Challenges of Digital Entrepreneurship on Development of Africa

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Abstract. There is no doubt about the fact that the globe is turning toward digitalization in all aspects of activities and businesses, which affects the development of countries. The recent thriving in technological development and advancement has opened various opportunities for entrepreneurs, thereby making digital entrepreneurship become a contemporary topic. Since majority of the countries in Africa are still developing, digital entrepreneurship should be seen as an essential tool towards positive economic development. However, it is easier said than done. Hence, this paper aims to explore the challenges of digital entrepreneurs in Africa and how these challenges affect its development. The top three biggest economies in Africa were selected (Nigeria, Egypt, and South Africa) using data between 1992 to 2021 (30 years). Gross Domestic Product was used to measure the development, while the explanatory variables were measured using patent application, trademark application, secured internet access, mobile subscription, and access to electricity. The data were analyzed using regression analysis by EViews, and the findings show a significant relationship between the development of a country and technology. This implies that the inadequate technological facility in African countries hinders the development of digital entrepreneurship and hence affects development .

Keywords: Digital Entrepreneurship · Development · Technology · Africa

1 Introduction

Entrepreneurship is among the crucial pillars for growth and development of a country. Entrepreneurs bring about employment opportunities and development to a country. The advancement of digitalization brings significant changes in the business ecosystem across the globe [1], and helps businesses to develop beyond their internal market [2]. Digital entrepreneurship is regarded as a basis for generating jobs, innovation and economic growth by many countries [3]. Hence digital entrepreneurship is fundamental part of any economy which is more of a national asset because of the enormous contribution they make.

The increase in technological innovations has completely changed the way and manner entrepreneurs handle their business for about a decade. However, the COVID 19

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global pandemic has completely changed the mindset and procedures of doing business across the globe, with digital entrepreneurship rising drastically. The world has become digitalized with the use of Artificial Intelligence making the production of goods easier and providing services faster. With Apple, Microsoft, Google, Amazon, Meta Platforms and TSMC among the top ten companies across the globe, this indicate that about 70% of the top ten companies are involved in technological and/or digital products and services. As digitalization takes over most sectors, from agriculture, finance, manufacturing, transportation, marketing, security, e-commerce, etc. more industries are shifting entirely to digital platforms.

Digital entrepreneurship is a marvel that resulted from technology using the information and communication technology and the internet [4]. The world is witnessing a continuous and radical innovations by entrepreneurs leveraging on the power of technology to provide newly developed goods and services via a variety of channels with ease. The use of technology influences businesses by introducing new range of options with considerable business values, the digital economy can therefore, lower the cost for new businesses [3]. Digital technologies are redesigning and restructuring business as well as the economy by creating more jobs and accessibility of more products across the globe.

Africa has a population of about 1.5 billion, have 520 million digital buyers anticipated by 2025, up from an estimated 281 million in 2020 (Statista, 2022). Nevertheless, the current number of active users on Africa's largest e-commerce site is seven million, demonstrating the vast market gap that remains on the continent. In spite of the enormously energy resources available in Africa, only 43 percent the total population of Sub-Saharan Africa has access to electricity [5]. Only 22 percent of Africans have access to the internet, which could be attributed to high cost of internet in the region. This and several other reasons affect digital entrepreneurship in the region.

This paper argues that with the trend in technological advancement, the development lies in digital enterprises. Therefore, the paper aims to discuss some of these challenges that hinder digital entrepreneurship and how these challenges affect development in Africa. To this effect, the following important questions pertaining to research are addressed:

RQ1: How does digital entrepreneurship affect development in Africa?

By concentrating on the research questions above, the paper will contribute to the existing literature on the challenges of digital entrepreneurship. Africa is relevant because of the huge opportunities available in the continent for digitalization which is hindered by some technological challenges. Which, if curtailed, will bring about great growth and development. The next section presents the literature review, after that comes the methodology of the research, next the data analysis and discussion, and finally the conclusion.

2 Literature Review

2.1 Meaning of Digital Entrepreneurship

Entrepreneurship is defined by Hsieh & Wu, (2018) as a designing procedure and launching a new business [6]. However, entrepreneurship by most authors is not about starting a

new business but about creating more value to a product or service [7]. Hull et al. (2007) defined digital entrepreneurship as digitalization of traditional physical products. To Le Dinh et al. (2018) digital entrepreneurship means the combination of the conventional entrepreneurship combined with the new innovative way of using technology in businesses [4]. More so, it means an innovative way of monetizing busing opportunities by being radical and taking risk [8]. It is also the the spotting and pursuit of business opportunities based on the production of digital artifacts, platforms, and infrastructures that, when applied, enable the delivery of services by means of technological means[9] and a powerful tool for local innovation and economic revolution [10].

