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# Unveiling the Drivers of Customers' Loyalty Toward Mobile Money Service Providers Based on SEM: A Clarion Call for Industry Players Survival

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**Abstract:** The present study aims at exploring the antecedents of customers' behavioral intention in the mobile money service industry to enhance industry players' competitive edge and financial inclusion value co-creation in Ghana. A total of four hundred and seventeen (417) respondents were contacted via social media platforms for the study. AMOS graphics and IBM SPSS were used to analyzed the data. The findings of the study reveal that perceived quality and security are the most significant precursors of mobile money subscribers' satisfaction and loyalty drive. Satisfaction was also observed to have a significant positive effect on both brand equity and brand trust. The study further reveals that satisfaction mediate between perceived quality and security to positively impact subscribers' loyalty. Studies exploring subscribers' behavioral intentions towards mobile money service providers to the best of our knowledge still remains a major gap in extant literature. Thus, the present study extends knowledge on mobile money services and financial inclusion in general by providing a schema for mobile money service providers to tailor their services to meet the expectations of subscribers whiles enhancing their competitive edge.

**Keywords:** Mobile Money, Financial Inclusion, Service Quality, Loyalty, Financial Technology, SEM

## 1. Introduction

The astronomical growth in mobile telephony penetration globally in the last decade has occasioned a new wave of financial inclusion option among poor communities through Mobile Money Service (MMS). Empirically, Africa remains the birthplace and the epicenter of MMS [32, 80]. Since its inception, there has been a momentous improvement in both financial inclusion and financial literacy in most developing economies [2, 32, 8]. One unique feature of the financial service landscape in sub-Saharan Africa and other developing economies is the sluggish diffusion of mainstream financial services among the populace. This is due to factors such as entrenched financial exclusion policies, low levels of financial literacy, rigid financial service documentations, and traveling distance. Other reasons are costly service, minimum balance requirement, uneven distribution of financial service facilities, high cost of operation due to 'human encounters and failure to optimize or leverage lean production concepts due to underdeveloped financial service ecosystem [21, 69, 75, 2, 8]. It is estimated that within the enclave of sub-Saharan Africa, 80%, of the economically active population do not have access to any form of financial service. More specifically, only 34% have accounts for mainstream financial services as a result of

the aforesaid factors [20, 69, 32, 3].

The success story of M-PESA model of mobile banking launched in Kenya (2008), however, brought a great relief of financial inclusion, and further revolutionized the face of the financial service ecosystem in most developing countries. It has scaled up the financial service landscape by covering the hitherto unbanked, and the underserved demographic cohorts of most societies [75]. MMS is comparatively, secure, convenient, affordable, dependable, more accessible, and thus, has provided economic empowerment through saving, lending, insurance, and remittance opportunities to a plethora of low-income recipients [31, 57, 58]. According to Global Findex Database, sub-Saharan Africa's financial account penetration soared from 24% to 34%, between 2011 and 2014, mainly as a result of innovative financial services platforms such as Mobile Money [33].

In recent times, through replication and renewed innovative drives in similar socio-economic countries, MMS is now ubiquitous, and has gained an unflinching currency in most developing countries. Consequently, it has become a byword for a reliable, perceived usefulness, ease of use, affordable, and convenient digital financial service option in its catchment area [2, 75, 61]. "Mobile Money is fast, simple, convenient, secure and affordable way of transferring money, making payments and doing other transactions using a mobile phone" [58] - a telecom giant and MMS provider in Ghana and other countries in African.

Financial inclusion is defined as the percentage of individuals who have access to financial service of any kind - banking and non-banking. Globally, it is estimated that 50% of the world's adult population amounting 2.5 billion do not have access to mainstream financial services [33-34]. Financial inclusion mechanisms are pivotal in combating socio-economic inequalities and abject poverty. It fosters shared prosperity [20]. Thus, financial inclusion remains as the corner stone for actualization of the Millennium Development Goals (MDGs), and the Sustainable Development Goals (SDGs) [21]. These two developmental goals are both explicit on socio-economics upliftment and bridging of societal economic gaps. For example, MDG1, SDG1, and SDG2, are all crystal clear on eradication of extreme poverty, hunger; and MDG3, SDG4, and SDG5, are all poverty gap-bridging goals. Thus, widening the financial service net through inclusive-financing channels such as Mobile Money in targeted economies will set the tone for a meaningful economy-wide contribution for accelerated and sustainable socio-economic growth and development [21, 2, 8].

[32], posits that Mobile Money as a financial technology has expressively contributed towards thirteen (13) out of the seventeen (17) SDGs in the form of improvement in health status, job creation, improved connectivity, women empowerment, and poverty reduction by extending life-changing financial resources to people from all shades of life, mostly for the first time in their life. These are mostly found in the poor and vulnerable demographic cohorts of sub-Saharan Africa [32]. In details, Mobile Money is extending lifeline services to thousands of people across the globe daily. Humanitarian and affordable remittance services are digitally being routed seamlessly to refugees and other people with the low-income bracket to enhance their sustenance [32]. It is evinced that the unbanked global population has sharply downsized in recent years owing to the MMS financial technology [32, 21, 28]. Again, a nascent report on the Payment System of [29] accentuates that Mobile Money accounts have outstripped the nation's total population of 29.61 million.

### *1.1. The Global Landscape of the Mobile Money Ecosystem*

Mobile Money (MM) is now serving as the topmost banking service option in the developing world as a result of its knack for providing financial services to all kinds of socio-economic clusters in societies without discrimination. Currently, it is available in 90 countries with a global subscription of 690 million – indicating 25%, increment from 2016 to 2018 [32]. According to [26] "Mobile money adoption in Africa outpaced growth in the rest of the world, with over half of all services globally, and more than 40% of adults in active use." Collectively, Africa has 140 MMSs, out of the global statistics of 277. This further provides support for the fact that, MMS has emerged as a pervasive disruptive innovation for socio-economic inclusiveness which guarantees subscribers cost-effective, reliable, and convenient services [75, 8, 9].

MMS business model has one of the most unique financial technologies for integrating the unbanked - particularly, in countries with remote settlements which makes mainstream financial services unavailable or limited in supply. [32], advanced that there are seven leading MMS markets operating in sub-Saharan Africa namely, Ghana, Kenya, Zimbabwe, Tanzania, Gabon, Namibia, and, Uganda; with 40% active adults' population**.** Aside sub-Saharan Africa, other regions of excellent MMS deployment include South Asia, Latin American & Caribbean, East Asia and Pacific, Middle East & North Africa (Figure 1).

The main service providers of MMS are Mobile Network Operators (MNOs). In both models of mobile banking services – i.e., bank-led and non-bank-led, MNOs provide infrastructural services [35]. The fundamental problem in the current market dynamics among MNOs in developing countries is the dwindling business fortunes accruing from instant messaging and voice call subscriptions [26, 84]. This is principally as a result of the twin-problem of alternative communication offerings by glossy, and disruptive innovation (technologies) such as WeChat, Facebook, Instagram, WhatsApp, among others; and a surge in the number of MNOs. This, in effect, has constantly reduced the market share of industry players [26]. Thus, in order for the MNOs to stay afloat, and remain dominant in the industry, they must be more competitive by designing other innovative service offerings that will attract additional revenues for their growth, and sustainability. The drive for additional revenues by the MNOs to augment their paltry gains via voice calls, and SMS has occasioned the offering of financial services – Mobile Money [33]. "Telecom operators have no choice but to capitalize on the innovation and the scalable nature of mobile money" [33].

