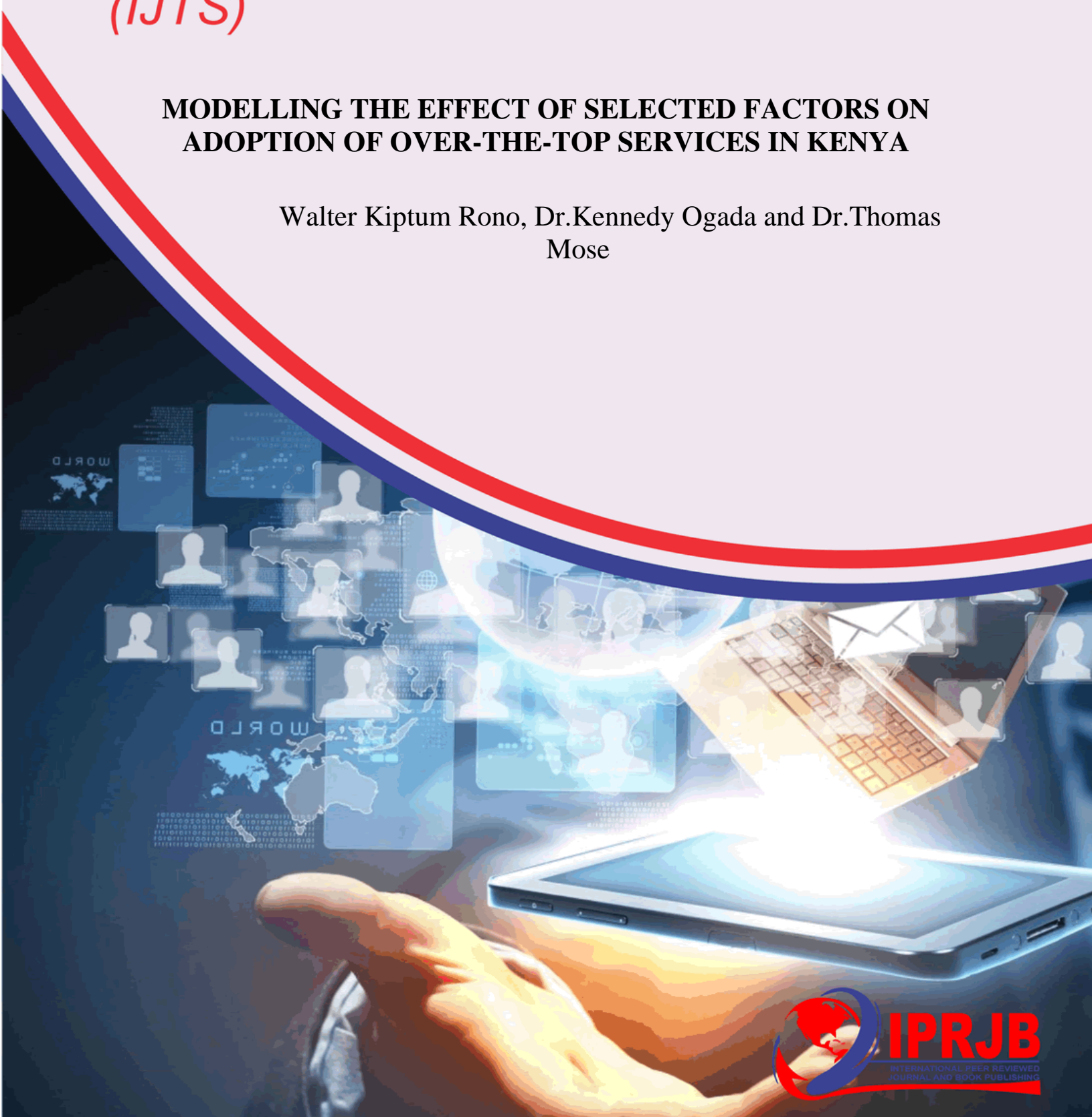


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MODELLING THE EFFECT OF SELECTED FACTORS ON ADOPTION OF OVER-THE-TOP SERVICES IN KENYA

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Abstract

Purpose: The goal of this research was to develop a model for the impact of several factors on OTT adoption in Kenya.

Materials and Methods: This study employed an explanatory research technique. The target population for this study was limited to 23076 subscribers, who were the active subscribers of Viusasa as of December 2018. Simple random sampling was used to sample from the target population. Data collection was done through a structured questionnaire, which was both in soft and hard copy. Statistical package for social sciences (SPSS v25.0) was utilized to analyze the responses received from the questionnaire. The study generated and used averages, frequencies, and percentages to present the analysis.

Results: The findings revealed that individual factors ($\beta=0.326$, $p=0.000$), technological factors ($\beta=0.268$, $p=0.000$), organizational factors (users) ($\beta=0.166$, $p=0.000$) and environmental factors (users) ($\beta=0.270$, $p=0.000$) have a positive and significant relationship with the adoption of OTTs in Kenya. Pay TV providers and broadcasting stations that are providing or purpose to provide OTT services to focus on the key individual factors that lead to the adoption of OTT services. Based on the multiple regression findings, the null hypotheses were rejected since the P values were less than 0.05 and thus, there is a significant effect individual factors, technological factors, organizational factors and environmental factors on the adoption of OTT services in Kenya is not statistically significant.

Unique contribution to theory, practice and policy: The study findings indicate that the theory of diffusion is applicable to the study of factors influencing the adoption of OTT. Pay TV providers and broadcasting stations that were providing or purposed to provide OTT services are encouraged to focus on the key individual factors that lead to the adoption of OTT services. The understandings assisted on the providers improving their relationship with the users and have a bigger market even in terms of the customer base. Telecom operators in Kenya are encouraged to develop competitive OTT services to gain a competitive advantage over the present OTTs' players.

Keywords: *Modelling, Selected Factors, Over-The-Top Content (OTT) Services*

1.0 INTRODUCTION

Over-the-top content (OTT) is the delivery of video, audio, and other media material to consumers directly online, without the use of a multiple-system administrator (Prymak, 2017). Media consumption in digital formats has increased dramatically over the world. Today's consumers have the freedom to access the media material of their choosing at any time and from any location. This has been made feasible by an increase in the number of devices that accommodate electronic channels, as well as faster internet speeds. Netflix, Hulu, Amazon, Apple TV, and other streaming services have begun to challenge conventional network's dominance (Deloitte, 2017).

Over the past few years, the evolution of OTT services has sparked a tremendous transition both in the telecommunications and broadcasting sector. The emergence of these services has led some cable companies who offered TV services including video-on demand (SVOD) subscription for media houses, to undergo a digital transformation, shifting focus to over-the-top TV services (PWC, 2015). The consideration by these companies to offer OTT services have been influenced by the stiff competition emerging from the OTT providers (Prymak, 2017). This competition has been propelled by blooming features of OTT services that draw the attention of many. Sujata *et al.* (2015) argues that OTT players have effectively leveraged features such as convenience, cost, content availability, social user experience and propensity and thus offering better substitutes to telcos offerings and Pay TV providers.

