The Mediating Effect of Intentions to Leapfrog on the Relationship between Perceived Product Quality and Urgency to Replace

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***Abstract*: The purpose of this paper is to investigate the mediating effect of leapfrogging intentions on the relationship between perceived product quality and urgency to replace in the mobile phone industry. The study used a cross-sectional research design and simple random techniques to collect data from 349 employees of three Kenyan county governments. Findings reveal that perceived product quality positively enhances customers' intentions to leapfrog, which positively influences their urgency to replace a product. In addition, results indicate that perceived product quality positively and significantly enhances customers' urgency to replace. Finally, intention to leapfrog acts as a mechanism through which perceived product quality enhances urgency to replace. This reflects the consumers' enthusiasm for variety and change which influences their urgency of replacing the existing product with the next generation. The mediation findings bring new insight to theory and existing literature in the marketing industry. The management need to recognize that for consumers to replace the existing product they expect new generation products to have improved safety, superior quality attributes, and superior performance than what is currently available. Thus, during the product development process, these features should be incorporated into the new product to increase acceptability and replacement.**

***Key Words*: Perceived product quality, Intentions to leapfrog, Urgency to replace**

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I. INTRODUCTION

Customers who want to buy future generations of mobile phones differ in their perceived urgency to replace the phone due to the rapidly changing nature of mobile phone technology. A number of motivating factors, including the intention to skip and the perceived improvement in product quality causes this.

The customer's desire to purchase the new product is primarily determined by the functionality of the current product (Evans et al., 1989; Rogers, 1995). The capabilities of any product degrades over time due to wear and tear, and with increasing age, increased breakdowns of most items are to be expected. In support of this view, Bayus & Gupta (1992) demonstrate that the perceived condition of the currently owned item influences intentions to replace the item (Labay & Kinnear, 1981). Further, consumers' desire for variety and change also influences the urgency to replace the current product (P0) by the next generation (either P1 or P2).

Urgency to replace the current product is also determined by the competitive nature of the market and how products are becoming outdated (Prehald, & Gary, 2010). It is critical for a company to ensure it remains the most trending business in the market, for this will make the consumers to associate products from the company with high quality (Smith, 2004) and have an urgency to replace their current product. The most efficient way of remaining fashionable in a competitive environment is to ensure that the company produces unique styles and have effective promotion strategy.

For example, in the fashion industry, organizations such as Gucci, supreme, Celine among others, have perfected the art of creating new styles and effective promotion of their products, which have made them to remain relevant within the fashion market (Haas, & Hansen, 2005). The traditional calendars that were highly observed where new styles were presented to the market during the vacations or fashion shows are being ignored. Fashion designers in this industry look for any public show where they can show their superb designs as opposed to waiting for the old-fashioned calendar days. Businesses that continue to receive more consumers in a highly competitive industry have a good standing in terms of brand and with that comes the competitive advantage (Kueng 2016).

Celebrities and the media influence fashion and the use of new products on the market. Consumers, according to Suh (2017), want products that are trending and relevant to specific target groups. Companies in this case invest heavily in research in order to stay on top of new designs and trends. People are influenced to peruse a celebrity's social media page to identify their recent design trends because groups tend to copy what their favorite celebrities consume or use (Hall, & Saias, 2015). It is natural for mobile phone companies to use celebrities and media personnel to introduce their product line.

We argue that, similar to the fashion industry, mobile phone gadgets set by celebrities and media personalities are more likely to progress and become pronounced than promotion done on televisions and other advertisements. These mobile gadgets and the ever-changing trends make the consumer feel compelled to change whatever they own in order to keep up with what is currently available on the market.

II. BACKGROUND OF THE STUDY

The will to get a product is caused by both internal and external signals (Wansink 1994; Youn & Faber, 2000). Internal indications or signals include the self-feelings, moods, and emotional states of consumers, while external indications/signals include environmental and sensory factors regulated by retailers. Studies indicate that within the retail setting, ambient signals (such as sights, sounds, and smells) are significant external stimuli that affect the will of consumers to make a purchase (Eroglu & Machleit, 1993); Mitchell 1994). Additionally, the marketing mix such as point-of - purchase, displays, promotions, and advertising can also influence the consumer's willingness to make a spontaneous decision to purchase.

