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Digital Entrepreneurship in a Resource-Scarce Context: a focus on entrepreneurial digital competencies

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Digital Entrepreneurship in a Resource-Scarce Context: a focus on entrepreneurial digital competencies

Abstract

Purpose – This paper critically explores how context as an antecedent to entrepreneurial digital competencies (EDCs) influences digital entrepreneurship in a resource-scarce environment.

Design/methodology/approach – The data comprises semi-structured interviews with 16 digital entrepreneurs, as owner-managers of small digital businesses in Cameroon.

Findings – The results reveal the ways in which EDCs shape the entry (or start-up) choices and post-entry strategic decisions of digital entrepreneurs in response to context-specific opportunities and challenges associated with digital entrepreneurship.

Research limitations/implications – The data comes from one African country and 16 digital businesses thus the research setting limits the generalizability of the results.

Practical implications – This paper highlights important implications for encouraging digital entrepreneurship by focusing on institutional, technology and local dimensions of context and measures to develop the entrepreneurial and digital competencies. This includes policy interventions to develop the information and communication technology (ICT) infrastructure, transport and local distribution infrastructure, and training opportunities to develop the EDCs of digital entrepreneurs.

Originality/value – Whereas the capabilities to adopt and use ICTs and the internet by small businesses have been examined, this is among the first theoretically sensitised study linking context, entrepreneurial digital competencies and digital entrepreneurship.

Key Words Digital entrepreneurship, entrepreneurial digital competencies, context, resource-scarce environment, small digital businesses, Cameroon

Paper type Research paper

Introduction

Digital entrepreneurship, defined as the practice of pursuing “new venture opportunities presented by new media and internet technologies” is attracting world-wide attention (Davidson and Vaast, 2010, p. 8). It is similar to traditional entrepreneurship with regard to pursuing entrepreneurial opportunities by creating new enterprises or commercialising products and services (Davidson and Vaast, 2010). The main difference arises because in digital entrepreneurship “some or all of the entrepreneurial venture takes place digitally instead of in more traditional formats” (Hair *et al.*, 2012, p. 3). Examples of digital businesses include businesses that provide online accounting, software development (Vasilchenko and Morrish, 2011), social computing and digital platforms for cataloguing, e-commerce (Javalgi *et al.*, 2012) and multi-media businesses that sell digitized products and services (Hair *et al.*, 2012; Onetti *et al.*, 2012). A digital entrepreneur is therefore an individual who creates and delivers key business activities and functions, such as production, marketing, distribution and stakeholder management, using information and communication technologies (ICTs) (Hair *et al.*, 2012). ICT is used broadly to include landline telephones,

computers, radio and television and emerging digital technologies (e.g. smartphones, online platforms and artificial intelligence).

This dependence on ICTs is significant because of the unique challenges and opportunities that newly digital businesses face with regards to entry mode, production methods, capturing of payments/revenues, and managing stakeholder relationships (Beckman *et al.*, 2012; World Bank, 2014). Despite evidence of increases in the number of small digital businesses in developing countries, compared to advanced economies, “academic enquiry to date has merely skimmed the surface as to how” they are created and operated (Javalgi *et al.*, 2012, p. 743). African countries represent a nascent market for small digital enterprises due to resource-scarce **constraints** (WTO, 2013). Resource-scarce is used to emphasise the bottom-of-the-pyramid (BoP), characterised by a high proportion of people with low purchasing power (less than \$2.5 per day), growing but untapped market opportunities and a high number of active entrepreneurs (Linna, 2013; Prahalad, 2005). Resource **constraints** include shortage of finance and human resources for production, exchange and consumption as well as a failure of government institutions to address this (Bradley *et al.*, 2012; Linna, 2013).

By experiencing one of the fastest growth rates in internet usage worldwide, there are growing opportunities for creating digital businesses across Africa (Gathege and Moraa, 2013; WTO, 2013). Yet we know little about digital entrepreneurship beyond the adoption and use of ICTs by existing small businesses (Kyobe, 2004; Okolo and Obidigbo, 2014). In addition to this knowledge gap, the focus on digital entrepreneurship is theoretically significant with respect to the entrepreneur in new business creation where “the mechanisms by which entrepreneurs shape ventures are often contingent on factors such as the industry sector, talent, institutional characteristics of the national economy, and experiences of the entrepreneurs themselves” (Beckman *et al.*, 2012, p. 203; Ghobakhloo and Tang, 2013). This

suggests a research need to examine the competencies needed to be a successful digital entrepreneur beyond entrepreneurial competencies (e.g. Manolova *et al.*, 2007; Revell-Love and Revell-Love, 2016). In digital entrepreneurship “some or all of the entrepreneurial venture takes place digitally instead of in more traditional formats” (Hair *et al.*, 2012, p. 3). This implies the need to follow Welter (2011) in studying the context-specific influences in resource-scarce environments and where digital technology is becoming both a trigger and an enabler (Lusch and Nambisan, 2015) of entrepreneurial behaviours and small business practices. Welter (2011) calls for more empirical research to understand how context can be an asset (where it facilitates entrepreneurship) or a liability (challenges that constrain entrepreneurship). Unpacking the competencies needed to create and operate small digital businesses in Africa contributes to our understanding of the “fit” between the context-specific opportunities and challenges associated with digital entrepreneurship in resource-constrained African countries.