Although telecom operators and the Pay TV providers are in an unreceptive move to counter the challenge posed to them by the OTT players, they are well positioned to confront the players (Sujata *et al.*, 2015). An analysis of the individual, environmental and technological factors that are leading to the adoption of OTT services is expected to help the operators and Pay TV providers to remain relevant in the market. In addition, the service providers can opt to introduce their own OTT service. Such a move will lead the service providers to be in control of the consumer relationship and expand in terms of their market space and also have a wider base of customers. However, the expenses needed for such an approach are high and the investment is also a risky venture on the basis that it has not been done before (Sujata *et al.*, 2015). This study aimed to determine a model for the effect of selected factors on adoption of OTT services, which will work a long way in assisting Pay TV services providers, telecoms and other entities who want to venture into the market of OTT services.

The US which is one of the wealthiest nations and single market, make it easier for key internet companies and online service providers to build domestic scale quickly (MTM, 2015). OTT subscription services and TV services that are conveyed over the internet are being adopted at a high rate in USA (MTM, 2015). In this country, OTT venture has grown so strongly over time, largely propelled by Hulu, Amazon, and Netflix. In 2014, the market of the OTT services had a worth of USD4bn, which is a growth of 36 percent Compound Annual Growth Rate (CAGR) between 2011 and 2014. It is observed that by the close of the year 2014, 40.3% of the households in US who used TV were subscribed to at least a premium of the OTT service (Fluent, 2017). This growth of the OTT market has been propelled by; the highly developed broadband penetration at 77% in USA and the penetration of connected devices (Smartphone penetration at 75% and tablet penetration at 44% in 2014). The fact that the Pay-Tv services are

expensive has also paved way for OTT players to lower prices on the demanded content and also offer the consumers free trials.

The development of international OTT players in African countries remains lower than in developed countries (Stork, *et al.*, 2017). For the international OTT players, developing countries are the major source of future growth; and with that regard they are investing in these continents directly. OTT players like Facebook and Netflix opened their offices in South Africa in 2015. Similarly, Vodacom also partnered with Naspers to offer the OTT services in the same country (South Africa, 2015). South Africa is the preferred point of entry for OTT players because the players identify other developing countries in Africa with lack in terms of developed telecom networks and a higher per capita Gross Domestic Product (GDP).

In March 2016, the Communication Authority (CA) attributed the drop by 19.7% of short messaging services (SMS) in Kenya to the emergence of OTT service. Common OTT services that are dominant in the Kenyan market include WhatsApp, Facebook messenger, Skype and Viber. The penetration of internet and smart phone has favored the OTT services in Kenya, considering that most smart phones have applications that support OTT services (CA, 2016). Further, features such as convenience, social flexibility and cost reduction embedded in the OTT services has impelled the high uptake of these services in the Kenyan market (Sujata *et al.*, 2015). OTT communication services are expected to increase over time, which is a threat to the Kenya telcos revenue if they continue depending on the traditional services (CA, 2016). A decision by Kenyan telcos to develop their local applications that offer OTT services will help them to gain competitive advantage over OTTs players in Kenya (Sawe, 2015).

Media Sector in Kenya

The media and communication industry is a diverse sector with various media technologies that have been created to reach millions of people with an aim of conveying a particular content that is informative or entertaining (Owuor, 2016). The industry is known to produce and offer diverse content through the use of different formats over computerized platforms. For example, the digital media is a platform that uses mediums like internet and phones to convey information to the intended users. On the other hand, broadcast media is a platform that utilizes mediums like recorded music, films, televisions and radios to transmit information to the audience. The media and communication industry in Kenya comprise of 4 international Pay TV providers, more than 90 FM stations, 15 TV stations, Telecommunication networks and OTT players (Owuor, 2016). The operators mainly use English and Kiswahili to deliver their content; however, some media houses use vernacular language (Deloitte, 2012 & PWC, 2013).

According to the Media Council of Kenya (2016), Kenya is one of the most vibrant markets in sub-Saharan Africa. Growth in population, rise in literacy levels, a growing middle class and technological advancement, have led to significant change in the entertainment and media market. The media industry has recorded incredible growth since the country achieved its independence in 1963. The industry started with the Kenya Broadcasting Corporation (KBC) as the only broadcasting station. Today the country has over 386 FM radio stations, and 105 TV stations (GeoPoll, 2015 & Kentra, 2016).

The government of Kenya has over time invested in this industry of information and telecommunication helping the sector to tune in to the technological advancement in the world. This has seen a radical transformation in the banking, broadcasting and telecommunication fields

(Owuor, 2016). Today, cellular services infiltration stands at nearly 80% and telecommunication networks have more than 30 million subscribers registered in their databases. Over time the confidence by users to use technology to access the broadcasts content has grown and is still growing tremendously. Due to the frankness of the media industry in Kenya, international OTT players such as Netflix, YouTube and Amazon have paved in to meet this rising demand by users (Deloitte, 2012). Local network operators and Pay TV providers have also not been left behind in offering OTT services in Kenya. For instance, Showmax which is an OTT platform was recently introduced by Safaricom (network operator) and DSTV (Pay TV provider) to offer video content to users.

The telecommunication networks in Kenya namely; Safaricom, Airtel Kenya, Finserve Africa, Telkom Kenya and most recently Sema mobile services are responsible for supply of data to consumers and OTT players such as, Netflix, YouTube, Showmax and Viusasa (Okore, 2014). Telcos have an advantage over OTTs because OTTs depend on the telcos infrastructure to run their services. The broadcasting sector has groups such as; the Nation Media Group Limited (NMG), the Standard Group (SG), Royal Media Services (RMS) and Radio Africa Group (RAG). Even though the demand for online video content is high, so far only the Royal Media group has concentrated on electronic media and they have launched Viusasa as an OTT service provider.

Statement of the Problem

The adoption rate of Viusasa application in Kenya is low. According to the second quarter sector statistics report of Communication Authority of Kenya (CA) 2018/2019, the application had 23,076 active subscribers, a fall from 606,096 subscribers, who had initially signed up. As per the data, 583,020 were inactive subscribers (CA, 2019). The biggest challenge facing Viusasa services are lack of free trial time, buffering, inadequacy in content availability, low loading time and crashes among others (Chenze, 2018). The content of Viusasa cannot be accessed through a website; it is only accessible through the application; this is not the case of other OTT players in the market.

The competing players of Viusasa (Netflix and Showmax) offer a free trial to subscribers for half or one month before they can be charged (Chenze, 2018). In addition, subscribers of Viusasa have complained that the content they receive is a direct copy from Citizen TV and other media houses, arguing that it does not make sense to view content on Viusasa which they can get it somewhere else for free. Due to the poor-quality services of Viusasa, subscribers in Kenya prefer international OTT players that provide quality services such as YouTube and Netflix (Wenzel, Mahle & Pätzmann, 2016). This poses a great threat for Content Aggregation Limited (a subsidiary company of Royal Media Services) who are the financiers of Viusasa to lose revenues. This calls for a quick response of building up a model that will assist Content Aggregation Limited and other Pay TV providers that aspire to start successful OTT services so as to meet the rising demand by Kenyans of online applications for content view (Bhawan & Marg, 2015).