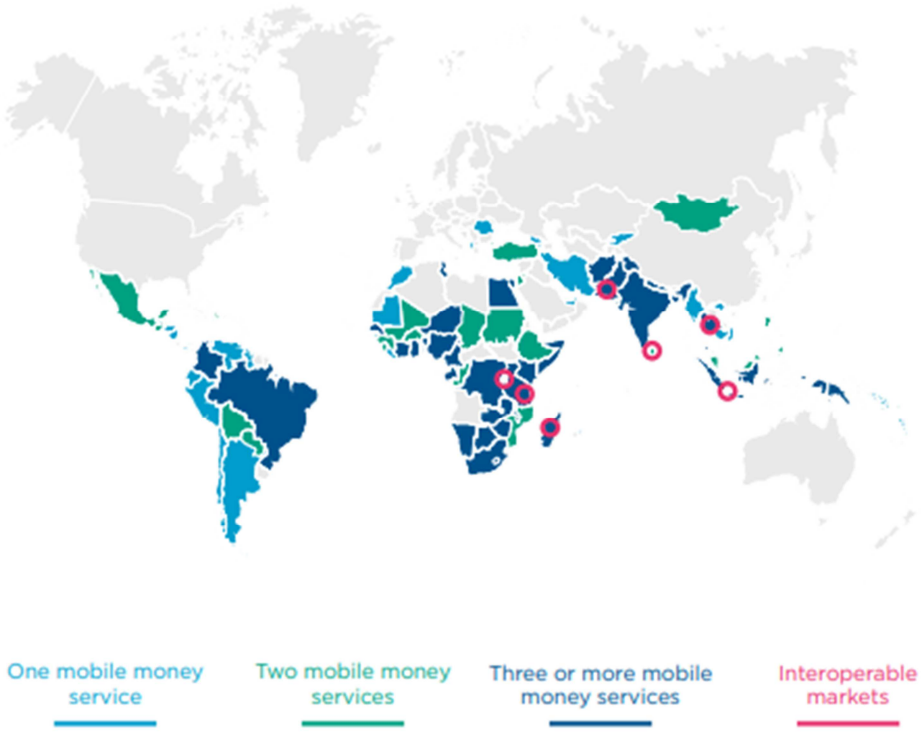


***Figure 1.*** *MMS Global Distribution. Source: GMSA, 2017.*

Again, the disproportionate distribution and complex service barriers in relation to traditional financial service provision have created a pool of unbanked segment in a lot of societies, especially, in developing countries. According to Global Findex Database, and the Consultative Group to Assist the Poor (CGAP), there is an average of two (2) billion unbanked population globally [11, 84]. To enhance inclusive financial systems in Africa, and other developing regions, banks are now partnering with the MNOs to offer MMS. The [84] espouse that "…telecom players have churned out multiple use cases by cutting across all economic divides in Africa, from simple ones like money transfer and air time top-up to more sophisticated ones like bill payments and bank-to-mobile wallet transactions".

Consequently, the MMS has created a turbulence business environment for the MMOs, and traditional financial services providers due to unexampled competition for market space. Thus, the MMS industry players need to position themselves strategically, to ensure profit growth and business sustainability. To this end, harking to the voice of customers emerges as the surefire for the success of MMS providers via improved service quality. In other words, staying afloat as a business entity, requires knowing what subscribers are actually looking for and, accordingly, produce to meet their service quality expectations [67, 76, 6, 16].

In general, the MMS industry has not been given the needed attention it deserves in extant literature. To the best our knowledge, it remains the least researched area in the domain of mobile banking. Specifically, most literature on mobile financial technology (FinTech) focus primarily on developed and emerging economies; and thus, neglect MMS which is dominant in developing countries. A few studies have been conducted on MMS in Africa, and other developing enclaves However, not with explicit concentration on consumers behavioral intentions towards service providers to the best of our knowledge. For example, Ardey (2016) conducted a study on the need for a robust and effective legal framework to regulate the activities of the MMS service provider in Ghana. [75] empirically, studied mobile financial services in Kenya and observed that the presence of MMS in a locality stirs the propensity to save, and job creation among the economically weak owing to the nature of the MMSs – convenient, flexible, secure, and affordable. This affirms the outcomes of similar studies by [20, 5].

Again, [55] through the application of the Unified Theory of Acceptance and Use of Technology (UTAUT) established that the level of exposure, security, performance and effort expectations, among others as the delimitation and, constraints to the smooth operation of MMS in Uganda. A study by [36] showed some barriers and risk elements of MMS. These barriers and risks include fake money, loss of password, identity theft, unstable network, and inadequate cash on the part of agents. [35] under the auspices the World Bank conducted a study on the necessary legal framework and the required congenial environment for smooth operation of MMS. Their study indicated that the operation of MMS requires a vibrant telecommunication infrastructure, and a flexible legal regime. In particular, a legal system that allows non-bank financial service providers to have authorization for the issuance of money and also operate with banking agents were proposed. The study further indicated the need for financial education on the usage of Mobile Money among the

populace. [63] researched on the effect of gender on the adoption of mobile banking and established that most people adopt mobile technology as a financial intermediary based on the opinions of their colleagues and family members. In a related development, [8] investigated Social Network effect on Mobile Money application and financial inclusion in Uganda, and concluded that there is a significant positive association between Mobile Money usage and Social Network in sub-Sharan Africa. They also showed that MMS is very cardinal in expanding the corridors of financial inclusion.

An explicit commonality in the narrative is that prior literature on MMS in Africa has been silent on the antecedents of subscribers' behavioral intentions. This chasm in prior literature, thus, creates a conceptual framework for further discourse. Explicit knowledge on the expectation of customers is the heartbeat of value co-creation and service quality. Consumer sovereignty is highly revered by strategic managers due to its indispensable role on business sustainability and continuity. The voice of the customer counts the most in every competitive business environment. Thus, business entities which operate with a holistic understanding of the consumers preference and expectation are equally rewarded with reasonable profit margins [25, 41]. The poor market performance of most firms in a highly competitive industry are mostly as a result of production quality that are below the expectation of the consuming public [85, 25].

Thus, the objective of the current study is to understand factors that motivate MMS subscribers' decision-making toward service providers with empirical evidence from Ghana. By examining the relationships among these factors, we intend to address the gaping hole in literature as indicated earlier. The outcome of the current study will augment streams of literature on MMS and Mobile Banking in general. It will also equip MMS providers with handy information on how to design customer-centric services to engender business growth.

In the context of the current study, we define MM as a digital repository of e-money, designed and operated on mobile phones (both feature and smart phones) for peer-to-peer transfers (P2P) or between mobile-to-mobile devices (M2M) – either from users of similar services or through MM interoperability.

The remainder of the paper is partitioned as follows: context of the study; theoretical background, hypotheses development, and conceptual framework; materials and methods; result/discussion and conclusion.

### *1.2. Context of the Study: Mobile Money Service in Ghana*

The last decade has witnessed ubiquitous fast-growing digital society owing to massive spread and technological advances made in telecommunication. Consequently, MNOs in Ghana, through technology adoption, are also offering MMS to the consuming public as a novel financial and social inclusive technology, and as a medium for additional source of revenue. [29] pegged the number of registered mobile money (MM) accounts at 29.99 million (indicating 40.40%).

Again, given the estimated total population of Ghana (29.6 million), it means the number of MM accounts have outran the nation's total population size. It is also evidenced that the number of MM subscribers have outstripped the nation's bank accounts holder. This denotes a telltale for huge and unparallel competitive business environment among industry players [29, 5, 64].

The registered number of MM accounts in 2012 (3.78 million) indicates a 693.69%, increment between 2012, and the first two quarters of 2018. Furthermore, the number of MM active users soared by 24.29%, between the first two quarters of 2017, and 2018, while the volume of transactions within the same reference point surged by 52.26% [29, 70].

The flagship launch of Mobile Money Interoperability (MMI) - a cross border remittance service in Ghana has added a new impetus, and has brought a staggering improvement in the areas of digital financial service intermediation, and financial inclusion in the country; within the framework of accessibility, convenience and value for money [5]. The launch of the first phase (of MMI) saw an astronomical growth in digital financial services, and products in both transaction value (292.8%,) and volume (229.3%) from May to September, 2018 [29].