Thus, this paper analyses a theoretical relationship in which context as the antecedent to entrepreneurial digital competencies (EDCs) influences digital entrepreneurship (Figure 1). EDCs are the combination of entrepreneurial competencies (Manolova *et al.*, 2007; Marvel, 2011), and ICT competencies (Ashurst *et al.*, 2012) that shape a digital entrepreneur’s start-up choices and post-entry strategic decisions (Autio *et al.*, 2014). Competencies include knowledge and behavioural skills and is connected to the goals pursued, business activities and tasks that entrepreneurs undertake (Bianchi *et al.*, 2017; Mitchelmore and Rowley, 2013). Context is the resource-scarce environment in an African economy, seen as imposing contextual influences on entrepreneurial behaviour as seen in the effects on the entry choices and post-entry strategic decisions of entrepreneurs (Autio *et al.*, 2014) about the creation and operation of digital businesses. The key research question addressed is: how does context

influence digital entrepreneurship in a resource-scarce environment? **“Insert Figure 1 Here”**

By addressing the above question the paper contributes to existing entrepreneurship literature concerned with the role of context in entrepreneurship (Autio *et al.*, 2014; Welter, 2011; Zahra *et al.*, 2014), by introducing EDCs as mediating how context influences digital entrepreneurship. Empirically, the paper provides a qualitative analysis of the experiences of digital entrepreneurs or owner-managers (Ghobakhloo and Tang, 2013) of small digital enterprises in Cameroon. Cameroon is relevant because of the growing number of digital businesses (Gathege and Moraa, 2013; Ngoasong *et al.*, 2015), the high proportion of entrepreneurial activities as a career option (GEM, 2014) and the resource-scarcities that entrepreneurs have to overcome to ensure business survival (Stevenson and St-Onge, 2011). The next section presents the theoretical framework for this research, followed by the research method and findings respectively. Discussion and conclusion are then presented.

Literature Review

Context and Digital Entrepreneurship

Context is the external “circumstances, conditions, situations, or environments” (Welter, 2011, p. 167) of an enterprise or an entrepreneur, which helps us “to understand the origins, forms, functioning and diverse outcomes of entrepreneurial behaviour” (Zahra *et al.*, 2014, p. 481). There are two reasons why context matters for understanding digital entrepreneurs. Firstly, it can be an asset (opportunity) and a liability (challenge) (Welter, 2011). Secondly, the influence of context on the entry behaviours and post-entry decisions of entrepreneurs (Autio *et al.*, 2014) can reveal the conditions and possibilities for discovering, creating and exploiting entrepreneurial innovations, defined as a commercially viable new or upgraded

enterprise, product, service or approach (Garud *et al.*, 2014). This study therefore focuses on the entry (situations where individuals create new ventures) and post-entry decisions (activities undertaken once new venture has been launched) (Autio *et al.*, 2014, p. 1100) of digital entrepreneurs when pursuing context-specific entrepreneurial opportunities and dealing with context-specific challenges (Zahra *et al.*, 2014).

Taken together the above studies identify six dimensions of context namely, temporal or historical, spatial or geographic, institutional, social, industry and organizational contexts (Autio *et al.*, 2014; Welter, 2011; Zahra *et al.*, 2014). For the entrepreneur, how each of these dimensions is understood and negotiated depends on career choices, attitudes towards risk-taking, and most importantly skills and competence. For example, even if entrepreneurial opportunities exist in a given context, an individual or group of individuals with the right sets of competencies must discover and exploit such opportunities (Garud *et al.*, 2014). Specific dimensions of context can also affect the extent to which entrepreneurs can successfully deploy their competencies to discover, create or exploit opportunities that are present in a given context. (Beckman *et al.*, 2012).

This paper focuses on three dimensions of context namely, institutional, technology, and local contexts. This conceptualization downplays the significance of industry and temporal dimensions of contexts from the six dimensions mentioned earlier. Industry context includes the type of industry, the industry supply chain and the industry lifecycle (Autio *et al.*, 2014; Zahra *et al.*, 2014). These are not seen as significant in this article because digital businesses do not constitute a separate industry. They constitute businesses that operate in the ICT sector (Vasilchenko and Morrish, 2011) but often classified under different industries, for example a digital business that provides travel services (Javalgi *et al.*, 2012) can be classified in the tourism industry. Welter (2011) distinguishes between “where” and “when” influence of context. “Where” relates to the geographic context of the entrepreneur and his/her

enterprise/innovation (e.g. country, political system, neighbourhood). “When” signifies the temporal context, such as historical influences and changes over time. The temporal context is concerned with the influence of time and history, such as changes in regulations and market conditions, witnessed over the stages of an enterprise’s lifecycle (Autio *et al.*, 2014). This is beyond the scope of this study because the digital businesses studied are start-up and early staged businesses.

The institutional context signifies the formal and informal rules and regulations in a country (Welter, 2011; Zahra *et al.*, 2014). Laws and regulations can either promote or restrict new business creation, intellectual property and competition. Informal rules operate through established social norms and perceptions of legitimacy and social desirability, which influence opportunity recognition and exploitation by (potential) entrepreneurs and ability to access resources (Mair *et al.*, 2012; Welter, 2011). Local context includes features of spatial, geographic, organizational and social contexts that can be analysed to better capture the “where” and “when” effects on contexts. This includes the characteristics of communities, neighbourhoods and regions (e.g. rural-urban and national-global reach) that make them attractive for digital entrepreneurship. Such characteristics include the existence of suitable networks (customers, partners and suppliers), finance and physical resources (Cho *et al.*, 2008; Ngoasong and Kimbu, 2016). Finally, the technology context, is the “architectural attributes of the underlying technology” that shape the entrepreneurial/innovative activities of stakeholders within a network (Autio *et al.*, 2014, p. 1100) as seen in digital platforms (Kyobe 2004; Peña *et al.* 2011) and networking technologies (Davidson and Vaast, 2010; Hair *et al.*, 2012).

The three dimensions are linked in the sense that both the institutional context and the technology context shape the local context through changing local practices. The institutional context (government policies) shapes the ICT infrastructure (mobile/internet penetration

rates) and physical infrastructure (logistics and local distribution channels) (Cho *et al.*, 2008).

These in turn affect the choices that businesses make about the extent of digitalization and product/service delivery channels (Cho *et al.*, 2008). This interlinkage is crucial for understanding what digital entrepreneurs do (Autio *et al.*, 2014) and how their competencies shape and are shaped by their familiarity with the context-specific opportunities and challenges (Manolova *et al.*, 2007). The theoretical framework linking context, competencies and digital entrepreneurship is presented below.

