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Technology acceptance among micro-entrepreneurs in a marginalized social strata: The case of social innovation in Bangladesh

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ABSTRACT

Technology adoption by the marginalized community is indeed an important issue in global poverty reduction. To realize it, this paper contributes by doing an empirical test of the technology acceptance model, amongst those users typically always deprived in the existing social structure. Firstly, the study aims to examine the influence of Technology Readiness Index (TRI) 2.0's four indicators (optimism, innovativeness, discomfort and insecurity) on bKash entrepreneurs' perceived ease of use (PEOU) and perceived usefulness (PU) of bKash technology. Secondly, it aims to investigate the effect of 'bKash' entrepreneurs' PEOU and PU on their well-being. A total of 360 usable data were collected from the bKash agents in Bangladesh. We employed SEM-PLS3.0 for data analysis. The results indicate that optimism and innovativeness strongly drive perceived ease of use and perceived usefulness. Subjective well-being was found to be strongly predicted by perceived ease of use and perceived usefulness. The study indicates that poor people are somewhat ready to use and accept technology that leads to a sense of well-being. Bringing together the concept of subjective well-being with TRI and Technology Acceptance Model (TAM) is this paper's contribution to the knowledge domain.

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1. Introduction

With the advancement of science, technology has become an integral part of modern civilization. Technology has made our lives so simple that the world is now at our fingertips. The robustness and effectiveness of technology have introduced a tremendous, dynamic change to the course of socio-economic development. It has been well argued that information and communication technology (ICT) can reduce the poverty level in a country, if marginalised people are supported by appropriate access to information, education, health, as well as financial services (Ashraf and Malik, 2011; Cecchini and Scott, 2003; Thatchenkery et al., 2004). In fact, ICT has fuelled a surging wave of innovation which is diffusing across the globe to bring about social and economic uplifting (Mwachofi, 2013). According to scholars, information and communication technologies have enabled new patterns of industry dynamics by persistently creating new types of markets (Lee et al., 2015). However, the question that is still unsettled is whether the poor are ready to handle technology? Another unanswered question is how technology can ensure the well-being of the poor people. Indeed, there are stands for and against these issues. Muhammad Yunus, noble laureate and social entrepreneur, predicted decades ago that technology

will be in the hands of the poor around the globe. They are capable and ready to use technology, and eventually this will alleviate poverty (Yunus, 1998). It can therefore be asserted that technology can be one of the tools for social development. Technological inclusion can also be perceived as an integral part of inclusive growth. The World Economic Forum stated in a global information technology report that in the developing countries the usage of ICT is still very low (<50%), and Bangladesh ranks 120 out of 142 countries (World Economic Forum, 2015). Yet, even against such a backdrop, the triumph of technology is unprecedented. This is what affects developing countries adversely.

Using technology as a means to uplift the condition of the poor is considered a remarkable example of social innovation. In recent times, social innovation is deemed to be new panacea for achieving socio-economic development (Bock, 2015). According to Mulgan (2006), social innovation refers to creative activity and service that aim to meet social needs. Phills et al. (2008) have discussed social innovation as innovation which brings novel and useful solution to a social need, and creates values that accrue primarily to the society as a whole. Some of the social innovations appeared to be successful in enabling inclusive growth due to amalgamation of technological and financial inclusion (authors of this paper term it as techno-fin inclusion). Financial inclusion denotes a method that warrants easy access, availability, and usage of the formal financial systems for all members in an economy, which eventually leads to inclusive growth (Sarma and Pais, 2011).

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Scholars, however, have also demonstrated financial inclusion to be a solution for the market problem, besides being a market opportunity (Schwittay, 2011). Under the techno-fin inclusion approach, financial transactions are carried out by a particular technology in order to achieve inclusive growth (for all) in the society. For instance, in Kenya, the emergence of M-Pesa was a classic example of social innovation and techno-fin inclusion, through which the societal need for inclusive growth was served. M-Pesa is considered as one of the successful projects (Dunn, 2015) to bring out the fact that mobile phone technology adoption is a worthy initiative for economic and social change of the marginalized strata. According to scholars, the rapid growth of M-Pesa in Kenya was fuelled due to the poor alternatives for money transfers (Mas and Morawczynski, 2009). Similar social innovations that use technology have transformed the economic and social conditions of the marginalized people in several developing countries. Bangladesh is one such nation. As a true representation of social innovation and techno-fin inclusion, the first mobile money service deployment in the country, bKash, a private venture was launched in Bangladesh in 2011. M-Pesa and bKash are both considered as market disruptions, and disruptive social innovations, in the financial services sector. However, compared to M-Pesa, bKash gained customers much quicker due to its ease of use, vast availability, broad acceptance, diverse group of investors, supportive regulatory environment, and strong brand presence (Davidson, 2015). In addition, it has been put forward that bKash is the cheapest phone-to-phone money transfer option, and the cheapest cash-out option among all the money transfer providers in the world (Amin, 2014). That enabled bKash to hold 95% of the mobile money services business in Bangladesh, whereas in Kenya, 55% is captured by M-Pesa (Realini and Mehta, 2015). Further, according to Chen and Rasmussen (2014) from Consultative Group to Assist the Poor that is housed in the World Bank, bKash was the fastest-growing mobile money service in the world during the year 2013. It has been designed to work as a mobile money transaction tool for the entire population, aiming for inclusive growth. The users can open an account linked to a mobile phone number. Account owners can deposit or withdraw at appointed bKash agents, using any kind of handset. These bKash agents are basically the micro-entrepreneurs located in different parts of Bangladesh. In addition, it has been found that most transactions are made by people sending money to family members. They include migrant labours, garment factory workers, and rickshaw pullers sending money home. Also benefitting from bKash are students receiving money for living expenses (Chen and Rasmussen, 2014). Therefore, scholars have asserted that mobile money services ensure and add value to the well-being of people.

Previous research indicates that using mobile phone has positive influence on the subjective well-being of people (Chan, 2013). So far, the influence of mobile phone financial services on subjective well-being has been overlooked. Previous studies have carried out integrating technology readiness model and technology acceptance model, popularly known as TRAM (technology readiness and acceptance model) in different research settings (Lin et al., 2007; Chen, 2011; Chen and Li, 2010). To the best of the authors' knowledge, till date the impact of technology readiness and acceptance among the marginalized group has not been revealed. However, the impact of TRAM as outcome could be versatile, and one significant outcome is subjective well-being. Scholars also believe that there is a significant lack of research in the area of social innovation (Phillips et al., 2015). However, in the domain of social innovations like bKash technology, there is lack of studies that measure people's subjective well-being, focusing particularly on the marginalized. There are numerous social innovation activities occurring around the world, but to what extent the marginalized populace can benefit from them is still unclear. However, a unique attempt has been made here by targeting a marginalized group of people. The objective is to see whether, and the extent to which, use of technology has influenced their subjective well-being. Perhaps that would illustrate how social innovations impact the marginalized population. Hence, the major

contribution of this paper is in investigating the technology readiness and acceptance model comprehensively in a marginalized setting, by positing subjective well-being as an outcome. This will also validate a social innovation initiative that brings prosperity and development to the deprived segment of the society. Along this line, the current study has embarked on investigating the role of technology readiness of the bKash agents, using the technology acceptance model to understand the possible attainment of subjective well-being. The study aims to examine the influence of TRI 2.0's four indicators (optimism, innovativeness, discomfort and insecurity) on bKash entrepreneurs' PEOU and PU of bKash technology. Secondly, it aims to investigate the effect of PEOU and PU on bKash entrepreneurs' subjective well-being.

