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► **To cite this version:**

Evelyn Odonkor, Jessie Pallud. A Configurational Approach to Understanding the Drivers of Mobile Phone Usage in Developing Countries. *Journal of Global Information Management*, 2022, 30 (1), pp.22. 10.4018/jgim.299322 . hal-03866912

HAL Id: hal-03866912

<https://hal.science/hal-03866912>

Submitted on 23 Nov 2022

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A Configurational Approach to Understanding the Drivers of Mobile Phone Usage in Developing Countries

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ABSTRACT

While mobile technology adoption has been largely examined by IS research, the symbolic meanings related to these technologies and the role they play in the adoption of mobile technologies in developing countries has been neglected. Thus, this study examines the effects of symbolic drivers (extended self, uniqueness, and status gain), experiential (flow), and functional drivers (ease of use, usefulness) on mobile technology usage by applying the fuzzy-set configurational approach (fsQCA). Survey responses were collected from 430 inhabitants from Ghana. The results show six configurations in which different combinations of symbolic meanings with traditional adoption factors lead to mobile phone usage. These multiple configurations reveal that there is not a single optimal feature that leads to mobile phone adoption in developing countries but rather a blend of features, depending on different combinations of symbolic, experiential, and functional variables.

KEYWORDS

Developing Countries, Extended Self, Fuzzy-Set Qualitative Comparative Analysis (fsQCA), Ghana, Mobile Phone Adoption, Symbolic Drivers

INTRODUCTION

The Mobile Revolution in many developing countries has made mobile phones and smartphones central technologies worldwide. Current global figures released by Statista indicate that approximately 4.66 billion people use the internet (Johnson, 2021). Internet users in developing countries increased from 7.7% in 2005 to 53.3% by the end of 2020, according to the International Telecommunication Union (ITU, 2020). Africa showed the strongest growth of over 27% (from 2.1% in 2005 to 29.5% in 2020). Developing countries also reported higher growth in active mobile broadband subscription (with a penetration rate of 67.5 per 100 inhabitants) than developed countries. The increase in both mobile cellular and mobile broadband subscriptions from 2015 to 2020 was also led by Africa and the Asia-Pacific (ITU, 2020).

Smartphone adoption can easily be explained by the pervasive digitalization in most societies and the increasing number of people worldwide who are now connected to the internet with mobile devices. Even for the bottom of the pyramid, poorest socio-economic group, there seems to be a potential for smartphone-producing companies (Baishya & Samalia, 2020). For this reason, information

DOI: 10.4018/JGIM.299322

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systems (IS) researchers have examined smartphone adoption for more than two decades to gain a better understanding of which factors actually play a role in it (e.g., Ameen et al., 2008; Baishya & Samalia, 2020; Choudrie et al., 2020; Kim, 2008; Shukla & Sharma, 2018). Famed IS adoption models such as the Technology Acceptance Model (TAM) (Davis, 1989) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) have been used to examine smartphone adoption. For instance, Kim (2008) examined individuals' intention to use mobile wireless technology by taking into account both individual perceptions and professional variables, such as job relevance, perceived cost savings, and company's willingness to fund. Ameen et al. (2018) examined the gender gap in smartphone adoption. The issue of smartphone adoption is still relevant nowadays, especially in developing countries (Baishya & Samalia, 2020). Indeed, Baishya and Samalia (2020) conducted a survey with 590 Indian citizens to investigate the antecedents of smartphone adoption among people at the bottom of the pyramid. Their study extended the UTAUT model with the variable of perceived monetary value. However, recent IS research also indicates that smartphone adoption is not always based on functional characteristics, such as perceived ease of use and usefulness (Choudrie et al., 2020). Experiential and symbolic interpretations, such as self-image, can intervene in adoption decisions. Therefore, it is reasonable to argue that smartphone adoption may also reflect a symbolic dimension in developing countries.

Nonetheless, few researchers have tried to understand the values and assumptions embedded in mobile technologies and how they drive IS adoption. Through a literature review of 200 articles, Donner (2008) presents papers dealing with mobile phones as symbols of modernity, empowerment, and capitalism. Jung (2014) also examines user values and the different types of goals that users aim to achieve through their smartphones. Arbore et al. (2014) emphasize the symbolic aspects of information technology (IT) adoption by analyzing consumers' acceptance of mobile TV. They include the notion of self-concept in their work, which enhances the symbolic dimensions of adoption. Drawing from customer research, they assess the role of self-identity (personal and social identities) in the adoption of personal technologies. Their study's results indicate identity-signaling mechanisms, which describe what occurs when technology consumers evaluate whether an innovation will be consistent or inconsistent with their identity-signaling goals.

In line with these findings, in this study, we aim to highlight the factors that influence smartphone usage in developing countries by identifying a blend of features, depending on different combinations of symbolic, experiential, and functional variables. The symbolic drivers include extended self, uniqueness, and status gain. The experiential driver is measured with flow, while the functional drivers correspond to ease of use and usefulness. We further contribute to the IS literature by investigating the values embedded in technologies to gain a better understanding of mobile phone adoption in developing countries.

We attempt to fill in this knowledge gap by addressing this research question:

- What configurations of symbolic, experiential, and functional drivers lead to high mobile phone usage in developing countries?