Today, the mobile phone plays a key part in the lives of most consumers, including the lives of young teens. It is a gadget that many consumers cannot seem to do without; they always have it on and check it almost everywhere they go. For these consumers, the cell phone is not only a personal device used to stay connected with friends and family, but it is also a device that showcases the extension of their persona and individuality (Grant and O'Donohoe, 2007; Sultan and Rohm, 2005). For marketers, the prevalent adoption of cell phones signifies a huge marketing prospects to reach and serve cell phone customers anytime, anywhere (Grant and O'Donohoe, 2007; Roach, 2009; Barutcu, 2007). Furthermore, the brands of these mobile phones play an important role in the customer's daily life, and can present a big asset for companies owning them. Due to the massive presence of mobile phones, brands play an important role in the customer's decision making process of using or adopting a mobile phone. For this reason this study sought to understand if intention to leapfrog mediates the relationship between perceived product quality and urgency to replace in the mobile phone industry.

III. STATEMENT OF THE PROBLEM

Urgency to replace the current product is determined by the competitive nature of the market and how products are becoming outdated (Prehald, & Gary, 2010). It is critical for a company to ensure it remains the most trending business in the market, for this will make the consumers to associate products from the company with high quality (Smith, 2004) and have an urgency to replace their current product. The most efficient way of remaining fashionable in a competitive environment is to ensure that the company produces unique styles and have effective promotion strategy. Shortage seems to amplify the sense of urgency among consumers generally (Aggarwal, Jun, & Huh, 2011). When there are limited time periods for purchasing limited goods, the sense of urgency is more noticeable, thus buyers seem to create "urgency to purchase" in their minds. The authors argue that because of the consumer's willingness to purchase the merchandise immediately the "urgency to get" restricts the consumers power to postpone purchasing decisions. Other researchers depict the sense of urgency as a selected need within the immediate or near future to undertake and complete an act (Swain, Hanna, & Abendroth, 2006). The impulse to shop for a product stems from a fixation on the product or a sudden and spontaneous desire to shop for it (Rook, 1987). As noted by Beatty & Ferrell (1998), buying urgency may be a state of desire that precedes the particular action of impulse and is encountered within the atmosphere when an object seen. This implies that a change occurs within the point of reference of an individual when being physically close to the merchandise and this may end in certain desires and decisions to acquire the merchandise.

This study thus seeks to understand the mediating effect of leapfrogging intentions on the relationship between perceived product quality and urgency to replace in the mobile phone industry

IV. RESEARCH OBJECTIVES

The main objective of the study is to understand the mediating effect of leapfrogging intentions on the relationship between perceived product quality and urgency to replace in the mobile phone industry. The specific objectives include:

i) To establish the effect of perceived product quality on the intention to leapfrog
ii) To determine the effect of intention to leapfrog on urgency to replace
iii) To analyse the effect of Perceived product quality on urgency to replace
iv) To examine the mediating effect of Intention to leapfrog on the relationship between perceived product quality and urgency to replace

V. HYPOTHESIS OF THE STUDY

H1: Perceived product quality significantly and positively influences intention to leapfrog

H2: Intention to leapfrog significantly and positively influences urgency to replace

H3: Perceived product quality significantly and positively influences urgency to replace

H4: Intention to leapfrog mediates the relationship perceived product quality and urgency to replace

VI. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The Theory of Planned Behaviour

The theory of planned behavior (Ajzen, 1991) is an extension of theory of reasoned action (TRA) which was established to

get around the limitation within the theory of reasoned action (Ajzen, 1975 and Fishbein, 1980). Theory of planned behavior comprises attitude towards the behavior, subjective norm (SN) and perceived behavioural control (PBC) (Ajzen, 1985, 1991). Consistent with the theory, attitude toward behavior, subjective norms, and perceived behavioral control, together cause individual's behavioural intention and behavior. Theory of planned behavior has been applied to varied studies in varied sectors to review consumer behaviour such as e-coupon usage (Kang et al., 2006), green consumption (Sparks et al., 1992), smoking (Godin et al., 1992), and e-commerce services (Bhattacherjee, 2000; Tonglet *et al.,* 2004).

A large number of studies supporting the idea of Planned Behavior are evident in this sphere of research (Yadav & Pathak, 2017). These studies present evidence that the intentions are the projection of actual behavior (Rahimah *et al.*, 2018). The current research intends to include various factors that culminate into behavior intention using the idea of Planned Behavior (TPB) (Fishbein & Ajzen, 1975). Furthermore, the current study is focused on finding a positive attitude and subjective norm in purchase behavior. Among the various psychological theories, TPB has been widely accepted amongst consumer behavior scholars (Cheng et al., 2011) as the more insightful theory in explaining the relationship between intention and behaviour. TPB is the extended version of Fishbein's theory of reasoned action (TRA) (Abraham & Sheeran, 2003; Schierz et al., 2017).