Theoretical Framework

Entrepreneurship literature defines competencies variably to include knowledge and skills. This suggests that the acquisition and use of both to create new businesses or operate existing ones can be context-specific (Garud *et al.*, 2014; Manolova *et al.*, 2007). For example, Marvel (2011) discusses how differences in individual human capital influence search-based discovery in high-tech firms, emphasising prior knowledge of markets, ways to serve markets, and customer problems. He suggests that “an entrepreneur with experience in machine design is more likely to package a technology in a way that is germane to some kind of machine than a service. Other entrepreneurs might instead recognize service opportunities due to lack of knowledge about machine design and manufacturing but a high level of knowledge about a particular service industry” (Marvel, 2011, p. 408). Manolova *et al.*, (2007) focused on how human capital (entrepreneurs’ education and experience) influence founder’s choices and expectations in a transitional economy. This combination of high-technology, institutional and local contexts are interrelated and implies that both entrepreneurial competencies and ICT or digital competencies are crucial in digital entrepreneurship.

From the above perspective, this paper uses entrepreneurial digital competencies (EDCs) to capture the combination of entrepreneurial and ICT competencies that mediate the role of context as antecedent to digital entrepreneurship. Entrepreneurial competencies include knowledge and skills required to search and acquire new information, to identify and pursue entrepreneurial opportunities (Marvel, 2011) and to innovate (Bianchi *et al.*, 2017). These can be acquired through formal education (business and/or technology degree), context-specific training and specific prior experience (Fayolle and Gailly, 2015; Manolova *et al.*, 2007). ICT competencies include business systems thinking and architecture planning (Ashurst *et al.*, 2012), technological capabilities (integrating web applications, customizing market-specific online experience) used to build the technology infrastructure and to integrate business processes and build a brand’s community (access to buyers, suppliers and partners) (Hair *et al.*, 2012; Reuber and Fische, 2011).

Based on the above literature review, Figure 2 presents a theoretical framework depicting the link between context, competencies and outcomes. The research framework suggests that the influence of context on digital entrepreneurship is mediated by EDCs. This is the theoretical basis on which the relationship between context and digital entrepreneurship in a resource-scarce environment is examined in this paper. The framework is applied to examine how digital entrepreneurs use EDCs to either discover or create entrepreneurial opportunities (Garud *et al.*, 2014) and make entry choices and post-entry decisions to overcome context-specific challenges (Autio *et al.*, 2014; Welter, 2011), using Cameroon as empirical setting.

“Insert Figure 2 Here”

Research Method

Research Design and Sampling

Digital entrepreneurship is relatively nascent and under-researched in emerging markets. As such a qualitative method with one case study (Cameroon) and multiple cases (digital businesses) was adopted. Such an approach has been shown to be suitable for improving knowledge and developing theory (Bruton *et al.*, 2011). A case study is defined as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 2009, p.18) Thus, the case study is digital entrepreneurs in Cameroon, with each entrepreneur representing one of many cases that can be examined as empirical evidence to elaborate the theoretical framework developed in the preceding section. Analysis of qualitative cases is suitable where the aim is theory elaboration rather than theory generation (Miles and Huberman, 1994; Ngoasong and Kimbu, 2016).

As mentioned earlier, Cameroon was selected for context-specific relevance and growing presence of small digital businesses. To elaborate on the Cameroon context, statistical data was collected from a variety of sources, including comparable data on other African countries. Data on entrepreneurship in many African countries usually contain missing or inconsistent data from different sources (Kimbu and Ngoasong, 2016). The statistical data used here are indicative of the context of digital entrepreneurship in Cameroon, given the limited availability of published literature. They are drawn from the Cameroon Government and World Bank sources depicting institutional context (Josué, 2007; Ndongfack, 2007).; the Global Entrepreneurship Monitor data on entrepreneurial activities (GEM, 2014), the World Economic Forum’s Network Readiness Index measure of a country’s leveraging of ICTs to boost competitiveness and well-being; the Global Innovation Index measure of the level of innovation of a country (WEF, 2015).

Patton (2002) suggests that qualitative cases selected through purposeful as against random sampling provides information-rich cases for an in-depth study and enables the

researcher to learn a great deal about the purpose and the phenomena being investigated. Two factors informed purposive case selection. First, the fit with the definition of digital entrepreneurship as businesses that either use ICT as the main operating infrastructure or develops and commercialises ICT and digitised products/services (Davidson and Vaast, 2010; Javalgi *et al.*, 2012; Vasilchenko and Morrish, 2011). Second, a focus on digital entrepreneurs as owner-managers of entrepreneurial firms (Beckman *et al.*, 2012; Ghobakhloo and Tang, 2013), given the technology, local and institutional contexts (Welter, 2011). Digital businesses that have operated for two-six years were considered as new because they started as non-digital and often operated in the informal (unregulated) sector businesses. This notion of the informal sector in which businesses avoid the administrative bottlenecks to business registration is well documented (Bruton *et al.*, 2011; World Bank 2014). This age restriction is consistent with existing entrepreneurship literature, which considers new businesses to include those between two and six years in operation (Vasilchenko and Morrish, 2011).

To access study participants an email request was sent to Activspaces, a digital business incubator with branches in three major cities (Buea, Douala, and Yaoundé) (Gathege and Moraa, 2013) and the author’s professional contacts developed from previously completed research projects in Cameroon. Through these contacts a list of 31 potential participants was drawn up. The websites of their digital businesses were examined against the sampling criteria described earlier and invitations to participate sent out via emails and phone calls. A total of 16 digital entrepreneurs accepted to participate (Table 1), which is consistent with the sample size of existing qualitative research (Bruton *et al.*, 2011; Yin, 2009). The rest had underdeveloped websites and a limited accessible information to determine fit with the definition of a digital business, the owner-manager could not be reached (e.g. failed email attempts) or was unavailable during the period of study. **“Insert Table 1 Here”**

Data Collection and Analysis

In-depth semi-structured interviews were conducted with each of the 16 entrepreneurs during May-June 2014, complemented by information from the websites of the digital businesses and media reports (Vasilchenko and Morrish, 2011). Interview questions were informed by the literature review and conceptual framework (Figure 2). First, demographic information about their business and EDCs was sought (Table 1). Secondly, questions were asked about the role of EDCs in discovering versus creating and pursuing context-specific entrepreneurial opportunities (Garud *et al.*, 2014), and how the three dimensions of context influenced the entry and post-entry strategic decisions (context as asset or liability) of the entrepreneurs (Welter, 2011). The interviews typically lasted between one and two hours, and occurred either in the entrepreneurs' place of business or a mutually agreed place in the entrepreneur's city. Given that this paper is about theory elaboration rather than generation, the themes developed in the literature guided the interviews rather than serve as variables to be tested. Additionally, field visits to three digital business incubators, warehouse of one of the digital enterprise and government offices which involved informal discussions with their management were recorded as notes. Notes from field visits provided deeper insights and corroboration of the views expressed by the entrepreneurs (Kimbu and Ngoasong, 2016) about opportunities and challenges associated with digital entrepreneurship in Cameroon.

