



Compatibility and Relative Advantage of New Technology on the Performance of Digital Ventures in Nigeria

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Abstract

The purpose of this study is to investigate how compatibility and relative advantage of new technology affect the performance of digital ventures in Nigeria. A descriptive research methodology was adopted, which involved the utilization of a survey. The primary data was obtained by means of a questionnaire that was distributed to 519 content creators in Nigeria. After the numerous assumptions of multiple regression were satisfied, the hypotheses were put to test. According to the findings, there is a significant correlation ($r = 0.702$) between new technology and digital firm performance. Variations in the independent variables, which include compatibility and relative advantage of new technology, are responsible for explaining 61.3 percent of the total variation in digital firm performance. On the other hand, the findings of the study led to the conclusion that compatibility and relative advantage of new technology have a major impact on the performance of digital ventures. Also, content creators ought to conduct an assessment of the efficiency and effectiveness of their performance considering new technologies that are compatible and have relative advantage.

Keywords: New Technology, Technology Compatibility, Relative Advantage, Digital ventures, Digital Firm Performance

1.0 Introduction

The digital economy is becoming an integral part of global economic processes, being the engine of growth and development of companies. With the acceleration of the development of industry 4.0, the world has entered the digital economy era led by a new generation of information and communication technologies (Mottaeva *et al.*, 2023). Due to its impending impacts on various sectors of the economy, such as agriculture, commerce, government, education, health, transportation and many others, digital economy is now seen as one of the important cardinals for growth, development and treasure for countries, as it aids job creation, entrepreneurship development and innovations (Oloyede *et al.*, 2023). The digital economy refers to economic activities carried out through electronic means enabled by information technology (Sazhneva *et al.*, 2019). This encompasses the contribution of digital business to the general economy which has broken down barriers

in the implementation of communications between market participants and ensured the development of the domestic and international economy in the post-epidemic era.

Digital firm performance is a multidimensional construct that encapsulates the effectiveness of digital firms or ventures. It goes beyond the mere adoption of new technologies; rather, it encompasses the entire process from ideation to practical application (Zhao, 2021). The performance of digital ventures is complex, generally measured through various financial and non-financial metrics. Non-financial metrics include market share expansion, market performance, customer acquisition rates, customer satisfaction, and the scalability of business models. Performance of digital ventures, particularly in a developing country like Nigeria, also encompasses social impact, such as job creation, improvement in quality of life, and contribution to economic development (Baig *et al.*, 2022). As a result of the business nature of digital venture, technology adoption is the primary factor influencing the performance of individual digital firms. This is because their operations are entirely dependent on technology. It is presumed that the competitive advantage and performance of digital ventures will improve as they adopt new technology (Martínez-Caro *et al.*, 2020; von *et al.*, 2018; Skare *et al.*, 2023).

When evaluating the adoption of new technologies, individuals frequently consider a variety of factors that are associated with their prior user experience (Aldhaban, 2012). These factors include the technology's usefulness and ease of learning and use, the visual excellence of the applications, and the possibility for pleasure that the technology provides (Al-Rahmi *et al.*, 2019; Paul *et al.*, 2023). Scholars have identified potential areas where the adoption of technology can serve as a catalyst for driving performance (Nambisan, 2017). However, the process goes beyond simply obtaining the most recent technological devices but also entails making a strategic choice that requires thoughtful evaluation of factors such as compatibility and relative advantage. Osei-Bryson and Ko (2021) demonstrated that digital ventures in Nigeria that adopted compatible technologies reported higher performance metrics and these ventures experienced fewer disruptions and were able to leverage existing infrastructures, making the transition to new technologies smoother and more beneficial. Technology compatibility ensures that the technology complements the strategic goals of business, enhancing overall performance. Adegbite and Olaopa (2019) found that digital ventures in Nigeria that recognized substantial relative advantages in new technologies, such as superior features, faster processing, and cost savings, were more likely to adopt these technologies because this adoption, in turn, led to improved performance outcomes, including higher productivity, better customer service, and increased profitability. The clear benefits of new technologies provide a compelling case for their adoption, driving performance enhancements.