According to Abraham and Sheeran (2003) in the TPB (a) is the simplest to predict personal behavior is to know the intention, (b) the intentions are described by people's judgment of performing behavior and by their social issues (subjective norms), and (c) the external determinants only show the indirect impact on behavior – these could be moderator, mediator and components of the model. Lastly, TPB extends the idea of reasoned action by adding another important construct-perceived behavioral control (PBC), which refers to people's assessment of their ability to perform a behavior.

Perceived Product Quality and Urgency to Replace

Consumers use different variables when assessing the quality of a commodity. These factors depend on consumers understanding of the product. Accordingly, we first incorporate the view of perception in order to provide a profound understanding of what the perceived output of consumers implies. The perception of consumers varies from person to person, according to Kotler (1997), and it depends on the way we perceive stimuli. In addition, the understanding of customers is affected depending on-knowledge that enters their senses. External stimuli, such as product characteristics and internal stimuli, such as the motivations and aspirations of the consumer (Agyekum, Haifeng, & Agyeiwaa, 2015) may attract the attention of the consumer.

Perceived Quality is the decision and valuation of a product's superiority. Perceived quality includes: performance, features, confor-mance, reliability, durability, serviceability, and fit and finish. Keller(2003) defines perceived quality as consumer perceptions of quality/superiority of product's relation to alternatives that are relevant to the expected goals. Perceived quality relates to both goods and service contexts (Aaker, 1991).

It is imperative to consider the expectations of customers, since it is what most affects perceived quality. To explain the concept of perceived efficiency, there are various approaches. According to Aaker (1991) the understanding of consumers' products overall dominance is based on multiple reasons and alternatives (Aaker, 1991). Aaker & Joachimsthaler (2000) add that, since it affects both brand affiliation and brand equity, perceived consistency is a sort of affiliation. The perception of quality is affected by two kinds of signals: intrinsic and extrinsic. Intrinsic indicators, for example, are the understandings of innovation by a buyer of the product, while extrinsic indicators are the characteristics of the product itself, like the price and brand name (Teas & Agarwal, 2000). Several studies have shown that intrinsic signals are more important in the interpretation of quality for a variety of goods considerably (Fiore & Damhorst, 1992). Likewise, several streams of research have been steered with the objective of identifying the elements that influence perceived quality, however, there is no general consensus on the particular factors that influence the perception of quality by consumers. One may then wonder what the relation between perceived and objective quality is.

Perceived quality is the opinion of the consumer on the superiority of a product (Zeithaml, 1988). The requirement of product quality production in the chemical industry is discussed by some previous studies that include product development in relation to environmental concerns, energy cost, safety risk, and level of emissions (Saling et al., 2002;Shonnard, Kicherer, & Saling, 2003). These might ultimately be validated by the industrial consumer who agrees to buy the goods and services as a whole package, thereby providing value to the customer in terms of tangible products and intangible services (Ulaga & Eggert, 2006). Product quality has a beneficial effect on industrial consumers who are pleased with the value of the product (Baumgarth & Binckebanck, 2011).

A substantial number of empirical studies have confirmed the positive influence of industrial product quality on consumer satisfaction (Berens, Van Riel, & Van Bruggen, 2005; Cretu & Brodie, 2007). If there is no point of distinction in the tangible product, then the attractiveness must lie in the efficiency of the service. Improving the standard of quality of service will help a business distinguish between competition and gain a competitive advantage (McKecnie, Ganguli, & Roy, 2011).

Perceived quality is expressed by product quality and service dimensions in this empirical analysis. Service dimensions apply to the RATER definition of (Asubonteng, McCleary, & Swan, 1996). For further strategy and consequences, analysis

of both product quality and service performance is important. Service is an operation or advantage offered to the purchaser or prospect by the seller (Armstrong, Kotler, Harker, & Brennan, 2018). Grönroos & Ojasalo, (2004) describe service as an interactive process between clients and staff, physical resources, goods or systems, and the impact on customer satisfaction of perceived service quality (Hong & Goo, 2004).