To answer this research question, we employ fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2008). This analysis determines configurations of factors instead of single factors that allow achieving a given outcome. It goes beyond the scope of multiple regression analysis that estimates the net effect of variables on a dependent variable (Woodside, 2013), allowing researchers to identify multiple factors that help explain the same outcome. Traditional analytical methods are not always able to explain complex interactions among variables. The fsQCA overcomes this inadequacy. It provides various solutions that allow researchers to determine which variables are essential or unessential for achieving a specific goal.

This paper is structured as follows. In the Drivers of Mobile Phone Adoption section, we review the literature on the adoption of mobile technologies and introduce the functional and the experiential factors found in prior research. We also discuss the symbolic drivers of IS adoption and the role of the extended self. In the Methodology section, we describe the research methodology. This is followed

by the Data Analysis and Results section. In the Discussion and Implications section, we conclude this paper by discussing the implications of our research and presenting its limitations and some avenues for future studies.

DRIVERS OF MOBILE PHONE ADOPTION

Park et al. (1986) identify three basic consumer needs: functional, experiential, and symbolic needs. Consumers may acquire products, not because of the functional purposes they serve or the sensory pleasure and cognitive stimulation they provide, but because of their symbolic meaning. In the next subsections, we present how functional, experiential, and symbolic drivers can influence technology adoption.

Functional Drivers of IS Adoption

The functional drivers of IS adoption have often been measured using ease of use and usefulness as the criteria, two renowned variables drawn from the TAM (Davis, 1989). Ease of use is defined as “the degree to which a person believes that using a particular system would be free of effort,” while usefulness describes a system that can be “used advantageously” (Davis, 1989, p. 320). According to Okazaki and Barwise (2011), the TAM has been one of the most cited theories for understanding mobile advertising acceptance. This is also true for the adoption of mobile technologies, a subfield in which different studies have relied on the TAM to identify the determinants of mobile phone adoption (Kabbiri et al., 2018; Roy, 2017; Shukla & Sharma, 2018; Wu & Wang, 2005). These prior studies indicate ease of use and perceived usefulness as significant antecedents of mobile phone usage. Lu et al. (2005) also report strong causal relations among social influences, personal innovativeness, usefulness, and ease of use, which in turn affect adoption intentions in the context of wireless internet services via mobile technology. Thus, we assess the roles played by ease of use and usefulness in our context of mobile phone usage.

Experiential Drivers of IS Adoption

IS studies also point out the need to consider experiential variables when examining technology adoption (Van der Heijden, 2004; Wang & Scheepers, 2012; Zhang, 2013). For instance, Van der Heijden (2004) suggests that for hedonic systems, experiential variables, such as perceived enjoyment, are stronger predictors of intention to use than functional variables, such as perceived usefulness. “Hedonic systems aim to provide self-fulfilling value to the user, in contrast to utilitarian systems, which aim to provide instrumental value to the user” (Van der Heijden, 2004, p. 696). This finding is verified by Wang and Scheepers (2012), who show that emotional and imaginal responses, as well as flow experience, influence behavioral intentions to use hedonic systems. Zhang’s (2013) Affective Response Model (ARM) offers a holistic framework to study affect in a technological context. More recently, Choudrie et al. (2020) have found that an older population adopts smartphones more for perceived enjoyment. Since the literature has recognized the importance of experiential variables in explaining IS usage and since mobile phones provide both hedonic and utilitarian features, we have decided to add an experiential variable by measuring flow as an antecedent of mobile phone usage. Flow is defined as the “holistic sensation that people feel when they act with total involvement” (Csikszentmihalyi, 1975, p. 36). This multidimensional concept comprises concentration, perceived control, emergence of action and awareness, transformation of time, transcendence of self, and autotelic experience (Guo & Poole, 2009). We have chosen flow instead of perceived enjoyment because flow integrates the notion of control. This variable also plays a significant role in the context of smartphone usage (Martins et al., 2019).

Symbolic Drivers of IS Adoption

A few studies have demonstrated the influence of symbolic drivers on IS adoption (e.g., Arbore et al., 2014; Hong & Tam, 2006; Moore & Benbasat, 1991; Venkatesh & Brown, 2001). In fact, technologies

and digital possessions are status symbols that may lead to admiration and perhaps respect. For instance, during the 1990s, purchasing a personal computer (PC) for home use was a way to increase one's prestige and status (Venkatesh & Brown, 2001). Similarly, innovations play a role of signaling one's need for uniqueness (Hong & Tam, 2006). Berger and Heath (2007) explain that people use products to differentiate themselves (divergence strategy) in order to effectively communicate their desired identities. As such, people look for unique products to signal their distinct identities. Arbore et al. (2014) also show that symbolic drivers, such as the need for uniqueness and status gain, are significant determinants of self-identity and ultimately, of the intention to use a technology. This is in line with Forenbacher and colleagues' (2019) finding that employment status is one of the strongest factors that influences mobile phone ownership in Nigeria.

In sum, prior studies have demonstrated that symbolic aspects of mobile devices play a significant role in their adoption, but this research stream is limited. Furthermore, scant attention has been paid to these symbolic aspects, especially in the context of developing countries, to gain a better understanding of the role of the self in determining IT adoption. Thus, in this research, we assess the role played by the need for uniqueness and status gain in mobile phone adoption.