1.1 Statement of the Problem

The underestimation of digital ventures compared to traditional professions significantly impacts the performance of digital venture owners who create and sell contents. Digital fields are sometimes thought to be of secondary importance, despite the growing success of companies such as IrokoTV and Andela as compared to fields such as medicine and engineering, which are held in extremely high regard all over the world. This is the reason why digital content creators are unable to achieve full recognition, integration, and

performance inside the mainstream economy. The nature of digital content ventures, where collaborations occur without face-to-face interactions, necessitates high levels of trust. However, Nigeria's challenges with fraudulent activities in the digital domain have led to a generalized mistrust towards digital business opportunities, overshadowing their legitimacy. The frequent reports of online scams and fraud have created a negative perception of the digital business landscape in Nigeria. This perception is not limited to local consumers but extends to international audiences, further complicating efforts to attract global customers and investors. This lack of trust is a significant barrier for legitimate digital ventures trying to establish themselves in the market and improve their performance.

The main objective in this work is to examine the effect of compatibility and relative advantage of new technology on the performance of digital ventures in Nigeria. The specific objectives are to:

1. Investigate the effect of technology compatibility on performance of digital ventures in Nigeria.
2. Examine the effect of relative advantage of new technology on performance of digital ventures in Nigeria.

In line with this, the following hypotheses were tested:

HO1: Technology compatibility has no significant effect on performance of digital ventures in Nigeria.

HO2: Relative advantage of new technology has no significant effect on performance of digital ventures in Nigeria.

1.2 Scope of the Study

The domain of this study is the digital content creators who create and sell video content, audio content and E-books on Selar platform while the population include the owners of these contents in Nigeria. The choice of video content, audio content and E-books owners as the domain of study is premised on the fact that this business heavily rely on technology for their operations and most of their contents are always in video, audio and E-book forms.

2.0 Literature Review

2.1 Concept of Technology Adoption

The concept of new technology adoption encompasses the processes of accepting, integrating, and using new technological advancements within a given community (Oyewole, 2019). The adoption of new technologies encompasses the adoption of a wide range of new technological advancements, such as computer technology, microelectronics, and related technologies like microchips and microprocessors. It also includes adoption of multimedia and other information processing technologies and systems, as well as telecommunications technologies and infrastructure, including fixed line, wireless, satellite-based, and mobile infrastructure (Oyewole, 2019). Liu and Atuahene-Gima (2018) argued that the primary goal of new technology adoption is to enhance the efficiency and effectiveness of production processes, as well as to foster product innovation. Adopting new technology might be challenging since the process changes depending on the technology being used (Mwangi and Kariuki, 2015). For the purpose of this study, new technology adoption is defined as the process by which individuals, businesses, or society as a whole accept and integrate new digital technologies into their daily operations, workflows, or lifestyles. The independent

variable for this study is technology adoption. However, the two measures of new technology adoption selected in this study are relative advantage and technology compatibility. These measures are used because they are more related to this study:

2.2 Relative advantage of New Technology

Relative advantage of new technology is the degree in which an entrepreneur compares new technology tool or application with existing one, and also talks about the benefits and costs of an adopting new technology. Relative advantage refers to the degree that determines how the present method is considered better than previous one. Saifuzzaman *et al.* (2023) argued that technology offering more relative advantage will be adopted faster than other technologies. Wang *et al.* (2008) and Mndzebele (2013) however, cautioned that, getting a new idea adopted, even when it has obvious advantages, is difficult, so the availability of relative advantage of technology speeds up the innovation-diffusion process. Organisations adopt a technology when they see a need for that technology, believing it will either take advantage of a business opportunity or close a suspected performance gap. Previously published studies have proved that relative advantage is a factor affecting the adoption of technology. Moreover, the construct of relative advantage has been extensively studied in the context of technology adoption, particularly in online e-government services, where it is broken (Shatta *et al.*, 2020).