Sussan & Acs (2017) views digital entrepreneurship as Kirznarian entrepreneurship (entrepreneurship of discovering new profit opportunities) that works within the borders of already existing platforms [11]. Meaning they may not be digital in themselves but are engaging in activities that require participation via digital means, for example Airbnb and Uber. In addition, Davidson and Vaast (2010) defined digital entrepreneurship as the pursuit for opportunities through digital media and other information and communication technologies available [12]. Digital entrepreneurship is transforming existing businesses and creating new ideas by developing novel digital technologies (European Commission, 2015).

Therefore, digital entrepreneurship is defined in this paper as a subsection of entrepreneurship that involves the transformation of physical products to digital products using technology and Artificial Intelligence.

2.2 Challenges of Digital Entrepreneurship in Africa

It has been linked with a high risk of failure, despite the fact that there are many great opportunities in digital entrepreneurship due to radical change in technology especially in the developing countries [13]. Inadequate technological development and innovation in Africa is mostly attributed to weak institutions and inadequate resources (Acemoglu, 2010; Sachs, 2010) and affordability [14]. Therefore, the absence of the appropriate structure makes it difficult for entrepreneurs to scale through. Institutional voids are prevalent in developing countries [15]. Institutional void is the absence of intermediaries that connect buyers and sellers efficiently, which create a unnerving difficulties for companies making effort to operate in an emerging markets.

Institutional voids are categorised into internal and external institutional void. The internal institutional void includes depends on how well someone uses ICT, how well they comprehend technology, how well they can afford to use it, and how they feel and perceive technology.in addition, the external institutional voids includes government regulations, market Challenges, weak digital infrastructures like internet, level of trust in society, inadequate support for e-industries [16, 13]. The findings of Samara and Terzian indicate that weak digital infrastructures affect digital entrepreneurship which is results to lack of policies and regulations and inaccessibility of start-up funds.

Hair et al., (2012) studied the advantages and challenges of the digital entrepreneur by examining the role of digitalized community and how successful digital entrepreneurs benefit from electronic community technologies to simplify effective communication with the related stakeholders [17]. Ngoasong (2017 explored how context and technological background influences digital entrepreneurship in a resources scarce country of

Cameroun [18]. The results indicated ways entrepreneurial digital competencies (EDC) shape entry of digital entrepreneurial start up, and their strategic decisions on context specific opportunities and challenges.

Kraus et al. (2018) conducted a systematic literature review to collect related up-to-date literature on digital entrepreneurship and also to provide the latest topics and methods discussed in the related literature [19]. The study mapped areas for opportunities for further research for academics currently at work in that area. The areas highlighted include digital entrepreneurship process, social digital entrepreneurship, digital business models Entrepreneurship education, digital ecosystem and platform strategies.

3 Research Methodology

3.1 Data

Digital entrepreneurship is not new on the African continent. However, being the second largest continent by population after Asia, with none of the countries being on top in terms of technological advancement, shows the vast opportunity available. This paper selected the top three biggest economy (in terms of GDP) in Africa, which include Nigeria, followed by Egypt then South Africa. One of the effective measures of economy of a country is gross domestic products (GDP) which gives a snapshot of a country's economic size and growth rate [20].

Nigeria is the most populous country in Africa with about 211 million people with huge market and possibilities for technology. Egypt is the second largest economy and termed the most prosperous country on the continent with population of about 104 million. South Africa is the third largest economy with a population of about 58 million. The data for each of the variables for the selected countries were from world bank database.

3.2 Research Design

The study used annual data of the selected countries form world bank database, covering 30 years (from 1992 to 2021). The study adopted a correlational research design due to the nature of the data used, using qualitative data. Furthermore, regression analysis is the tool for data analysis used in this paper. The study used annual data of the selected countries form world bank database, covering 30 years (from 1992 to 2021).

The dependent variable in the regression model of the study is development, which is represented by the gross domestic product (GDP) of Nigeria, Egypt and South Africa. GDP is widely accepted as a measure of economic growth, which indicates that a higher GDP implies high economic growth.

Digital entrepreneurship is the independent variable, which is represented by patent application, trademark application, secure internet servers, mobile cellular subscription, and access to electricity. The combination of these variables has not been used by any study to represent digital finance. However, inflation (INF) control variable was used in order to prevent causality of these variables which might lead to misleading conclusion.