Extended Self

Understanding the values and assumptions embedded in objects is an issue that has attracted the attention of researchers in many fields, such as marketing, psychology, sociology, and IS. Relying on the concept of the extended self, we now examine the link between consumer possessions and the sense of self.

Belk (1988) suggests that “knowingly or unknowingly, intentionally or unintentionally, we regard our possessions as parts of ourselves” (p. 139). As we are what we own, Belk (1988) contends that possessions play a crucial role in our lives by extending our selves, that is, by defining and symbolizing our identities. This central idea has given rise to the theory of the extended self. Belk defines the extended self as “a superficially masculine and Western metaphor comprising not only that which is seen as “me” (the self), but also that which is seen as “mine” (1988, p. 140). This mine, which acts as the extended self, can be a person, an animal, an object, a place, an idea, and so on. Not all objects or persons will be considered extensions of the self, but only those to which we are strongly attached and over which we have control or vice versa. Therefore, control is presented as a key factor to determine if an object will be part of the extended self. Possessions can contribute in different ways to the extended self; they can help in developing the self, can equip one with new abilities, and can reinforce one's identity/authority. As Belk (1988) explains, “having possessions can contribute to our capabilities for doing and being” (p. 145).

In 2013, Belk published another article on the extended self to take into account the evolution of consumer behavior and possessions in the digital world. In updating his theory, Belk emphasizes the possession of digital objects and shows how technologies have transformed the extended self. We summarize these changes made by Belk and other researchers by observing that the digital world has impacted the ways we consume (consumption), present ourselves (identity), and perceive technologies (symbolic meaning). Zhu et al. (2019) have found that functional brands and symbolic brands appeal not only to the consumer's actual self but also to the consumer's ideal self. This helps explain why individuals may purchase items they cannot afford and/or display such items openly to help exhibit their ideal selves.

The extended self construct has been measured in a post-positivist research tradition (Sivadas & Machleit, 1994). We rely on this perspective to understand the role of mobile phone possessions in the extended self.

In this section, we have presented the different drivers of technology adoption. Ease of use and usefulness represent the two most important variables explaining the intention to use a technology. Flow is considered a relevant experiential factor to account for in a mobile environment context. While functional and experiential drivers of IS adoption have been tested in several studies as presented

before, only a few studies have measured symbolic drivers and assessed them in conjunction with functional and experiential drivers. In this paper, we examine three symbolic factors: uniqueness, status gain, and extended self. By combining the literature on drivers of technology adoption with the theory of the extended self, our study accounts for six conditions of mobile phone usage that span three dimensions (functional, experiential, and symbolic). Greckhamer and Aguilera's (2018, p. 487) recommendation is "to include only a limited number of conditions because configurational models with many conditions may complicate findings' interpretation."

Arbore et al. (2014) have already provided a research model based on structural equation modeling to determine the role of symbolic drivers in the adoption of personal technologies. However, given that symbolic factors have rarely been measured along with functional and experiential variables, our research offers a new perspective. Furthermore, fsQCA is useful in testing whether symbolic factors represent a central condition in the configurations leading to mobile phone usage.

METHODOLOGY

Field Study: Survey Conducted in Ghana

The overwhelming majority of studies on mobile phone adoption have been conducted in developed countries; thus, some countries' cases have not yet been examined. In June 2020, the Population Reference Bureau reported that the less developed countries in Africa, Asia, and Latin America represented 80% of the world's population and 99% of global population growth. Growth on the African continent in particular has attracted much attention. *The Economist's* (2016) special report on business in Africa noted that the African population was young, better educated, and richer than ever before. The latter report also mentioned that mobile phones had transformed commerce across the continent. We studied one developing country, Ghana, with approximately 31.95 million inhabitants in 2020. Ghana was one of the first countries in Africa to connect to the internet. Interestingly, its inhabitants have developed a culture of mobile internet users (at the expense of the internet café, as observed in other African countries). At the end of 2019, mobile adoption in Ghana reached 55%, higher than the regional average of 44.8% (Omondi, 2020), indicating an increasing digitalization of the country. Six mobile phone companies operate in Ghana, but Mobile Telecommunications Networks (MTN) has the leading position, with approximately 50% of the market share. Considering the high prices of many mobile devices, which to many Ghanaians, represent more than a month's and often several months' salary, the number of people in Ghana who have acquired such devices is intriguing. As such, this phenomenon deserves extensive attention.

Research Design

The data were collected in Ghana, where one of the researchers spent a few weeks for our study. The data were obtained from paper-based questionnaires in English, which were distributed to and completed by the respondents in specific cities: Accra (the capital city, with approximately 2.2 million inhabitants), Tema (with the largest seaport in Ghana), and Takoradi.

This study relied on a convenience sampling method, which can be defined as "a sample in which research participants are selected based on their ease of availability" (Saumure & Given, 2008, p. 124). This technique allows researchers to survey the individuals who are the most ready, willing, and able to participate in the study. According to Malhotra (2010), intercept surveys correspond to one type of convenience sampling. These surveys allow researchers to intercept respondents in shopping malls or streets to conduct face-to-face research.