2.3 Technology compatibility

Technology compatibility is the degree to which a technology is perceived to be consistent with existing values or previous experience and need to the potential adopter. If adopters need to adjust their existing routines or if the technology or invention conflicts with their attitudes, they are less likely to adopt it (Pratama *et al.*, 2019). Technology compatibility refers to a team's belief in technology's usefulness, user-friendliness, and awareness of the risk underlying usage. Compatibility is the degree to which the use of the new technology is compatible with previous experience with the existing and related technology (Othman *et al.*, 2022; Caffaro *et al.*, 2020; Srimarut and Mekhum, 2020). Technology can be compatible or incompatible with socio-cultural values and beliefs, with previously introduced ideas, or with clients' needs for performance. In addition, the user's previous experience of adoption of new tool, whether this was a positive or negative experience will also influence the adoption of technology (Chen and Aklikokou, 2020). A negative previous experience can result in technology negativism which is where a negative previous experience with one technology can negatively impact the adoption of another (Mairura *et al.*, 2016; Pratama *et al.*, 2019; Chen and Aklikokou, 2020).

2.4 Concept of Firm Performance

Business performance refers to the level of achievements of the company within a certain period (Varadarajan, 2020). Performance of the company can be seen from the level of sales, the rate of profit, return on capital, the level of turnover and market share which was achieved (Abughniem *et al.*, 2020). Measuring company performance is conducted to know the results achieved by the company in a certain period, where the performance criteria should be able to be used as a guide for companies in taking operational decisions. Market performance is described as the efficacy of a company's market operations. It is

assessed by factors such as customer happiness, delivering value to consumers, retaining customers and achieving the targeted market share (Homburg and Pflesser, 2000). Market performance details the market share, sales determiners, revenue premium of products, and services (Katsikeas *et al.*, 2016). Market performance also refers to an organization's propensity to satisfy, develop, and maintain its customers through products and services offerings, and other elements that suit customers' needs (Leonidou *et al.*, 2013). Wang *et al.* (2015) pointed out market performance in terms of new product launches, market development and penetration, quality enhancement, and customer satisfaction. Hence, market performance is measured using brand awareness and loyalty. This measurement is based on the researchers' preliminary investigation on the right metric for measuring digital venture performance from different scholars using market performance (Pansari and Kumar, 2017).

Figure 1 presents the conceptual framework of the study, outlining the key variables and their relationships.

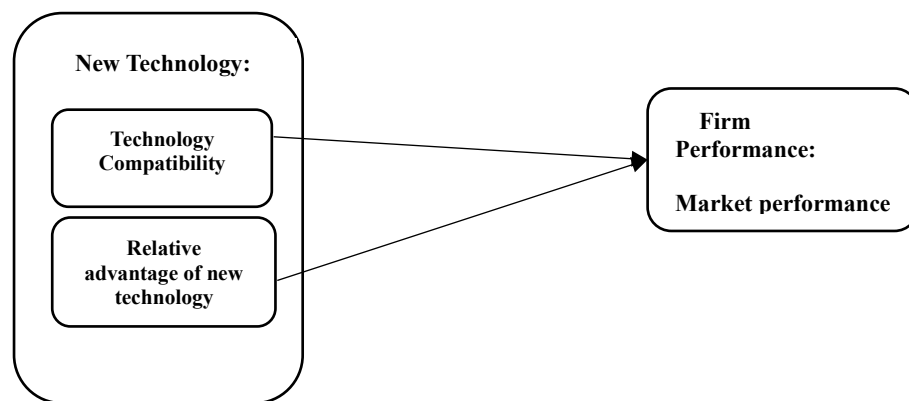


Figure 1: Conceptual Framework

2.5 Theoretical Framework

Technology acceptance model (TAM)