2. Theoretical background

2.1. Technology Readiness Index (TRI)

The Technology Readiness Index (TRI) was developed by Parasuraman (2000) to measure technology readiness (TR) of individuals. TRI has been defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000, p. 308). Technology readiness, with a 36-item scale, comprises two dimensions. Positive enablers include optimism and innovativeness, and negative inhibitors include discomfort and insecurity (Chen et al., 2014). Optimism refers to "a positive view of technology and a belief that it offers people increased control, efficiency, and flexibility in their lives"; innovativeness is "a tendency to be an early adopter of technology and opinion leader"; discomfort refers to "a perception of being unable to control the technology and a feeling of being overwhelmed by it"; insecurity is "suspicion of technology and doubt about its capability to work" (Kuo et al., 2013; Parasuraman and Colby, 2015).

However, recently TRI (TRI 1.0) was modified by Parasuraman and Colby (2015) and named TRI 2.0. The reason behind the modification is the accelerated pace of technological change in form of high-speed Internet access, mobile commerce, social media, and cloud computing (Parasuraman and Colby, 2015). TRI 2.0 has a 16-item scale measuring the four dimensions of TRI 1.0. Optimism and innovativeness are motivators contributing to TR, whereas discomfort and insecurity are inhibitors detracting from it (Parasuraman and Colby, 2015). People who have optimism and innovativeness, and have less discomfort and insecurity, are more likely to accept and use a new technology (Parasuraman, 2000). However, collective experience, feedback from researchers, and personal communications motivated Parasuraman and Colby (2015) to develop TRI 2.0. There was need to: (a) reassess scale statements referencing contexts that were no longer innovative; (b) examine and incorporate relevant implications of a changing technology environment; (c) make the instrument more parsimonious. Parasuraman and Colby (2015) elaborate why they had to modify the 36-items scale. Firstly, technologies change over time, Scale items measuring specific technologies cannot be relevant if the referenced technologies become outdated. Secondly, many formative technologies today were in the initial stages in 1999. These would include smartphones, wireless Internet services, social media, home videoconferencing, and cloud applications. Thirdly, there was a need to confirm that the TRI captures current technology-related subjects. Finally, the 36-item index was too long. The current research applies TRI 2.0 to measure technology readiness of entrepreneurs.

2.2. Technology Acceptance Model (TAM) and TRI 2.0

According to the Technology Acceptance Model (TAM) proposed by Davis (1989a), perceived usefulness (PU) and perceived ease of use (PEOU) are the two salient beliefs determining people's attitude towards accepting a technology. Perceived usefulness has a stronger relationship with user acceptance of a technology, compared to perceived

ease of use (Davis, 1989a). In different contexts, TAM has been applied to and has received empirical support from many studies (Kuo et al., 2013; Lee et al., 2003). TAM theory has been changed a few times, leading to TAM2 (Venkatesh, 2000), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), or TAM3 (Venkatesh and Bala, 2008). Each of these theories has donated greatly to the body of knowledge about technology acceptance.

As this paper aims to investigate the influence of technology readiness on the technology acceptance of bKash entrepreneurs, we integrate TRI 2.0 and TAM to explain people's technology acceptance. In a study by Walczuch et al. (2007) TRI and TAM were combined to gauge technology acceptance among the employees of a Belgian financial service provider. Kuo et al. (2013) combined TRI and TAM into one model to investigate nurses' acceptance of mobile electronic medical record systems. However, there is no study that investigates the relationship of PU and PEOU, with the subjective well-being of an individual while using technology, simultaneously in one model. The idea of well-being is commonly drawn from philosophy to imply what is good for a person eventually, (Crisp, 2008) and addresses concerns about optimal functioning (Ryan and Deci, 2001). According to Ryan and Deci (2001), well-being can be comprehended as fulfilment of pleasure and evading of pain. The concept implies a degree of functioning which leads to self-realization of an individual. Raz (2004) has also claimed that a good life is related to individual, personal values. Situations and functions like being adequately nourished, escaping morbidity and mortality, having mobility, being happy, achieving self-respect, taking part in the life of the community, appearing in public without shame etc. make up people's well-being (Nussbaum et al., 1993; Oosterlaken, 2009). Entrepreneurs usually have greater freedom, flexibility, and opportunity for self-fulfilment (Parasuraman and Simmers, 2001). In the domain of well-being studies, much of the research concentrates on subjective well-being, especially in measuring quality of life. Subjective well-being measures happiness through asking how individuals have felt about their life. Subjective well-being has been defined as the cognitive and affective assessment of own self by individuals (Diener et al., 2002). This study investigates to what extent the combined TRI 2.0 and TAM will affect the bKash entrepreneurs' well-being.

3. Research framework and hypothesis development

This study proposes a research framework depicted in Fig. 1. The framework suggests that the four indicators of TRI 2.0's - optimism, innovativeness, discomfort and insecurity - will influence entrepreneurs' PEOU and PU of bKash technology, resulting in achieving well-being. The basic concept of TAM indicates that the individual's intention to use technology can be affected by their PEOU and PU. But, rather than intention, this study suggests that the PEOU and PU can also influence an individual's well-being.

An important issue that needs to be investigated is the relationship between technology readiness and technology acceptance

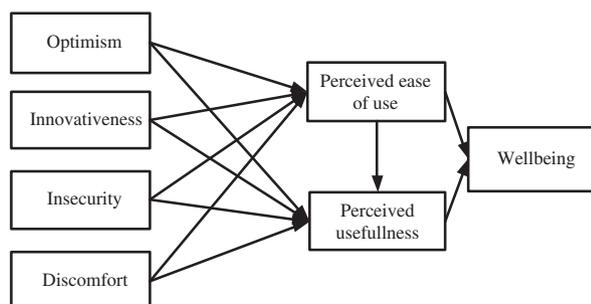


Fig. 1. Research framework.

among the bKash entrepreneurs, who are the marginalized strata of the society. This research aims to see how personality traits constructs such as optimism, innovativeness, insecurity, and discomfort may lead to a deeper understanding of the factors influencing PEOU and PU. According to Tsikriktsis (2004), optimism refers to an individuals' specific feeling that using technology can be a good thing in their life. Parasuraman (2000), noted that people who are optimistic about technology can gain more benefits in form of control over life, flexibility, and efficiency. Such people have positive strategies which have an effect on their realization of technology acceptance (Walczuch et al., 2007). In other words, optimistic people do not focus on negative things, and they accept technology more freely as they perceive it to be useful (Kuo et al., 2013). Previous studies also found that optimism has positive relationships with PEOU and PU in different contexts (Kuo et al., 2013; Walczuch et al., 2007). Therefore, this study presents the following hypotheses:

H1a. *Optimism positively influences PEOU among bKash agents.*

H1b. *Optimism positively influences PU among bKash agents.*

The tendency to be a technology pioneer and leader defines the concept of innovativeness (Parasuraman, 2000). Innovativeness is a main element of cognitive absorption that relates to PEOU and PU (Agarwal and Karahanna, 2000). Highly innovative people are more concerned about the innovativeness rather than the practicality of a new technology. They are keen to try new technologies to understand the new features and usage skills (Kuo et al., 2013). Thus, individuals with high technology innovativeness have stronger motivations to accept new technology and enjoy the feeling of trying it (Kuo et al., 2013). They also have a positive impression of a new technology's usefulness (Walczuch et al., 2007). According to scholars, individual innovativeness plays a key role in investigating the acceptance of innovative technology (Agarwal and Prasad, 1998). However, relationship of innovativeness with PEOU and PU found to be mix in the existing literature (Kuo et al., 2013; Walczuch et al., 2007). Based on the discussion above, thus, this study hypothesizes that:

H2a. *Innovativeness positively influences PEOU among bKash agents.*

H2b. *Innovativeness positively influences PU among bKash agents.*

Insecurity refers to being distrustful of technology and having scepticism about its capability to work properly (Parasuraman, 2000). People who feel less secure usually have low confidence on the security of new technology. In order to use the technology, they ask for assurance (Parasuraman and Colby, 2015). Such feelings bring about a sense of risk associated with using a new technology (Kuo et al., 2013), and this risk perception influences PEOU and PU (Lu et al., 2005). The results of the study by Walczuch et al. (2007) revealed that high personal insecurity about technology leads to lower PEOU and PU of a specific technology. However, Kuo et al. (2013) found the relationships of insecurity with PEOU and PU are contrasting. Therefore, this research proposes the following hypotheses:

H3a. *Insecurity negatively influences PEOU among bKash agents.*

H3b. *Insecurity negatively influences PU among bKash agents.*

Discomfort is defined as the perceived lack of control over, and feeling uncomfortable with, a new technology (Parasuraman, 2000). People who feels uncomfortable with a new technology believe that the technology can control them (Parasuraman, 2000). According to Walczuch et al. (2007), while high personal discomfort with regard to technology leads to lower PEOU, it does not lead to higher or lower perceived usefulness of a specific technology. Kuo et al. (2013) found that while the relationship between discomfort and PEOU is negatively significant, its

relationship with PU is insignificant. Building on this body of literature, we try to test the influence of discomfort on PEOU and PU. We hypothesise:

H4a. *Discomfort negatively influences PEOU among bKash agents.*

H4b. *Discomfort negatively influences PU among bKash agents.*

According to Venkatesh and Davis (2000), PEOU denotes the extent to which a person believes that using a new system will be free of effort, and PU denotes to the extent to which a person believes that using a system will enhance their job performance. Based on TAM model, PEOU influences PU (Davis, 1989a; Venkatesh and Davis, 2000). There are studies that confirmed the positive relationship between PEOU and PU (Kuo et al., 2013; Walczuch et al., 2007). Thus, in the context of the micro-entrepreneurs in the marginalized strata, this study hypothesizes that:

H5. *PEOU among bKash agents positively influences PU among bKash agents*

Well-being is a central issue in understanding the idea of socio-economic development. According to scholars, subjective well-being represents the state of happiness and satisfaction about life that individuals are willing to achieve (Diener, 2000). Further, in the research it has been asserted that well-being can be measured by an individual's sense of flourishing. This signifies self-evaluation of particular aspects, such as considering oneself competent and capable, contributing to the happiness and well-being of others, and engaging in daily activities (Diener et al., 2010). However, a diverse range of factors may assist in the subjective well-being of individuals. It is anticipated that technology acceptance model could lead to possible predictors of subjective well-being. According to Davis (1989b), perceived ease of use (PEOU) denotes the degree to which a potential user supposes the specific system to be free of effort. On the other hand, perceived usefulness (PU) is the subjective probability for the potential users that the system will improve his or her job performance within a specific context. If a particular application or system is easy to use and is useful, it may influence the user's state of satisfaction, which in turn, may impact subjective well-being. Thus, we believe that the perceived ease of use and perceived usefulness of the bKash transaction system enhances the state of subjective well-being of the entrepreneurs, that is, bKash agents.

H6. *PEOU among bKash agents positively influences their well-being*

H7. *PU among bKash agents positively influences their well-being*

4. Research Setting

The research has been conducted in Bangladesh to understand the state of well-being of the micro-entrepreneurs who act bKash agents to transfer money to bKash clients. bKash is a private limited company established to offer mobile money services in Bangladesh. It is a private venture of Bangladesh Rural Activation Centre (BRAC) a renowned social enterprise in Bangladesh. The BRAC bank, a subsidiary commercial bank of BRAC, owns 51% shares of bKash. While bKash copes with all facets of the mobile money service operations, BRAC Bank is responsible for regulatory compliance. By mandate, bKash must deposit the full value of its mobile account balances with a prudentially regulated commercial bank. The remaining 49% shares are held by the U.S.-based enterprise Money in Motion LLC, International Finance Corporation (IFC), and Bill & Melinda Gates Foundation (BMGF).

5. Research Methodology

Variables were constructed to empirically investigate the research questions raised in this study. Variables in the technology readiness model and technology acceptance model were combined to meet the

objectives of the study. Finally, based on our main query, the variable subjective well-being was used as the endogenous variable of the study. This study has employed a quantitative research approach, using a structured questionnaire (Appendix A) as the main research instrument. It was administered to the bKash mobile services agents. Using a five-point scale, from 1 = strongly disagree to 5 = strongly agree, the study adapted 12 measurement items to measure technology readiness from Parasuraman and Colby (2015). Four measurement items for perceived ease of use and four for perceived usefulness have been adopted from Davis et al. (1989). Subjective well-being is measured by eight items. These were developed by Diener et al. (2010) to measure social-psychological prosperity, which complements subjective well-being.

The primary version of this questionnaire was first developed in English, and later translated to Bengali by three experts who ensured clarity and accuracy of the translated items. Pre-testing was conducted using the debriefing method of personal interviews, as described by Hunt et al. (1982). In this study, five bKash agents and two researchers from academic institutions were chosen to be interviewed for their feedback. They were chosen using convenience sampling. The respondents who participated in this pre-testing study were excluded from the sample used in the actual analysis later. The targeted pre-test respondents were initially visited, and later, based on the participating respondents' convenience, appointments were fixed. Each of the respondents was given one set of questionnaire. They were asked to answer the questions, and the objective of evaluation of each item was explained to them. The respondents were asked to evaluate: 1) the clarity of the words, sentences, and meanings, 2) layout, and sequencing of the questionnaire, and finally, 3) the appropriateness of the questions for measuring the variables presented. Also, the researcher recorded the time taken to fill up the questionnaire by the respondents to ensure level of quality. The time taken by the average respondent to fill up a questionnaire was around 20–25 min. After filling up the questionnaire, each respondent was asked to provide remarks and suggestions on the items. These were noted down. The respondents were also requested to give specific suggestions to improve the questionnaire. Based on the remarks and suggestions given by the respondents in the pre-test, the questionnaire was modified.

Data was collected from the micro-entrepreneurs operating in the divisional headquarters of Bangladesh, who are also agents of bKash mobile money services. Many of the bKash agents run their own business, such as a grocery store or a mobile telephone booth. Therefore, the unit of analysis of this study is the bKash agent. There are about more than five thousand bKash registered agents throughout the country (Bangladesh Bank, 2012). Considering the context, the study has employed purposive sampling.