We felt that an intercept survey would be more appropriate to collect data for this study because prior research has indicated that traditional survey methods can be inadequate for some segments of the population (Miller et al., 1997). Indeed, telephone or web surveys tend to target people with higher incomes. If we had chosen web surveys, it would have presented limitations as well since this approach corresponds to another type of nonprobability sampling (Battaglia, 2008). Furthermore, we

neglected web surveys because we wanted to make sure that the respondents owned a smartphone, which was directly observed by the researcher on the field with the intercept approach.

Since the questionnaire was aimed at people who possessed a mobile phone, we targeted business and university areas where smartphone usage was the most widespread. One of the members of our research team approached pedestrians, briefed them on our research topic, and asked if they would like to participate in our study. Participation was voluntary and based on informed consent. We ensured an ethical data collection following the “Data Protection Act” of January 6, 1978 and the European Regulation No. 2016/679/EU of April 27, 2016. For instance, participants had the right to access, rectify, and delete their data or to limit its processing. Each participant received the contact information of the researcher who was conducting the study (email address and telephone number), to allow them to withdraw from the study at any time. The participants received a reward (e.g., a small gift) of less than one euro in phone credit.

We acknowledge that non-probabilistic methods have several limitations, such as time bias, generalizability issues, desirability, and self-selection bias. First, to limit the bias of time, we collected data at different times of the day (morning and afternoon principally) to account for the fact that people who respond in the morning may be substantially different than those available to take the study in the afternoon.

Second, regarding the generalizability of our results, we tried to survey the respondents in different urban areas of Ghana. We collected data from areas where various groups in the country were well-represented (major cities and university campuses). Owusu and Agyei-Mensah (2011) noted that all Ghanaian ethnic groups and socio-economic levels are represented in Accra. Collecting data at the capital as well as other big cities ensured that we gathered the views as well as the reasons for ownership and usage of mobile phones by many of the ethnic and socio-economic groups in the country. However, we admit that our results may not be generalizable to people living in the countryside. As stated in our limitations, future research can compare mobile phone adoption in urban vs. rural areas.

Third, we recognize the bias of self-selection with intercept surveys. Nonetheless, we wanted to make sure that the respondents owned a smartphone, which was directly observed by the researcher on the field. In our self-selection process, we did not exclude subjects willing to participate to our survey on any criteria other than possession of a mobile phone. Fourth, we tried to reduce the desirability bias by assuring the participants that they could share their personal opinions and that no answers were right or wrong when completing the questionnaire. We were interested in their own personal experiences with mobile phone usage. Also, we guaranteed anonymity to our respondents to incite them to tell the truth.

Regarding the survey instrument, we used existing scales from prior research that we adapted to the context of mobile phones. As recommended by Burton-Jones and Straub (2006), researchers must select the elements of usage that fit their nomological net to measure IS usage. Thus, we selected the seven activities performed with mobile phones that were suggested by AOL BBDO Mobile Research (2012) in order to have a richer measure of usage. These activities also overlap with the main features of smartphones, recently identified by Leung (2020). Ease of use and usefulness were borrowed from Davis’ (1989) study and had four items each. Four items measured possession incorporation in the extended self and were adapted from Sivadas and Machleit’s (1994) study. We relied on the five dimensions of flow developed by Guo and Poole (2009). Lastly, we assessed symbolic drivers of the personal self (uniqueness and status gain) with the scales of Arbore et al. (2014). We provide more details on all items and constructs in Appendix A.

In total, 430 respondents comprised our study sample, with an almost even representation by gender: 48% men and 50% women (2% of the participants did not indicate their gender). Their ages ranged between 18 and 70 years, with an average of 30.6 years (standard deviation = 9.11). Our participants had to specify the smartphone brand they possessed; Samsung (41%) and Nokia (18%) topped the list. Their work experience varied from 1 year to more than 25 years (with an average of 10 years).

FsQCA Methodology

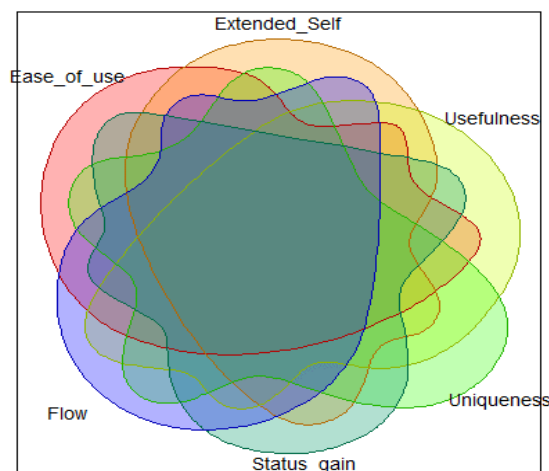
To examine the association between people’s attitudes (symbolic, experiential, and functional) and their mobile phone use behaviors, we employ fsQCA. This data analysis technique starts by listing and counting all the combinations of variables observed in the data set and then applies the rules of logical inference to reveal which conclusions or implications are supported by the data. We test this fsQCA model:

High Mobile Phone Usage= (Extended Self, Ease of Use, Usefulness, Uniqueness, Status Gain, Flow)

In fsQCA, both the causal conditions (extended self, ease of use, usefulness, uniqueness, status gain, and flow) and the outcome (high mobile phone usage) are represented using fuzzy membership scores (Ragin, 2008), which requires calibrating all variable scales to range from 0.00 for full non-membership to 1.00 for full membership. After data calibration, fsQCA uses a truth table function to generate configurations of conditions (high extended self, high ease of use, high usefulness, high uniqueness, high status gain, high flow, low extended self, low ease of use, low usefulness, low uniqueness, low status gain, and low flow) and all their possible interactions that are sufficient to achieve high mobile phone usage. Ragin (2008) suggests a consistency level above 0.75 as a rough benchmark. We adopt a consistency cut-off of 0.8.