Against the backdrop of the success chalked by the first phase of MMI in May, 2018, the second phase was accordingly, launched on 28th November, 2018, to further deepen the electronic financial service frontier by developing an efficient triadic payment system to digitize the financial services landscape of Ghana. The launch of the phase two of MMI was aimed at creating a digitized economy to serve as a conduit for a seamless interoperability, and movement of money across the three national payment systems – Ghana National Switch, E-zwich, and Mobile Money – mostly referred to as the financial inclusion triangle. According to [29] "… it will improve financial inclusion by bridging the gap between the banked and unbanked. It will also enable free flow of funds between and among all the three platforms; allowing the banked and the unbanked to interact at the same level" and "it is expected to remove the constraints faced in trying to move funds around in real time" [27].

Electronic transactions thrive well in an atmosphere of utmost security, and high degree of integrity on the part of service providers [86, 5]. Security assurance, and the sense of business legitimacy, therefore, set the tone for e-service adoption, and loyalty thereafter. Bank of Ghana (2018) reiterated the need to beef up the security apparatus to combat cybercrime, and adherence to established legal framework during the launch of phase two of MMI in the country. "We also must bear in mind issues regarding cyber security during electronic transfers and ensure that the proper structures and systems are in place to handle such threats" [5].

There is an intense rivalry among MNOs for customers' attention in the form of promotional drives, and the introduction of unique products and services. On the basis of the above development, it is imperative to study the MMS subscribers' behavior with respect to factors behind their preference, and loyalty for a given MMS provider.

# 2. Theoretical Background, Hypotheses Development, and Conceptual Framework

### *2.1. Brand Equity*

Branding encapsulates the creation of a recognizable and an identifiable name (image) uniquely enough to leave a lasting impression on the minds of consumers. This is ostensibly, done to serve as a fulcrum of attraction to customers within the marketing arena [38, 1, 51]. [51] posits brand as "the name associated with one or more items in the product line that is used to identify the source of character of the items". It serves as an enabler in apportioning responsibilities to service providers, and thus, has intrinsic qualities to reduce consumer risk tendencies [81].

Based on the above illustration, brand equity can be described as the link or the interplay between consumers and brands, and therefore, serves as a cornerstone for consumer decision and choice-making. Positive brand equity creates a memorial brand association. With the halo effect, this translates into appreciable profit margins as a result of the fact that consumers gravitate toward offerings with greater and trustful prestigious reputation, higher superior quality and reliability [71, 44-45].

Negative brand equity, on the other hand, adversely affects the fortunes of companies. Positive brand equity triggers tangible and intangible values – improve profitability through premium charges and goodwill. The reverse always holds if brand equity is negative. Brand equity affects both the pre-purchase and post-purchase behavioral intentions of consumers, enhances word-of-mouth referrals, attract premium price, deepens competitive edge, and ward off potential competitors [45].

[1] expressed Brand Equity as "a set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers." It is influenced by perceived quality, brand association, brand awareness, brand loyalty [1]. Empirical studies connect business successes to the immeasurable role of brand equity and its determinants, especially, in a highly competitive business environment [37, 22].

Again, a lot of studies advance that satisfied customers always feel secure when transacting business with companies with high prestige. This is because these companies are perceived to deliver topnotch offerings. Furthermore, brand equity lowers the perceived risk for new offerings, and a key determinant factor for business success in the long-run [19, 72] [50-51] We therefore, extend that:

*$H_1$: There is a positive relationship between Brand Equity and Perceived Quality in the MMS Industry.*

### *2.2. Perceived Quality*

Service quality encompasses consumers' general impression about the relative superiority or interiority of a delivered service. [87, 67] posit that perceived service quality entails "the customers' perception of the overall quality or superiority of a product or a service with respect to its intended purpose relative to alternatives." Thus, service quality, basically, involves the ability of a delivered service to meet consumers perceived expectations, needs, and satisfaction [82, 41]. Perceived service quality is one of factors empirically proven to impact the pre-adoption and post-adoption intentions of consumers positively [18, 50], [87-88].

Perception of high quality and prestigious services or products offering relative to similar offerings from competitors bolsters consumer confidence and deepens their levels of satisfaction [87]. Thus, a satisfied customer intrinsically, becomes loyal, and an apostle to a product with high perceived service quality.

Several studies portray the critical function of perceived service quality in shaping customer satisfaction and loyalty. Others studies however, deem brand equity as an antecedent of perceived quality [1, 46]. Offering quality service builds a confident clientele and inculcate element of trust in them. As a result, companies that deliver quality services are touted as trustworthy. Perceived service quality positions companies to charge premium prices, and also make product differentiation and brand extension possible [1, 44, 41]. In particular, studies indicate that mobile banking customers are motivated greatly through service quality in the form of affordability, convenience, safety, and security [17, 73, 56, 52]. These are peculiar idiosyncrasies of mobile banking services, and as such they are not mostly experience via mainstream or traditional banking services. Against, this backdrop, we advance that:

*$H_2$: There is a positive relationship between perceived quality and brand trust in the MMS Industry.*

*$H_3$: There is a positive relationship between perceived quality and satisfaction in the MMS Industry.*

*$H_4$: There is a positive relationship between perceived quality and brand equity in the MMS Industry.*

### *2.3. Security*

Security and privacy concerns are key determinants of mobile service adoption in general [25, 56]. The level of confidence, and trust repose in a service provider is measured by the assurance of confidentiality, and the delivery of value proposition. Consumers always desire to associate themselves with business entities with high level of perceived security [25]. It is evidenced that security and privacy remain precursors of customers' trust, satisfaction and loyalty in e-commerce [40, 89, 85]. Thus, ensuring customers' security bolster their level of trust in mobile service networks. Conversely, a sense of lack or limited security in mobile payment services stirs dissatisfaction, and eventually customer churn [86].

Myriad of studies have echoed the contribution of privacy, anonymity, and security in online transaction, and mobile service adoptions. According to [86] authentication, confidentiality, and service providers' integrity are the

primary concern of customers in electronic financial transaction adoptions. [56] assert that, the ability of service providers to assure customers' anonymity and privacy relative to personal data strengthen mobile transactions adoption and customers loyalty. In line with the above assertions, we argue that:

*$H_5$: There is a positive relationship between security and brand trust.*

*$H_6$: There is a positive relationship between security and continuous service utilization in MMS Industry.*

*$H_7$: There is a positive relationship between security and satisfaction in the MMS Industry.*

### *2.4. Brand Trust*

Consumer trust is critical and indispensable for market leadership, and its antecedent [59, 78]. Thus, failure on the part of managers to create an atmosphere to win customers trust will negatively affect their business fortunes. [13] advance that, brand trust is "the willingness of the average consumer to rely on the ability of the brand to perform its stated function". According to [1] trust embodies faith in a service or a product offering based on value proposition. Brand trust consolidates the consumer-supplier dyad, and solidify a long-lasting symbiotic relationship between the two entities in a continuum. Brand trust is realized whenever producers are able to connect with customers' emotion, sentiment, and thoughts. Businesses with an unflinching brand trust are always successful in a highly competitive business environment [1].

An overwhelming brand trust by customers attracts price premium via brand equity and brand positioning [1, 45, 76]. On the other hand, lack of trust in brand offerings portends business failure. Research touts brand trust as the heartbeat of business success [59]; and it is built through a long period of consumer patronage, and physical experience with a product or service offering. A high level of honesty, confidentiality, transparency and security experienced by customers foster brand trust [23, 83].

