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Disruptive ICT Innovation Adoption in Developing Economies: Challenging Developed World Theories (A Kenyan Perspective)

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Abstract
The rapid evolution of Information and Communication Technology (ICT) has significantly transformed economies worldwide. However, the adoption of disruptive ICT innovations in developing economies, particularly in Kenya, presents unique challenges that often contradict established theories developed in the context of advanced economies. This paper investigates the adoption of disruptive ICT innovations in developing economies, focusing on Kenya, to challenge dominant theories formulated in developed contexts. Using a mixed-methods approach, the research collected both quantitative data through structured questionnaires and qualitative insights from interviews with senior corporate employees, ICT officers, and departmental heads across Kenya's ICT and banking sectors. The sample was purposively drawn to capture diverse perspectives on innovation adoption. Key findings reveal that adoption of disruptive ICT innovations in Kenya is shaped less by the classical economic-driven models dominant in developed economies and more by social factors, regulatory frameworks, and user-centric considerations such as digital literacy, trust, and accessibility. Market forces, government policy, and organizational processes were also found to play significant roles, with financial investment emerging as a major determinant of success. Case examples such as the failure of M-PESA and the success of M-Shwari illustrate how context-specific dynamics override generalized adoption theories. The study concludes that developed-world theories of innovation diffusion and adoption are insufficient to explain trajectories in developing contexts, where disruptive ICTs thrive through inclusivity, social alignment, and adaptability to local needs. The research recommends that policymakers in Kenya and similar economies develop flexible legal and policy frameworks that encourage ICT growth while minimizing barriers. For organizations, the research highlights the need for clear innovation policies, adequate funding, employee motivation, and user-friendly design to drive adoption.

Introduction

The concept of disruptive innovation, initially articulated by Clayton Christensen, has been pivotal in understanding how new technologies can reshape industries (Garcia & Calantone, 2002). However, most research on disruptive innovation has predominantly focused on developed economies, resulting in a gap in gap regarding its applicability in developing contexts (Kilkki et al., 2018). In Kenya, the advent of mobile money services like M-Pesa has revolutionised financial transactions, serving as a case study for examining disruptive ICT innovations(González-Sánchez et al., 2020).

Despite the success of M-Pesa, existing theories of disruptive innovation often overlook the socio-economic and cultural dynamics that influence technology adoption in developing economies(Grieco, 2022). For instance, while developed economies may prioritise technological sophistication and performance, developing economies often require innovations that are affordable, accessible, and tailored to local needs(Comin & Hobijn, 2008). The unique characteristics of the Kenyan market, including high mobile penetration rates and a substantial unbanked population, pose challenges to the applicability of traditional models (Ganguly et al., 2010).

Innovation in information technology is a primary driver for growth in developed economies. Research indicates that countries typically progress through stages in the adoption of innovation strategies: from purchasing innovations through global trade to achieving incremental improvements and, ultimately, radical innovations that provide competitive advantages. In developing economies like Kenya, however, the trajectory of innovation adoption is influenced by different factors, including socio-economic conditions, cultural attitudes, and regulatory environments.

In Kenya, disruptive innovations in ICT have emerged as critical drivers of economic development (Nyerere et al., 2012). The introduction of mobile banking has not only enhanced financial inclusion but has also reshaped traditional banking practices (García-Medina & Tur-Viñes, 2017). However, the complexities surrounding the adoption of these innovations necessitate a deeper understanding of the underlying factors that facilitate or hinder their success. This paper seeks to address the question: How do the unique characteristics of developing economies, specifically Kenya, challenge the applicability of developed world theories on disruptive innovation? The specific objectives of this study are: To identify the factors influencing the adoption of disruptive ICT innovations in Kenya. This study will also assess the impact of socio-economic factors on the success of these innovations, ultimately aiming to propose a contextual model for understanding disruptive ICT innovation in developing economies.

Literature review

Disruptive innovation is characterised by the introduction of simpler, more affordable technologies that initially target underserved markets(Han, 2017). This concept, as articulated by Clayton Christensen, emphasises that disruptive innovations often begin at the lower end of the market, offering basic solutions that gradually improve and eventually displace established competitors(Bhaskaran, 2006). However, the applicability of this theory in developing economies remains a subject of debate. Scholars argue that the socio-economic landscape, regulatory frameworks, and cultural factors in these regions differ significantly from those in developed countries, necessitating a re-evaluation of existing models.