We gave questionnaires to registered bKash agents and used the drop-off/pick-up (DOPU) method. This method helps reduce non-coverage error and possible sample bias, without reducing response rate (Steele et al., 2001). This method also creates face-to-face contact with respondents, so that researchers can explain the purpose of the research and provide instructions on completing the questionnaires. DOPU can also further reduce interviewer bias effect and allow the respondents to complete the questionnaire alone in their own time (Allred and Ross-Davis, 2011).

A total of 960 questionnaires were distributed among the bKash agents located in eight divisional headquarters of Bangladesh. Of them, 360 were usable for the data analysis purpose, yielding response rate of 37.5%.

In a well-cited study by Baruch (1999), it is noted that average response rate in the managerial and behavioral science is 55.6% out of 200,000 respondents. Though, the author added that there are no such norms for standard response rate. Previously in the field of entrepreneurship study, the useable response rate found to be 17% (Lohrke et al., 2015), 18% (Wong and Aspinwall, 2005), and 18.8% (Jiao and Cui, 2010). In another research conducted in Bangladesh, the response rate was found to be 31.46% (Islam and Tsuji, 2011).

6. Data analysis

In the initial analysis phase, as suggested by Hair et al. (2013), we used SPSS to identify errors, missing values (using multiple imputation) and common method bias in this dataset. As data were collected from single source, it is important to check common method variance as recommended by Podsakoff et al. (2003). Harman's single factor test was conducted by entering all the principal constructs into a principal component factor analysis (Podsakoff and Organ, 1986). The findings indicate that the first factor explains 26.5% of the variance, which is <50%, as per the recommendation by Podsakoff et al. (2003). Further, eight factors explain 63.8% of the cumulative variance, which is higher than the suggested value of 50%. Therefore, common method bias is not an issue in this study.

The demographic profile indicates that 55% of the respondents are between 21 and 30 years old, followed by 34.4% of the respondents who fell in the age range of 31 to 40. In terms of gender, 96.7% of the respondents are male, which reflects the male domination in the Bangladesh market. 65% of the respondents are married. The largest cohort of the respondents has obtained higher secondary school certificate (36.4%). Majority of the respondents (28.9%) have more than five family members, and 28.6% of the respondents have five family members. Within the time frame of last twenty years, 17.2% bKash agents have been using mobile phones for the last 10 years, 12.8% for the last eight years, 10.6% for the last nine years, and 9.4% for the last five years. The rest have been using mobile phones for different time periods, ranging between one and 20 years. Regarding the time period of usage of bKash mobile money services, 31.7% have been using the service for the last three years, 29.7% using for the last four years, and 23.1% for the last two years. The respondents were also asked the amount of income generated each month only from bKash mobile money services. It was found that 16.1% of the bKash agents earn USD200 per month, 11.4% earn USD160, 9.2% of the respondents earn USD133 per month (1 USD = 75 Bangladeshi currency). The study also probed into the percentage of change in respondents' incomes, after they had become agents of bKash. The data indicates that 14.2% of respondents believe their income has increased by 20%, 10.8% revealed an income change of 15%, and 10.6% of the respondents reported change of income by 25%. The details of the demographic profile have been given in Appendix B.

We employed partial least squares method using the SmartPLS 3.0 software (Ringle et al., 2015) for analysing the data. The study tested the measurement model (validity and reliability) and structural model (testing the relationship among variables) to finalize the outcome.

6.1. Measurement model

For assessing the measurement model, we examined the convergent validity and the discriminant validity.

6.1.1. Convergent validity

As suggested by Hair et al. (2014), convergent validity is determined through factor loading, average variance extracted (AVE), and composite reliability (CR). The results validate that all criteria were satisfactory as the items loading were higher than 0.6, the AVE were higher than 0.5, and also the values of CR were above 0.7 (Table 1). However, a total of four items were dropped due to low factor loading (DIS1, DIS4, WB1, and WB4).

DIS1, DIS4, WB1, and WB4 were dropped due to low factor loading.

6.1.2. Discriminant validity

Discriminant validity was assessed through heterotrait-monotrait ratio of correlations (HTMT) based on the multitrait-multimethod matrix suggested by (Henseler et al., 2015). The first way is, if the HTMT value is greater than HTMT₈₅ value of 0.85 (Kline, 2015), or HTMT₉₀ value of 0.90 (Gold and Arvind Malhotra, 2001) then discriminant

Table 1
Convergent validity.

Construct	Items	Loadings	AVE	CR
Optimism	OPT1	0.853	0.59	0.851
	OPT2	0.651		
	OPT3	0.796		
	OPT4	0.759		
Innovativeness	INN1	0.611	0.602	0.856
	INN2	0.824		
	INN3	0.835		
	INN4	0.811		
Insecurity	INS1	0.846	0.682	0.895
	INS2	0.819		
	INS3	0.784		
	INS4	0.852		
Discomfort	DIS2	0.684	0.627	0.768
	DIS3	0.887		
Perceived ease of use	PEU1	0.852	0.713	0.908
	PEU2	0.813		
	PEU3	0.865		
	PEU4	0.847		
Perceived usefulness	PU1	0.840	0.640	0.876
	PU2	0.786		
	PU3	0.856		
	PU4	0.710		
Well-being	WB2	0.772	0.531	0.871
	WB3	0.797		
	WB5	0.754		
	WB6	0.776		
	WB7	0.608		
	WB8	0.645		

Note: average variance extracted (AVE), composite reliability (CR).

validity is questionable. The second way is to test the null hypothesis (H₀: HTMT ≥ 1) against the alternative hypothesis (H₁: HTMT < 1). If the confidence interval contains the value 1 (i.e., H₀ holds), it indicates a lack of discriminant validity (Henseler et al., 2015). As shown in Table 2, all the values are below the threshold level, HTMT₉₀ (Gold and Arvind Malhotra, 2001) and also the HTMT_{Inference} shows that the confidence interval did not show a value of 1 on any of the constructs, thus indicating that discriminant validity has been determined.

6.2. Structural model

Partial least squares regression is an extension of the multiple linear regression model. In the simplest form, the basic equation is: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_pX_p$, where Y is the dependent variable, X_i are the predictors, β₀ is the regression coefficient for the intercept and the β_i values are the regression coefficients.

For assessing the structural model (Table 3, and Fig. 2), R², standard beta, t-values via a bootstrapping procedure with a resample of 5000, the predictive relevance (Q²), and the effect sizes (f²) were examined as suggested by Hair et al. (2014).

The results reveal that optimism has significant relationship with perceived ease of use (β = 0.300 and p < 0.01), and perceived usefulness (β = 0.349 and p < 0.01). Thus, H1a and H1b are supported. Similarly, innovativeness has significant relationship with perceived ease of use (β = 0.084 and p < 0.05), and perceived usefulness (β = 0.129 and p < 0.01). Hence, H2a and H2b are also supported. Unpredictability or insecurity has positive relationship with perceived ease of use (β = 0.377 and p < 0.01). H3a was not supported by the findings, since it proposes that insecurity negatively influences PEOU of bKash users. But, insecurity has negative relationship with perceived usefulness (β = -0.117 and p < 0.05) and H3b was supported. Such unpredictable results are also revealed for discomfort. In contrast with insecurity, discomfort has negative relationship with perceived ease of use (β = -0.084 and p < 0.05) and H4a was supported. But discomfort has positive relationship with perceived usefulness, and so H4b was not supported. H4b proposed that discomfort negatively influences PU of bKash users.

Table 2
Heterotrait-Monotrait (HTMT).