Several studies have been conducted on the OTT services on the media system. Kwizera *et al.* (2018) in their study in Rwanda revealed that the adoption of OTT messaging services was so fast and widespread but the study failed to focus on individual, technological and company factors that lead to the acceptance of OTT services; whereas Sujata's *et al.* (2015) study focused on the factors driving users towards OTT service, the study concluded that the determining

driver of the growth of OTT services was regulatory and government position towards them, but the study failed to focus on a model that informs the adoption of the services. Further, Stork *et al.* (2017) studied the OTTs threat on African Telecommunication operators, the study established that OTTs can be embraced to retain revenues, however the study did not focus on a model that can be used to encourage the acceptance and use of the OTT services to increase the revenues; whereas Fowora *et al.* (2018) conducted a study on the impact of OTTs in Nigeria and established that the OTTs had low cost delivery prices that influenced consumers to adopt them, however the study was conducted in Nigeria and not in Kenya. The four studies failed to strictly focus on a model that can facilitate successful adoption of OTT services in Kenya.

Theoretical Review

Diffusion of Innovations Theory

The Diffusion of Innovations theory was initialized by Rogers (1995). DOI studies the steps that a modern technical discovery goes through to gain market acceptability across time and across societies. It aims to understand how, why, and how frequently new technology gets known and spread across cultures across time. When it comes to corporate innovation, the DOI observed that personal qualities, internal elements of a corporate design, and outward characteristics of a corporation are all important (Roger, 2003). These factors may affect the adoption rate of OTT applications and systems at the firm level.

Diffusion can be defined as the means through which an innovation is converted to people in the community over time (Rogers, 1995). Thus, the theory of diffusion explains the concept of diffusion in detail; it is one of the models utilized in explaining adoption of new technology in the field of IS. Individual attributes, internal elements of a firm structure, and the company's exterior features were discovered to be major antecedents in terms of the company's innovativeness (Tiago & Maria, 2011).

Nripendra *et al.* (2013), argues that the frequency of diffusion is determined by a relative merit of an innovation, its complexity, trialability, compatibility, and its observability. However, out of the constructs only three were found to be used across different studies, that is, compatibility, complexity, and relative merit. The degree to which a discovery is thought to be more significant or superior than its precursor is referred to as its comparative privilege. Compatibility refers to the extent a technology is seen to match perfectly with the existing beliefs, values, cultures and the requirements of the society. Complexity can be defined as the extent an individual sees a technology to be difficult to use and apprehend. Trialability is the extent to which a scheme or plan can be experimented on a limited basis and observability can be defined as the extent to which the results of an innovation are visible.

The theory of diffusion of innovation is commonly utilized to increase the speed of adoption of public health programs that are established to change the conduct of a social framework. For example, a problem in the public health can be solved through an intervention that is introduced to the community through a social system with the main aim that people are going to adopt it. It is observed that the successful adoption of the health programs comes when one understands the target population and factors leading to increased frequency in adoption (Davis, 2009).

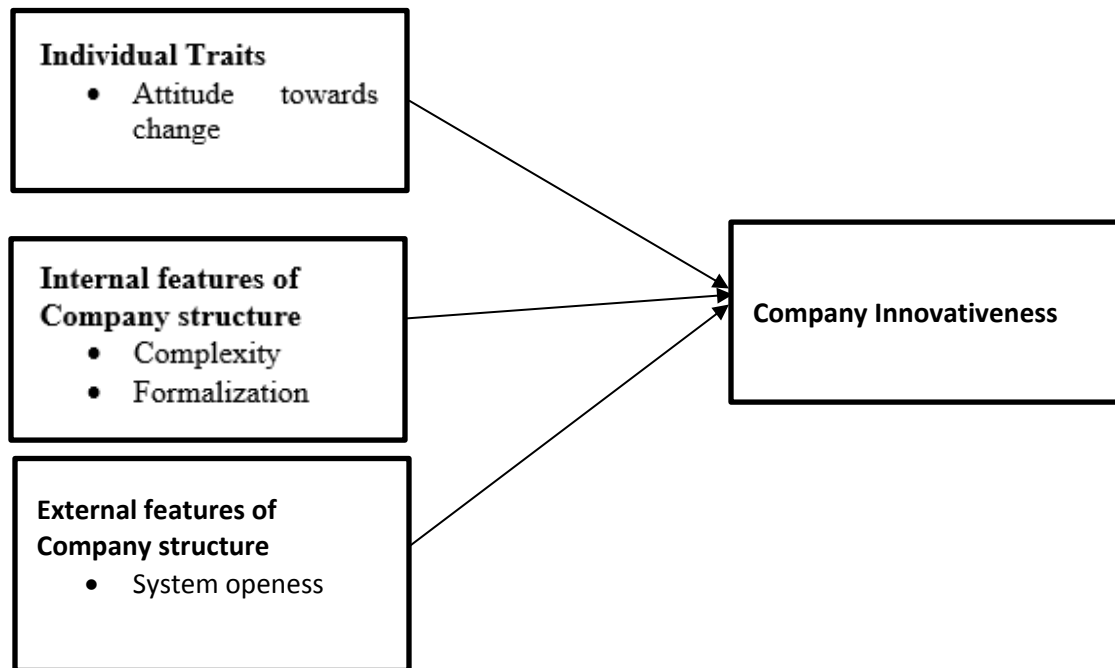


Figure 1: DOI Theory as applied by Rogers,1995 to company's level

Source: Rogers (1995)

1.3 Conceptual Framework

The adoption of OTTs was the study's dependent variable. It was calculated based on the amount of subscription packages purchased by viewers or sold by developers. Independent factors include the developer's industrial aptitude, perceived utility, perceived simplicity of use, security and privacy, compatibility, regulatory environment, and the development context.