The most popular theory which has been offered with respect to technology acceptance is Technology Acceptance Model (Davis, 1989). The Technology Adoption Model (TAM) is a well-established technological framework developed by Davis in 1989, which primarily focuses on the factors influencing the adoption and usage of technology. The theory was developed based on the Theory of Reasoned Action (Ajzen and Fishbein 1988) and it is one of the most influential information system theories that explains users' adoption of technology. This is interpreted to mean that entrepreneurs' perceptions on the relative advantage of using new technology and its relative advantage can significantly influence their decision to adopt technology. According to Chau and Hu (2002) cited in Lai, (2016), relative advantage and new technology compatibility can be seen as outcomes of technology adoption. TAM aligns with the idea that technology adoption directly impacts firm performance considering its compatibility and relative advantage (Lakshminarayanan, 2018; Legris *et al.*, 2003).

2.6 Empirical

Ramadhani *et al.* (2022) studied the influence of compatibility and technology acceptance model toward intention to use E-wallet during Covid-19 in Malaysia. The study utilised a quantitative method and data were collected from 100 team members. The study adopted Structural Equation Modelling (SEM) technique using partial least square analysis by SmartPLS Version 3. Findings shows that technology compatibility and relational boundary were found to have a significant relationship with rescue frontliners' performance. While Ramadhani *et al.* (2022) explored compatibility and technology acceptance, their study was limited to a specific group (search and rescue teams in Malaysia). This narrow focus restricts generalizability to broader digital ventures, particularly in different geographic contexts like Nigeria.

Sebetci, (2018) investigated the end-user satisfaction through technology compatibility: An assessment on health information system. The study used a survey of 543 employees of medical faculty hospitals supported six of the seven hypotheses included in the model using SEM (PLS). The study focused on end-user satisfaction within health information systems, emphasizing technology compatibility, but was limited to healthcare settings and specific user groups. This restricts the applicability of findings to digital ventures in broader sectors, such as entrepreneurship in Nigeria, where technology dynamics and user expectations differ significantly.

Saifuzzaman *et al.* (2023) evaluated the effects of relative advantage, complexity, social influence, and awareness on Islamic Banking adoption in Bangladesh. Through a survey of 407 respondents and the application of Partial Least Squares Structural Equation Modeling, the study explores the relationships between perceived relative advantage, complexity, social influence, awareness, and the intention to adopt Islamic banking. The findings shed light on the potential avenues for further growth in this sector and the importance of raising public awareness to bolster Islamic finance in Bangladesh. The study explored factors affecting Islamic Banking adoption in Bangladesh, yet did not address digital ventures or technology performance in other sectors. This gap limits understanding of how these factors specifically impact the adoption and performance of new technologies in diverse digital business environments.

Shatta *et al.* (2020) examined the influence of relative advantage towards e-Procurement adoption model in developing countries. The collected data were analysed by using Partial Least Squares Structural Equation Modelling with the help of SmartPLS 3 software. Findings reveal that in the presence of attitude, relative advantage has direct and indirect influences towards e-procurement adoption. The study examined e-procurement adoption in developing countries, focusing on the role of relative advantage and user attitudes. However, the study's scope was limited to public sector e-procurement, excluding other digital venture contexts. This necessitates research into how relative advantage influences technology adoption across various private sector digital ventures.