	Discomfort	Insecurity	Innovativeness	Optimism	Ease of Use	Usefulness	Well-being
Discomfort	0.152						
Insecurity	CI.90 (0.104, 0.290)	0.199					
Innovativeness	0.333	CI.90 (0.130, 0.304)	0.439				
Optimism	0.132	0.422	CI.90 (0.318, 0.550)				
Ease of use	0.078	0.568	0.278	0.543			
Usefulness	CI.90 (0.069, 0.206)	CI.90 (0.473, 0.674)	CI.90 (0.185, 0.379)	CI.90 (0.452, 0.634)			
Well-being	0.206	0.347	0.438	0.894	0.458	0.671	
	CI.90 (0.154, 0.316)	CI.90 (0.25, 0.461)	CI.90 (0.255, 0.461)	CI.90 (0.845, 0.942)	CI.90 (0.420, 0.621)	CI.90 (0.592, 0.748)	

Moreover, the results show that perceived ease of use has positive relationship with perceived usefulness ($\beta = 0.262$ and $p < 0.01$) and H5 was supported. It was found that both perceived ease of use and perceived usefulness have strong positive relationship with subjective well-being of bKash users, with $\beta = 0.268$, $p < 0.01$, and $\beta = 0.450$, $p < 0.01$ respectively. Therefore, H6 and H7 postulated in this study were supported.

The R^2 value for perceived ease of use is 0.344, perceived usefulness is 0.312, and subjective well-being is 0.368. Hair et al. (2014) have suggested examining the change in R^2 value to see the effect size, f^2 . Table 3 shows the results of f^2 revealing acceptable effect size for the supported hypotheses, following the Cohen (1988) guideline.

We evaluated for multicollinearity among the variables in our model, and did not find any cause for concern using the criteria of variance inflation factor (VIF), which were (Table 3) all below the suggested value of 5.00 (Hair et al., 2013). Finally, we also assessed the predictive relevance of the model through the blindfolding procedure (Table 3) as suggested by (Hair et al., 2014). The Q^2 values for perceived ease of use ($Q^2 = 0.235$), perceived usefulness ($Q^2 = 0.191$), and subjective well-being ($Q^2 = 0.189$) are > 0 , suggesting that the model has sufficient predictive relevance.

6.3. Importance-Performance Matrix Analysis

Importance Performance Matrix Analysis (IPMA) was originally introduced by Martilla and James (1977). This method uses respondents' assessments of the importance of various attributes, and the relative performance of these attributes in evaluating comparative advantage (Meng Leong and Tiong Tan, 1991). In IPMA, data are used to construct a two-dimensional matrix, where importance is depicted along the x-axis and performance along the y-axis. The matrix would suggest which variables are important and which variables possess higher performance (Matzler et al., 2004).

Fig. 3 shows that due to their relatively higher importance values, perceived usefulness and perceived ease of use of adopting bKash

mobile money services are very important factors in determining subjective well-being of bKash agents. The performance of these two variables is higher in relation to subjective well-being. In addition, optimism of the bKash agents towards the bKash mobile money services also has higher importance and performance compared to the other variables. Though insecurity and innovativeness scored relatively high in performance, they have little relevance in influencing bKash agents' perceived ease of use and perceived usefulness. Discomfort exhibited lower importance and performance towards perceived ease of use and perceived usefulness. Therefore, managerial activities to improve the subjective well-being of the bKash agents should focus on improving perceived ease of use and perceived usefulness. Special attention should also be given to optimism. Though innovativeness and insecurity show high performance and low importance, but variables, optimism, innovativeness, and insecurity in fact do function as predictors of perceived ease of use and perceived usefulness. It is expected that if this IPMA is considered in practice, eventually the subjective well-being of the marginalized strata will be ensured.

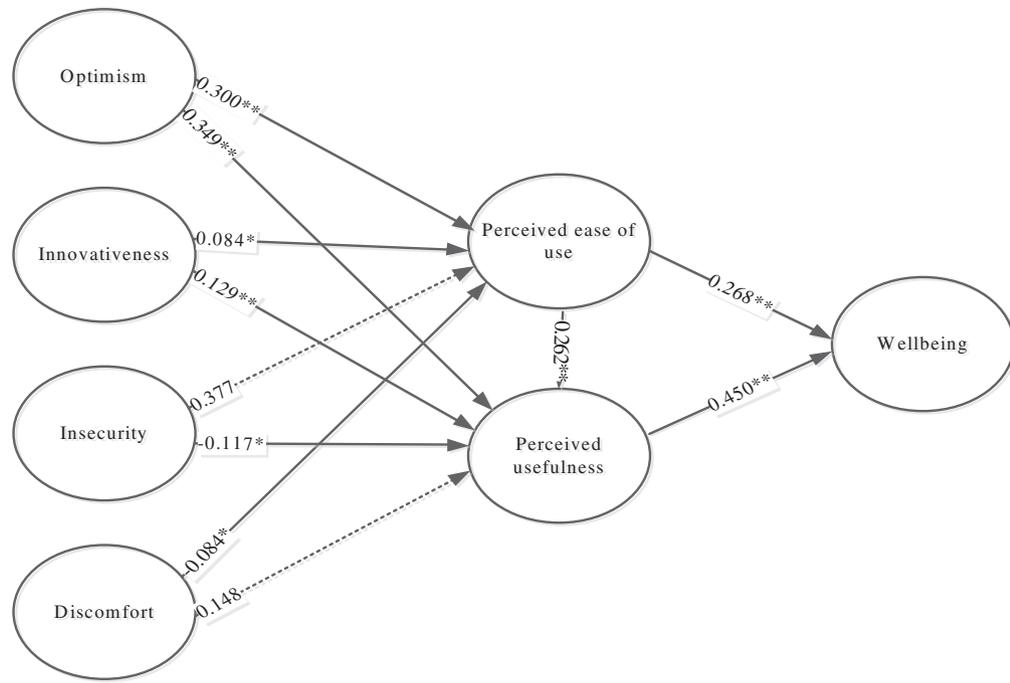
7. Discussion

From a holistic view, our society has both privileged and marginalized groups of people. The privileged have easy access to knowledge, technology, and other economic activities, whereas, in most of the cases the marginalized are deprived from the same. We can term them as deprives group as well. Bearing this in mind, two core questions have been addressed in this study. The first question sought to know whether the micro-entrepreneurs of the marginalized group are able to use the technology of mobile money services. The second pertained to whether there is any change of their social condition as a result of using such technology. The demographic data of respondents indicates that the average income of micro-entrepreneurs have increased by 27% on an average. This means that after being agents of bKash mobile money services, these micro-entrepreneurs were able to generate an additional USD168 per month on an average. Even though we cannot

Table 3
Structural model.