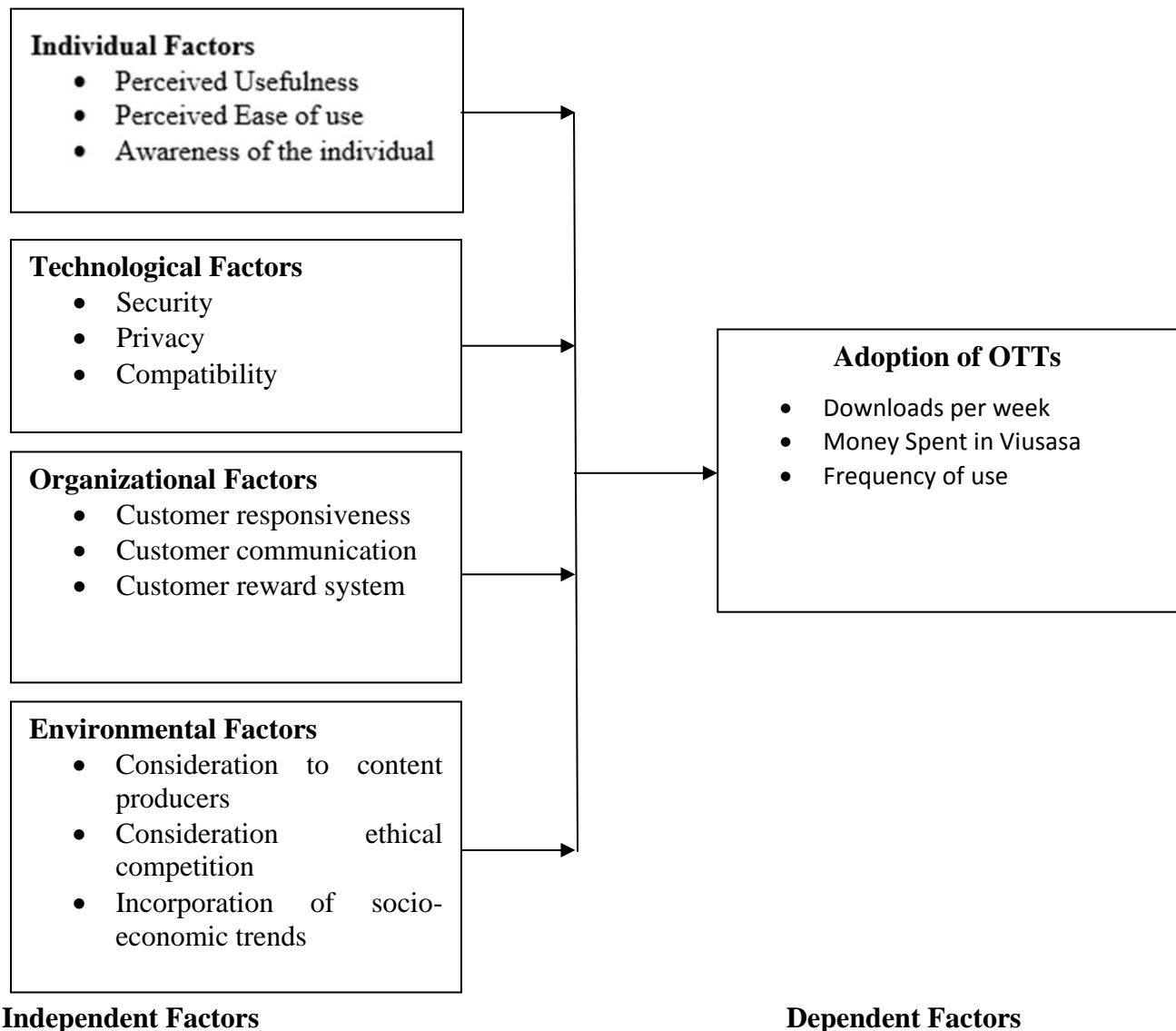


Figure 2: Conceptual Framework

Critique of the Existing Literature Relevant to the Study

Troshani (2011) in his study adopted a technology- organization- environment model for analytical framework. He established management capability and management commitment and environmental factors as constructs leading to the adoption of HRIS but this study fails to investigate other TOE constructs such as compatibility and industrial competition which the current study will focus on. Ahmad *et al.* (2011) on his study on the usage of computer-mediated technology, he focused on limited types of constructs that is, perceived usefulness, self-efficacy, intention to use and self-reported usage and leaves out other views by the user such as attitude towards change, which was studied in this study.

Hussein *et al.* (2010) uses DOI constructs, perceived characteristics of innovating theory and the constructs for TAM model as determinants of adoption of e-filing system; however, this study focused only on the government systems leaving out other adoption systems like the case of our

study which focuses on OTT systems. Tiago and Maria (2011), on their study on firms' patterns of e-Business Adoption, they established that most important constructs for e-business adoption was the type of industry and its characteristics, however this conclusion cannot be made for other industries because the environmental, technological and company constructs for industries differ from one to another.

Research Gap

It very well may be concluded from the survey of current hypotheses and models around innovation reception that there is nobody model that fits all situations of individual or potentially authoritative settings of reception. New models are for the most part enhancements for prior models addressing inadequacies to fit explicit situations. Rui (2007) noticed that an extensive information on the conduct of use reception in organizations is missing and surprisingly the current constructions are restricted as far as giving significant arrangement of drivers that can help scientist in IS in fostering a closefisted however compelling model in the reception of IS innovations. The vast majority of the current speculations/models were created north of twenty years. The social request practices towards innovation reception have changed over this period. In this manner, another model was crucial for guide the reception of OTT administrations in the current time.

Tiago and Maria (2011), on their study on firms' patterns of e-Business Adoption used EU27 members, that means that the study focused on the whole of Europe, leaving a contextual gap, which was filled by the current study which was conducted in Kenya. Troshani (2011) in his study only focuses on the adoption HRIS (Human resources information systems) in public sectors, a conceptual gap exists in Troshani study because he focused on adoption of HRIS whereas this study concentrated on the adoption of OTT services. Ukoha and Emecheta (2016) on their research work, the adoption of enterprise resource planning (ERP) they used snow ball and purposive sampling posing a methodological gap, this study filled the gap by using simple random sampling. Ahmad *et al.* (2011) on his study on the usage of computer-mediated technology mainly focused on public universities as their unit of analysis, the current study filled the conceptual gap by focusing on the media sector and in particular the OTT local industry.

2.0 METHODOLOGY

This study employed an explanatory research technique. The target population for this study was limited to 23076 subscribers, who were the active subscribers of Viusasa as of December 2018. Simple random sampling was used to sample from the target population. Data collection was done through a structured questionnaire, which was both in soft and hard copy. Statistical package for social sciences (SPSS v25.0) was utilized to analyze the responses received from the questionnaire. The study generated and used averages, frequencies, and percentages to present the analysis.

3.0 RESULTS

3.1 Descriptive statistics

This section presents the findings of the descriptive results including the means, standard deviations, percentages and counts.

3.1.1 Individual Factors

Table 1: Descriptive results of Individual Factors (Perceived Ease of Use-Users)

Statements	1	2	3	4	5	Mean	Std Dev
1. To navigate from one icon of Viusasa application is easy	43%	52%	2%	3%	0%	1.64	0.66
2. Viusasa requires less ICT knowledge to understand it compared to international OTT platforms	41%	49%	8%	0%	2%	1.73	0.78
3. I understand the options in Viusasa because they use both Kiswahili and English languages	47%	41%	8%	0%	4%	1.73	0.92
4. Viusasa programs are short video clips that are straight to the point	45%	36%	3%	3%	13%	2.03	1.34
5. Viusasa has reduced the waiting time to catch up my favorite programs on TV	43%	43%	0%	8%	6%	1.90	1.12
6. With Viusasa am no longer in a hurry to catch up TV programs at home	39%	40%	10%	3%	8%	1.99	1.13
7. I am aware of the price per video on VIUSASA	40%	36%	5%	10%	9%	2.12	1.29
8. The programs on Viusasa are vast covering any content I want to watch	50%	40%	5%	3%	2%	1.67	0.86
9. The application does not air commercials that delay my watch time	45%	48%	3%	0%	4%	1.72	0.89
Aggregate Mean/Std Dev						1.84	1.00

Table 1, 95% respondents indicated that to navigate from one icon of Viusasa application is easy (mean=1.64 \approx 2, SD=0.66). Likewise, 90% of the respondents agreed that Viusasa requires less ICT knowledge to understand it compared to international OTT platforms (mean=1.73 \approx 2, SD=0.76). The findings indicated that 88% of the respondents agreed that they understand the options in Viusasa because they use both Kiswahili and English languages (mean=1.73 \approx 2, SD=0.92).

