital or otherwise (Zaech & Baldegger, 2017; Ester, 2017). Nielsen, Reisch and Thogersen, (2016) note that a “dynamic and effective” leader (founder or CEO) can influence startup success. Zaech and Baldegger, (2017) study evaluates the impact of three types of leadership styles (transactional, laissez-faire and transformational) emanating from (Bass & Avolio, 1996) research, on startup performance. “Transactional” and “laissez-faire” leadership behaviours are associated with “less activity” or rather a “watch and wait” approach that may hinder success compared to “transformational leadership” style where the leader is engaged in the day to day operations.

3.9 Open Innovation, Hackathons and Code Sprints
Some of the most prominent digital innovations have occurred in an environment of open innovation and were spearheaded by startups. Open innovation (Teha & Keeb, 2020) provides opportunities for co-creation, co-design, co-production (Stroh, 2018; Toros et al., 2020) or collaboration with potential customers or other innovation stakeholders (Nielsen et al., 2016) in the ecosystem. Teha & Keeb, (2020) note that open innovation allows for exploration and exploitation of previously inaccessible knowledge and resources. Hackathons and code sprints (Coetzee, 2010; Ross, Mitchell & May, 2012; Baccarne et al., 2014b; Toros et al., 2020) or innovation competitions are important avenues that encourage open innovation or co-creation of digital innovations, leveraging on the diverse competencies (technical and non-technical) of collaborating innovators. Post innovation competition or hackthon support can be an enabler where innovators receive financial and/or technical support to scale their prototypes or minimum viable products (MVPs) to success. Where such support is lacking, misplaced or the value add to participating innovators is unclear, then success could be hindered as resultant innovations are normally abandoned at pre-mature stages of development. Hjalmarsson et al., (2014) study focuses on understanding the constraints or limiting factors that hinder the success of innovations that emanate from innovation competitions. They bring out the concept of perceived versus actual barriers. Both types have the potential to hinder innovation.

3.10 Government
Government is an important player in influencing digital innovation or digital entrepreneurship success. On the flip side, a disengaged government that fails to create an enabling environment for digital innovations to thrive, can pose as a barrier. A dictatorial regime that imposes digital solutions or are pro “digital solutionist approach” as put by Rowe, Ngwenyama and Richet,
(2020) on its citizenry can pose as a barrier to success of such innovations. Initiatives such as “national R&D funding” and “economic incentives” (Manning et al., 2018) are among key government contributions towards strengthening or building of a technology innovation ecosystem. In Silicon Valley, government funding, participation as a “launching customer of technology innovations” and supply of requisite resources for innovation is reported as some of the factors that have enabled digital startup success (Hess, 1997). As an innovation market regulator (Ester, 2017) the “ease of doing business” is another key government role that can pose as an enabler of or a barrier to digital innovation success. A World Bank report on the ease of doing business (World Bank, 2020) notes that its take “six times” longer for digital entrepreneurs in developing economies to start a business compared to their counterparts in developed economies. Further, they use up to 50% of the “country’s per capita income to launch a company while their counterparts in developed world take only 4.2%”. Laws, regulations and policy are key contributors to the ease of doing business.

3.11 Culture
Culture is an important aspect of entrepreneurial innovativeness (Manning et al., 2018). In Silicon Valley, Ester, (2017) argues that a culture that encourages and rewards innovation, openness in sharing ideas, feedback and learning, expectation to “launch disruptive technologies”, “risk taking and tolerance of failure”, “24/7 business economy”, “diversity in innovation teams” among others could be contributing factors that continue to steer new innovators towards building successful digital innovations. He concludes that such a culture could be the reason why Silicon Valley has maintained its position as “the global paradise for high-tech startups”. This does not however mean that failure is non-existent. In the Global South, digital startups, especially those under a structured digital innovation environment, are said to face pressure to employ a ‘silicon valley startup mindset’, which is assumed to be an enabler of success. The lack of a “strong incumbent industry” (Bocken, 2015) or an environment embossed with an entrepreneurial culture could deter innovation success.

4. Conclusions and Recommendations
This paper set out to uncover barriers and enablers for successful digital innovation. From a shortlisted 421 academic papers, 38 papers were analyzed in-depth using a Structured Literature Review (SLR) process. In total, 49 different factors were uncovered (Table 3). These can then be grouped under the following major themes or headings: digital technology, incubators and accelerators, capital, business model, leadership, networks, culture, government, education and training, and open innovation. Some factors can pose as both an enabler and barrier.

This study has two implications for practice. First, by understanding the enablers of and barriers to digital innovation success, such a research can inform development of a guiding framework that can influence policy and action by explaining how the effects of the enablers or barriers can be enhanced or moderated by digital innovation stakeholders such as government, incubators and investors. Secondly, the study results can be used by digital startups and innovators, to develop sustainable strategies that can support success of their digital innovations. The study recommends two research agendas. First, there is need for more research on digital innovation success, particularly contextualized studies. Future IS researchers investigating success in digital or technology innovations could explore the differences between the Global North versus Global South contexts. This agenda stems from fragmented research on digital innovation success as evidenced in the SLR. The review confirmed that digital innovation success has not been addressed in a systematic manner. The search for relevant literature was complicated through the fact that there were few studies that
directly addressed enablers of and barriers to “digital” innovation success (Vega & Chiasson, 2019), thereby contributing to the fragmentation. Because of the fragmentation, studies on “user innovation”, “social innovation”, “bottom-up innovation”, “grassroot innovation” or “digital entrepreneurship” were included in the SLR process as they had some relatable results relevant to the phenomenon under study. Secondly, the review revealed that innovation concepts such as the triple helix model and the “Silicon Valley syndrome” amalgamates some of the factors discussed, specifically government, industry and academia. An important research agenda would be a review of linkages between the discussed factors to investigate their impact on digital innovation success. In particular, the linkages between incubators or technology hubs or accelerators or living labs is seen as critical.

References
Rowe, F. (2014). What literature review is not: Diversity, boundaries and recommendations.

[NOTE: Reference list for Systematic Literature Review excluded to meet the 12-page limit requirement.]