Empirically, there are substantial evidence which indicates that brand trust mediates both the pre-adoption and post-adoption behavioral intentions of customers in mobile banking [73, 14, 4]. Customers always want to be assured of a guaranteed trust before making a purchasing decision. The direct experience of perceived brand trust is the bases for maintaining customer satisfaction, retention, brand affect and brand loyalty [78, 13, 30, 54, 4, 52]. By extension, we argue that:

*$H_8$: Brand trust mediates between security and continuous service utilization in the MMS Industry.*

*$H_9$: There is a positive relationship between brand trust and satisfaction in the MMS Industry.*

### *2.5. Satisfaction*

In a competitive business ecosystem, the sovereignty of consumers cannot be undermined. Business sustainability, and profitability rely heavily on the ability of producers to get customers satisfied by garnering customers support for their products and service offerings. Satisfaction shapes and fosters repurchase and post-adoption behavior of consumers [87]. Brands that are able to meet consumers' satisfaction are rewarded by positive brand equity (i.e., strong tangible value and intangible values) [1, 44]. A satisfied customer, intrinsically becomes loyal, and apostle to service offerings. On the other hand, a disgruntled or a dissatisfied customer registers it by a complete withdrawal from service patronage, and also refrains from word-of-mouth referrals [67, 88].

A customer becomes satisfied whenever the expected perceived qualities relative to value propositions are met. Disgruntled customers have high propensity to switch, and consequently, engage in negative word of mouth. Evidentially, satisfaction is asserted as the result of a subjective assessment between what is perceived and what is expected on the basis of post-adoption experience [67]. Again, studies indicate that satisfaction correlates positively with loyalty, and instills trust in consumers as they experience value proposition in reality. Against this framework, customers' satisfaction has been identified as a key factor in the adoption of mobile-related services [17, 73, 4, 6, 56]. We therefore, extend that:

*$H_{10}$: There is a positive relationship between satisfaction and brand equity in the MMS Industry.*

*$H_{11}$: There is a positive relationship between satisfaction and continuous service in the MMS Industry.*

## 3. Materials and Methods

The current study emphasizes on the principal factors that motivate MMS subscribers' loyalty and continuous service utilization. In order for our study to be distinct from others studies relative to data acquisition method, and also to enhance statistical representativeness, we mainly collected our data form social medial platforms.

In general, previous studies on MMS, though not with explicit focus on behavioral intentions of consumers, have overtly focused on traditional techniques of data collection, and thus, have inherited the attendant demerits of these methods – overemphasis on human encounters, high cost, interview influence, time lag, among others. Social medial - an alternative platform for data collection, addresses the challenges of traditional techniques such as real-time and cost effectiveness. As part of our data collection process, we deployed structured questionnaires on all accessible social groups and personal contacts on social medial within our domain. These include WhatsApp, WeChat, Facebook among others. Social media reflects a wider 'geographical' coverage as compared to traditional methods, and therefore, it has a higher probability to mirror the characteristics of the population.

In order to measure both pre-adoption and post-adoption behavioral intentions of subscribers toward MMS providers, a well-crafted questionnaire with five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) was developed. The questionnaire designing was based on the constructs of our six (6) factor model consisting of Security, Brand Equity,

Perceived Quality, Satisfaction, Brand Trust, and Continuous Service Utilization (Figure 2). These unobserved variables were coded as SEK, BRE, PEQ, SAT, BRT, and CSU respectively for their plausible measurement through observable (endogenous) items. These items were carefully worded to denote customers' behavioral intentions within the MMS ecosystem. Scales from previous studies were adapted and operationalized ostensibly to enhance content validity and construct reliability.

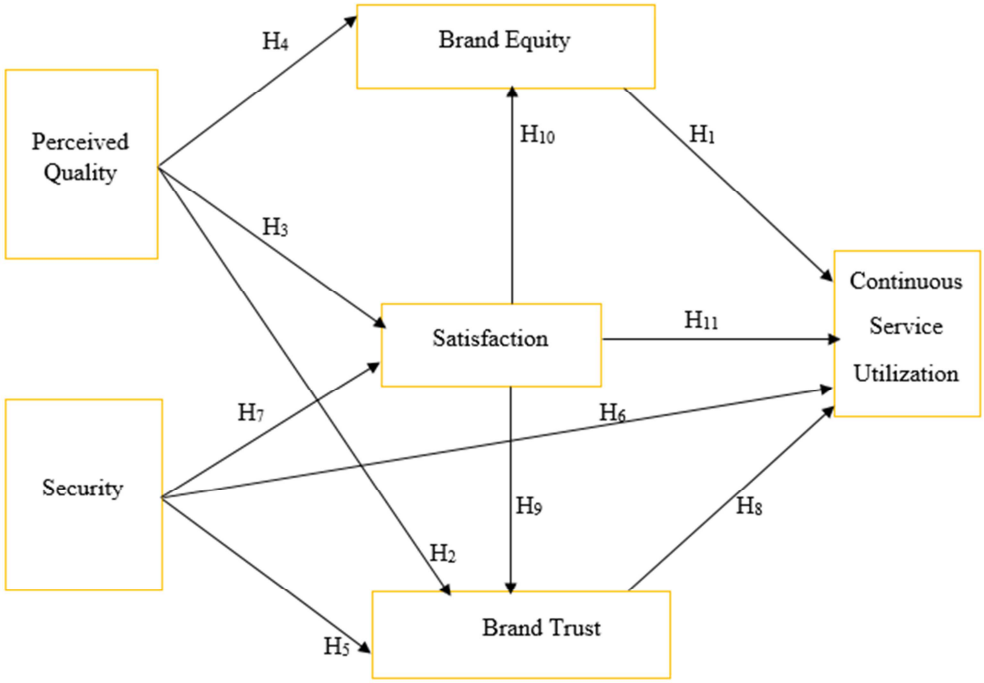


***Figure 2.*** *Conceptual Framework.*

Accordingly, items expressing Brand Trust were adapted from [66, 1] to reflect brand-based trust for MMS providers. Security which reflects a guaranteed value proposition and privacy of personal information measured was deduced from [4, 25]. Brand Equity construct was operationalized using items from [38, 1]; whiles Perceived Quality, Satisfaction and Continuous Service Utilization items were adapted from [67, 85] to reflect subscribers' loyalty intention toward MMS provider.

The final deployment of the questionnaire on Social media was done in May, 2018, after a pre-test and a pilot survey. Our impressive sample size was occasioned by snowball sampling. In all, we retained 417, respondents after the data was screened for further analysis. The rejected responses (a paltry 3.5%) were due to serious breaches in answering the questions. IBM SPSS version 22 and Analysis of Moment Structures (AMOS 21) graphics were used for both preliminary and further analysis.

Structural Equation Modeling (SEM) was used to critically examined the direct and the indirect (mediated) effects of our six-factor model. SEM (also refers to as causal modeling) integrates complex multivariate techniques (Path Analysis, Factor Analysis, Measurement Theory, Simultaneous Equation, and Regressions Analysis) with constructs that are measured with error into a unified modeling framework [10, 47]. It consists of two models – the measured and the structural model.

The measured model deals with the relationship among items and their respective unobserved factors. The structural model on the other hand, focuses on the relationship among the unobserved factors. SEM, specifically, analyzes the variance (covariance) matrix (S) with the singular objective of identifying the underlying structure [42]. A restricted factor model - Confirmatory Factor Analysis (CFA) was used to validate the factor structure of the observed variables. It was also used to test the hypotheses relative to the link between the observed variables and their associated latent variables.

Prior to CFA, we carried out diagnostic checks and mediation measures to avoid the violation of any of the assumptions of SEM (i.e., multivariate normality, multicollinearity, sample size, and positive definitiveness [47, 77]. Moreover, in order to improve model fit after model identification (i.e. achieving an over fit model), we underwent a series of modification indices procedures to obtain a parsimonious fit and minimum discrepancy.

# 4. Results and Discussion

### *4.1. Respondents Profile*

Table 1, shows an elaborative structure of respondents' profile. Out of the 417 respondents, 198 (47.6%) of them were males, and 219 (52.4%), of them were females. The age cohorts of the respondents were found to be: 118 (28.3%), 103 (24.7%), 182 (43.6%), and 14 (3.4%) for the cohorts '≥ 40',

'30-39', '20 -29' and '< 20', respectively. Also, the distribution of respondents' choice of MMS provider was found to be: 186 (44.6%) for MTN; 92 (22.1%) for Tigo; 39 (9.4%) for Airtel and, 100 (24%) for Vodafone.