The findings indicated that 81% of the respondents agreed that Viusasa programs are short video clips that are straight to the point (mean=2.03 \approx 2, SD=1.34). The findings indicated that 86% of the respondents agreed Viusasa has reduced the waiting time to catch up my favorite programs on TV (mean=1.90 \approx 2, SD=1.12). The findings indicated that 79% of the respondents agreed that with Viusasa they are no longer in a hurry to catch up TV programs at home (mean=1.99 \approx 2, SD=1.13).

The findings showed that 76% of the respondents agreed that they are aware of the price per video on VIUSASA (mean=2.12 \approx 2, SD=1.29). The findings indicated that 90% of the respondents agreed that the programs on Viusasa are vast covering any content I want to watch

(mean=1.67 \approx 2, SD=0.86). The findings indicated that 93% of the respondents agreed that the application does not air commercials that delay my watch time (mean=1.72 \approx 2, SD=0.89).

This meant that the majority of the respondents agreed that the individual factors led to an improvement in the adoption of VIUSASA. Likewise, these findings corroborate those of Mbachu and Bizien (2017) who stated that individual factors are very critical in the prediction and act as a driving force of adoption of any technological innovations. These factors can be past experience, personal innovativeness, perceived usefulness, attitude, image and delight in an innovation (Davis, 1989; Lewis *et al.*, 2003). It has been revealed that perceived ease of use (PEOU) positively influences perceived ease of use. PEOU is the extent one goes in believing that using a particular technology, the effort required to do a particular task will be reduced or eliminated (Davis, 1989). The two individual factors are simultaneously influenced by an external factor (Stamam, Ahamad, Zainudin & Rashidi, 2013).

3.1.2 Technological Factors (Security and Privacy-Users)

Table 2: Descriptive results of Technological Factors (Security and Privacy-Users)

Statements	1	2	3	4	5	Mean	Std Dev
1. Viusasa is less prone to virus attack	34%	35%	13%	10%	8%	2.23	1.24
2. Viusasa is less prone to programming bugs	51%	46%	2%	0%	0%	1.51	0.55
3. Viusasa is less prone to hacking	13%	8%	8%	20%	52%	3.91	1.43
4. Viusasa does not share my payment details with third party	18%	15%	47%	10%	10%	2.79	1.15
5. Viusasa application has enables me to create my own security password	30%	49%	15%	3%	3%	1.98	0.89
6. Viusasa ensures that my address is kept confidential	26%	46%	13%	5%	10%	2.27	1.19
7. Viusasa is not slowed down by other applications in my device e.g., phone, iPad, computer	39%	36%	17%	0%	8%	2.01	1.12
8. I am able to save videos so that I can watch them offline even on any operating system such as IOS/Android	15%	28%	36%	10%	10%	2.72	1.15
9. It takes a short time to download Viusasa application in my device, e.g., phone, iPad, computer	31%	25%	29%	8%	7%	2.35	1.20
10. Viusasa can be accessed through the web and the mobile phone	18%	15%	47%	10%	10%	2.79	1.15
Average						2.46	1.11

From Table 2, 69% respondents indicated that Viusasa is less prone to virus attack (mean=2.23 \approx 2, SD=1.24). The findings depicted that 97% of the respondents agreed that Viusasa is less prone to programming bugs (mean=1.51 \approx 2, SD=0.55). However, 72% of the respondents indicated that Viusasa is more prone to hacking (mean=3.91 \approx 4, SD=1.43).

The findings indicated that 47% of the respondents were not sure that Viusasa does not share their payment details with third party (mean=2.79 \approx 3, SD=1.15). The findings indicated that 79% of the respondents agreed that Viusasa application has enables them to create my own security password (mean=1.98 \approx 2, SD=0.89). The findings indicated that 72% of the respondents agreed that Viusasa ensures that my address is kept confidential (mean=2.27 \approx 2, SD=1.19).

The findings indicated that 75% of the respondents agreed that Viusasa is not slowed down by other applications in my device e.g., phone, iPad, computer (mean=2.01 \approx 2, SD=1.12). The findings indicated that 43% of the respondents agreed that they are able to save videos so that they can watch them offline even on any operating system such as IOS/Android (mean=2.72 \approx 3, SD=1.15). The findings indicated that 56% of the respondents agreed that Viusasa can be accessed through the web and the mobile phone (mean=2.35 \approx 2, SD=1.20). The findings indicated that 47% of the respondents were not sure that it takes a short time to download Viusasa application in their device, e.g., phone, iPad, computer (mean=2.79 \approx 2, SD=1.15). This meant that the majority of the respondents agreed that the technological factors lead to an improvement in the adoption of VIUSASA.

These findings resonated with Tiago and Maria (2011) and Awa, Ukoha and Emecheta (2016) who established that technological factors were found to contribute more to the adoption of the software (ERP), only that compared to environmental factors. Aljowaidi (2015) claims that enhancement of marketing, operational efficiency, and compatible shopping environment. The rate of implementation of e-commerce was realized to be low due to factors such as; inadequate government initiatives, legislative systems, lack of e-payment ways, poor infrastructure, insufficient external ICT infrastructure, and low e-readiness among local trade associates.

3.1.3 Organizational Factors (Users)

Table 3: Descriptive results of Organizational Factors (Users)

Statements	1	2	3	4	5	Mean	Std Dev
1. Viusasa has a good response team to deal with security issues	54%	33%	2%	2%	9%	1.79	1.19
2. My questions are accurately addressed	59%	35%	0%	2%	5%	1.59	0.96
3. My complaints are timely acted upon by the Viusasa	23%	2%	1%	36%	39%	3.67	1.55
4. The pioneers of Viusasa have encouraged me to use Viusasa	65%	33%	0%	0%	2%	1.41	0.68
5. The customer care always responds to me in good mood and attitude	43%	33%	0%	4%	20%	2.25	1.53
6. The customer care likewise provides me with extra read materials and manuals for me to familiarize with	57%	34%	0%	2%	7%	1.67	1.07
7. Customers are given discounts and incentives over and above the normal requirements of subscriptions	67%	33%	0%	0%	0%	1.35	0.52
8. Viusasa holds rallies and tours to various parts of the country for personal contact with the customers	21%	48%	0%	4%	26%	2.65	1.51
Average						2.05	1.13

From Table 3, 87% respondents indicated that Viusasa has a good response team to deal with security issues (mean=1.79 \approx 2, SD=1.11). Likewise, 94% of the respondents agreed that their questions are accurately addressed (mean=1.59 \approx 2, SD=0.96). The findings indicated that 75% of the respondents disagreed that their complaints are timely acted upon by the Viusasa (mean=3.67 \approx 4, SD=1.15).

The findings indicated that 98% of the respondents agreed that the pioneers of Viusasa have encouraged them to use Viusasa (mean=1.41 \approx 1, SD=0.68). The findings indicated that 76% of the respondents agreed that the customer care always responds to them in good mood and attitude (mean=2.57 \approx 2, SD=1.53). These findings are in line with Hussein, Mohamed, Ahlan, Mahmud and Aditiawarman (2010) who specified that constructs such as; web-based service

quality, social influence, internet trust, trusts of the government political self-efficacy, and perceived risk are important in the adoption of technology. E.g., the e-filing system.