Hs	Path relationship	Std. Beta	SE	t- value	Decision	f^2	R^2	VIF	Q^2
H1a	Optimism - > Perceived ease of use	0.300	0.045	6.733**	Supported	0.109	0.344	1.253	0.235
H1b	Optimism - > Perceived usefulness	0.349	0.051	6.912**	Supported	0.128	0.312	1.390	0.191
H2a	Innovativeness - > Perceived ease of use	0.084	0.050	1.669*	Supported	0.009		1.166	
H2b	Innovativeness - > Perceived usefulness	0.129	0.047	2.766**	Supported	0.021		1.176	
H3a	Insecurity - > Perceived ease of use	0.377	0.055	6.787	Not supported	0.189		1.148	
H3b	Insecurity - > Perceived usefulness	-0.117	-0.056	2.085*	Supported	0.015		1.365	
H4a	Discomfort - > Perceived ease of use	-0.084	-0.043	1.952*	Supported	0.010		1.043	
H4b	Discomfort - > Perceived usefulness	0.148	0.042	3.455	Not supported	0.030		1.054	
H5	Perceived ease of use - > perceived usefulness	0.262	0.060	4.4**	Supported	0.065		1.524	
H6	Perceived ease of use - > Well-being	0.268	0.051	5.288**	Supported	0.096	0.368	1.179	0.189
H7	Perceived usefulness - > Well-being	0.450	0.044	10.247**	Supported	0.271		1.179	

** $p < 0.01$, * $p < 0.05$.



** $p < 0.01$, * $p < 0.05$

Fig. 2. Structural model.

conclude, only based on this data, that they have made positive changes in their life, it can be presumed that being bKash agents helped widen their scope of income generation. Perhaps, this result would support the main findings of this study.

To get an inclusive idea of technology readiness and its impact on well-being, this study has embarked on formulating a research framework with eleven hypotheses. The questionnaires were collected from 360 bKash agents who are basically micro-entrepreneurs and represent the marginalized section of the society. The result of our study has brought out some interesting, and also mixed, results compared to earlier research. This study indicates that optimism and innovativeness are predictors for perceived ease of use and perceived usefulness, which is similar to most of the previous research such as Walczuch et al. (2007). The theoretical view suggests that when insecurity and

discomfort is higher, the perceived ease of use and perceived usefulness will be lower. However, the relationships of insecurity with perceived ease of use, and discomfort with perceived usefulness, are positive. One of the prior research studied the influence of technology readiness as a composite construct on perceived ease of use and perceived usefulness (Lin et al., 2007). The influence of technology readiness has been also found to have significant relationship with service quality and behavioural intention of self-service technology (SST) among the SST users (Lin and Hsieh, 2006).

The present study reveals that optimism and innovativeness are strong predictors of perceived ease of use and perceived usefulness, in the context of using bKash mobile money services. The micro-entrepreneurs who are using the bKash technology have positive views on perceived ease of use and usefulness as predicted in this



Fig. 3. Importance-Performance Map. Note: The figure above has been extracted from the IPM analysis (PLS 3.0v). Dis = discomfort, INS = Insecurity, Inno = Innovativeness, OPT = Optimism, PEU = Perceived ease of use, PU = Perceived usefulness, WB = Subjective well-being.

study. In fact, it can be presumed that the bKash agents consider bKash mobile money service as a tool that contributes to quality of life and freedom of mobility. Using such a tool makes them productive in their daily life. The expectation of having a certain quality of life, and enjoying the possible liberty in life, leads to the ease of use and usefulness of bKash mobile money services. Innovativeness also indicates similar results as optimism. It can be asserted that the ability and imagination to craft new things lead to the quick adoption of new technologies like bKash mobile money services. It can also be inferred that bKash agents possess the innovativeness which positions them ahead of others. The ability of doing things in new way, or carrying out new things, or being able to handle new technology has facilitated their adopting to the mobile money services, even though they are from the marginalized section. Such a result also highlights the fact that marginalized people can also exercise innovativeness within their sphere. Similar results were found in the study of Walczuch et al. (2007) which was carried out on service employees.

The relationship between insecurity and perceived usefulness is found to be significant, as predicted. Based on the theoretical groundwork, this study had assumed that insecurity would lower the perceived usefulness. The results are in keeping with that assumption. Insecure bKash agents think that use of such technology too often may worsen the quality of interpersonal relationships and reduce personal interaction. The insecure micro-entrepreneurs comprehended bKash mobile money services as a way to distract individuals.

The result of the relationship between insecurity and perceived ease of use came out to be unexpected and opposite to the hypothesis. Even though, based on the t-value the result is significant, the path coefficient turned out to be positive. A possible explanation could be the contextual perception of the micro-entrepreneurs and the bKash software application system. Insecurity may decrease the perceived usefulness, but due to the user-friendly software, the perceived ease of use prevails over the insecurity. In addition, a growing number of users are now currently easily using smartphones and different applications. Therefore, the sense of insecurity has been reduced compared to before.

Further, the study found that discomfort reduces the perceived ease of use, as predicted by the hypothesis. The study confirms that if technical support is not provided, if technical support lines are not helpful, and if no manual instruction has been provided, the perceived ease of use is likely to be lower. On the other hand, unexpectedly, the relationship between discomfort and perceived usefulness turned out opposite, contrary to the hypothesis. The perceived value of utility of bKash mobile money services is higher than the discomfort that the respondents are facing. Perhaps, satisfactory technical support given by the bKash authorities accounts for this.

This study has also tested the relationship between perceived ease of use and perceived usefulness. As expected, the result showed significant relationship in the context of bKash mobile money services. Similar result has been found in other studies conducted in different settings (Lin et al., 2007; Pai and Huang, 2011; Walczuch et al., 2007). Therefore, the results suggest that it is important to leverage the use of bKash mobile money services by framing the interface of the system in a simple, easy, and user-friendly way.

Finally, the novel and contributory result of the study shows that perceived ease of use and perceived usefulness of bKash mobile money services are strong predictors for the well-being of the micro-entrepreneurs. The path coefficient indicates that higher perceived usefulness of the service leads to higher well-being, even compared to perceived ease of use. The utility derived from the mobile money services, and the flexibility of using the services, lead to a meaningful life among the bKash agents. This represents the well-being of the bKash agents. The more useful and easy to use the service is, the more a bKash agent becomes optimistic about future life. In fact, such mobile money services do create an impact on the life of the micro-entrepreneurs, and holistically, may contribute to eventual societal change. It is also worthwhile to mention that technology does influence

and ensure the well-being of individuals. Using such technology, they are able to increase their financial returns. Therefore, together with financial returns and satisfaction over a meaningful life, adopting the technology brings well-being to this marginalized group.

To sum up, this study modified the research model given in Fig. 1 in the context of bKash agents in Bangladesh. Optimism has influence on perceived ease of use and perceived usefulness among bKash agents. Similarly, innovativeness has influence on perceived ease of use and perceived usefulness among bKash agents. Insecurity negatively influences perceived usefulness, and discomfort negatively influences perceived ease of use among bKash agents. Perceived ease of use effects perceived usefulness among bKash agents. Finally, both perceived ease of use and perceived usefulness enhance the subjective well-being of bKash agents.