***Table 1.*** *Profile of Respondents.*

| Variables | Options | Frequency (f) | Percentage (%) |
|---|---|---|---|
| Sex | Male | 198 | 47.6 |
| | Female | 219 | 52.5 |
| Age | < 20 | 14 | 3.4 |
| | 20 – 29 | 182 | 43.6 |
| | 30 - 39 | 103 | 24.7 |
| | ≥ 40 | 118 | 28.3 |
| Educational Level | Pre-secondary/Vocational | 70 | 16.8 |
| | Secondary/Diploma | 117 | 42.4 |
| | Bachelor | 89 | 21.3 |
| | Masters | 76 | 18.2 |
| | Doctorate | 5 | 1.2 |
| Preferred MMS Provider | MTN | 186 | 44.6 |
| | Tigo | 92 | 22.1 |
| | Airtel | 39 | 9.4 |
| | Vodafone | 100 | 24 |

### *4.2. The Measurement Model*

Fundamentally, SEM tries to confirm whether a set of data collected from indicator variables (items) truly supports (fits) a proposed theoretical model. In order to ensure this and subsequent good 'model fit' analysis, all the assumptions of SEM namely, multivariate normality, multicollinearity, sample size, and positive definitiveness were carefully checked. In the case of multivariate normality, we conducted a Cook's distance (an alternative to Mahalanobis distance) analysis so as to establish any potential multivariate outlier. We did not breach the assumption of multivariate normality because we did not encounter any Cook's distance statistics in excess of 1 (Steiger, 1990).

Multicollinearity refers to the presence of high intercorrelation among the independent variables in the model. To check for the non-violation of the multicollinearity assumption, we assessed the Variable Inflator Factors (VIF) of all independent variables, and we did not notice that any of the VIF and Tolerance statistics was outside the threshold of < 10 and, < 0.01, respectively [39]. The 'a-priori sample size calculator for SEM was used to confirmed the appropriateness of our sample size (417) as proposed [42, 7]. Tables 2 and 3, were used to check for plausible correlation among the studied constructs, and as a metric for internal consistency respectively.

***Table 2.*** *Factor Score Correlation Matrix.*

| Factors | SEK | PEQ | BRE | SAT | CSU | BRT |
|---|---|---|---|---|---|---|
| SEK | **1.000** | | | | | |
| PEQ | 0.233 | **1.000** | | | | |
| BRE | 0.212 | 0.641 | **1.000** | | | |
| SAT | 0.231 | 0.352 | 0.464 | **1.000** | | |
| CSU | 0.353 | 0.252 | 0.263 | 0.542 | **1.000** | |
| BRT | 0.251 | 0.513 | 0.531 | 0.491 | 0.342 | **1.000** |

***Table 3.*** *Intraclass Correlation Coefficient for Internal Reliability.*

| | | 95% Confidence Interval | | F Test with True Value 0 | | | |
|---|---|---|---|---|---|---|---|
| | Interclass Correlation | Lower Bound | Upper Bound | Value | DF1 | DF2 | Sig. |
| Single Measures | .301 | .271 | .334 | 14.604 | 416 | 10816 | .000 |
| Average Measures | .921 | .909 | .931 | 14.604 | 416 | 10816 | .000 |

The positive definitiveness assumption stipulates that, the determinant of the correlation matrix should not be equal to zero. According to Table 4, we did not violate the assumption of positive definitiveness because the determinant of correlation matrix was within the acceptable region. This means there exist a relationship among the factors and, thus Factor Analysis is possible.

***Table 4.*** *KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity.*

| Measures | Value |
|---|---|
| KMO | .902 |
| Bartlett's Test | 6739.167 |
| Chi-Square | 460.280 |
| Df. | 260 |
| Sig. | .000 |

Both Exploratory Data Analysis (EDA) and, CFA were conducted in order to examine cases of convergent and discriminant validity, model adequacy and composite reliability for internal consistency, and Goodness-of-fit indices. We examined the reliability of our six-factor model from Cronbach's alpha (α). The test of reliability is basically aimed at the consistency of a scale measurement on a repeated dimension (i.e. construct validity).

As indicated in Table 5, all the Cronbach's alpha metrics of the six constructs were within the recommended threshold of ≥ 0.7, and therefore, we achieved an excellent construct validity [62, 66, 64, 79]. We also established convergent validity by using the Average Variance Extraction (AVE) and the Composite Reliability (CR) indices. By convergent validity, we mean whether the items (indicators) actually loaded on their unique unobserved factors. In other words, whether the items measured the same construct or otherwise.

To establish this validity, we utilized the standard regression factors loadings and deduced our AVE and CR from eqns. (1) and (2) respectively. According to eqns. (1) and (2), $\lambda_{ij}$ and $\varepsilon_{ij}$ are the standard factor loadings, and the disturbance terms of ij respectively.

***Table 5.*** *Convergent, Discriminant and Nomological Validity.*

| Construct/Measures | Recommended Value | | |
|---|---|---|---|
| | **AVE > 0.5** | **CR > 0.7** | **α ≥ 0.7** |
| Brand Trust | 0.73 | 0.92 | 0.92 |
| Satisfaction | 0.64 | 0.90 | 0.90 |
| Security | 0.72 | 0.92 | 0.91 |
| Brand Equity | 0.57 | 0.84 | 0.84 |
| Cont. Serv. Utilization | 0.54 | 0.82 | 0.84 |
| Perceived Quality | 0.69 | 0.87 | 0.87 |

As demonstrated in Table 5, we did not violate the assumption of convergent validity owing to the fact that all the AVEs and CRs of the six constructs were within the acceptable threshold of > 0.5 and, 0.7, respectively [24].

$$AVEj = \frac{\left(\sum_{i=1}^{k} \lambda^2 ij\right)}{\left(\sum_{i=1}^{k} \lambda^2 ij + \sum_{i=1}^{k} (\varepsilon ij)\right)} \quad (1)$$

$$CRj = \frac{\left(\sum_{i=1}^{k} \lambda ij\right)^2}{\left(\sum_{i=1}^{k} \lambda ij\right)^2 + \left(\sum_{i=1}^{k} \varepsilon ij\right)^2} \quad (2)$$

Furthermore, we examined whether the constructs of our six-factor model uniquely measured something differently by conducting a discriminant validity test. As evidenced in Table 2, and 6, each of the off-diagonal values, communalities and standard factor loadings were within the recommended threshold of < 0.7 and, > 0.5 respectively [24].

Also, we computed a 95%, confidence interval in order to ascertain the accuracy of the metric on internal consistency [49] as indicated in Table 3. We are therefore, 95% confident that, the actual reliability of our sample lies within the region of 0.909, and 0.931, inclusive. As a confirmation of sample adequacy and relationship among the observed factors – a requirement for FA analysis (Table 4), the KMO exceeded the required threshold of > 0.5, and the Chi-square value was equally significant (P < 0.001), suggesting that the factor correlation matrix is not identical [24].