3.0 Methodology

A survey design was used for this study through a random sampling technique. The population consists of the total number of digital content creators in Nigeria. Specifically, the researcher considered content creators who are registered on the Selar digital platform (one of the top digital platforms in Nigeria, as reported by Bolat, 2019). As of December 2023, the number of registered content creators is 150,000, which is higher than the 115,000 reported in the 2023 bulletin of the Nigerian Content Development and Monitoring Board. The sample size for the study is 400, determined using the Spiegel and Stephens (2017) formula. To account for non-response 30% was added to the sample size (in line with Israel 2013), bringing the total sample size to be 520. The choice of online questionnaires is because the operations of digital ventures are mostly online and the distribution of the online questionnaire is very quickly, as online communities are a great way to share information (Ball, 2019). The study employs multiple linear regression analysis to analyse the collected data as well as test for the null hypotheses using SPSS. The model used by Zhou *et al.* (2023) in their study on digital technology adoption and innovation performance is adapted in this study. The adoption of Zhou *et al.* (2023) models is due to the common features this study shares with theirs. Functionally, the relationship among the variables is expressed as shown in Equation 1.

$$IP_{i,t} = \beta_0 + \beta_1 DTA_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where:

IP = dependent variable

DTA = independent variable

β_0 = constant term

ε = is the error term,

From the above equation and with reference to the modified models of Zhou *et al.* (2023), the broad model for the study is stated as follows:

$$PF_{it} = \beta_0 + \beta_1 TC_{it} + \beta_2 RAT_{it} + \mu_{it} \quad (2)$$

Where:

PF = Performance of digital venture measured by market performance

TC = Technology compatibility

RAT = Relative advantage of new technology

β_0 = Intercept

β_{1-2} = Regression Coefficients

ε = The error term.

4.0 RESULTS AND DISCUSSION

This section presents the result of the study. Table 1 presents the demographic information of the respondents.

Table 1: Demographics of the respondents

Characteristics	Frequency	Percentages (%)
Gender		
Male	291	55.8
Female	230	44.2
	519	100.0
Age		
18-24 yrs	71	13.83
25-31yrs	173	33.3
32-38yrs	109	21.0
39-45yrs	68	13.0
46 and above	98	18.8
Total	519	100.0
Educational Qualification		
ND	95	18.1
HND/B.Sc	304	58.7
Postgraduate	119	23.2
Total	519	100.0
Management Level		
Owner	518	99.8
Manager	1	0.2
Supervisor	0	0.0
others	0	0.0
Total	519	100.0
Working Experience		
1-5yrs	90	17.4
6-10yrs	165	31.9
11-15 yrs	117	22.5
over 15yrs	147	28.3
Total	519	100.0

Researcher's computation, 2024

Correlation analysis determines the inter-correlation between the variables and for this study, the relationship between technology compatibility, relative advantage and firm performance is presented in Table 2 below.

Table 2: Correlation coefficient

		TC	RAT	FP
TC	Pearson Correlation	1	.506**	.562**
	Sig. (2-tailed)		.000	.000
RAT	N		519	519
	Pearson Correlation		1	.675**
FP	Sig. (2-tailed)			.000
	N			519
	Pearson Correlation			1
	Sig. (2-tailed)			
	N			

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 revealed the values ranging from less than 0.9 to greater than 0.1. This means that the variables correlate fairly well enough to be used in the study, and there is no risk of harmful multicollinearity. Table 3 below shows the regression for the effect of compatibility and relative advantage of new technology on the performance of digital ventures in Nigeria.

Table 3: Regression Statistics

Variable	Coefficient	t Statistics	p value
Constant	0.205	0.607	0.547
TC	0.595	5.638	0.000
RAT	0.232	2.033	0.048
R	0.702		
R squared	0.613		
Adj R squared	0.599		
F stat	60.809		
Prob (F stat)	0.000		
Durbin Watson	2.251		

Author's computation 2024

From Table 3, the F-statistic, which measures the adequacy and fitness of the model used in the study, was 60.809 with a p-value of 0.000, which is significant at 1%; this indicates that the model is appropriate for the study.