As an asymmetric approach, fsQCA performs solutions for the outcome (high mobile phone usage) or the negated outcome (low mobile phone usage). In this study, we focus only on the outcome’s occurrence (high mobile phone usage). Additionally, the output from fsQCA includes three sets of solutions: complex, parsimonious, and intermediate. In this paper, we report the intermediate solution, also known as “the optimal solution” that “strikes a balance between complexity and parsimony, using procedures that mimic the practice of conventional case-oriented comparative research” (Ragin, 2008, p. 171). Furthermore, fsQCA supports causal asymmetry, which means that for an outcome to occur (high mobile phone usage in our study), the presence or the absence of a causal condition depends on how this causal condition combines with one or more of the other causal conditions. Figure 2 illustrates the conceptual model and how our six predictors (extended self, ease of use, usefulness, uniqueness, status gain, and flow) co-vary from each other.

Figure 1. The conceptual model



DATA ANALYSIS AND RESULTS

Reliability and Descriptive Statistics

Before conducting fsQCA, each variable scale was examined for reliability using Cronbach's coefficient alpha, composite reliability (CR), and average variance extracted (AVE). Cronbach's alphas ranged from 0.704 to 0.882 and were thus satisfactory. The CR values ranged from 0.819 to 0.927 and were therefore above 0.7. The AVE values ranged from 0.535 to 0.809 and were thus above 0.5. Consequently, all scales were deemed reliable. The psychometric statistics for each variable are shown in Table 1.

Table 1. Correlation matrix and average variance extracted (AVE) values

	Cronbach's alpha	Composite reliability	Ease of use	Extended self	Status gain	Uniqueness	Usefulness
Ease of use	0.726	0.844	0.643				
Extended self	0.842	0.894	0.130	0.679			
Status gain	0.761	0.862	0.020	0.506	0.676		
Uniqueness	0.882	0.927	0.070	0.615	0.606	0.809	
Usefulness	0.704	0.819	0.382	0.392	0.196	0.297	0.535

Notes: Each value in bold font is the square root of the AVE. The fact that they are all greater than other off-diagonal values is evidence of discriminant validity.

For each variable, the Likert scores for each item were then summed to provide a quantitative overall level of each variable. For example, mobile phone usage was measured on a 7-point scale and included 7 items (use1 to use7). Thus, the composite score ranged from 7 to 49. A higher score on this scale means greater mobile phone usage. Ease of use was measured on a 7-point scale and included 3 items (ease1 to ease3). Thus, this composite score ranged from 3 to 21. The descriptive statistics for each variable are shown in Table 2.

Formative constructs require specific tests that are distinct from those conducted for reflexive constructs (Cenfetelli & Bassellier, 2009; Ellwart & Konradt, 2011; Howell et al., 2007). Since flow and mobile phone usage qualify as formative constructs, we examined each indicator's outer weight (relative importance) and outer loading (absolute importance) and employed bootstrapping to assess their significance. For the construct flow, the weights and outer loadings of each dimension were as follows: autotelic experience ($p = 0.390$; $T = 32.36$), transcendence of self ($p = 0.145$; $T = 13.24$), transformation of time ($p = 0.257$; $T = 27.74$), control ($p = 0.298$; $T = 30.31$), and concentration ($p = 0.266$; $T = 28.94$). For the construct mobile phone usage, the indicators ranged from 0.179 to 0.515. We deleted use3, which demonstrated low weight and non-significance after bootstrapping. We also calculated the variance inflation factor (VIF). Each indicator tolerance value should be higher than 0.20 and lower than 5. All our formative indicators were found within that range. Overall, the two formative constructs also demonstrated good quality.

Table 2. Descriptive statistics

Variable	N° items	Obs.	Mean	Std. Dev.	Min.	Max.
Mobile phone usage	7	430	35.009	7.679	7	49
Ease_of_use	3	430	17.272	3.621	3	21
Self_identity	4	430	16.347	5.906	4	28
Status_gain	3	430	11.658	6.491	3	21
Uniqueness	4	430	16.649	6.016	4	28
Usefulness	3	430	16.305	3.567	3	21
Flow	11	430	50.684	11.824	11	77

Data Calibration

The first step in conducting fsQCA is calibrating dependent (the outcome) and independent variables (the conditions) into fuzzy sets. Fuzzy sets range from 0 (which denotes an absence of set membership) to 1 (which indicates full set membership). Since we used a composite score to measure constructs, the interval scaled values were transformed into a fuzzy value scale using Ragin’s (2008) direct method. The degree of set membership is based on three anchor values. These represent a full set membership threshold value (fuzzy score = “maximum value”), a full non-membership value (fuzzy score = “minimum value”), and the crossover point (fuzzy score = “mean value”). The selection of the qualitative anchors for calibration is based on the statistical distribution of the data because no universal criteria define full membership, full non-membership, or the crossover point for all our predictors and the outcome of interest. Table 3 shows the calibration thresholds for the outcome and the six conditions considered in this study.