***Table 6.*** *Standard Factor Loadings and Items Statistics.*

| Unobserved Variable | Observed Variables | Loadings | Communalities | Mean | Kurtoses | Skewness | SD |
|---|---|---|---|---|---|---|---|
| Brand Trust (Aaker, 1991; Morgan and Hunt, 1994) | I have an utmost level of trust for my mobile money service provider. (BRT1) | 0.838 | 0.708 | 3.95 | 1.119 | -0.707 | 0.721 |
| | I am highly certain that my mobile money service provider will not act contrary to its value propositions. (BRT2) | 0.895 | 0.813 | 3.97 | 0.898 | -0.617 | 0.720 |
| | I trust that my mobile money service provider is reliable and delivers on its promises. (BRT3) | 0.877 | 0.779 | 3.95 | 1.356 | -0.726 | 0.742 |
| | My mobile money service provider is trusted on matters of corporate responsibilities. (BRT4) | 0.808 | 0.653 | 4.03 | 0.878 | -0.575 | 0.705 |
| | I trust that my mobile money service provider legally operates within the framework of Banking and Insurance laws of the land. (BRT5) | 0.723 | 0.530 | 4.07 | 2.148 | -0.875 | 0.695 |
| Satisfaction [85, 67, 65] | I am very satisfied with how my mobile money service provider handles clients. (SAT1) | 0.730 | 0.563 | 3.42 | -0.247 | -0.373 | 0.935 |
| | I am highly satisfied with the general office atmosphere of my mobile money service provider. (SAT2) | 0.867 | 0.759 | 3.50 | -0.194 | -0.486 | 0.925 |
| | I am highly satisfied with the kind of products offered by my mobile money service. (SAT3) | 0.854 | 0.731 | 3.54 | 0.233 | -0.625 | 0.903 |
| | I am highly satisfied with the service cost of my mobile money service provider. (SAT4) | 0.766 | 0.641 | 3.38 | -0.370 | -0.336 | 0.953 |
| | In general, I am very satisfied with the kind of services rendered by my mobile service provider. (SAT5) | 0.767 | 0.642 | 3.65 | 0.306 | -0.638 | 0.853 |
| Security [40, 25] | My mobile money service provider guarantees the protections of customers' wealth. (SEK1) | 0.807 | 0.659 | 2.38 | 0.149 | 0.793 | 0.928 |
| | My mobile money service provider guarantees the protections of | 0.839 | 0.713 | 2.35 | -0.126 | 0.868 | 0.975 |

| Unobserved Variable | Observed Variables | Loadings | Communalities | Mean | Kurtoses | Skewness | SD |
|---|---|---|---|---|---|---|---|
| | customers' personal information. (SEK2). | | | | | | |
| | My mobile money service provider has a structured policy that covers customers in the event of accidental loss. (SEK3) | 0.893 | 0.805 | 2.20 | 0.534 | 0.777 | 0.828 |
| | My mobile money service provider operates within the regulatory banking and MNO laws. (SEK4) | 0.849 | 0.718 | 2.25 | 0.029 | 0.700 | 0.906 |
| | My mobile money service provider has a unique corporate niche in terms of product offering. (BRE1) | 0.739 | 0.520 | 3.98 | 1.759 | -0.847 | 0.670 |
| Brand Equity [1, 39] | My mobile money service provider is well established and the most popular for reliable insurance provision. (BRE2) | 0.752 | 0.539 | 3.90 | 0.873 | -0.748 | 0.738 |
| | My mobile money service provider has an outstanding public identity. (BRE3) | 0.789 | 0.716 | 4.06 | 2.804 | -1.010 | 0.663 |
| | My mobile money service provider is innovative and is known to operate a propitious business model (BRE4) | 0.741 | 0.557 | 3.87 | 1.646 | -0.907 | 0.745 |
| | My mobile money service provider offers prompt service. (PEQ1) | 0.888 | 0.772 | 3.86 | 1.771 | -0.884 | 0.726 |
| Perceived Quality [85, 67] | My mobile money service provider offers convenient service. (PEQ2) | 0.889 | 0.824 | 3.87 | 0.873 | -0.604 | 0.742 |
| | My mobile money service provider offers personalized and professional financial service. (PEQ3) | 0.701 | 0.495 | 3.72 | 0.929 | -0.708 | 0.763 |
| | I shall continue to utilize the services of my mobile money service provider (CSU1). | 0.557 | 0.506 | 2.81 | -0.294 | 0.417 | 0.890 |
| | I shall continually recommend the services of my mobile money service provider to others. (CSU2). | 0.802 | 0.858 | 2.94 | -0.795 | 0.147 | 0.822 |
| Cont. Serv. Utilization [(85, 67] | I shall stick to my mobile money service provider unconditionally. (CSU3) | 0.756 | 0.508 | 3.11 | -0.699 | -0.310 | 0.892 |
| | I shall continuously remain loyal to my mobile money service provider irresponsive of the activities of other service providers (CSU4). | 0.808 | 0.545 | 3.01 | -0.895 | -0.116 | 0.957 |

### *4.3. Structural Model Parameter Estimates and Hypotheses Testing*

This part basically, encompasses the results from the second-order CFA of our measurement model. It is intended for cross-examination after achieving the psychometric properties of the measurement model at the preliminary stages. The structural model was examined based on the magnitude and the direction the estimates $\beta_S$ (regression weights) as showcased in Figures 3, 4, 5, and Tables 7 and 8.

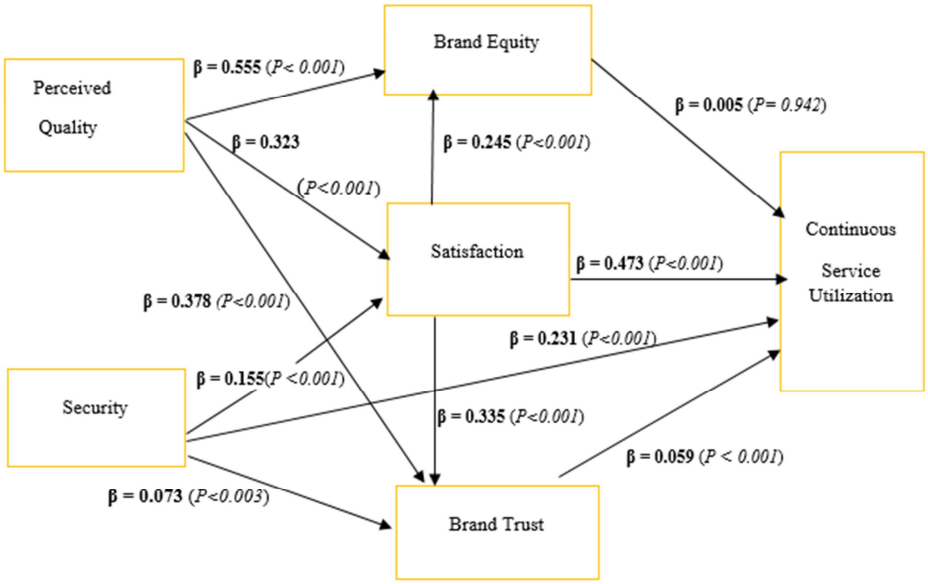


***Figure 3.*** *Structural Model Results from AMOS Graphics.*

Positive relationship was found between Perceived Quality and Brand Trust ($\beta$ = 0.378, $P$ = *0.000*), and also between Satisfaction ($\beta$ = 0.323, $P$ = *0.000*) and Brand Equity ($\beta$ = 0.555, $P$ = *0.000*). These provided support for $H_2$, $H_3$ and, $H_4$. Again, we established that there was a positive relationship between Satisfaction and Brand Equity ($\beta$ = 0.245, $P$ = *0.000*); Brand Trust ($\beta$ = 0.345, $P$ = *0.000*); and Continuous Service Utilization ($\beta$ = 0.473, $P$ = *0.000*). Therefore, $H_9$, $H_{10}$, and $H_{11}$,

were supported.

Furthermore, we observed a positive relationship between Security, Continuous Service Utilization ($\beta$ = 0.230, $P$ = *0.000*), and Satisfaction ($\beta$ = 0.155, $P$ = *0.004*), and thus, provided support for $H_6$, *and* $H_7$, respectively. There was also a positive association between Brand Trust and Continuous Service Utilization ($\beta$ = 0.059, $P$ = *0.000*); as well as between Security and Brand Trust ($\beta$ = 0.073, $P$ = *0.000*) and thus, gave support for $H_5$ and $H_8$. Contrary to our expectation, our results did not demonstrate a significant positive relationship between Continuous Service Utilization and Brand Equity (β = 0.005, $P$ = *0.942*). Thus, $H_1$, was not supported.