7.1. Implications

The facts unearthed in this research are particularly important for managers and researchers who deal with entrepreneurship, technology, mobile money services, and their possible impact on society. After the initiation of M-Pesa in Kenya and its success saga, mobile money services has come to be the focus of attraction among business professionals, intellectuals, and researchers alike. As a matter of fact, the immense popularity and the noteworthy societal change due to the usage of mobile money services in Kenya and other countries have propelled research interest. In Bangladesh, via the bKash initiative, mobile money service has also proven its triumph as an outcome of social innovation. In general, it can be postulated that social innovation in the field of technology is very important for the development and change of society. Technology has proved its worth by contributing to the socio-economic upward shift for any particular cohort. The study has indicated that technology can be used by anyone, even if they are from the marginalized segment. The managers in this industry perhaps could see how mobile money services like bKash impact the social groups by overriding economic impediments. It is the contention of the researcher of this study that bKash, the mobile money service, has proved that it was able to improve the accessibility, to reduce task complexity, and to eliminate the intermediaries for transferring money. Therefore, managers should consider for the development of new product or services, the ones that generate such benefits to the individuals, groups, and eventually, to the society as a whole. Managers in the industry may come up with innovative technology-based products and services, which ensure ease of use and offer higher utility. Industry managers may use the mobile money services as platform for any kind of transaction related to their products and services. From payment of fees like tuition fees, hospital fees, emergency fees, or postal fees, to purchasing tickets for different events, every transaction can be made through mobile money services. The study intends to claim, on the basis of the results, that micro-entrepreneurs from the marginalized group are very much optimistic about the technology that enables mobile-based financial services. Therefore, it would widen the scope of the telecommunications industry to engage with the financial sector, and other industries, to develop effective product and services for the consumers. The current study has also revealed the impact of technology readiness and acceptance model on the well-being of the individuals who are micro-entrepreneurs as well. In fact, the study has given an empirical support to the contention that the marginalized are able to handle technology, and it brings benefits to their own selves. Therefore, enterprises aiming to contribute to social change through technology, may consider this study to provide a new direction for developing new products and services. The fact is that there are billions of people who are at the base of the economic pyramid. If technology companies can tap them, and provide them the technology with ease of use, it will not only increase the market share but also contribute to the reduction of poverty.

7.2. Limitations and Future Direction

The study has a few limitations, some of which were out of hand and some were manageable. Due to the political unrest in the country for quite a long time, many of the respondents couldn't participate in the survey. However, statistically the sample size has proved to be sufficient. Most of our respondents were from young cohort. A mixed age group might have given a different picture. In future, researchers may target a wider group of respondents. Perhaps, this result will inspire the technology companies to get involved in social entrepreneurship ventures. Therefore, in future, a researcher may consider this study in the context of social entrepreneurship and also, sustainable entrepreneurship. In addition, the technology readiness and acceptance model can be tested among the users of the bKash, or other mobile money services, or other technology-based financial services which lead to the consumer well-being as individual user. Future research may also consider the continuance intention of mobile money services which is influenced by TAM or UTAUT2 model. This model has been tested in a least developed country (LDC) where technology still remains far behind, compared to similar LDCs or developing countries, and developed countries for sure. The current tested framework with the significant relationships can also be applied to regions where similar mobile money services are being used by the citizens, like M-Pesa in Kenya (Africa) or G-Cash in the Philippines (ASEAN). Similar research, amalgamating technology adoption model with social capital theory or social cognitive theory, can be applied in the context of different inspiring social innovations in India, Sri Lanka, Zimbabwe, and Brazil, as these countries have marked significant success in the field of social innovation.

8. Conclusion

Much has been said about the technology readiness and the technology acceptance model in the field of information and technology. The theoretical framework has been tested in different settings of the society and environment. Scholars, practitioners, and researchers are discoursing on the issue of digital divide. However, testing the framework in the context of a new social innovation initiative, on a different setting of respondents, will surely improve the scope of removing the digital divide. This study contributes towards better understanding of how technology shapes the patterns and structures of the market, and impacts societal development. The study has marked its effort by revealing that the marginalized are ready to use technology, they are at ease using technology, and by means of using technology they can change their future and eventually, lead a life of well-being.

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References

- Agarwal, R., Karahanna, E., 2000. Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS Q.* 24 (4), 665–694.
- Agarwal, R., Prasad, J., 1998. A conceptual and operational definition of personal innovativeness in the domain of information technology. *Inf. Syst. Res.* 9 (2), 204–215.
- Allred, S.B., Ross-Davis, A., 2011. The Drop-off and Pick-up Method: An Approach to Reduce Nonresponse Bias in Natural Resource Surveys. *Small-Scale For.* 10 (3), 305–318.
- Amin, A., 2014. The Cost of bKash (Retrieved from www.sites.tufts.edu/inclusivecommerceblog/catagory/mobile-money-2/).
- Ashraf, M., Malik, B.T., 2011. Gonokendra model: a response to "information poverty" in rural areas of Bangladesh. *Inf. Technol. Dev.* 17 (2), 153–161.

- Bangladesh Bank, 2012. Policy Paper on Mobile Financial Services in Bangladesh: An Overview of Market Development (Retrieved from Dhaka).
- Baruch, Y., 1999. Response rate in academic studies—A comparative analysis. *Hum. Relat.* 52 (4), 421–438.
- Bock, B.B., 2015. Rural marginalisation and the role of social innovation; a turn towards nexogenous development and rural reconnection. *Sociologia Ruralis*.
- Cecchini, S., Scott, C., 2003. Can information and communications technology applications contribute to poverty reduction? Lessons from rural India. *Inf. Technol. Dev.* 10 (2), 73–84.
- Chan, M., 2013. Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media Soc.* (1461444813516836).
- Chen, J.L., 2011. The effects of education compatibility and technological expectancy on e-learning acceptance. *Comput. Educ.* 57 (2), 1501–1511.
- Chen, S.C., Li, S.H., 2010. Consumer adoption of e-service: integrating technology readiness with the theory of planned behavior. *African J. Bus. Manag.* 4 (16), 3556.
- Chen, S.-C., Jong, D., Lai, M.-T., 2014. Assessing the relationship between technology readiness and continuance intention in an E-appointment system: relationship quality as a mediator. *J. Med. Syst.* 38 (9), 1–12.
- Chen, G., Rasmussen, S., 2014. bKash Bangladesh: A Fast Start for Mobile Financial Services. Retrieved from www.cgap.org.
- Cohen, J., 1988. Statistical power analysis for the behavioral sciences. Erlbaum.: Routledge, Hillsdale, NJ.
- Crisp, R., 2008. Well being. In: Zalta, E.N. (Ed.), *The Stanford Encyclopedia of Philosophy*, Winter ed..
- Davidson, A., 2015. Lesson from bKash: Bangladesh's Leader in P2P Mobile Money Transfer. Retrieved from www.mintel.com/blog/finance-market-news/lessons-from-bkash-bangladesh-leader-in-p2p-mobile-money-transfer.
- Davis, F.D., 1989a. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13 (3), 319–340.
- Davis, F.D., 1989b. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 319–340.
- Davis, F.D., Bagozzi, R.P., Warshaw, P.R., 1989. User acceptance of computer technology: a comparison of two theoretical models. *Manag. Sci.* 35 (8), 982–1003.
- Diener, E., 2000. Subjective well-being: The science of happiness and a proposal for a national index. *Am. Psychol.* 55 (1), 34–43.
- Diener, E., Lucas, R.E., Oishi, S., 2002. Subjective well-being. *Handbook of positive psychology*, pp. 63–73.
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., Biswas-Diener, R., 2010. New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Soc. Indic. Res.* 97 (2), 143–156.
- Dunn, L., 2015. What Leads to a Mobile Banking Program's Success? A Comparison of M-Pesa and Eko India Financial Services. *J. Public Int. Aff.* (1), 108–117.
- Gold, A.H., Arvind Malhotra, A.H.S., 2001. Knowledge management: An organizational capabilities perspective. *J. Manag. Inf. Syst.* 18 (1), 185–214.
- Hair, J.F., Hult, Ringle, Sarstedt, 2013. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publishers, UK.
- Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., 2014. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publication, Los Angeles.
- Henseler, J., Ringle, C.M., Sarstedt, M., 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* 43 (1), 115–135.
- Hunt, S.D., Sparkman Jr., R.D., Wilcox, J.B., 1982. The pretest in survey research: issues and preliminary findings. *J. Mark. Res.* 19 (2), 269–273.
- Islam, M.A., Tsuji, K., 2011. Bridging digital divide in Bangladesh: study on community information centers. *Electron. Libr.* 29 (4), 506–522.
- Jiao, H., Cui, Y., 2010. An empirical study of mechanisms to enhance entrepreneurs' capabilities through entrepreneurial learning in an emerging market. *J. Chin. Entrep.* 2 (2), 196–217.
- Kline, R.B., 2015. Principles and practice of structural equation modeling. Guilford Publications.
- Kuo, K.-M., Liu, C.-F., Ma, C.-C., 2013. An investigation of the effect of nurses' technology readiness on the acceptance of mobile electronic medical record systems. *BMC Med. Inform. Decis. Mak.* 13 (1), 88–102.
- Lee, H., Harindranath, G., Oh, S., Kim, D.-J., 2015. Provision of mobile banking services from an actor-network perspective: Implications for convergence and standardization. *Technol. Forecast. Soc. Chang.* 90, 551–561.
- Lee, Y., Kozar, K.A., Larsen, K.R., 2003. The technology acceptance model: Past, present, and future. *Commun. Assoc. Inf. Syst.* 12 (1), 752–780.
- Lin, J.-S.C., Hsieh, P.-L., 2006. The role of technology readiness in customers' perception and adoption of self-service technologies. *Int. J. Serv. Ind. Manag.* 17 (5), 497–517.
- Lin, C.H., Shih, H.Y., Sher, P.J., 2007. Integrating technology readiness into technology acceptance: The TRAM model. *Psychol. Mark.* 24 (7), 641–657.
- Lohrke, F.T., Franklin, G.M., Kothari, V.B., 2015. Top Management Team Heterogeneity and SME Export Performance: Investigating the Role of Environmental Uncertainty. *J. Small Bus. Strategy* 14 (1), 86–102.
- Lu, H.-P., Hsu, C.-L., Hsu, H.-Y., 2005. An empirical study of the effect of perceived risk upon intention to use online applications. *Inform. Manag. Comput. Secur.* 13 (2), 106–120.
- Martilla, J.A., James, J.C., 1977. Importance-performance analysis. *J. Mark.* 77–79.
- Mas, I., Morawczynski, O., 2009. Designing mobile money services lessons from M-PESA. *Innovations* 4 (2), 77–91.
- Matzler, K., Bailom, F., Hinterhuber, H.H., Renzl, B., Pichler, J., 2004. The asymmetric relationship between attribute-level performance and overall customer satisfaction: a re-consideration of the importance-performance analysis. *Ind. Mark. Manag.* 33 (4), 271–277.