All the interviews were tape-recorded, manually transcribed and content-analysed to isolate themes and patterns (Mair *et al.*, 2012) that could be used to identify specific dimensions of context linked to the use of EDCs to undertake digital business activities. This was followed by a cross-case analysis between the sixteen digital businesses to isolate illustrative cases and sections of transcripts for use as direct quotations in supporting the empirical analysis (Kimbu and Ngoasong, 2013; Vasilchenko and Morrish, 2011). Thus, the

data that underpinned each of the 16 cases was based on the responses to the interview questions and field notes that were context-analysed. Cross-case comparison was used to triangulate the data and to clarify the case-specific features for cross-case generalizability (Kimbu and Ngoasong, 2016). To validate the findings, the suggestion in Bruton *et al.*, (2011) was adopted. Specifically, four Cameroon-based informal expert interviews were conducted with one IT consultant for a large telecom company, two university lecturers in entrepreneurship and IT respectively, and one owner-manager of an established medium-sized ICT firm. The study findings are presented below.

Findings

The Context of Digital Entrepreneurship in Cameroon

Entrepreneurial activity is high in Cameroon (Table 2); however digital entrepreneurship is nascent given the relatively low internet penetration rate (Tables 2 and 3). Despite being a lower-middle income country (WEF, 2015), there is a high level of entrepreneurial activity in Cameroon compared to an upper-middle income country such as South Africa. Entrepreneurship is seen as a career option as high unemployment pushes more people to start their own businesses (Kimbu and Ngoasong, 2016; Stevenson and St-Onge, 2011). This suggest that the local context of Cameroon can be an asset in terms of encouraging necessity-driven entrepreneurship. Push factors dominated the list of reasons for starting a business, such as not being able to find a wage earning or salaried job (Fox and Sohnesen, 2013).

Most start-up businesses operate in the informal sector (Ngoasong and Kimbu, 2016). In fact, 32.8 percent of Cameroon’s GNP in 2002 was generated by the informal sector and

the country was ranked 5th out of 23 African countries for which data was available (Schneider, 2002, p. 6). Thus, the institutional context can be a liability, where start-up entrepreneurs either lack the entrepreneurial competencies and/or resources needed to transition into the formal sector to grow their businesses (Kasabov, 2015; Stevenson and St-Onge, 2011). Cameroon also suffers from a shortage of ICT trainers, power outages that affects the effective functioning of equipment (Ndongfack, 2007), poor infrastructure for logistics, transport and local distribution (Porter, 2014). All of these are seen as context-specific factors that increase costs to digital entrepreneurs (Hinson and Adjasi, 2009).

“Insert Table 2 Here”

In terms of technology context, dial-up services at local call rates were only available in the two biggest cities (Yaoundé and Douala) in the 1990s and slowly diffused through a growing mobile and internet network to other parts of the country (Hinson and Adjasi, 2009; Gathege and Moraa, 2013). Through a series of legislation, imported computers and associated accessories for educational purposes became duty-free from 2001 (Josué, 2007) with a target set at 80 percent for equipping all schools with basic ICT infrastructure (Ndongfack, 2007). Table 3 compares Cameroon’s performance with the highest (Mauritius and South Africa) and lowest (Chad) ranked African countries on the Network Readiness Index, a measure of a country’s leveraging of ICTs to boost competitiveness and well-being. Cameroon’s rank of 126 out of 143 is among the worst world-wide. The Global Innovation Index, which measures the level of innovation of a country also ranks Cameroon very low (WEF, 2015). Table 3 also reveals that although the progress in the use of ICT is low, it has been on a continuous rise. Mobile text messages are being used by health agencies to establish hospital-patient communication channels (Mbuagbaw *et al.*, 2013). A new generation of digital entrepreneurs is emerging, as seen in technology incubators in Cameroon and across Africa (Gathege and Moraa, 2013; Ngoasong *et al.*, 2015). The next

section presents the qualitative results on Cameroon as a resource-scare environment for understanding context is an asset and a liability for digital entrepreneurship. **“Insert Table 3 Here”**

Context, Entrepreneurial Digital Competencies and Entry Choice

Context can be an asset or a liability and can be evidenced by examining the contextual influences on the entry choices of entrepreneurs in determining what type of digital enterprise to create, when, how and where (Autio *et al.*, 2014). However, entrepreneurial digital competencies (EDCs) are the antecedent to realising such choices. The sixteen entrepreneurs demonstrated varying EDCs. Education, training and prior entrepreneurial experience (Fayolle and Gailly, 2015) affects the entrepreneurs’ interpretation of context as either an asset or a liability (Welter, 2011). The acquisition of EDC, through either a university degree, professional certificate or self-study of computer sciences, information management, and web/mobile development by the main founder or at least one co-founder initiated the process of creating of a digital business. The data revealed that entrepreneurs who successfully created a digital business were actively using their knowledge and skills of ICTs to identify and offer innovative solutions to the problems facing society.