Quality of service is an organizational advantage and a critical component that affects financial results (Kassim & Abdullah, 2010). Conceptually, service is a critical component that greatly contributes to the success of businesses/organizations. Zeithaml, Bitner & Gremler (2018) have established a model with a positive relationship between service quality and customer satisfaction in which the five dimensions of Parasuraman's RATER principles represent service quality (Parasuraman, Zeithaml & Berry, 1983, 1988). Perceived consistency has a positive impact on consumer satisfaction in the American Customer Satisfaction Index (ACSI) model and in the European Customer Satisfaction Index (ECSI) (Alvin et al., 2019;Askariazad & Babakhani, 2015; Johnson, Nader, & Fornell, 1996). The positive relationships between perceived quality and customer satisfaction are supported by past studies (Baumgarth & Binckebanck, 2011; Cretu & Brodie, 2007, Berens et al., 2005). Thus, we propose;

H1: Perceived product quality significantly and positively influences intention to leapfrog

Intention to Leapfrog and Urgency to Replace

Intention to leapfrog is described as making a decision to wait to replace a current product with a future product instead of the latest version currently available in the market. This concept borrows from purchase intention which is the kind of decision-making that studies the reason to buy a particular brand by the consumer (Shah *et al.*, 2012). Morinez *et al.*, (2007) defined purchase intention as the situation where the consumer have a tendency to buy a certain product and in a certain situation. Customers' purchase decision is a multifaceted process. The aim of a purchase is usually related to the behavior, perceptions, and attitudes of consumers. Purchase behavior is a key point for buyers to access and evaluate the exact product. Ghosh (1990) affirms that purchase intention is a well-organized means to forecast the buying process. Buying intention may be affected by the influence of price or perceived quality and value. Moreso, consumers are affected by internal or external stimuli during the purchase process (Gogoi, 2013). Researchers have proposed six stages through which a consumer goes before deciding to buy the product. These are: awareness, knowledge, interest, preference, persuasion and purchase (Kotler & Armstrong, 2010, Kawa *et al.*, 2013).

Leapfrogging has been used to discover how, when, and why consumers avoid existing technologies and wait for newer generations. In this research domain, leapfrogging can be defined as a consumer's intention to skip a new technology in anticipation of purchasing the next generation. This research area is not only relevant from an economic perspective, but it is increasingly important for technology-driven companies. Amongst fierce competition, firms in technologically driven industries must invent and launch new technologies at an increasing rate, and sometimes even pay the price of cannibalization (Sood and Tellis 2005).

In addition, there is infinite literature examining the rate of diffusion of new products in different marketplaces that can be tied to leapfrogging. Steinmueller (2001) showed that the transmission of leapfrogging is challenged by the degree of adaptation of the technology to local needs, costs, knowledge and skills required for effective adoption as well as limitations due to local market dynamics. These challenges are intensified in developing countries and thereby hinder the velocity of diffusion. The results evidence how relevant social and cultural conditions are in the adoption and diffusion of new technologies (Herbig and Dunphy 1998).

Although literature exists on how people perceive and adopt radical technologies and how fast new products spread across a population, only a handful of studies have examined consumers' decisions to postpone buying a new generation product at some point in the future. In a recent study in the United States, Herrmann, Sprott, and Schlager (2017) examined several drivers of consumer leapfrogging in the locomotive industry. The authors proposed that perceived urgency, quality of the new product, perceived condition, switching costs determine the occurrence of intention to leapfrog. Interestingly, they found that switching cost was the most relevant predictor of the intention to leapfrog. The authors also found that the link between leapfrogging intention and leapfrogging behavior was stronger as consumers' income increased. Unfortunately, no theoretical framework was proposed to explain the findings.

The term leapfrogging has presumed different meanings depending on the context of its use. Steffen (2006) describes leapfrogging as the impression that describes a condition where areas which have poorly developed technology or economic bases can change themselves and move forward rapidly through the adoption of recent systems without browsing intermediary steps. Furthermore, Steffen (2006) argues that such a strategy is constant with the changing world in which one does not "need a 20th century industrial base to create a 21st century bio/nano/information economy".

Leapfrogging as a procedure was first distinguished back in 1962 by a political philosopher named Alexander Gerschenkron in his contribution titled "Economic Backwardness in Historical Perspective" (Gerschenkron, 1962). He argued that sometimes not having capitalized on a particular industry or technology can be beneficial when a paradigm shift occurs, as the society in which the firm exists does not have to deal with sunk costs and legacy issues. This society can adopt the new systems more rapidly and completely than can other societies, ostensibly more "advanced," societies, gaining the social and economic benefits that had been realized earlier (Ibid). Leapfrogging can

be done by skipping over generations of technologies e.g. the use of cellular phones in rural Africa skipping landlines, or avoiding the use of fossil fuels, and going straight to renewable energies. It can also be evidenced in urban development policies that avoid the proliferation of private cars, and promote sustainable mobility in the urban, medium cities.