The findings indicated that 91% of the respondents agreed that the customer care likewise provides them with extra read materials and manuals for them to familiarize with (mean=1.67 \approx 2, SD=1.07). The findings indicated that 100% of the respondents agreed that customers are given discounts and incentives over and above the normal requirements of subscriptions (mean=1.35 \approx 2, SD=0.52).

The findings indicated that 69% of the respondents agreed that Viusasa holds rallies and tours to various parts of the country for personal contact with the customers (mean=2.65 \approx 3, SD=1.51). This means that the majority of the respondents agreed that the organizational factors (users) lead to an improvement in the adoption of VIUSASA.

Likewise, these findings were consistent with Atkin, Chaudhry, Chaudry, Khandelwal, & Verhoogen (2017) that large firms are more likely to successfully take on an innovation, both because of the availability of funds and the foreseen benefits of the technology adoption. Those organisations whose market share is large are more likely to initiate a new technology because of the capacity they possess such that they are able to distribute the profits they receive from the adoption. Heavy investments in research, development, marketing, training, infrastructure and employment of workers come along with the invention and development of a new technology (Atkin *et al.*, 2017). Huang *et al.* (2017) notes that cost of services are crucial and thus OTT players can fail to make profits due to high costs of creation and limited sources of revenues.

3.1.4 Environmental Factors (Users)

Table 4: Descriptive results of Environmental Factors (Users)

Statements	1	2	3	4	5	Mean	Std Dev
1. The content producers are properly rewarded	44%	52%	2%	3%	0%	1.64	0.66
2. The rights to the uploads by content producers are secured by Viusasa	41%	49%	8%	0%	2%	1.73	0.78
3. Content producers are discouraged to upload mature and socially inappropriate content on Viusasa	47%	41%	8%	0%	4%	1.73	0.92
4. There is fair competition between Viusasa and other platforms like YouTube	45%	36%	3%	3%	13%	2.03	1.34
5. The costs per video (streaming/download) are fair to you as a user compare to other platforms	43%	44%	0%	8%	6%	1.90	1.12
6. The application consumes heavy traffic and works only under strong network	39%	40%	10%	3%	8%	1.99	1.13
7. The company allows participation of both genders in advertising of their programs	40%	36%	5%	10%	9%	2.12	1.29
8. Viusasa registration requirements are minimal	50%	40%	5%	3%	2%	1.67	0.86
9. The company allows participants from every social/economic class to be partakers of their programs	45%	48%	3%	0%	4%	1.72	0.89
Average						1.84	1.00

From Table 4, 95% respondents indicated that the content producers are properly rewarded (mean=1.64 \approx 2, SD=0.66). Likewise, 90% of the respondents agreed that the rights to the uploads by content producers are secured by Viusasa (mean=1.73 \approx 2, SD=0.78).

The findings showed that 88% of the respondents agreed that content producers are discouraged to upload mature and socially inappropriate content on Viusasa (mean=1.73 \approx 2, SD=0.72). The

findings indicated that 81% of the respondents agreed that there is fair competition between Viusasa and other platforms like YouTube (mean=2.03 \approx 2, SD=1.34). The findings indicated that 87% of the respondents agreed that the costs per video (streaming/download) are fair to you as a user compared to other platforms (mean=1.90 \approx 2, SD=1.12). The findings indicated that 80% of the respondents agreed that with the application consumes heavy traffic and works only under strong network (mean=1.99 \approx 2, SD=1.13).

The findings indicated that 76% of the respondents agreed that the company allows participation of both genders in advertising of their programs (mean=2.12 \approx 2, SD=1.29). The findings indicated that 90% of the respondents agreed that Viusasa registration requirements are minimal (mean=1.67 \approx 2, SD=0.86). The findings indicated that 93% of the respondents agreed that the company allows participants from every social/economic class to be partakers of their programs (mean=1.72 \approx 2, SD=0.89). The majority of the respondents agreed that the related environmental factors (users) lead to an improvement in the adoption of VIUSASA.

The findings agreed with Mwambia (2015) who reveal that environmental factors entail the setting or the arena in which a company conducts its business. These environmental factors comprise of factors such as industry competition, customer influence, rivalry and regulatory compliance. Therefore, a company is mainly influenced by its industry, competitors and regulations surrounding its operations (Susan *et al.*, 2006). Besides, the connection among expertise and involvement in esteem is straightforwardly corresponding, where the higher the ability capability and the more prominent the experience an organization has with application improvement, the higher the imminent worth of the application (Nazareth & Choi, 2015).

3.1.5 Adoption of VIUSASA

Table 5: Descriptive results of Adoption of VIUSASA

Statement	Category	Frequency	Percent
Would you use Viusasa to download music	Yes	160	41.7
	Not sure	134	34.9
	No	90	23.4
Would you use Viusasa to download videos	Yes	197	51.3
	Not sure	178	46.4
	No	9	2.3
Would you use Viusasa to watch or stream in TV programs	Yes	147	38.3
	Not sure	97	25.3
	No	140	36.5
How many videos do you download per week?	Over 10 videos	107	27.9
	1– 10 videos	59	15.4
	None	218	56.8
How many songs do you download per week?	Over 10 songs	257	66.9
	1 – 10 songs	126	32.8
	None	1	0.30
How much do you spend on Viusasa per week?	10 Kshs	180	46.9
	10- 50 Kshs	186	48.4
	50– 100 Kshs	18	4.7
How many times do you use Viusasa app in a week?	Over 10 times	156	40.6
	5 – 10 times	200	52.1
	1 – 5 times	28	7.3
I am satisfied with the services that I am receiving from Viusasa	Agree	199	51.8
	Not sure	158	41.1
	Disagree	27	7

The findings in Table 5 indicated that 41.7% of the respondents indicated that they use Viusasa to download music, 51.3% of the respondents indicated that they use Viusasa to download videos while 38.3% of the respondents indicated that they use Viusasa to watch or stream in TV programs. Likewise, 56.8% of the respondents indicated that they download zero videos from VIUSASA per week while 66.9% of the respondents they download over 10 songs from VIUSASA per week. Regarding the cost and frequency of downloads, 48.4% of the respondents indicated that they spend Kshs 10 to Kshs 50 on Viusasa per week while 52.1% of the respondents indicated that they use Viusasa app 5 to 10 times in a week. In general, the findings indicate that 51.8% of the respondents likewise agreed that they are satisfied with the services that I am receiving from Viusasa.

3.2 Inferential statistics

Inferential analytics are approaches that allow research to draw conclusions about a population based on data acquired from a subset. In short, they determine the likelihood of obtaining a set of findings from a particular data point. Regression and correlation tests were used in this section.