Consider the case of Entrepreneur 2, the co-founder of a mobile application that functions as a travel agency. As a university student who has to travel to a different region of the country for studies, he knew that a major societal problem is the unreliable itinerary of local travel companies, which caused avoidable travel delays. While this ‘lived experience’ represents an entrepreneurial competency (Manolova *et al.*, 2007), it did not enable the entrepreneur to make a decision about whether the lack of an itinerary represents an entrepreneurial opportunity waiting to be discovered (Garud *et al.*, 2014). In the final year of studies towards a BSc in Computer Science and in discussion with a friend who later became

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3 a co-founder (BSc Marketing), Entrepreneur 2 was able to sport the entrepreneurial
4 opportunity through a combination of ICT and the marketing competencies of the co-
5 founders that ultimately led the creation of a digital business. The entrepreneur described the
6 digital business as follows:
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11 My co-founder and I developed an online platform that can connect users to bus
12 companies' travel itineraries. But then we realized that there were two categories of
13 clients that we could target, the users or travellers and the bus companies or travel
14 providers. Rather than simply connecting users to bus companies, we re-developed
15 the digital platform such that the bus companies now use it to sell tickets to
16 travellers. [Entrepreneur 2]
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27 All the entrepreneurs who had formal ICT education spoke along a similar line to
28 Entrepreneur 2. They can be said to have created an entrepreneurial opportunity (Garud *et al.*,
29 2014), and the local context can be seen as an asset because of the existence of a market
30 opportunity for creating a digital travel agency. Crucially, EDCs can be said to have mediated
31 the entrepreneurs' interpretation of the entrepreneurial opportunity and the choice of digital
32 enterprise created. However, Entrepreneur 2 explained that their start-up phase was
33 challenging because of limited access to financing, which led them "to rely on student interns
34 with knowledge of IT and market research, hired ad-hoc on either low-pay or as volunteers to
35 physically collect and input the travel data of local bus companies onto the digital platform".
36 Here EDCs is used to overcome challenges associated with context as a liability (lack of
37 access to operating capital for hiring employees) (Welter, 2011).
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52 Another typical case is Entrepreneur 6, the founder of an online tourism agency. The
53 entrepreneur explained that "growing up in a region that has geographic features such as
54 lakes, caves and mountains", many tourists are visible in the region. When completing a
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professional diploma in software development and information management, Entrepreneur 6 began to trial a web platform for connecting foreign visitors to local tourism agencies and tour operators. The following quotation vividly captures his start-up choice of a digital business:

I collect and upload the profile of local tourism agencies and their packages, tourist attractions and their tour guides in order of experience on my app. The information is not available online so I have to physically travel to the tourist destination for data collection. When a tourist signs up they are able to see this information. The tourist pays the full cost of the package to me and I then pay the local agency after deducting my commission. Basically I sell the tour packages of local agencies online.

[Entrepreneur 6]

The cases of Entrepreneurs 2 and 6 illustrate the importance of formal education and lived experiences as entrepreneurial competencies (Manolova, 2007). Those entrepreneurs without formal ICT education explained how being passionate and having a strong desire about new technologies, let them to self-study ICT to gain the digital competencies necessary to develop their digital businesses. For them, entrepreneurial competencies, developed through learning-by-doing or general business education (Manolova *et al.*, 2007; Marvel, 2011) are equally important and complementary to ICT competencies. Consider Entrepreneur 4, the owner-manager of a small media business. Despite completing a BSc in Journalism and Mass Communication, becoming an entrepreneur was always his childhood dream, especially in a society where well-paid journalism jobs are hard to find. As captured in the quote below, Entrepreneur 4 is an example of necessity-driven entrepreneurship (Stevenson and St-Onge, 2011):

After graduation there were just no jobs. My dad bought me this machine [pointing to a desk top computer] which is eight years old now. I sat with my computer and started learning and developing my business. I refer to it as a media business. We help institutions to communicate online, on print, brochures, fliers because we do design fliers, brochures, letterheads and business cards. Basically we use ICT as a vehicle to do our business. [Entrepreneur 4].

Other cases of entrepreneurs who created digital businesses but who did not have any formal ICT education include Entrepreneur 14, whose self-study of ICTs provided the basic ICT tools for integrating context-specific opportunities, challenges and risks associated with digital entrepreneurship. All the digital entrepreneurs studied are said to have undertaken entrepreneurial innovations because they created new digital businesses in a context where none existed; however, once this entry choice is realised the entrepreneurs are faced with what Autio *et al.*, (2014) call post-entry decisions, which are also affected by context. This is explored in the next sub-section.

Entrepreneurial Digital Competencies and Post-Entry Strategic Decisions

Once a new venture has been launched, other sets of contextual factors which may be in the same institutional, local and technology context categories become more important in shaping the post-entry decisions of entrepreneurs (Autio *et al.*, 2014). To succeed, newly created digital businesses have to build a critical mass of online customers (Oestreicher-Singer and Zalmanson, 2013). As discussed earlier, this is a major challenge in Cameroon due limited access to the internet, low levels of digitalization and low internet penetration rate. The entrepreneurs confirmed this challenge in terms of a lack of basic information needed to build such a critical mass. Many relied on referrals and whatever limited online social networking

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3 sites that were available to access information about customers and suppliers. Entrepreneurs 2
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5 and 4 presented in the preceding sub-section already alluded to how entrepreneurs have to
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7 physically travel to different parts of the country to collect data and conduct the market
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9 research needed to develop a customer-base. Their views reflect the quotation below by
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11 Entrepreneur 12, whose business includes online advertising services for small and medium-
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13 sized enterprises:
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16 Sending emails to potential clients or making phone calls is too expensive and time
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18 consuming. The internet lines do not always work. I have tried alternatives such as
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20 newsletter, flyers, and direct visits. Some of my clients are small businesses that can
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22 use my platform to advertise their businesses, yet many are not used to paying and
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24 advertising online. [Entrepreneur 12].
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30 The above quotation suggests that although the technology context of Cameroon can be
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32 an asset in terms of opportunities for creating digital businesses, growing a digital business
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34 remains constrained by a lack of access to market information, low internet penetration rates
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36 and willingness to pay. Here context can be seen as liability (Welter, 2011) because of the
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38 high search cost (Hinson and Adjasi, 2009). The technology context (poor network readiness)
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40 and local context (low internet use due to high costs) can be attributed to the challenging
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42 institutional context (government has been slow to develop affordable ICT infrastructure
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44 necessary to increase network readiness). However, while this represents a challenge for
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46 Entrepreneur 12, other entrepreneurs described it as a market opportunity for creating digital
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48 businesses, such as online search engines and classifications (Javalgi *et al.*, 2012).
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52 Entrepreneur 3 (online classification of travel agencies, local businesses, housing
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54 search engine) and Entrepreneur 13 (online classification and information access to all
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56 national exams at primary, secondary and high schools) are typical examples. For these
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entrepreneurs the specific needs of the target market (Hair *et al.*, 2012) and the ICT competencies (Ashurst *et al.*, 2012) needed to access and grow their market share are seen as critical post-entry decisions once their business has been launched. Entrepreneur 3 explained that “we’ve tried to create an alternative to the problem of internet, where the person without the internet on a 2G phone can still use the service through SMS, even though not as good as the person with the internet service”.