Table 3. Qualitative thresholds of the predictors and outcome of interest

Variables	Code	Threshold of full non-membership	Crossover point	Threshold of full membership
<i>Outcome variable</i>				
Mobile phone usage	B	7	35.00	49
<i>Predictors</i>				
Extended self	T	4	16.34	28
Ease of use	Z	3	17.27	21
Usefulness	L	3	16.30	21
Uniqueness	Q	4	16.64	28
Status gain	G	3	11.65	21
Flow	W	11	50.68	77

Results

The drivers of mobile phone adoption are presented in Table 4 and suggest that six configurations are sufficiently linked to higher mobile phone usage. These causal paths display a consistency

higher than the 0.8 threshold (Ragin, 2008); the overall solution consistency is 0.824, and the overall solution coverage is 0.881. This means that the set of experiential, functional, and symbolic drivers constitutes a near-perfect subset (i.e., high consistency) of the set of mobile phone usage, and the six combinations are helpful (i.e., high coverage) in determining the most common or meaningful pathways to mobile phone usage.

The six solutions displayed in our results indicate that by including a QCA approach in mobile phone adoption, one's unavoidably recognizes the existence of equifinality, that is, a scenario in which alternative factors can produce the same outcome. Specifically, higher mobile phone usage could be achieved through multiple routes from different conjunctions of extended self, ease of use, usefulness, uniqueness, status gain, and flow. This multi-root perspective has not been addressed in previous studies and allows different, mutually non-exclusive explanations of the same behavior (higher mobile phone usage).

Each solution (from 1 to 6) supports the assumption of conjunctural causation, which foresees the effect of a single condition unfolding only in combination with other, precisely specified conditions. For example, in solution #1, usefulness has to interact with uniqueness and flow in order to lead to higher mobile phone usage. Therefore, usefulness can be identified as a necessary but insufficient condition, since it must be combined with another condition (or the union thereof) in order to imply the outcome. Using QCA in our findings provides a twofold advantage. It allows us to find distinct combinations of causal variables that, in turn, suggest different theoretical pathways to mobile phone adoption.

The first solution is a three-way interaction, involving a high level of usefulness combined with high levels of uniqueness and flow. This solution has a sufficiency consistency score of 0.919. This means that 91.1% of our cases (the respondents) have smaller or equal membership in the set of Usefulness*Uniqueness*Flow compared with the set of higher mobile phone usage. Solution #2 shows that the presence of extended self, usefulness, and uniqueness may lead people to use their mobile phones more. As such, this combines functional and symbolic drivers. Solution #3 posits that extended self, ease of use, and flow may lead people to use their mobile phones more. Solution #4 indicates that extended self, ease of use, and status gain influence mobile phone usage. Solution #5 reveals that ease of use combined with uniqueness leads to mobile phone usage. Lastly, solution #6 demonstrates that the two functional drivers (usefulness and ease of use) are capable of leading to mobile phone usage. This combination is the least surprising since it confirms the premises of the TAM (Davis, 1989).

A plausible explanation for our results can be found in existing research. Prior studies have shown that consumers purchase certain products not only because of their functionality but also because of what they believe the products reveal about them (Abosag et al., 2020; Zhu et al., 2019). In developing countries, mobile phones have contributed to social, economic, and environmental development. Individuals need to be unique (Abosag et al., 2020), and a mobile phone may also be a way for people to respond to this need. It is thus comprehensible that people will increase their usage of a device that they find useful and at the same time, helps them showcase their uniqueness. Their perceived usefulness of the device will also make the users feel in control of the tasks that they perform with it; they will even be so focused that they will ignore everything else going on around them (i.e., flow). Solutions #2, 3, and 4 combine extended self with another functional, experiential, or symbolic driver or a mix of them. Research has also demonstrated that the products we acquire are extensions of the self (Belk, 2014; Schultz, 2014). Customers' perception of a product or a service is influenced not only by the features of the product or the service but also by the relative ease of use of the product or the service. The importance of ease of use in motivating mobile usage is disclosed again in a recent study (Li et al., 2020), emphasizing that firms that wish to create an effective mobile marketing strategy must design apps based on ease of use. The customer experience is enhanced when consumers possess a product that they feel competent in using without apprehension, so they

feel in control of maneuvering it. This experience is further enriched when the product also allows the consumers to showcase their identities, encouraging augmented usage of the product.

In many developing countries where an individual’s status determines one’s access to everything, from education, employment and healthcare to government services, it is not surprising that consumers yearn to utilize products associated with high status. In their fsQCA solutions, Liu et al. (2017) also demonstrate the significant role of image among males to explain the intention to use mobile government services.