Furthermore, linear regression analysis model is used for the study, which is clearly defined the model below:

$$\text{GDP} = f(\text{PA},\ \text{TA},\ \text{SI},\ \text{MS},\ \text{AE},\ \text{INF}) \tag{1}$$

The function form of the model is presented as follows:

$$\text{Y} = \beta 0 + \beta_{\text{PA}}\text{PAt} + \beta_{\text{TA}}\text{TA}_{\text{t}} + \beta_{\text{SI}}\text{SI}_{\text{t}} + \beta_{\text{MS}}\text{MS}_{\text{t}}\,\beta_{\text{AE}}\text{AE}_{\text{t}} + \beta_{\text{INF}}\text{INF}_{\text{t}}\mu_{\text{t}} \tag{2}$$

where; GDP = Gross Domestic Product, PA = Patent Application, TA = Trademark Application, SI = Secured Internet Servers, MS = Mobile Cellular Subscription, AE = Access to Electricity, and INF = Inflation.

3.3 Data Collection Method

Due to the nature of this research, the secondary data was employed to access the challenges of digital entrepreneurship and development of Africa. The data were generated from world bank database from year 1992 to 2021.

3.4 Data Analysis

To evaluate the interaction between digital entrepreneurship and the development of Africa, the study uses the co-integration approach. This technique is justified because time series data frequently have a unit root, which can lead to spurious regression [21]. Furthermore integrating time series data at I(1), also known as order one, indicates that the data is non-stationary and therefore at I(0). There are various methods of co-integration techniques available. Nevertheless, In this study, the autoregression distributive lag (ARDL) techniques were utilized to estimate the degree to which the variables were co-integrated with one another. ARDL technique overcomes the weakness present in other tests of co-integration. Narayan (2004) ARDL technique overcomes the challenges associated with autocorrelations and variables omissions, and all the variables in the model are assumed to be vector or endogenous variables [21]. The ARDL model consisting of the digital entrepreneurship and African development from the model are presented below:

$$\begin{aligned}\Delta \ln(GDP)_t = {} & a_0 + \lambda_1 \ln(\text{PA})_{\text{t}-1} + \lambda_2 \ln(\text{TA})_{\text{t}-1} + \lambda_3 \ln(\text{SI})_{\text{t}-1} + \lambda_4 \ln(\text{Ms})_{\text{t}-1} \\ & + \lambda_5 \ln(\text{AE})_{\text{t}-1} + \lambda_6 \ln(\text{INF}) + \lambda \ln(\text{PA})_{\text{t}-1} + \sum\nolimits_{1=0}^{P} \beta_1 \Delta \ln(PA)_{t-1} \\ & + \sum\nolimits_{i-0}^{P} \beta_2 \Delta \ln(TA)_{t-1} + \sum\nolimits_{i-0}^{P} \beta_3 \Delta \ln(SI)_{t-1} + \sum\nolimits_{i-0}^{P} \beta_4 \Delta \ln(MS)_{t-1} \\ & + \sum\nolimits_{i-0}^{P} \beta_5 \Delta \ln(AE)_{t-1} + \sum\nolimits_{i-0}^{P} \beta_6 \Delta \ln(INF)_{t-1+} + \varepsilon 1\end{aligned} \tag{3}$$

where lag length of the model is denoted by ln, the first difference operator by Δ, α as the intercept, while the elasticity or coefficients denoted by $\lambda\beta 1$ to $\lambda\ \beta 6$, and ε_t = the error term. Use the ordinary least square (OLS) approach to check if the variables are co-integrated in the equation estimation before estimating co-integration under ARDL. The combined significance of the variables will then be estimated using F-statistics to determine their long-term relationship with one another.

4 Results and Discussions

4.1 Test of Stationarity (Unit Root) and Co-integration Test

To co-integration the ARDL techniques, there is need to estimate determines whether or not the variables are integrated in the same order. Though, it is worthwhile to test for stationarity, in order to ensure that no variable of order two is merged which may classify the computed F-statistics as invalid.

The unit root test in Table 1 shows that the dependent variable for the three countries is a mixture of stationary at a level and first difference. The result of the mixture justifies the selection of ARDL for co-integration in the study. Furthermore, the bound test. In the ARDL method of co-integration, which is provided in Table 1, a bound test is established in order to determine whether or not there is a relationship in the long run between the variables.