4.1 Discussion of findings

R, the multiple correlation coefficient for new technology variables, was 0.702, indicating that technology compatibility and relative advantage are significant predictors of the performance of digital ventures in Nigeria. The findings of the study suggest that changes

in the independent variables (Technology compatibility and relative advantage) account for around 61.3 per cent of the overall variability in firm performance, as indicated by the multiple coefficients of determination (R^2) of 0.613. The adjusted R^2 value of 0.599 suggests that upon controlling for other variables, the dimensions of new technology (Technology compatibility and relative advantage) will continue to account for 59.9% of the variance in firm performance in the digital industry. This finding implies that if new technologies are compatible and relatively better than the existing ones it will be economical, faster and efficient to adopt which will enhance the organizational performance of digital ventures. According to Wang (2019), technology innovation is positively related to firm performance in SMEs and there is a negative relationship between radical innovation and firm performance. This finding supports previous research by Chege *et al.* (2020) and Rajapathirana and Hui (2018) which discovered that new technology adoption improves and enhance the organization's potential role in terms of improving its overall performance.

Table 3 presents the constant value of 0.205, which signifies that the firm performance would equal 0.205 if both technology compatibility (TC) and relative advantage of new technology (RAT) were rated as zero. Upon careful analysis of the beta values, it is

possible to determine the extent to which each independent variable contributes to the model. With a coefficient of 0.595, technology compatibility (TC) influences firm performance in a positive way. This implies that if new technology does not render the existing ones totally useless it will be more economical for digital ventures to adopt it which will enhance the performance of the firm by 59.5 percent. The significance of the effect is assessed using the t-statistics, which for technology compatibility (TC) on Firm performance (FP) stood at 5.638 with a p-value of 0.00, indicating that the relationship is significant with a level of confidence of 99 percent. This suggests that the study accepts the alternative hypothesis, which posits that technology compatibility does indeed have a significant impact on the performance of digital ventures in Nigeria. This result is consistent with Ahmad *et al.* (2019) and Li *et al.* (2020) assertion that technology compatibility is positively significant with firm performance. Additionally, Yadegaridehkordi *et al.* (2020) discovered that technology compatibility has a statistically significant impact on the performance of businesses.

Additionally, the research reveals that relative advantage of new technology (RAT) exerts a positive impact on the performance of digital ventures in Nigeria, as evidenced by a coefficient of 0.232. This suggests that if a new technology is relatively profitable than the existing ones it will increase the performance of digital ventures in Nigeria by 23.2 percent. The p-value of 0.05 was applied to the t-statistic of 2.033 in order to ascertain the significance of the observed effect. The p-value suggests that the influence of relative advantage of new technology on firm performance is statistically significant with a 95% level of confidence. This suggests that the alternative hypothesis is accepted, which asserts that the relative advantage of new technology does indeed affect the performance of digital ventures in Nigeria. The results of this research are consistent with the conclusions drawn by Ahmad *et al.* (2019) and Chege *et al.* (2020), whose studies also discovered a positive correlation between relative advantage of new technology and organizational performance.

5.0 Conclusion and Recommendation

5.1 Conclusion

There is a moderate positive correlation between TC and RAT, indicating that as technology compatibility increases, the perceived relative advantage of the technology also tends to increase. The correlation between TC and FP is moderate to strong (0.562), suggesting that greater compatibility of technology is associated with better performance in digital ventures. The strongest correlation is between RAT and FP, highlighting that a higher perceived relative advantage of new technology is strongly associated with improved performance of digital ventures.

5.2 Recommendations

Based on the findings, the following recommendations are made for stakeholders involved in the digital ventures sector in Nigeria:

- i. The owners of digital ventures especially content creators need to focus on developing technologies that are highly compatible with existing systems and

- ii. processes within digital ventures. This can be achieved by ensuring interoperability and ease of integration with current technologies used by these ventures.
- iii. Digital Venture Managers also need to prioritise the adoption of technologies that align well with current operations and infrastructure. This will likely lead to better integration and performance outcomes. They also need to assess the relative advantages of new technologies before implementation. Consider factors such as improved efficiency, cost savings, or enhanced capabilities that the new technology offers.

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