Table 4. Results of fsQCA analysis: Configurations leading to mobile phone usage

Antecedents	Solutions					
	1	2	3	4	5	6
Extended self						
Ease of use						
Usefulness						
Uniqueness						
Status gain						
Flow						
Consistency	0.919	0.908	0.907	0.947	0.893	0.855
Raw coverage	0.634	0.602	0.634	0.503	0.680	0.786
Unique coverage	0.008	0.004	0.002	0.000	0.025	0.098
Overall solution coverage	0.881					
Overall solution consistency	0.824					

Notes: ● indicates the presence of an antecedent condition, □ indicates the absence of an antecedent condition and blank cells indicate that the condition is unimportant for that particular configuration. "Raw coverage" is the proportion of cases that have the outcome that fits the causal conditions of each path, and "unique coverage" is the proportion of cases that are covered only by that solution. "Consistency" is the proportion of cases in a path that has the outcome. "Overall Solution consistency" is the average consistency score across all causal paths. "Overall solution coverage" is the proportion of cases with the outcome covered by all paths.

DISCUSSION AND IMPLICATIONS

In this study, we examine how symbolic (extended self, uniqueness, and status gain), experiential (flow), and functional drivers (ease of use and usefulness) all affect mobile phone usage in a developing country located in sub-Saharan Africa. Most of the previous studies on the adoption of mobile phones have used linear regression and structural equation modeling to predict which variables influence the intention to use or the actual usage. However, as demonstrated by Olufadi (2015, p. 85), a combination of factors can be more powerful in explaining an outcome variable, and “several variables may overlap to produce the relationship.” Our findings reveal six unique combinations that represent sufficient conditions for mobile phone usage.

Our results indicate that ease of use and usefulness are significant antecedents of mobile phone usage. Ease of use appears in four out of six combinations, while usefulness is manifested in three combinations. In solution #6, ease of use and usefulness are the only two conditions leading to mobile phone usage, confirming that the TAM is still the most effective theory that predicts technology acceptance (Lee et al., 2003). Flow also plays a role as it is present in two combinations. In solution #3, we particularly observe the complementarity between a functional factor and an experiential factor since ease of use and flow are both present. This result supports a recent study’s finding that ease of use is important in experiential interaction design (Huarng et al., 2020).

Our study makes insightful contributions to the IS literature by demonstrating the need to account for symbolic aspects of IS adoption. More precisely, status gain, the need for uniqueness, and extended self also represent significant predictors of mobile phone adoption. These conditions play a vital role in five out of six solutions. Technologies and digital possessions that have become staples in developed countries remain status symbols in many developing countries. Despite the high costs of some of these devices relative to the incomes of consumers at the bottom of the socioeconomic pyramid, these customers want to use the same products as those owned by affluent customers (Srivastava et al., 2020). In terms of symbolic meaning, a technology can be a way for individuals to feel that they are attaining their aspirations, such as wealth and status (Denegri-Knott & Molesworth, 2010).

With this study, we also respond to the call of George et al. (2016), who encourage management scholars to conduct more research in Africa. They point out the opportunities offered by the expansion of mobile technology on the continent. Other recent research stresses the importance of studying mobile phone adoption in developing economies (e.g., Vimalkumar et al., 2020). Our study on mobile phone usage in Ghana contributes to that research stream. Our focus on a non-Western culture also allows us to confirm the importance of possessions in developing countries. By analyzing how the inhabitants of Ghana use mobile technologies, as well as the values and assumptions embedded in them, we shed light on the phenomenon of the Mobile Revolution in developing countries and further explain the roles of technologies in people's lives. We have chosen a country in West Africa, but there is a wide array of cultures in Africa, so examining other countries from the same or different geographical regions (e.g., North, Central, Southern, East, and West Africa) would probably yield valuable results.

Our study provides practitioners with knowledge that is useful in strategic planning, both in designing their mobile devices and marketing them in developing countries. In design, products need to serve a clear purpose, be easy to use, and be attractive, so they are not only functional but also help consumers showcase the attributes of the product with which they wish to be associated. This is even more important today as recent research has shown that consumers increasingly shop for hedonic reasons (Horváth & Adıgüzel, 2018). To attract purchasers, the promotion of these mobile devices should appeal to both the head and the heart. Marketers should demonstrate the utilitarian benefits associated with a product while revealing its symbolic connotations.

These results also help companies in their analyses of past and current product performance. These could be useful tools that will help in determining why a product succeeds or fails on the market. If a mobile device is underperforming on the market, practitioners can question its design for ease of use and attractiveness. If it is determined that the device is both easy to use and attractive, then the company should evaluate the marketing of the product itself. What message regarding the product is communicated? Does the message stress the product's utilitarian as well as hedonic values? Our research shows that customers in developing countries do not just buy products for their functionality but also for what they represent. Both functionality and symbolic meaning of the product drive consumers toward adopting and purchasing it. To attract consumers to mobile devices such as phones, marketers should communicate the benefits that consumers in this market appreciate (such as ease of use, usefulness, flow, uniqueness, status gain, and extended self). We subscribe to Martins and colleagues' (2019, p. 384) argument that in the context of smartphone advertising, "advertisers should consider creating advertisements that arouse emotions." In the context of mobile phones, companies should also use the emotional lever to sell their technologies.