In terms of local context, such as neighbourhood, communities, networks and sub-national characteristics of a country (Welter, 2011; Zahra *et al.*, 2014), the views of the entrepreneurs suggest that the more a digital business relies on ICTs to manage the entire value chain of its activities, the more likely it is that its post-entry decisions will yield successful outcomes. For example, Entrepreneur 3 and 13 are wholly dependent on ICTs. This does not mean that they do not face local context challenges relating to geography (e.g. the travel costs involved in searching and access market information). However, to illustrate how geographic and sub-national dimensions of context affect post-entry decisions, the way entrepreneurs use EDCs to respond to transport and logistics challenges that increase the complexity of the value chain activities of their digital businesses was examined (e.g. Cho *et al.*, 2008). Entrepreneurs 4, 5 and 16 are typical cases. Consider the quote below from Entrepreneur 4:

We focus on IT because our start-up capital was very small. We create and sell designs and our clients go and print elsewhere. If we had the capital requirements, we could invest in printing and our clients will be more committed to us. We have clients who print between 1000 and 5000 flyers for publicity, but we do the design and give them the soft copy. [Entrepreneur 4].

The above quotation relates to a lack of capital, part of which is caused by limited access to affordable venture financing (Ngoasong *et al.*, 2015). Handling the entire value chain from design to printing and delivery to the customer would cause Entrepreneur 4 to incur additional expenses, such as large printing equipment, larger physical space and delivery of printed material to clients that is beyond the affordability of a necessity entrepreneur. Other entrepreneurs rely on large telecom companies for SMS provisions because of a lack of financial and technical resources to build their own mobile platforms (Entrepreneur 2, 5 and 16).

Entrepreneurs 5, 6, 12 and 16 have to deal with the additional challenges associated with poorly developed logistics and local distribution channels, which constrain the delivery of market offering to end customers (Cho *et al.*, 2008). For these four entrepreneurs, physical products have to be transported and delivered to final consumers. They provide useful cases for illustrating not only the significance of EDCs in helping entrepreneurs deal with logistics and transportation challenges, but also how a realistic understanding of practical transportation and logistical issues (integrating the virtual and the physical) increase the likelihood of successfully creating a digital business. The initial business strategy of Entrepreneur 5 was unsuccessful due to a focus on ICT competencies and an apparent neglect of entrepreneurial competencies relating to product distribution to end users (Cho *et al.*, 2008). On the other hand, by combining both sets of competencies, Entrepreneur 16 was able to design logistics and delivery challenges into its strategy from the onset. The views, as expressed below, suggest that those entrepreneurs who are able to deploy EDCs are more likely to develop innovative digital businesses.

We created a digital platform that facilitated information exchange but failed to actually make sales or trades happen – goods and money did not change hands. A physical player was needed that will facilitate logistics and direct deliveries. We also

opened warehouses where farmers take food to and shops where consumers come to pay and collect their foodstuff. [Entrepreneur 5].

80 percent of local retailers we surveyed were interested in buying in group with others to reduce the unit price and especially because it will reduce their logistics cost. So our first target is on B2B wholesale buyers. Foreign sellers ship products directly to our local buyers or use one of our recommended logistic providers. [Entrepreneur 16]

A typical comparison can be made here between Entrepreneur 5 and 16. While Entrepreneur 16 outsources transport and local delivery to third party providers, “Entrepreneur 5 manages logistics in-house. The businesses contracts individuals who own vehicles to transport products to own shops and warehouses. Most neither adhere to time nor possess insurance which is very critical. Entrepreneur 5 therefore faces serious additional challenges, such as high costs, long delays and insurance issues which are well documented as barriers to business performance in African (Okolo and Obidigbo, 2014; Porter, 2014). Entrepreneur 16 avoids these through an innovative alternative solution, which involves creating a digital platform accessible online and offline. EDCs played a role in creating an infrastructure for managing commercial interactions between customers, suppliers and logistics service providers. The decision-making process of both entrepreneurs represent domain-specific entrepreneurial competencies (Manolova *et al.*, 2007) while the creation of an integrated business system by Entrepreneur 16 can be seen as using EDCs to respond to local context challenges in the operating environment.

Discussion

The theoretical framework developed and critically explored in this paper reveals how context as the antecedent to EDCs leads to digital entrepreneurship, with empirical cases developed in Cameroon. A resource-scarce context negatively impacts entrepreneurship because existing and potential entrepreneurs lack access to resources (e.g. finance and human resources) and the support of the government (e.g. poorly developed infrastructure and legislation governing new businesses) for production, exchange and consumption (Bradley *et al.*, 2012; Linna, 2013). The findings reveal how the negative impact of resource-scarcity on digital entrepreneurship can be overcome depending on the EDCs of digital entrepreneurs. For example, given the poorly developed rural-urban physical infrastructure, which constraints product distribution, those entrepreneurs with ICT competencies (e.g. use of internet technology) can overcome this logistic challenge by connecting buyers and sellers online, for example through digital businesses that trade in online sales of food crops and e-travel tickets). Thus, the skills required to pursue digital entrepreneurship in a resource-scarce environment go beyond a narrow focus on entrepreneurial competencies (Mitchelmore and Rowley, 2013) and knowledge of the resource constraints in Africa (Kyobe, 2004; Okolo and Obidigbo, 2014). It includes digital competencies such as knowledge about the use of digital applications (mobile and web, online search engines, and software development) to create and capture payments from sales of products and services (Beck *et al.*, 2012; Bianchi *et al.*, 2017; Ashurst *et al.*, 2012).