The forgoing demonstrates that Security is a major concern for the MMS subscribers. In detail, the results of the study explicitly show that Security impacts greatly on Brand Trust, Satisfaction and subscribers' Loyalty as indicated in prior studies [86, 25, 56]. The MMS subscribers have demonstrated that they will always affiliate with the MMS providers who will constantly guarantee them the security of their wealth as well as the protection of their personal details. Our results also reveal the overarching influence of Satisfaction on other constructs such as Brand Trust, Brand Equity and Continuous Service Utilization. In other words, the MMS providers who are able to satisfy their subscribers through service quality (i.e., prompt service, personalized and convenient services) are able to boost the trust levels of the latter and position in their mind the assurance of constant supply of value proposition [75, 4]. The results further demonstrate a strong positive link between Perceived Quality, Brand Trust and Brand Equity. In effect, MMS subscribers have revealed that they will aligned themselves with service providers who have carved a niche for service quality and trustworthy in the public eye as evinced in prior studies [19, 50].

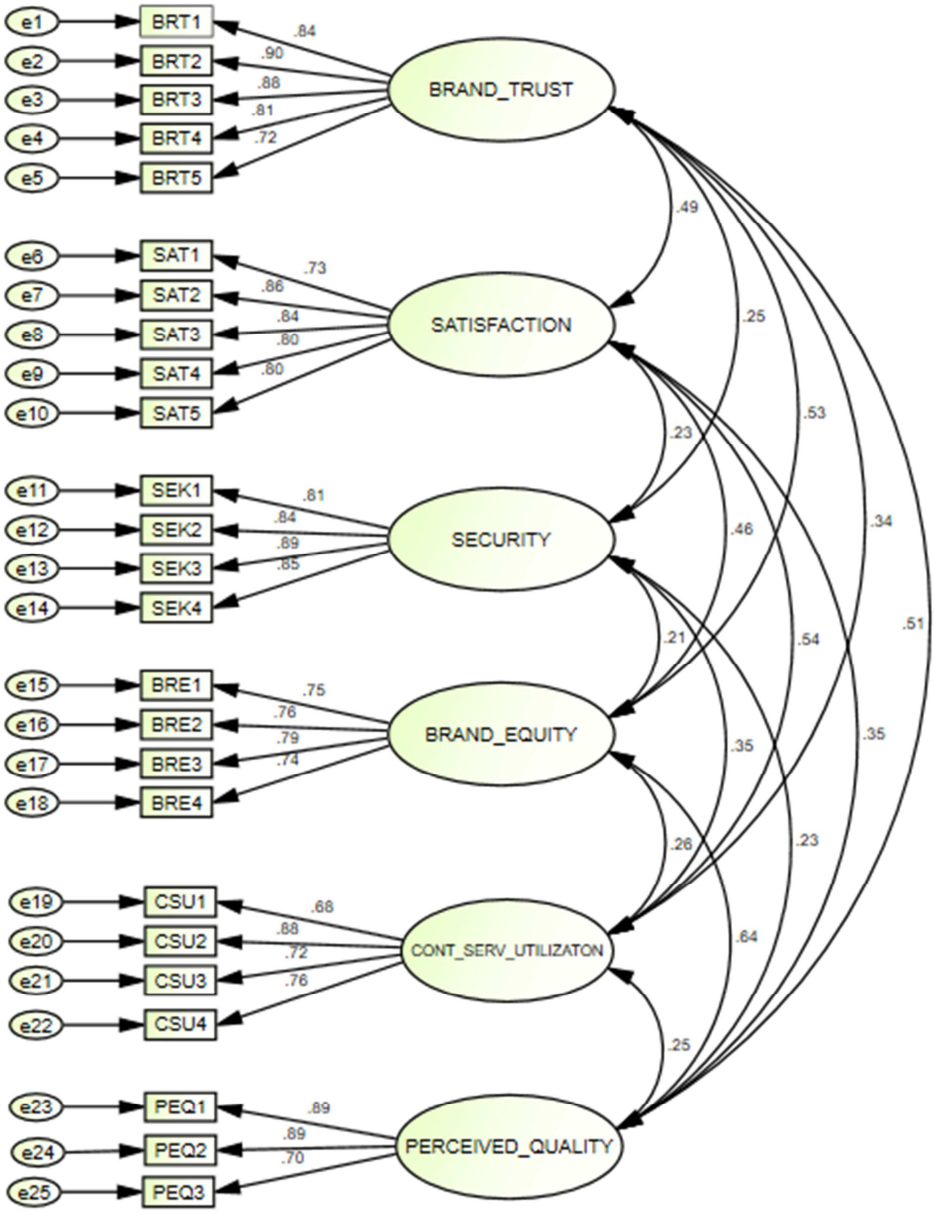


***Figure 4.*** *Graphical Illustration of Discriminant and Convergent Validity.*

***Table 7.*** *Regression Weight Estimates.*

| Hypotheses | Regression Path | Standard Error | Critical Ratio (CR) | Estimates (βs) | *p*-values | Remarks |
|---|---|---|---|---|---|---|
| $H_1$ | BRE→CSU | 0.550 | 0.900 | 0.005 | 0.942 | Not Established |
| $H_2$ | PEQ→BRT | 0.480 | 7.430 | 0.378 | *** | Established |
| $H_3$ | PEQ→SAT | 0.590 | 5.828 | 0.323 | *** | Established |
| $H_4$ | PEQ→BRE | 0.420 | 10.04 | 0.555 | *** | Established |
| $H_5$ | SEK→BRT | 0.370 | 1.969 | 0.073 | *** | Established |
| $H_6$ | SEK→CSU | 0.035 | 4.308 | 0.231 | *** | Established |
| $H_7$ | SEK→SAT | 0.048 | 2.916 | 0.155 | *** | Established |
| $H_8$ | BRT→CSU | 0.049 | 1.227 | 0.059 | *** | Established |
| $H_9$ | BRT→SAT | 0.046 | 6.452 | 0.335 | *** | Established |
| $H_{10}$ | SAT→BRE | 0.350 | 5.014 | 0.245 | *** | Established |
| $H_{11}$ | SAT→CSU | 0.540 | 6.365 | 0.473 | *** | Established |

Note: *** P < 0.001.

### *4.4. Model Fit Indices*

In order to affirm how best the collected data fits our model and to test the model's predictive capabilities and robustness, we conducted the following fit analysis through a series of modification indices: Absolute Model Fit (RMSEA, and GFI), Incremental Model fit (AGFI, CFI, NFI, IFI, SRMR and TLI), and Parsimonious Model Fit ($x^2$/df, i.e., minimum discrepancy) [10, 42, 77, 53].

***Table 8.*** *Model fit Indices.*

| Goodness of fit | $x^2$ | df | $x^2$/df | *P* | IFI | TLI | SRMR | GFI | AGFI | PGFI | CFI | RMSEA | NFI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CFA Model | 460 | 260 | 1.770 | 0.000 | 0.970 | 0.965 | 0.051 | 0.970 | 0.911 | 0.753 | 0.970 | 0.043 | 0.933 |
| Recommended value | | | <3.0 | | ≥0.9 | ≥0.9 | <0.08 | >0.8 | >0.8 | >0.8 | >0.9 | <0.8 | >0.9 |

Note: $x^2$/df=Chi-square Statistics/Degree-of-Freedom; IFI = Incremental Fit Index; TLI = Tucker-Lewis Index; *p* = *p*-value; SRMR= Standardized Root Mean Square Residual; GFI = Goodness -of-fit Index; AGFI = Adjusted Goodness-of-fit Index; PGFI = Parsimony Goodness-of-fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square of Approximation; NFI = Normed Fit Index.