- Meng Leong, S., Tiong Tan, C., 1991. Assessing national competitive superiority: An importance-performance matrix approach. *Asia Pac. Int. J. Mark.* 3 (2), 26–37.
- Mulgan, G., 2006. The process of social innovation. *Innovations* 1 (2), 145–162.
- Mwachofi, M.M., 2013. Technology Adoption and the Banking Agency in Rural Kenya. *J. Sociol. Res.* 4 (1), 249.
- Nussbaum, M.C., Sen, A., Sugden, R., 1993. *The quality of life*. Clarendon Press Oxford, Oxford.
- Oosterlaken, I., 2009. Design for Development: A Capability Approach. *Des. Issues* 25 (4), 91–102.
- Pai, F.-Y., Huang, K.-I., 2011. Applying the technology acceptance model to the introduction of healthcare information systems. *Technol. Forecast. Soc. Chang.* 78 (4), 650–660.
- Parasuraman, A., 2000. Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *J. Serv. Res.* 2 (4), 307–320.
- Parasuraman, A., Colby, C.L., 2015. An updated and streamlined technology readiness index TRI 2.0. *J. Serv. Res.* 18 (1), 59–74.
- Parasuraman, S., Simmers, C.A., 2001. Type of employment, work–family conflict and well-being: a comparative study. *J. Organ. Behav.* 22 (5), 551–568.
- Phillips, W., Lee, H., Ghobadian, A., O'Regan, N., James, P., 2015. Social Innovation and Social Entrepreneurship A Systematic Review. *Group Organ. Manag.* 40 (3), 428–461.
- Phills, J.A., Deiglmeier, K., Miller, D.T., 2008. Rediscovering social innovation. *Stanf. Soc. Innov. Rev.* 6 (4), 34–43.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y., Podsakoff, N.P., 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88 (5), 879.
- Podsakoff, P.M., Organ, D.W., 1986. Self-reports in organizational research: Problems and prospects. *J. Manag.* 12 (4), 531–544.
- Raz, J., 2004. The role of well-being. *Philos. Perspect.* 18 (1), 269–294.
- Realini, C., Mehta, K., 2015. *Financial Inclusion at the Bottom of the Pyramid*. Friesen Press, Victoria, Canada.
- Ringle, C.M., Wende, S., Becker, J.-M., 2015. SmartPLS 3. Retrieved from. www.smartpls.com.
- Ryan, R.M., Deci, E.L., 2001. On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annu. Rev. Psychol.* 52 (1), 141–166.
- Sarma, M., Pais, J., 2011. Financial inclusion and development. *J. Int. Dev.* 23 (5), 613–628.
- Schwittay, A.F., 2011. The financial inclusion assemblage: subjects, technics, rationalities. *Crit. Anthropol.* 31 (4), 381–401.
- Steele, J., Bourke, L., Luloff, A., Liao, P.-S., Theodori, G.L., Krannich, R.S., 2001. The drop-off/pick-up method for household survey research. *Commun. Dev.* 32 (2), 238–250.
- Thatchenkery, T., Kash, D., Stough, R., 2004. Information technology services and economic development: The Indian experience. *Technol. Forecast. Soc. Chang.* 71 (8), 771–776.
- Tsikriktsis, N., 2004. A technology readiness-based taxonomy of customers a replication and extension. *J. Serv. Res.* 7 (1), 42–52.
- Venkatesh, V., 2000. Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Inf. Syst. Res.* 11 (4), 342–365.
- Venkatesh, V., Bala, H., 2008. Technology acceptance model 3 and a research agenda on interventions. *Decis. Sci.* 39 (2), 273–315.
- Venkatesh, V., Davis, F.D., 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Manag. Sci.* 46 (2), 186–204.
- Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D., 2003. User acceptance of information technology: Toward a unified view. *MIS Q.* 27 (3), 425–478.
- Walczuch, R., Lemmink, J., Streukens, S., 2007. The effect of service employees' technology readiness on technology acceptance. *Inf. Manag.* 44 (2), 206–215.
- Wong, K.Y., Aspinwall, E., 2005. An empirical study of the important factors for knowledge-management adoption in the SME sector. *J. Knowl. Manag.* 9 (3), 64–82.
- World Economic Forum, 2015. *The Global Information Technology Report 2015*. Retrieved from Geneva. http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf.
- Yunus, M., 1998. Alleviating Poverty Through Technology. *Science* 282 (5388), 409–410.

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