This is what makes EDCs, the combination of entrepreneurial and digital competencies, critical for understanding how context influences digital entrepreneurship. Whatever orientations, intentions and motivations entrepreneurs have about what type of digital business to start, maintain and grow in an African country, the combination of formal education, self-study and on-the-job experiences (Caskey and Subirana, 2007; Manolova *et al.*, 2007) are sources of EDCs that they use to realise their entry and post-entry decisions

(Autio *et al.*, 2014). For the digital entrepreneurs studied, sole founders either had a formal ICT-related education or self-studied basic computer programming, which provided ICT skills to pursue digital entrepreneurship. For co-founders, at least one had an ICT-related educational background (e.g. Chief Technical Officer) and the other had formal management education even if these were not tailored to entrepreneurship.

The focus on how dimensions of context influence digital entrepreneurship is also reflected on the extent to which ICT acts as the trigger and enabler for entrepreneurial activities and the infrastructure that supports business transactions (Javalgi *et al.*, 2012; Lusch and Nambisan, 2015). The EDCs of digital entrepreneurs enables them to interpret context either as an asset or a liability and therefore, the type of digital enterprise they create. The findings support extant research by Bianchi *et al.*, (2017), which argues that resources and ICT capabilities are equally important for enabling small businesses to pursue new opportunities in dynamic contexts. Given the growing trend in digitisation and internet penetration in Africa (Gathege and Moraa, 2013; Ngoasong *et al.*, 2015), competencies in ICT and digitalisation is fast becoming as important as those in entrepreneurship.

The ways in which the dimensions of context act as antecedents of EDCs leading to digital entrepreneurship is evident in the start-up and post-entry decisions of digital entrepreneurs. For example, the lack of access to information about basic services is often described as a failure of formal (state) institutions in developing countries with negative impacts on small businesses (Mair *et al.*, 2012; Bradley *et al.*, 2012). Here the institutional context is a liability. However, Entrepreneurs 2, 3 and 10 see this as entrepreneurial opportunity for creating digital businesses that provide access to transport, housing, educational materials and exams, and local business directories respectively. The combination of entrepreneurial competencies (e.g. how to develop a commercially viable venture (Hair *et al.*, 2012; Manolova *et al.*, 2007) and ICT competencies (how to create a

digital platform) (Ashurst *et al.*, 2012) are EDCs that enable entrepreneurs to pursue such opportunities. In the specific case of Cameroon, inadequate ICT and physical infrastructures needed to create and sustain digital businesses remain major challenges. This is especially crucial for digital businesses that are unable to manage their entire value chain of activities using ICTs (Cho *et al.*, 2008; Hair *et al.*, 2012; Javalgi *et al.*, 2012). This makes both the local and technology context liabilities in terms of high costs of handling logistics and distribution (Entrepreneurs 5 and 16). Thus, although both entrepreneurs developed e-commerce platforms, their newness and small sizes means they face similar challenges to all types of small businesses seeking to secure buy-in from established third party logistics providers (Cho *et al.*, 2008). The implications of these findings are summarised in the conclusion below.

Conclusion

This study offers at least two contributions to the study of entrepreneurial behaviour and small business practice in resource-scarce contexts such as those in Africa. First, a theoretical framework is developed and critically explored for analysing context as the antecedent to EDCs leading to digital entrepreneurship, using qualitative cases developed in Cameroon. Second, this paper complements existing research on the role of context in entrepreneurship by providing empirical evidence of three dimensions of context, namely institutional, technology and local contexts as an asset (facilitator or enabler of entrepreneurial activities) and as liability (challenges to and/or constraints the successful pursuit of entrepreneurial activities) (Autio *et al.*, 2014; Welter, 2011).

The paper therefore extends existing research on the influence of information and communication technologies (ICTs) on entrepreneurship in Africa, which has so far focused on the adoption and strategic use of ICTs by small businesses to reduce costs and improve

performance (Ghobakhloo and Tang, 2013; Kyobe, 2004; Okolo and Obidigbo, 2014). By focusing on three dimensions of context, namely institutional, technology and local contexts the paper also extends entrepreneurship research on the role of context in entrepreneurship (Autio *et al.*, 2014; Welter, 2011; Zara *et al.*, 2009) to the increasingly important domain of digital entrepreneurship by uncovering how digital entrepreneurs respond to context as an asset (opportunities) versus context as a liability (challenges) (e.g. Welter, 2011; Marvel, 2011).

Based on the findings, two important policy implications emerged for encouraging digital entrepreneurship, focusing on context as opportunity versus liability. First, government investment on ICT infrastructure development. This is evidenced by mPesa in Kenya, which has revolutionised digital banking, increased access to broadband internet and thereby enabled the technology context to serve as opportunity, enabling digital business to access online banking (Beck *et al.*, 2009). Similar government policy intervention increased the number of internet-enabled SMEs in India due to increased penetration and adoption of ICTs and the internet (Javalgi *et al.*, 2012). The lessons from these two countries, if adapted to Cameroon can strengthen the institutional-technology-local context linkages and resulting in a reduction in the search costs and increased market outreach in regions where logistics and transportation challenges constrain physical market access and where online platforms can facilitate business activities.

Second, the findings suggest that specialized training can help entrepreneurs to develop EDCs needed to respond to local contextual challenges. Direct funding and technical assistance, both public and private, is needed to upgrade existing ICT incubators and IT clusters, such as Activespaces (Gathege and Moraa, 2013). Evidence from other countries show that incubators provide specialized in-house ICT and entrepreneurship training, mentorship, and access to venture capital (Ngoasong *et al.*, 2015; Voisey *et al.*, 2006).