As showed in Table 8, all the Absolute Model Fit indices (RMSEA = 0.043, GFI = 0.973); Incremental Model Fit (AGFEI = 0.911, CFI = 0.970, NFI = 0.933, IFI = 0.970, SRMR = 0.051, TLI = 0.965) and Parsimonious Model Fit ($x^2$/df = 1.770) were consistent with suggested values by [10, 42, 77, 53] and thus, proved that our model had a good fit.

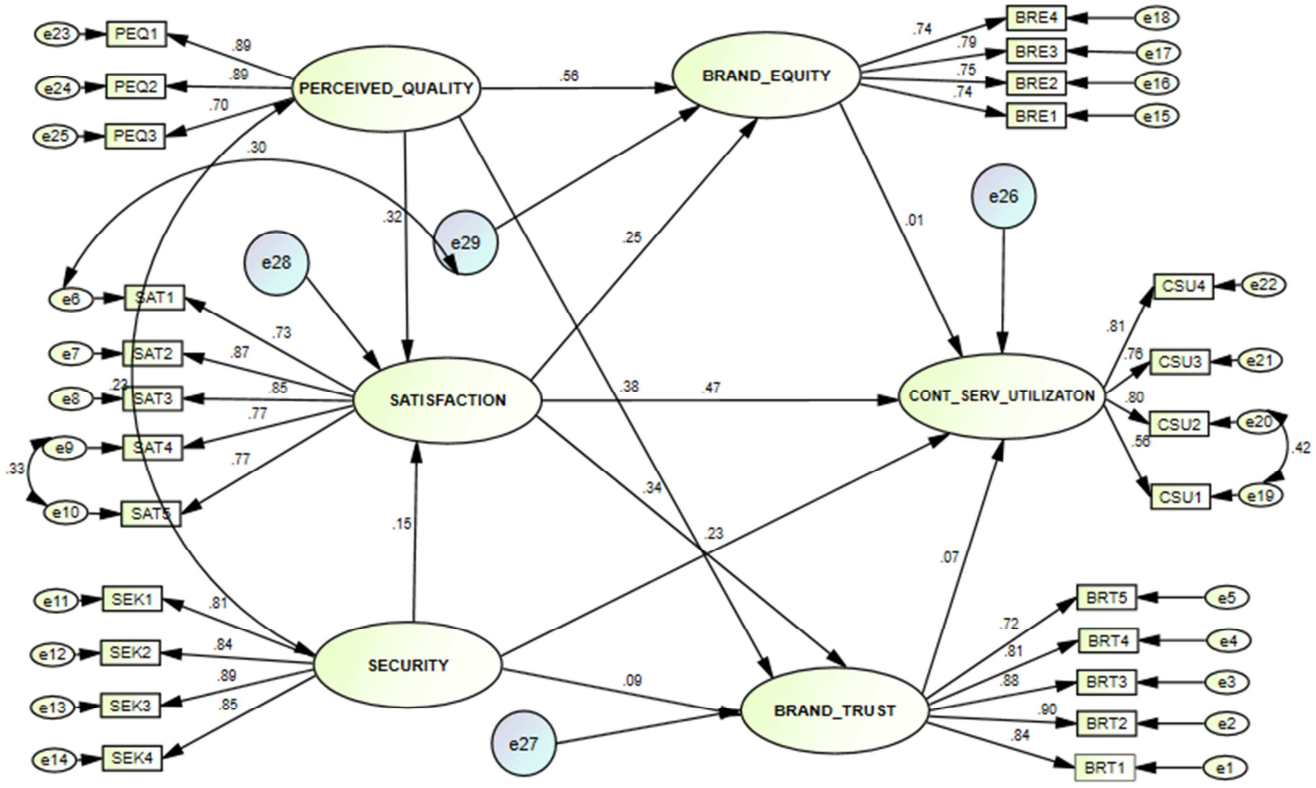


***Figure 5.*** *Structural Regression Estimates from AMOS Graphics.*

# 5. Conclusion

The MMS market in Africa is very developed in terms of operations, yet there are no explicit studies relative to subscribers' expectations and behavioral intentions toward service providers, coupled with the obvious fact that there is paucity and dearth of general studies on MMS subsector. This study was therefore, conducted to address this gap in literature.

In consistent with previous studies, we demonstrate that Perceived Quality has a positive impact on Brand Equity, Satisfaction, and Brand Trust. Also, our findings indicate the mediating role of Perceived Quality on both pre-adoption and post adoption behavior of consumers. This suggest that subscribers' perception toward the MMS providers directly or indirectly affect their loyalty drive. Again, our results also provided support for research that espouse positive relationship between Satisfaction, Brand Equity, Trust and Loyalty [19, 88, 15].

With the relationship between Security, Brand Trust, Satisfaction, and intentions for Continuous Service Utilization, we found a striking positive direct relationship between Security, Satisfaction, and Continuous Service Utilization; and an indirect positive relationship between Security and Brand Trust in consistent with previous studies [40, 85, 48]. This further implies that customers will assure MMS providers their utmost loyalty whenever the latter guarantee the former their expected privacy and security during the service delivery process [37, 71].

The MMS landscape in sub-Saharan Africa is can be described as an abyss of competition as a results of industry players unflinching quest for markets dominance. Thus, ignorance on concerns of customers may spell doom for some firms in the industry. Therefore, action on the expectations of subscribers will engender value-creation in the sphere of financial inclusion [68, 12, 74]. Currently, switching from one MMS service provider to another costs a pittance owing to mobile number portability arrangement in most countries sub-Saharan Africa. Thus, strict adherence to subscribers' clarion calls is critical for service providers to remain competitive. The present study comes at an opportune time to provide enough empirical evidence for the MMS industry players on the motivating factors that impinge upon customers behavioral intentions. The study also serves as our modest contribution to related literature on financial inclusion and financial technology. Though, the study focuses on Ghana, its theoretical and managerial implications are applicable to all regions with massive presence of MMS due to technological, cultural and socio-economic commonalities among these regions.

The findings of the present study have both theoretical and practical implications. First, to the best of our knowledge, this is the first endeavor to examine the impact of the relationships among the constructs – Brand Equity, Perceived Quality, Satisfaction, Brand Trust and Security in the context of MMS subscribers' behavioral intentions and thereby, contributing to the streams of literature on digital banking, financial inclusion, and consumer behavior. Second, the study also provides a wealth of managerial implications for attracting and retaining loyal customers. The results illustrate the indispensable contribution of service satisfaction on continuous service utilization and other constructs, directly or indirectly. This presupposes that, the ability for MMS providers to satisfy their customers relative to their value proposition will translate into improved service quality and business sustainability. Also, the striking positive link between Security and Loyalty suggests that managerial decision to uphold stringent privacy and security measures will instill corporate trust and confidence in customers.

The present study has some limitations. First, the survey was principally conducted on Social Media. In effect, the findings of the study are limited to the views of the MMS subscribers who are on social media only. Consequently, we propose that future research should broaden the debate by considering the MMS subscribers who are not yet on social media platforms. Second, the application of SEM in conducting our analysis limits our findings to Unifinality outcome and the net effects of constructs. In reality, there are several sets of configurations to an outcome – i.e., Equifinality. In the light of this, we propose that further research should be considered on the application of Equifinality methodologies such as fuzzy set Qualitative Comparative Analysis (fsQCA) to identify the sets of multiple solutions that define MMS subscribers' intentions toward service providers. Third, the study used Brand Equity, Brand Trust, Security, Satisfaction and Perceived Quality as the main constructs to assess subscriber's loyalty. This therefore, provides a conceptual framework for studies to be conducted on other factors that may also dictate MMS subscribers' loyalty. Four, our survey was confined to Ghana. This may affect the statistical representativeness of our findings. On the basis of this, we propose that a comparative study should be conducted at different jurisdictions for the affirmation of our findings.

# Conflict of Interest

Authors declare that they have no competing interest.

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