Theoretical Frameworks

Several theories provide insights into the dynamics of disruptive innovation, particularly in the context of developing economies:

Technology Acceptance Model (TAM)

This model pinpoints that perceived usefulness and perceived ease of use significantly influence users' intentions to adopt new technologies (García-Medina & Tur-Viñes, 2017). In the context of Kenya,

understanding how users perceive the benefits of mobile banking services, such as M-Pesa, is crucial (Hwang & Christensen, 2008). The model suggests that if users find these technologies beneficial and easy to use, they are more likely to adopt them (Hwang & Christensen, 2008). However, the varying levels of digital literacy across different socio-economic groups can impact these perceptions, highlighting the need for tailored educational initiatives.

Unified Theory of Acceptance and Use of Technology (UTAUT)

This theory integrates several previous models, including TAM, to explain technology adoption (Christensen et al., 2017). UTAUT identifies four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions ("Disruptive Technologies," 1995). In Kenya, social influence plays a crucial role, as community acceptance and peer usage can significantly impact an individual's decision to adopt ICT innovations (Jones et al., 2016). Additionally, facilitating conditions such as infrastructure and government support are critical for enabling widespread adoption (Hwang & Christensen, 2008).

Diffusion of Innovations Theory

Proposed by Everett Rogers, this theory explains how, why, and at what rate new ideas and technology spread (Chatterjee & Nath, 2014). It emphasises the role of communication channels, social systems, and the perceived attributes of innovations(Hauser & Katz, 1998). In Kenya, the rapid diffusion of mobile money can be attributed to the strength of social networks and the effectiveness of communication strategies employed by service providers (Hauser & Katz, 1998). The theory highlights that innovations perceived as advantageous, compatible with existing values, and easy to trial are more likely to be adopted (Damanpour, 2020).

Disruptive Innovation Theory

While primarily focused on how smaller companies with fewer resources can successfully challenge established businesses, this theory also underscores the importance of understanding the specific market context (Dieterlen & Abramovitz, 1958). In developing economies, the characteristics of consumer needs and the competitive landscape can differ markedly from those in developed countries (Appelbaum, 1997). For instance, the success of M-Pesa in Kenya demonstrates that disruptive innovations can thrive in environments where traditional banking services are limited or inaccessible (University of Belgrade, Faculty of Organisational Sciences et al., 2018).

Social Construction of Technology (SCOT)

This theory posits that the development of technology is shaped by social, cultural, and political contexts (Bălan, 2018). In Kenya, the adoption of ICT innovations is influenced by local cultural attitudes towards technology, trust in digital financial systems, and the socio-political environment (Kim et al., 2007). Understanding these social constructs is essential for developing strategies that promote technology acceptance and practical implementation (Farajollahi & Moenikia, 2010).

Contextual Factors in Kenya's ICT Landscape

Kenya's ICT landscape has experienced rapid growth, particularly in mobile technology. The success of M-Pesa illustrates how local innovations can disrupt traditional banking systems. However, the adoption of such technologies is influenced by several contextual factors:

Digital Literacy: The varying levels of digital literacy among different demographics can significantly impact the adoption of technology. In regions where users lack basic digital skills, the effectiveness of ICT innovations may be limited.

Infrastructure Availability: The success of ICT innovations often hinges on the availability of reliable infrastructure, including internet connectivity and electricity. Areas with poor infrastructure may experience slower adoption rates.

Government Policies: Supportive regulatory frameworks and government initiatives can facilitate the growth of disruptive ICT innovations. Conversely, restrictive policies can hinder their adoption. The Kenyan government has played a pivotal role in fostering an environment conducive to technological innovation, which has been crucial for the success of mobile banking solutions.

Methodology

Study Design

The study employed a mixed-methods research design, integrating both quantitative and qualitative approaches to provide a comprehensive understanding of the adoption of disruptive ICT innovations in Kenya. The quantitative component allowed for statistical analysis of factors influencing adoption, while the qualitative component provided in-depth contextual insights from experts and industry practitioners.