3.2.1 Correlation analysis**Table 6: Correlation matrix**

Correlations		Adoption of VIUSASA	Individual Factors	Technological factors	Organizational Factors	Environmental factors
Adoption of VIUSASA	Pearson Correlation	1				
	Sig. (2- tailed)					
	N	384				
Individual Factors	Pearson Correlation	.494**	1			
	Sig. (2- tailed)	0.000				
	N	384	384			
Technological factors	Pearson Correlation	.512**	.290**	1		
	Sig. (2- tailed)	0.000	0.000			
	N	384	384	384		
Organizational Factors	Pearson Correlation	.433**	.171**	.181**	1	
	Sig. (2- tailed)	0.000	0.001	0.000		
	N	384	384	384	384	
Environmental factors	Pearson Correlation	.499**	.204**	.294**	.187**	1
	Sig. (2- tailed)	0.000	0.000	0.000	0.000	
	N	384	384	384	384	384

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

The results in table 6 above showed that there is a direct and strong relationship between individual factors and the adoption of OTTs in Kenya ($r=0.494^{**}$, $p=0.000$). The strong r value of 0.494 indicated a value of greater than 0 which implied that individual factors as a linear variable has a positive association with the adoption of OTTs in Kenya. These findings corroborated those of Mbachu and Bizien (2017) who stated that individual factors are very critical in the prediction and act as a driving force of adoption of any technological innovations. These factors can be past experience, personal innovativeness, perceived usefulness, attitude, image and delight in an innovation (Davis, 1989; Lewis *et al.*, 2003). It has been revealed that perceived ease of use (PEOU) positively influences perceived ease of use. PEOU is the extent one goes in believing that using a particular technology, the effort required to do a particular task will be reduced or eliminated (Davis, 1989). The two individual factors are simultaneously influenced by an external factor (Stamam, Ahamad, Zainudin & Rashidi, 2013).

Likewise, the table showed that there is a direct and strong relationship between technological factors and the adoption of OTTs in Kenya ($r=0.522^{**}$, $p=0.000$). The strong r value of 0.522 indicated a value of greater than 0 which implied that technological factors as a linear variable has a positive association with the adoption of OTTs in Kenya. These findings resonated with Tiago and Maria (2011) and Awa, Ukoha and Emecheta (2016) who established that technological factors were found to contribute more to the adoption of the software (ERP), only that compared to environmental and company factors.

The results further showed that there is a direct and strong relationship between organizational factors (users) and the adoption of OTTs in Kenya ($r=0.433^{**}$, $p=0.000$). The strong r value of 0.433 indicated a value of greater than 0 which implied that organizational factors (users) as a linear variable has a positive association with the adoption of OTTs in Kenya. These findings were consistent with Huang *et al.* (2017) who notes organizational factors such as cost of services are crucial and thus OTT players can fail to make profits due to high costs of creation and limited sources of revenues.

The results further showed that there is a direct and strong relationship between environmental factors (users) and the adoption of OTTs in Kenya ($r=0.499^{**}$, $p=0.000$). The strong r value of 0.499 indicated a value of greater than 0 which implied that environmental factors (users) as a linear variable has a positive association with the adoption of OTTs in Kenya. The findings agreed with Mwambia (2015) who revealed that environmental factors entail the setting or the arena in which a company conducts its business. These environmental factors comprise of factors such as industry competition, customer influence, rivalry and regulatory compliance. Therefore, a company is mainly influenced by its industry, competitors and regulations surrounding its operations (Susan *et al.*, 2006). Besides, the connection among expertise and involvement in esteem is straightforwardly corresponding, where the higher the ability capability and the more prominent the experience an organization has with application improvement, the higher the imminent worth of the application (Nazareth & Choi, 2015).

3.2.2 Relationship between independent and dependent variables

Table 7 presents the model of fitness of regression used where the results implied that the selected factors are good and satisfactory predictors of the adoption of OTTs in Kenya. This is evident, as shown by the R^2 value which 0.593. This implied that individual factors (perceived ease of use-users), technological factors (security and privacy-users), organizational factors (users) and environmental factors (users) explain more than 50% (that is 59.3%) of the adoption of OTTs in Kenya. These findings corroborate those of Mbachu and Bizien (2017) who stated that individual factors are very critical in the prediction and act as a driving force of adoption of any technological innovations. Awa, Ukoha and Emecheta (2016) established that technological factors were found to contribute more to the adoption of the software (ERP), only that compared to environmental and company factors. Huang *et al.* (2017) notes organizational factors such as cost of services are crucial and thus OTT players can fail to make profits due to high costs of creation and limited sources of revenues. Mwambia (2015) revealed that environmental factors entail the setting or the arena in which a company conducts its business. These environmental factors comprise of factors such as industry competition, customer influence, rivalry and regulatory compliance.

Table 7: Summary Model of fitness

Model	R Square	Adjusted R Square	Std. Error of the Estimate	R Square
1	.770a	0.593	0.588	0.227

The Analysis of Variance as shown in table 7 was also statistically significant implying that individual factors (perceived ease of use-users), technological factors (security and privacy-users), organizational factors (users) and environmental factors (users) affects the adoption of OTTs in Kenya. This is further supported by the F statistic 137.797 where the value was greater than the critical value at 0.05 significance level, $F_{\text{statistic}} = 137.797 > F_{\text{critical}} = 2.372 (4, 374)$.

Table 8: ANOVA

	ANOVA				
	Sum of Squares	df	Mean Square	F	Sig.
Regression	28.514	4	7.129	137.797	.000b
Residual	19.607	379	0.052		
Total	48.121	383			

The findings revealed that individual factors and the adoption of OTTs in Kenya have a direct and strong relationship ($\beta=0.326$, $p=0.000$) indicating that an increase in one unit of individual factors improves the adoption of OTTs in Kenya by 0.326 units. Therefore, based on the hypothesis that H_{01} : The effect of individual factors on the adoption of OTT services in Kenya is not statistically significant, the study rejects the null hypothesis and indicates that the effect of individual factors on the adoption of OTT services in Kenya is statistically significant

These findings corroborate those of Mbachu and Bizien (2017) who stated that individual factors are very critical in the prediction and act as a driving force of adoption of any technological innovations. These factors can be past experience, personal innovativeness, perceived usefulness, attitude, image and delight in an innovation (Davis, 1989; Lewis *et al.*, 2003). It has been revealed that perceived ease of use (PEOU) positively influences perceived ease of use. PEOU is the extent one goes in believing that using a particular technology, the effort required to do a particular task will be reduced or eliminated (Davis, 1989). The two individual factors are simultaneously influenced by an external factor (Stamam, Ahamad, Zainudin & Rashidi, 2013). Table 8 shows the results obtained

The results also revealed that technological factors and the adoption of OTTs in Kenya have a direct and strong relationship ($\beta=0.268$, $p=0.000$) indicating that an increase in one unit of technological factors improves the adoption of OTTs in Kenya by 0.268 units. Therefore, based on the hypothesis that H_{02} : The effect of technological factors on the adoption of OTT services in Kenya is not statistically significant, the study rejects the null hypothesis and indicates that the effect of technological factors on the adoption of OTT services in Kenya is statistically significant.

These findings resonated with Tiago and Maria (2011) and Awa, Ukoha and Emecheta (2016) who established that technological factors were found to contribute more to the adoption of the software (ERP), only that compared to environmental and company factors. Aljowaidi (2015) claims that enhancement of marketing, operational efficiency, and compatible shopping environment. The rate of implementation of e-commerce was realized to be low due to factors such as; inadequate government initiatives, legislative systems, lack of e-payment ways, poor

infrastructure, insufficient external ICT infrastructure, and low e-readiness among local trade associates.