Leapfrogging can also mean leaping further ahead to become the technological leader, surpassing contemporary leaders, for example Korean leapfrogging in the steel sector (Gallagher (2006). Industrial systems in a given area, say a country or region, can undergo technological evolution through three patterns of catching-up, namely path-creating catching-up, path-skipping catching-up, and path-following catching-up (Lee and Lim (2001). The first two instances of catch-up can be interpreted as leapfrogging. Leapfrogging can happen accidentally, situationally, or intentionally (Steffen (2006). A situation that fits the first case well is where the only systems around for adoption in the area under consideration are better than legacy systems elsewhere. In the second case where leapfrogging occurs situationally is where, for example, in a sprawling rural area decentralized communication system are adopted. The intentional leapfrogging happens in the circumstance where policies by design are developed, for example, to promote the installation of WiFi and free computers in poor urban areas.

Reliant upon the research tradition, the literature contains various ideas about leapfrogging (Badawy, 2009; Boone, 2001; Chen & Li-Hua, 2012). The common denominator is that leapfrogging occurs when consumers (or businesses and countries) make the decision to adopt a new-generation product or technology (Binz, Truffer, Li, Shi, & Lu, 2012; Cripps & Meyer, 1994; Holak & Lehmann, 1990). During this course, the customer must choose between purchasing the product that is currently available on the market or postponing the purchase for a future anticipated (improved) product from the following generation (Bell & Bucklin, 1999). Leapfrogging thus revolves around three different groups of a product: The mature product (P0) in current use by the consumer; the innovative product (P1), which is from the latest generation of product currently available on the market; and the yet to come product (P2), which is the anticipated, but not currently available, future generation of the item.

Leapfrogging refers to skipping the latest product generation offered on the market (P1) in anticipation of purchasing a future generation (P2), which is characterized by an improvement in relation of performance. Leapfrogging involves a conscious decision and does not reflect situations when consumers miss the adoption of a new product or unintentionally postpone a purchase. Further, leapfrogging does not occur when consumers postpone the acquisition of a new product until the same product becomes available under more favorable conditions or the replacement purchase becomes necessary due to defects or wear. Also, leapfrogging can only occur if the product used by the consumer does not correspond to the new product currently available on the market. Thus, the key feature in leapfrogging is that current users of a product (P0) decide against purchasing the new product (P1) with the intent of waiting to purchase the future product generation (P2) once it becomes available.

Gordon (2009) developed a vibrant model of consumer demand that accounts for the replacement decision when consumers are unclear about future price and quality. The results reveal disparity in replacement behaviour over time, with such heterogeneity providing an opportunity for companies to tailor their product introduction and pricing strategy to target particular market segments (Erdem *et al.*, 2005). Similarly, Song and Chintagunta (2003) developed a model for the acceptance of new durable products that accounts for consumer heterogeneity, as well as consumers' forward-looking behaviour. These researchers demonstrated that consumers who look forward optimise purchase timing by trading off the utility from buying the product and expectations about future prices, quality levels, and product availability.

Further, Chanda and Bardhan (2008) studied the relative changes of diffusion parameters for both first-time purchasers and upgraders. The results of their work for first-time purchasers suggest that the contribution of innovators to total sales is reduced and the value of imitation parameters increases as newer technologies come to the market. For repeat purchasers, the relationships are exactly opposite. Kim *et al.,* (2001) developed a model whereby purchase chances for buyers are captured as a function of purchase history, expectation about future generations, and preferences for the present generation.

Finally, Bayus and Gupta (1992) explore the impact of variables associated with product and household characteristics on replacement intentions. Results demonstrate that the perceived condition of the currently owned product and its age are significantly related to replacement intentions. Based on this discussion we propose:

H2: *Intention to leapfrog significantly and positively influences urgency to replace*

H3: *Perceived product quality significantly and positively influences urgency to replace*