In terms of design, IT developers should focus on embedding both functional and experiential drivers in smartphones, especially when developing apps to be installed in mobile phones. Yang (2010) demonstrates that hedonic features of mobile shopping services represent the most critical driver of US consumers' intentions to use such services. She suggests including animated or multisensory features in the design of a mobile shopping service, adding that its utilitarian aspects can be developed with ubiquitous features. More recently, Huarng et al. (2020) have developed a model for experiential

interaction that includes four criteria: perceived ease of use, affordability, duration, and fun. These studies are complementary to ours and suggest operational ways to deploy our six configurations.

This research has limitations as well. First, our outcome variable is focused on mobile phone usage, but continued usage is especially relevant for ubiquitous media systems (Carillo et al., 2017) and mobile apps (Wu et al., 2020). Furthermore, Choi et al. (2007) recommend measuring mobile systems' impacts on the overall quality of life because these technologies are pervasive. As such, other variables, such as happiness and well-being, could be measured to gain a better understanding of the impacts of mobile phone technologies on users in developing countries. Sey and Ortoleva (2014) argue that research on mobile phone usage in developing countries should also account for play and leisure-related activities, while Ameen et al. (2018) highlight the gender gap in smartphone adoption in emerging countries.

Second, the data for this research were collected from participants in urban areas in Ghana. In the future, we can survey users in suburban and rural areas since their need for mobile technology and their use of it may differ from those of residents in urban areas (Tognisse & Degila, 2021). Our study also focuses on one country, but future research could conduct cross-cultural comparisons with a country in the same region (West Africa) or in a different region (e.g., North, Central, Southern, and East Africa) since even neighboring countries have different cultures. Including a developing country from another continent can also help confirm and generalize the drivers of mobile phone usage. We also intend to add a developed country from Europe, North America, or Asia to reveal new combinations. Finally, our cross-sectional study could be extended in future research with a longitudinal approach in order to compare people's perceptions across time and to account for rapid digital changes.

FUNDING AGENCY

Open Access Funding for this article has been covered by the authors of this manuscript.

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APPENDIX A

Details of the scales can be found in Table 5 below.

Table 5. Research Instrument

Contracts	Measures (7-point Likert scales)
IT Usage (adapted from Burton Jones and Straub 2006 to include the 7 dimensions suggested by AOL BBDO Mobile Research)	<ol style="list-style-type: none"> 1. I use my mobile phone to plan for upcoming activities. 2. I use my mobile phone to seek news and information. 3. I use my mobile phone to participate in hobbies and interests. [deleted] 4. I use my mobile phone to seek relaxation or entertainment. 5. I use my mobile phone to manage finances, health, and productivity. 6. I use my mobile phone to seek a product or a service. 7. I use my mobile phone to interact with other people.
Ease of use (Davis 1989)	<ol style="list-style-type: none"> 1. My interaction with my mobile phone is clear and understandable. 2. Interacting with my mobile phone does not require a lot of my mental effort. 3. I find it easy to get my mobile phone to do what I want it to do. 4. Overall, I find my mobile phone easy to use.
Usefulness (Davis 1989)	<ol style="list-style-type: none"> 1. Use of mobile phone can decrease the time needed for my work/study/life tasks. 2. Use of mobile phone can significantly increase the quality or output of my life. 3. Considering all tasks, the use of mobile phone could assist my work/study/life. 4. Overall, I find my mobile phone useful in my daily life
Possession Incorporation in the Extended self (adapted from Sivadas & Machleit, 1994)	<ol style="list-style-type: none"> 1. My mobile phone helps me achieve the identity I want to have. 2. My mobile phone helps me narrow the gap between what I am and what I try to be. 3. My mobile phone is central to my identity. 4. My mobile phone is part of who I am.

Table 5 continued on next page

Table 5 continued

Contracts	Measures (7-point Likert scales)
Flow (Guo and Poole 2009)	<p><i>Concentration</i></p> <ol style="list-style-type: none"> 1. When I use my mobile phone, my attention is focused entirely on what I am doing. 2. I am completely focused on the task at hand when using my mobile phone. <p><i>Perceived control</i></p> <ol style="list-style-type: none"> 3. I feel in total control of what I am doing with my mobile phone. 4. I feel in total control of my action with my mobile phone. <p><i>Transformation of Time</i></p> <ol style="list-style-type: none"> 5. Time appeared to go by very quickly when using my mobile phone. 6. I lose track of time when using my mobile phone. <p><i>Transcendence of Self</i></p> <ol style="list-style-type: none"> 7. I am not concerned with what others may have been thinking of me. 8. I am not concerned with how I am presenting myself. <p><i>Autotelic Experience</i></p> <ol style="list-style-type: none"> 9. I really enjoy the experience of using a mobile phone 10. The experience leave me feeling great. 11. I find the experience extremely rewarding.
Symbolic drivers of personal self (Arbore et al. 2014)	<p><i>Need for uniqueness</i></p> <ol style="list-style-type: none"> 1. I often think of the things I buy and do in terms of how I can use them to shape a more unusual personal image. 2. I am often on the lookout for new products or brands that will add to my personal uniqueness. 3. I actively seek to develop my personal uniqueness by buying special products or brands. 4. Buying and using products that are interesting and unusual assists me in establishing a distinctive image. <p><i>Status Gain</i></p> <ol style="list-style-type: none"> 1. Having a mobile phone is a status symbol. 2. People who have a mobile phone have more prestige than those who do not. 3. People who have a mobile phone have a high profile.

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