Study Area

The research was conducted in Kenya's three major metropolitan cities: Nairobi, Mombasa, and Kisumu. These urban centres were chosen because they represent the country's leading hubs for ICT adoption, financial services, and technological innovation, and thus provide a rich environment for examining disruptive ICT practices.

Study Population

The target population comprised organisations and individuals actively engaged in the development, deployment, or adoption of ICT innovations with disruptive potential. This included senior corporate employees, ICT officers, departmental heads, and experts from government and telecommunications sectors, as well as private firms developing ICT-based solutions.

Sample Size and Sampling

A total of 101 respondents participated in the study. For the qualitative strand, 20 ICT experts and leaders were purposively selected using snowball sampling, ensuring that participants had relevant expertise and experience in decision-making related to ICT innovation. For the quantitative strand, 81 respondents were drawn from private sector firms across the three cities, specifically those organisations identified as having adopted or developed disruptive ICT innovations. The sampling approach ensured diversity while focusing on respondents with practical exposure to disruptive technologies.

Data Collection

Data were collected through two primary instruments: structured questionnaires for the quantitative data and key informant interviews for the qualitative data. The questionnaires captured information on organisational processes, financial investment, market structure, and regulatory environment, while the interviews explored deeper insights into challenges, opportunities, and contextual factors influencing ICT adoption. Both instruments were pre-tested to ensure reliability and validity before full-scale data collection.

Data Analysis

Quantitative data were analysed using R statistical software, with both descriptive and inferential statistics applied to identify patterns, correlations, and determinants of ICT innovation adoption. Regression analysis was performed to test relationships among the variables. Qualitative data from interviews were transcribed and thematically analysed to generate categories and patterns that complemented the statistical findings. The integration of both forms of analysis provided triangulation, enhancing the robustness and credibility of the results.

Results

Factors Influencing Adoption

Several interrelated factors influence the adoption of disruptive ICT innovations in Kenya. Understanding these factors is crucial for identifying barriers and facilitators to technology uptake in developing economies.

Socio-Economic Factors

Economic stability and income levels are critical determinants of technology adoption. In Kenya, the economic landscape varies significantly across different regions and demographic groups.

Affordability: Innovations that are affordable and accessible tend to gain traction more quickly. For instance, mobile money services like M-Pesa offer low-cost transaction fees compared to traditional banking services, making them attractive to low-income populations. As more individuals gain access to affordable ICT solutions, the overall adoption rate increases.

Income Levels: Higher income levels generally correlate with greater access to technology. Individuals with disposable income are more likely to invest in smartphones and internet services, facilitating the adoption of digital solutions. Conversely, in economically disadvantaged areas, limited financial resources can restrict access to essential technologies.

Economic Stability: Regions experiencing economic growth are more conducive to adopting new technologies. Economic stability fosters consumer confidence, encouraging individuals and businesses to invest in ICT innovations. In contrast, areas facing economic challenges may see slower adoption rates due to uncertainty and limited resources.

Digital Literacy

The level of digital literacy among users plays a crucial role in determining the success of ICT innovations.

Importance of Training: Users who lack basic digital skills may struggle to navigate new technologies, resulting in frustration and a reluctance to adopt them. Therefore, comprehensive training and awareness programs are essential for fostering acceptance and empowering users. These programs can help demystify technology, making it more approachable and easier to use.

Impact on Adoption Rates: Higher levels of digital literacy correlate with increased confidence in using ICT innovations. For example, individuals who are familiar with smartphones and mobile applications are more likely to engage with services like M-Pesa. Conversely, low digital literacy can create barriers that hinder the adoption of technology, particularly among older populations or those with limited educational backgrounds.

Government Policies

Supportive regulatory frameworks and government initiatives can significantly facilitate the growth of disruptive ICT innovations.

Regulatory Support: Governments that implement favourable policies, such as reducing taxes on technology imports or providing incentives for ICT startups, can create an environment conducive to innovation. In Kenya, the government has established a supportive regulatory framework that encourages the growth of mobile money services, contributing to their widespread adoption.

Restrictive Policies: Conversely, restrictive policies can hinder adoption. For instance, stringent regulations on financial services or excessive bureaucratic requirements can stifle innovation and deter potential users. Policymakers must strike a balance between regulation and innovation, ensuring that consumer protection does not hinder technological advancement.

Cultural Context
Cultural attitudes towards technology and innovation significantly influence user acceptance.