Similarly, IT clusters promote human capital and entrepreneurial alertness while increasing access to technology alliances and networks for business development (Kasabov, 2015), accessing customers and third party logistics providers (Cho *et al.*, 2008; Porter 2014). This would ensure that the technology context serves more as asset than liability.

Finally, this paper opens up three possibilities for researching the role of EDCs for digital entrepreneurship in resource-constrained settings in Africa. First, by focusing on the entrepreneur as owner-manager (Beckman *et al.*, 2012; Ghobakhloo and Tang, 2013), the results provide rich evidence of the context of digital entrepreneurship in Cameroon. Future research can focus on industry and/or organizational contexts to uncover the intra-organisational and inter-organizational dynamics within digital businesses and with key stakeholders (Welter, 2011). For example, the servers hosting the internet/digital platforms of all the digital businesses studied are based in Europe and North America. In-depth studies into the IT support and potentially knowledge exchange between western servers/domain providers and digital entrepreneurs studied can reveal opportunities for developing EDCs required by digital entrepreneurs and thereby enhance their decision-making. Second, repeating the current study with a nonprobability sample or applying the proposed framework to a probabilistic sample in Cameroon or other resource-scarce environment can strengthen the credibility of the findings beyond the participants and cases studied. Third, quantitative research can help clarify the “fit” between context as asset versus context as liability (Welter, 2011) for digital entrepreneurs in Africa. This could build on existing quantitative studies (e.g. Bianchi *et al.*, 2017; Peña *et al.*, 2011) to measure the direct linkages between specific dimensions of EDCs linked to different digital business outcomes or performance.

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Table 2. Entrepreneurial activity in Cameroon (%)

	Cameroon	South Africa
Total early-stage entrepreneurial activity: nascent entrepreneurs or owner-managers of new businesses	37	7
Established business ownership (more than 42 months)	11.5	2.7
Perceived opportunities: entrepreneurs see good opportunities to start a firm in the area where they live	69	37
Perceived capabilities: entrepreneurs who believe they have the required skills and knowledge to start a business	74	38
Latent entrepreneurs intending to start a business within three years	56	10
Individuals who indicate that fear of failure would prevent them from setting up a business	23	25

Source: Global Entrepreneurship Monitor 2014 data <<http://www.gemconsortium.org/country-profile/>> (Accessed: 21 August 2016)

Table 3. Network Readiness Index 2015^a and Progress in the Use of ICT^b

	Cameroon		Mauritius		Chad		South Africa	
Network readiness	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>	<i>Rank</i>	<i>Score</i>
Overall	126	3	45	4.5	143	2.3	75	4
Environment	115	3.5	33	4.1	142	2.5	31	4.8
Readiness	136	2.4	43	5.3	138	2.4	102	4
Usage	116	2.4	53	4.1	142	2.1	67	3.9
Impact	110	3.1	61	3.8	140	2.1	92	3.4
Global innovation index (rank on 0-100)	110	27.80	49	39.23	N/A	N/A	60	37.45
Progress in the use of ICTs in Cameroon								
					2000	2005	2010	2015
Percentage of Individuals using the internet					0.25	1.4	4.3	20.16
Fixed-broadband subscriptions per 100 inhabitants					N/A	0.00	0.03	0.07
Fixed-telephone subscriptions per 100 inhabitants					0.6	0.55	2.62	4.51
Mobile-cellular telephone subscriptions per 100 inhabitants					0.65	12.42	41.88	71.85

Source: ^aWorld Economic Forum <<https://widgets.weforum.org/gitr2015/>>; ^bInternational Telecommunication Union <<http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>> (both sources accessed: 21 August 2016)

Table 1. Demographics of Digital Businesses Studied

Case Study	Legal Status	Digital business ^a	Number of staff ^b	Start-up capital (US\$) ^c		No. of Years	Education & Training
				size	Source		
1	Informal	“online chatroom for people to discuss about what they are watching on TV”	6	7000	Own funds, Venture Prize	3	High School
2	CIG	“digital platform that connect users to travel providers’ itineraries and allows providers to sell tickets to users”	5	7500	Own funds, venture capital	2	BSc
3	Ltd Company	“online urban guide providing information about local businesses and house search on web, mobile apps, and SMS”	6	5000	Own funds	3	BSc
4	Informal	“multi-media business”	5	9500	Self-funded	8	Self-study
5	Co-operative	“digital platform that connects food-stuff farmers to consumers via web, mobile app and SMS ... and e-commerce platform”	6	14500	Grant, Venture Prize, Own funds	4	BSc
6	CIG	“web platform that links international tourists to local tourism agencies and tour guides in Cameroon”	5	1500	Self-funded	0.5	Diploma
7	CIG	“a web and mobile app chatroom for people to discuss about what they are watching on TV”	3	1350	Self-funded	0.9	Self-study
8	Ltd company	“Security systems, networking systems, telecommunication systems and other ICT-related services”	8	20000	Self-funded	8	BSc
9	CIG	“e-payment and e-commerce platform accessed via web and mobile app”	2	11000	Own funds and Crowdfund	2	BSc
10	CIG	“cyber café, internet services and ICT training”	9	17000	Own funds and Grant	4	Self-study
11	Ltd Company	“cyber café, phone booth, computer maintenance, print and multi-media services”	8	10500	Family investment	6	MSc
12	Ltd Company	“Cyber café, website development, ICT consultancy”	4	15000	Own funds	8	BSc
13	CIG	“website of information services about national exams”	2	2300	Own funds	0.5	BSc
14	Consulting contracts	“buy-sell mobile phone airtime from large telecom providers to call boxes”	1	1000	Self-funded	4	High School
15	Ltd Company	“design website, develop mobile apps and provide IT systems support”	10	12000	Own and family funds	6	HND
16	CIG	“digital market where people can make group purchases even without access to the internet”	8	25000	Own funds and VC	2	BSc

^a As described by interviewees; ^b Includes founder and part-time staff; ^c Exchange Rate: \$US 1: 578 CFA Francs rounded-off to nearest hundred.

Figure 1. Relationship between context and digital entrepreneurship

Figure 2. The mediating role of entrepreneurial digital competencies