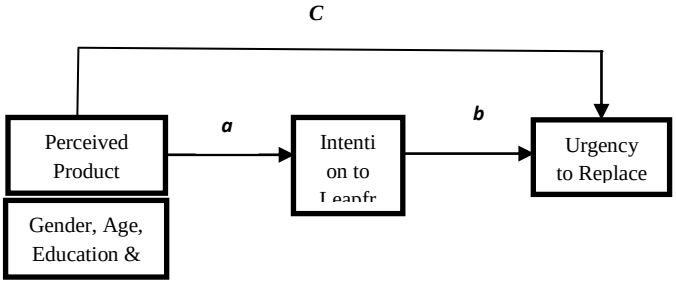

Figure 1: Conceptual model

H4: *Intention to leapfrog mediates the relationship perceived product quality and urgency to replace*

VII. METHODOLOGY

Design and participants

The data was collected using a structured closed ended questionnaire from a target population of 15506 employees of three Cosmopolitan County Governments in the Republic of Kenya, namely, Trans-Nzoia, Nakuru, and Nairobi using a cross-sectional survey design, and simple random techniques. A total of 384 questionnaires were distributed, with 349 being filled out and returned, resulting in a response rate of 90.89%. **Table 1** reveals results of the demographic characteristics of the study. Male respondents accounted for 59.6% of the total, while female respondents accounted for 40.4%. Most of the participants (55.3%) were between the ages of 29 and 39, while those over 50 were the least (5.4%). Furthermore, most respondents (57.9%) had a bachelor's degree, while the least (1.4%) had a high school certificate. Finally, the income of respondents shows that 62.5% earns more than Ksh.50, 001, while 37.5% earn less than 50,000.

Table 1: Respondents Demographics

Variable	Response	Frequency	Percentage
Gender	Female	141	40.4
	Male	208	59.6
	Total	**349**	**100.0**
Age	Below 28 yrs	79	22.6
	29-39	193	55.3
	40-50	58	16.6
	51 and above	19	5.4
	Total	**349**	**100.0**
Education Level	Certificate and Below	5	1.4
	Diploma	70	20.1
	Bachelor	202	57.9
	Masters	62	17.8
	Phd	10	2.9
	Total	**349**	**100.0**
Income	below 30,000	64	18.3
	31,000 -50000	67	19.2
	51000-70000	137	39.3
	71000-90000	72	20.6
	Above 100000	9	2.6
	Total	**349**	**100.0**

Measurement of the study variables

All the variables in this study were measured using items that had previously been used in other studies, with minor changes. Six items adopted from Herrmann et al. (2017) were used to measure Urgency to replace. The items include, "I like to change things in my life, I like variety in my life, I am not satisfied with my old phone, I like things of good value, I like things that make my work easy, when there is a need to replace my phone, I will do a replacement purchase". Five items measuring perceived product quality were also adopted form Herrmann et al. (2017). The items included, "My Mobile phone has good security features than what is available currently, I like the design of my Mobile phone, I will accomplish my tasks more quickly with the next generation Mobile phone, Owning the next generation Mobile phone will improve the quality of output and the future generation Mobile phones will be superior to my current Mobile phone". Finally, five items measuring intention to leapfrog were adopted from Venkatesh and Davis (2000) and modified to suit the current. The items include, I will wait until the next mobile phone generation is available, I will wait if announcements pertaining to the next generation mobile phones are already available, I will recommend other customers to wait until a future model is released.

VIII. RESULTS AND DISCUSSION

Results of Descriptive

The descriptive statistics of the study variables are shown in **Table 2**. Perceived product quality and urgency to replace had the highest mean of 5.4 and 5.2, respectively, with SD =.804, .692, while intentions to leapfrog had the lowest mean of 4.8 and SD = 1.164. Additionally, the Table displays the results of the reliability test, with Cronbach's Alpha values above.6, with perceived product quality having the highest α =.758 and urgency to replace having the lowest α =.603. Finally, correlation analysis reveals that perceived product quality has the highest correlation with urgency to replace (r =.689, p<.01), while the relationship between intentions to leapfrog and urgency to replace has the weakest relationship (r =.496, p<.01).

Table 2: Descriptive, Reliability and Cronbach's Analysis

Variable	Mean	SD	α	Correlation			
Urgency to Replace	5.2	.692	.603	1			
Perceived product Quality	5.4	.804	.758	.689**	1		
Intentions to Leapfrog	4.8	1.164	.670	.496**	.344**	1	

** Correlation is significant at the 0.01 level, * significant at the 0.05 level (2-tailed).

Factor Analysis

Before testing the hypotheses, factor analysis was used to check for construct validity. This was done using Principal Component Analysis with Varimax rotation. **Table 3** shows how the items were loaded into three components that explains for 51.8% of the variance, with 3 items measuring urgency to replace loading on component 1 as four of its items did not load. This factor has an Eigen value of 2.497, with the items explaining for 20.8% of the variance in urgency to replace. Results further indicate that 3 items measuring

perceived product quality loaded on component 2. (Two items were dropped, as they did not load). This factor indicates an Eigen value of 1.988 with the items accounting for approximately 17% of the variance. Finally, three items measuring urgency to replace loaded on component 3 (three of its items were removed). This factor revealed an Eigen value of 1.737 and total variance of 14.36%. Findings show a Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO) of .549 with Bartlett's Test of Sphericity indicating a Chi-Square of 981.418, df = 66, p = .000, thus confirming appropriateness of factor analysis.