Regression of the coefficients results revealed that organizational factors (users) and the adoption of OTTs in Kenya have a direct and strong relationship ($\beta=0.166$, $p=0.000$) indicating that an increase in one unit of organizational factors (users) improve the adoption of OTTs in Kenya by 0.166 units. Therefore, based on the hypothesis that **H₀₃**: The effect of organizational factors on the adoption of OTT services in Kenya is not statistically significant, the study rejects the null hypothesis and indicates that the effect of organizational factors on the adoption of OTT services in Kenya is statistically significant.

These findings were consistent with Atkin, Chaudhry, Chaudry, Khandelwal, & Verhoogen (2017) that large firms are more likely to successfully take on an innovation, both because of the availability of funds and the foreseen benefits of the technology adoption. Huang *et al.* (2017) who notes organizational factors such as cost of services are crucial and thus OTT players can fail to make profits due to high costs of creation and limited sources of revenues

Regression of the coefficients results revealed that environmental factors (users) and the adoption of OTTs in Kenya have a direct and strong relationship ($\beta=0.270$, $p=0.000$) indicating that an increase in one unit of environmental factors (users) improves the adoption of OTTs in Kenya by 0.270 units. Therefore, based on the hypothesis that **H₀₄**: The effect of environmental factors on the adoption of OTT services in Kenya is not statistically significant, the study rejects the null hypothesis and indicates that the effect of environmental factors on the adoption of OTT services in Kenya is statistically significant.

The findings agreed with Mwambia (2015) who reveal that environmental factors entail the setting or the arena in which a company conducts its business. These environmental factors comprise of factors such as industry competition, customer influence, rivalry and regulatory compliance. Therefore, a company is mainly influenced by its industry, competitors and regulations surrounding its operations (Susan *et al.*, 2006). Besides, the connection among expertise and involvement in esteem is straightforwardly corresponding, where the higher the ability capability and the more prominent the experience an organization has with application improvement, the higher the imminent worth of the application (Nazareth & Choi, 2015).

Table 9: Regression of coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	Beta		
(Constant)	-0.053	0.092		-0.581	0.561
Individual Factors	0.326	0.035	0.318	9.273	0.000
Technological factors	0.268	0.031	0.303	8.652	0.000
Organizational Factors	0.166	0.020	0.285	8.469	0.000
Environmental factors	0.270	0.030	0.314	9.103	0.000

a Dependent Variable: Adoption of VIUSASA

b Predictors: (Constant), Environmental factors, Organizational Factors, Individual Factors, Technological factors

$$Y = -0.053 + 0.326X_1 + 0.268X_2 + 0.166X_3 + 0.270X_4 + e$$

Where:

Y = Adoption of OTT services

X₁ = individual factors

X₂ = technological factors

X₃ = organizational factors (users)

X₄ = environmental factors (users)

ϵ is the error term established from heteroscedasticity test

3.3 Hypothesis Testing

The acceptance/rejection format was that, if the p-value is less than 0.05, the H₀₁ is rejected but if it's greater than 0.05, the H₀₁ is rejected and the alternative hypothesis accepted. The null hypothesis H₀ was that the effect of individual factors, technological factors, organizational factors and environmental factors on the adoption of OTT services in Kenya is not statistically significant.

Table 10: Hypotheses Test Results

Tested Hypothesis	Rule	P-value	Results of the hypothesis
H ₀₁ : The effect of individual factors on the adoption of OTT services in Kenya is not statistically significant.	When p value is less than 0.05, reject the null hypothesis	0.000	Rejected
H ₀₂ : The effect of technological factors on the adoption of OTT services in Kenya is not statistically significant.	When p value is less than 0.05, reject the null hypothesis	0.000	Rejected
H ₀₃ : The effect of organizational factors on the adoption of OTT services in Kenya is not statistically significant.	When p value is less than 0.05, reject the null hypothesis	0.000	Rejected
H ₀₄ : The effect of environmental factors on the adoption of OTT services in Kenya is not statistically significant.	When p value is less than 0.05, reject the null hypothesis	0.000	Rejected

Based on the multiple regression findings (Table 9; Table 10), the null hypotheses were rejected since the P values were less than 0.05 and thus, there is a significant effect individual factors, technological factors, organizational factors and environmental factors on the adoption of OTT services in Kenya is not statistically significant.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The study concluded that individual factors (perceived ease of use-users), technological factors (security and privacy-users), organizational factors (users) and environmental factors (users) have a positive and significant relationship with the adoption of OTTs in Kenya. Thus, Viusasa App presents qualities that are perceived as easy to use, for instance, the app is easy to navigate, required less knowledge to understand it compared to international OTT platforms, it is accessed

via local language understood by many users in Kenya and presented short clips that presented the qualities of fun, short waiting time and affordability.

This was evidenced by the findings that indicated that Viusasa is less prone to virus attack, programming bugs and to hacking. Therefore, by use of VIUSASA, clients are assured that their payment details could not be shared with third parties (confidentiality). Besides, it takes a short time to download a video and saving of videos for offline viewing was possible. Thus, the advantages regarding technological factors have been visible in the adoption of OTT services in Kenya.

The adoption of VIUSASA has also been attributed to the timely response team to complaints and feedback. The service providers also ensure that the subscribers are provided with extra read materials and manuals for me to familiarize with which ensures the ease of use by the subscribers. Likewise, by extending discounts and incentives over and above the normal requirements of subscriptions to subscribers, the app has been widely adopted in Kenya.

The app has gained prominence in Kenya since it offers content that is socially acceptable and valued, which ensures the preservation of social norms and culture. For instance, the content producers were properly rewarded, the rights to the uploads by content producers were secured by Viusasa, content producers were discouraged to upload mature and socially inappropriate content on Viusasa and allowed participation of both genders in advertising their programs.

Recommendations

Pay TV providers and broadcasting stations that were providing or purposed to provide OTT services are encouraged to focus on the key individual factors that lead to the adoption of OTT services. The understandings assisted on the providers improving their relationship with the users and have a bigger market even in terms of the customer base. Telecom operators in Kenya are encouraged to develop competitive OTT services to gain a competitive advantage over the present OTTs' players.

The study also recommends the VIUSASA service providers to scale up their security platforms and solidify the application's perceived ease of use. This is evidenced by majority of the respondents in the current study acknowledging that security plays a pivotal role in them using the VIUSASA app.

The study also encourages the VIUSASA service providers to ensure that they scale up their promotional activities via use of social media and other ICT-related platforms (other than the rallies and tours). This will ensure that the knowledge about VIUSASA covers a larger group of potential subscribers in Kenya at minimum costs.

Likewise, the communication legislators in Kenya such as Communications Authority of Kenya (CA) and the Media Council of Kenya who were mandated to oversee media and broadcasting services in Kenya were advised to come up with media policies and programmes that uplift Kenyans through investing in quality local content. The media should build programming around Kenyan histories and show Kenyans the importance of OTT services. The media ought to protect media freedom but ensure that false allegations and defamation do not frustrate service delivery to the people.

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