Cultural Attitudes: In Kenya, cultural perceptions of technology can either promote or hinder the adoption of new technologies. For example, communities that view technology as a tool for empowerment and progress are more likely to embrace ICT innovations. In contrast, scepticism towards new technologies can create resistance, particularly if there is a lack of understanding of their benefits.

Understanding local customs and practices is crucial for the successful implementation of any project. Innovations must align with cultural norms and values to gain acceptance. For instance, marketing strategies that resonate with local beliefs and practices can enhance the perceived relevance of ICT innovations, fostering greater user engagement.

Case Study: M-Pesa
M-Pesa's success in Kenya exemplifies the potential for disruptive innovations to thrive in developing economies.

Simplicity and Accessibility: M-Pesa's model emphasises simplicity and accessibility, allowing users to perform financial transactions via mobile phones without the need for a bank account. This approach challenges the notion that only complex solutions can succeed in competitive markets. By addressing the needs of underserved populations, M-Pesa has effectively disrupted traditional banking systems.

Financial Inclusion: The service has played a pivotal role in enhancing financial inclusion in Kenya, enabling millions of unbanked individuals to access financial services for the first time. This has not only improved individual livelihoods but has also stimulated economic activity by facilitating transactions and enabling small businesses to thrive.

Community Engagement: M-Pesa's success can also be attributed to its strong community engagement strategies. By partnering with local agents and providing training on how to use the service, M-Pesa has built trust and familiarity among users. This grassroots approach has been instrumental in driving adoption, as users are more likely to engage with services that their peers endorse.

Impact on Other Innovations: The success of M-Pesa has inspired a wave of other ICT innovations in Kenya, such as mobile insurance and savings products. This demonstrates how one successful disruptive innovation can pave the way for further technological advancements, creating a robust ecosystem that supports ongoing growth and development.

Challenging Established Theories
The findings from Kenya suggest that established theories of disruptive innovation may not adequately account for the complexities of developing economies. Factors such as social influence, economic conditions, and cultural context must be integrated into existing models to enhance their relevance.

Proposed Model
A new model for understanding disruptive ICT innovation in developing economies is proposed, one that moves beyond traditional theories developed in the context of advanced economies. The model integrates four key elements that reflect the unique dynamics of countries like Kenya.

Technological Features: In developing economies, disruptive ICTs gain acceptance when they are simple, intuitive, and designed with user-friendliness in mind. Unlike developed markets, where sophistication and advanced features are often valued, users in emerging economies prioritise ease of use, minimal technical barriers, and compatibility with basic devices. This ensures that innovations can reach a wide range of the population, including those with limited technical skills.

Market Dynamics: Affordability and accessibility are at the core of ICT adoption in resource-constrained environments. Technologies that offer low-cost services and require minimal infrastructure investment have a higher chance of disrupting existing models. For instance, mobile money platforms like M-Pesa thrived because they offered accessible, low-cost financial services to populations previously excluded from formal banking systems. The model therefore emphasises the need for pricing strategies and distribution channels tailored to underserved markets.

Social Factors: Adoption is also heavily influenced by cultural attitudes, trust, and levels of digital literacy. Innovations must align with societal norms and values while addressing barriers such as scepticism toward digital transactions or low confidence in technology use. Social networks and word-of-mouth play a pivotal role in shaping perceptions, meaning that community influence can accelerate or hinder the spread of new technologies. Digital literacy programs, therefore, become critical for maximizing adoption.

Government Influence: Supportive policies, regulatory frameworks, and public investment create an enabling environment for disruptive ICT innovations. In Kenya, government initiatives such as the liberalization of telecommunications and favourable mobile money regulations were instrumental in shaping today's digital ecosystem. Conversely, restrictive or unclear policies can stifle innovation. The model underscores the importance of proactive and adaptive governance that fosters innovation, balances risk, and ensures consumer protection.