Table 3: Results of Component Factor Analysis

Kaiser-Meyer-Olkin Measure of sampling Adequacy			.549
Bartlett's Test of Sphericity Approx. Chi-Square			981.418
df			66
Sig			.000
Name of Variables	Eigen values	% variance	Cumulative %
1. Urgency to Replace	2.497	20.805	20.805
2. Product quality	1.988	16.569	37.374
3. Intentions to leapfrog	1.737	14.473	51.846
Measurement items	UTR	PQLT	ITL
My Mobile phone has good security features than what is available currently		**EXL**	
I like the design of my Mobile phone		**EXL**	
I will accomplish my tasks more quickly with the next generation Mobile phone		.694	
Owning the next generation Mobile phone will improve the quality of output		.877	
The future generation Mobile phones will be superior to my current Mobile phone		.663	
I like to change things in my life	.508		
I like variety in my life	**EXL**		
I am not satisfied with my old phone	.783		
I like things of good value	.688		
I like things that make my work easy, when there is a need to replace my phone	**EXL**		
I will do a replacement purchase	**EXL**		
I will wait until the next Mobile phone generation is available.			.678
I am going to wait provided that announcements pertaining to the next Mobile phone are already available			.756
I will recommend other customers to wait until a future model is released			.576

Note: UTR=Urgency to Replace, PQLT = Perceived Product Quality, ITL= Intentions to Leapfrog, EXL = Excluded

Testing Study Hypotheses

To analyze the data and test the hypotheses, Hayes (2018) Process Macro (Model 4) in SPSS vs23 was used. All control variables were included in the analysis. Additionally, MacKinnon (2012) recommendations on testing mediation process were followed. These involves;

i. There must be a significant link between perceived product quality (predictor variable) and intentions to leapfrog (mediator, path ***a*** of the conceptual model, **H1**)
ii. There must be a significant link between intentions to leapfrog (mediator) and urgency to replace (outcome variable, path ***b*** of the conceptual model, **H2**)
iii. One should test the link between perceived product quality (predictor variable) and urgency to replace (outcome variable) in the presence of the mediator variable (intention to leapfrog, path ***C'*** of the conceptual model, **H3**). It is not necessary for significant relationship to exist for mediation to exist.
iv. Lastly, a significant coefficient must exist for the indirect link between perceived product quality (predictor variable) and urgency to replace (outcome variable) through intentions to leapfrog (mediator, product of $a \times b$. To establish if this last recommendation has been met, confidence intervals must not cross zero (**H4**).

Table 4 summarizes the findings of the study. Results of control variables in Model 1 indicate that gender (β =.253, p =.019) was found to have a significant effect on intentions to leapfrog as age (β = -.084, p =.247), education (β = .062, p =.459) and income (β = -.016, p =.803) were all insignificant. Findings further show that perceived product quality significantly influences intentions to leapfrog as shown by β =.354, p =.000 (path '***a***' of the conceptual model). In addition, this model explains 13.6% of the variance in intentions to leapfrog as indicated by R^2.136, F= 10.701, p =.000. Based on these results, MacKinnon's recommendation (i), and Hypotheses H1 is supported by the study.

Model 2 of Table 4 shows findings of **H2** and **H3**. All control variables in this model were all found to be insignificant as shown by p >.05. Results further indicate that intention to leapfrog (mediator variable) has a positive and a significant effect on urgency to replace as shown by β = .296, p = .000 (path '***b*** 'of the conceptual model). This model indicates R^2.561, F= 71.934, *p* =.000, which implies that the model accounts for 56.1% of the variance in urgency to replace. Based on the above findings, recommendation (ii) and **H2** is also supported. **Model 2** of the same table was used to determine MacKinnon's recommendation (iii) and to test hypothesis **H3** (path ***C*** of the conceptual model). Findings indicate that perceived product quality (predictor variable) has a positive significant effect on urgency to replace as shown by β =.566, p =.000. Thus, recommendation (iii) and **H3** is supported.