Table 1. Results of Bounds F-Test and Unit Root Test

	Nigeria		Egypt		South Africa	
Level of Significance	Level	First Diff.	Level	First Diff.	Level	First Diff.
1%	-3.68	-3.69	-3.68	-3.69	-3.68	-3.69
5%	-2.97	-2.97	-2.97	-2.97	-2.97	-2.97
10%	-2.62	-2.62	-2.62	-2.62	-2.62	-2.62
Unit Root Test (ADF Test)	0.0878	0.0000	0.1350	0.0002	0.0380	0.0000

Source: EViews

Table 2. Results of ARDL

	Nigeria		Egypt		South Africa	
	Coefficients	t-Statistics	Coefficients	t-Statistics	Coefficients	t-Statistics
GDP (-1)	0.2782***	1.252846	0.581206***	3.066718	0.201329***	0.976456
PA	0.0168**	1.008048	-0.002876**	-1.204611	0.001386**	1.057192
TA	0.0002**	0.313370	0.000633**	3.615514	-0.000273**	-0.782518
AI	-0.7303***	-1.737502	-0.089321**	-1.474341	-0.035784**	-0.718542
MS	6.54E-08***	0.980813	-9.49E-08***	-1.896074	-4.62E-08***	-0.553228
AE	-0.0430**	-0.172849	0.211348***	0.786191	0.067112*	0.694775
INF	-0.0274	-0.624492	0.033136**	0.799079	-0.296305***	-1.891752
C	-14.18389	-0.846245	-17.89160	-0.683365	15.95081	1.784656

Note: *,** and *** represent statistical difference at 10%, 5% and !% respectively.
Source: EViews

Table 2 reveals that digital entrepreneurship factors affect development in Africa, with patent application (PA) positively and significantly affecting development in Nigeria and south Africa, while negatively affecting development in Egypt. With coefficient of 0.0168, 0.5812 and 0.2013 for Nigeria, Egypt and South Africa respectively. This implies that an increase in patent application to buy new start-ups will bring an increase the number of entrepreneur and hence development this affirms the findings of Saini & Jain (2011) [22]. Patent is reflected to be a technological output of innovative activity [23] (Schmookler 1966). Trademark application (TA) positively and significantly affect development in Nigeria and Egypt, while negatively affecting development in South Africa. With coefficient of 0.0002, 0.0006 and 0.0002 for Nigeria, Egypt and South Africa respectively. This implies that an increase in trademark application will increase development in Nigeria and Egypt while decreasing in South Africa. This indicates the importance of trademarks which gives a company the exclusive right to use its products while averting others from using identical products or services. This confirms the study of Benny (2020), whose study affirms the importance of trademark and patent in developing the Indian economy [24].

Furthermore, the result shows a negative effect of access to internet (AI) with development in Africa. With coefficient of -0.7303, -0.089 and -0.0357 for Nigeria, Egypt and South Africa respectively. This means that an increase in internet access reduces development. This finding contradicts the study of Lapatinas (2019), and Sichel (1999) [25]. However, the negative effect in this study could be due to the high cost of internet in most countries in Africa. Additionally, mobile subscription (MS) also shows a negative and significant effect on development of Egypt and South Africa while showing a positive and significant effect in Nigeria. With coefficient of -0.0000, -0.0000 and -0.0000 for Nigeria, Egypt and South Africa respectively. The result indicated this contradict the finding of Kyem & LeMaire (2006) that found a positive relationship between mobile subscription and development [26]. Access to electricity (AE) indicated a positive and significant impact on development in Egypt and South Africa, however the result shows a negative effect on development in Nigeria. With coefficient of -0.0430, 0.2113 and 0.0671 for Nigeria, Egypt and South Africa respectively. Which could be due to lack of access to adequate and affordable electricity. Lastly, inflation (INF) shows a negative

Table 3. Test Statistics

	Nigeria	Egypt	South Africa
R-squared	0.5586	0.721020	0.588339
Adjusted R-squared	0.3821	0.566031	0.359638
S.E. of regression	2.5648	0.985175	1.323122
Sum squared resid	131.56	17.47025	31.51171
F-statistic	3.1640	4.652070	2.572527
Prob(F-statistic)	0.0174	0.002319	0.038970
Durbin-Watson stat	2.1166	1.468715	2.294153

Source: EViews

effect on development in all the three countries. This finding is confirmed by studied of Brinkman & Brinkman [20].

Table 3 shows the test statistics with R-Squared of 0.55, 0.72 and 0.58 for Nigeria, Egypt and South Africa respectively which are higher than 0.05%. This indicate that the model is fit to be used for policy commendations.

5 Conclusion

Entrepreneurship as a country's economic engine cannot be over-emphasized, especially in emerging economies of the African continent. Digital entrepreneurship is regarded as a vital pillar for job creation, innovation and economic growth by many countries. Digital entrepreneurship gives easy access to products and services. This study explores the impact of digital entrepreneurship on development of Africa. The model in this paper suggests that patent application, trademark application, access to internet, mobile subscription and access to electricity significant impact on economic growth. Hence it is recommended for countries to implement policies that can increase access to internet, ease access to patent and trademark application and provide a universal access to clean energy. This study wouldn't be without limitations, as data was only limited to three countries in Africa out of fifty-four countries. However, further research is recommended on digital entrepreneurship in Africa for all countries in Africa for a robust test and result.

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