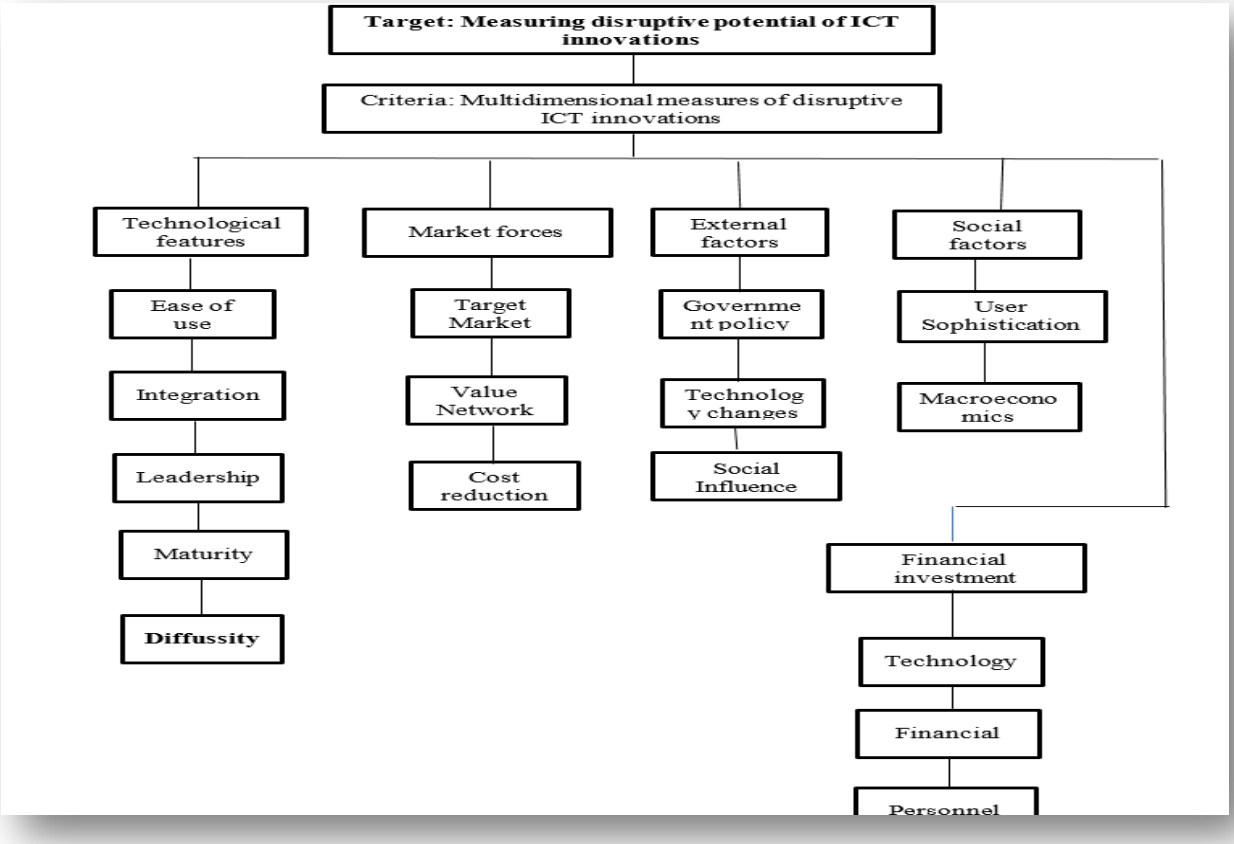

Figure 1: Proposed model

Conclusions

The adoption of disruptive ICT innovations in developing countries such as Kenya presents unique dynamics that differ markedly from those in advanced economies. This study demonstrates that traditional theories of disruptive innovation are not always applicable in these contexts, as local factors, including income levels, digital literacy, cultural attitudes, and regulatory frameworks, strongly influence adoption. The findings highlight that success in developing economies depends not only on technological advancement but also on aligning innovations with the social, cultural, and economic realities of the communities they serve. The case of M-Pesa illustrates how context-specific, user-friendly, and accessible solutions can transform industries and provide valuable lessons for both scholars and practitioners.

While this study provides valuable insights into the determinants of ICT adoption, further research is needed to understand the broader socio-economic impacts of disruptive innovations in developing economies. Scholars should explore how such technologies influence long-term economic growth, job creation, income distribution, and social equity. Additionally, comparative studies across different developing regions could help identify context-specific variables versus universal drivers of adoption. Future research should also examine the unintended consequences of ICT disruption, such as job displacement in traditional industries, data security risks, and shifts in cultural practices, thereby offering a balanced view of both opportunities and challenges.

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