To examine results of hypothesis **H4** and recommendation (iv), a percentile bootstrap estimation approach with 5000 samples was used to test the indirect effect of perceived product quality on urgency to replace through intention to leapfrog. Results indicate that the product of $a \times b$ = .296 × .354 = .105, SE =.024, 95% CI = [.062, .151]. Since both the

confidence intervals indicate nonzero, recommendation (iv) and **H4** is also supported. Since both direct effect results (path ***C'***-β = .566, p<.05) and indirect effect results are both confirmed as significant (a × ***b*** = .354 × .296 = .105), the study reveals a *partial mediation*.

Table 4: Regression Results of the Study

	Model 1 (ITL) ***a***		Model 2 (UTR) ***b***	
Gender	.253*	.019	.003	.970
Age	-.084	.247	.006	.906
Education	.062	.459	-.047	.433
Income	-.016	.803	-.076	.095
Perceived Product Quality	***a*** =.354***	.000	***C'***= .566***	.000
Intentions to leapfrog	-	-	***b*** =.296***	.000
R^2	.136		.561	
F	10.701***		71.934***	
Mediation (H4) *a*×*b*	**Effect**	**SE**	**LLCI**	**ULCI**
Mediation	.354 × .296 = .105	.024	.062	.156

Note: *p<.05, ***p<.001, Dependent variable**:** UTR=Urgency to Replace, ITL = Intention to leapfrog

IX. DISCUSSION AND CONCLUSION

Our findings on perceived product quality and intentions to leapfrog show that product quality is a significant factor in the evaluation of leapfrog intentions. This suggests that if a product is of higher quality, consumers will be more likely to get it however long it may take to be released on the market (Chi et al., 2008). These findings support the claim put forward in the work of Bayus and Gupta (1992) who explored the impact of variables associated with product and household characteristics on replacement intentions. Results demonstrate that the perceived condition of the currently owned product and its age are significantly related to replacement intentions.

The results on leapfrogging intention and urgency to replace were both positive and significant, implying that customers were willing to wait if announcements about the next Mobile phone were already available. This is in agreement with Prehald and Gary, (2010) who argue that Urgency to replace the current product is also determined by the competitive nature of the market and how products are becoming outdated. It is critical for a company to ensure it remains the most trending business in the market, for this will make the consumers to associate products from the company with high quality (Smith, 2004) and have an urgency to replace their current product. The most efficient way of remaining fashionable in a competitive environment is to ensure that the company produces unique styles and have effective promotion strategy.

The study results reveal that Perceived product quality significantly and positively influences urgency to replace. This reflects consumers' desire for variety and change in terms of improved quality thus influencing the urgency to replace the current product (P0) to the next generation (either P1 or P2).

Finally, the findings on the mediating role of intention to leapfrog on perceived product quality and urgency to replace a mobile phone reveal that intentions are described by people's judgment of performing behavior, and that intention to leapfrog will improve the relationship between perceived product quality and urgency to replace a mobile phone. These findings add some new understanding into literature that intentions to leapfrog is a mechanism that enhances urgency to replace.

Implications of the Study to Theory and Practice

The study's findings have implications for theory and existing literature. To begin, the findings of the study support the previous studies that perceived product quality influences consumers' intentions to leapfrog and urgency to replace products. Also, the study supports the theory of planned behavior which argues that an individual's behavioral intention depends on the person's attitude, subjective norms, and behavioral control. According to Abraham and Sheeran (2003) in the TPB (a) is the simplest to predict personal behavior is to know the intention, (b) the intentions are described by people's judgment of performing behavior and by their social issues (subjective norms), and (c) the external determinants only show the indirect impact on behavior – these could be moderator, mediator and components of the model.

Management must recognize that in order for buyers to replace existing products, newly developed products must have improved safety, outstanding quality characteristics, and better performance than what is presently available. As a result, these attributes should be added to the new product during the product development process to increase public acceptance and replacement.

Limitations of the study

This study used a particular product category of the mobile phone, to analyze the intention to leap and urgency to replace which inevitably restricts our implications. Variations in variables such as the duration of the product life cycle, the cost of replacement, the value of the abandoned product are likely to cause the significance of consumer determinants to differ. In order to provide a definitive answer on how to generalize the findings of the study, further research is required, especially with a broad range of product categories that differ from cell phones in terms of the different features and user information that constitute multiple generations of each product category.

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