

Firm-Customer Mobile Digital Connectedness: Conceptualization, measurement and application

Completed Research Paper

Abstract

Ubiquitous firm-customer digital connectedness for effective sensing and responding are a strategic imperative for firms in volatile environments. This paper conceptualizes and operationalizes the firm-customer digital connectedness in the context of ubiquitous Smartmobile customer focussed shopping app in consumer retail and empirically investigated its implications on customer expectations, experiences and satisfaction. Based on survey data collected from 431 customers in a field study, we tested hypothesis pertaining to the firm-customer mobile digital connectedness and (i) customer expectations,(ii) customer experience, and (iii) customer satisfaction. Our analysis using non-linear postulations reveals that whilst customers raise their expectations as they increase their mobile digital interactions with a firm, their experiences as well as satisfaction also increases proportionately. Then we summarise the findings, contributions to research and practice, limitations and implications.

Key words: Digital connectedness, Customer expectations, Smart mobile apps, Polynomial regression, Response surface methodology

Introduction

A firm's ability to sense-and-respond customer requirements in a timely and tailored manner is a strategic imperative in contemporary business environments (Overby et al. 2006; Roberts and Grover 2012a; Roberts and Grover 2012b). With the advent of smart mobile devices and associated apps, firms have gained a heightened 'digital connectedness' with their customers further strengthening firm's agility. This is especially true for the retail and service sector where the firm has the potential to connect with their customers through a Smart mobile app, that could lead it into a 24x7 sensing-and-responding. When Sambamurthy et al. (2003) first introduced digital options in sensing and responding over a decade ago, they argued that ubiquitous technology presents an unparalleled level of digital connectedness between firms and customers. Nazir and Pinsonneault (2012) demonstrated the employment of digital technologies to connect with external environment for unfettered information access for achieving agility in their agility discussion. Similarly, other researchers too have discussed how firms can effectively leverage digital technologies to improve customer side competencies and enhance localized firm dynamics for improved customer service performances (Setia et al. 2013).

Benefits of digital connectedness include (not limited to): (i) personalized product recommendations (Zhang et al. 2011), (ii) improved service quality achieved through improvisational capabilities (Pavlou and El Sawy 2010) and (iii) optimizing the time and effort that customers required when receiving a service (Xu et al. 2011). On the other hand, customer loyalty in mobile commerce (Lin and Wang 2006), and role of firm-customer relationship quality in customer loyalty in e-commerce context (Walsh et al. 2010) have been discussed in academic papers. This research attempts to contribute to this body of knowledge by conceptualizing and operationalizing the firm-customer digital connectedness.

A clear conceptualization of digital connectedness is essential at this juncture in time for several reasons. First, as Vodanovich et al (2010) identify, the new generation of consumers are innately techno-savvy and they let ubiquitous technologies to weave themselves into their very fabric of everyday life (Vodanovich et al. 2010). Such mimicking of daily routines allows organizations to sense customer needs better. Thus, contemporary firms are deploying multitude of digital technologies such as Smart-apps for ubiquitous customer connectedness anticipating close firm-customer relationships for better sensing and responding opportunities. Next, whilst customers are eager to connect with firms through Smart mobile apps they are well aware of the consequences of such digital engagements (Gao et al. 2010). As customers are aware that firms are sensing their unique requirements through uninterrupted digital associations, in return they expect better, personalized, unique responsiveness for their requirements from firms. Lastly, but not least the , contemporary firm's are effectively leveraging digital technologies to improve customer side competencies focusing on enhancing localized firm dynamics to improve firm's responsiveness in the areas of customer service performances (Setia et al. 2013), service automations (Ref), and personalized product recommendations (Zhang et al. 2011). Thus, conceptualizing digital connectedness is warranted for a better understanding the dynamics and implications associated with ubiquitous firm-customer digital connectedness.

Conceptualization of Firm-Customer Digital Connectedness

In developing the digital connectedness construct, we synergize the notions of connectedness in general (e.g...Jung 2008; Jung et al. 2001; Russell et al. 2004a; Russell et al. 2004b). Connectedness in a broader sense, signifies the quality of a relationship, the connection between or how much being in touch (Townsend and McWhirter 2005). Connectedness to a technology – internet connectedness (Jiang 2014), or connectedness to television (Russell et al. 2004a; Russell et al. 2004b), have been explained as the level of access, degree of interactions/usage or the degree to which a person is connected/attached to a particular technology. Thus, given the context of mobile apps, the digital connectedness construct can be viewed as a continuum of system use (Burton-Jones and Gallivan 2007; Burton-Jones and Grange 2013; Burton-Jones and Straub 2006).

¹ Increased level /degree of digital interactions

Conceptually, connectedness refers to a positive collective association (Pavlovich and Krahnke 2012), where the term reflects 'how-well' two things interact or the amount of interaction that supports a coalition or connection between two things. According to DeSanctis (2013), the digital connectedness implies 'how-much' a person utilizing the attached technology. In other words, digital connectedness refers to the *degree* (how-well) as well as the *amount* (how-much) of engagement that a person maintains over a period of time in a digital environment. Given the focus of our research is on mobile apps, customer's connectedness to a firm is measured through their individual use of the mobile app. Here, there is an implicit association that, to the extent a customer is engaged in repetitive use of a mobile app is associated with firm's ability to respond to customer unique requirements. In order to initiate or maintain connectedness between a firm and a customer, firm should sense customer's requirement through his/her use of the mobile shopping app. Hence, the firm-customer digital connectedness is not a simple reflection of a customer's 'use' of a firm's customer focused digital technology, rather a customer's use of the digital technology that allows a deeper, closer and well relationship between the customer and the firm in a longer run.

System Use has been one of the most mature research streams in the IS discipline. For example, system use is a construct of IS success (DeLone and McLean 1992; DeLone and McLean 2003; Petter and McLean 2009) and technology acceptance (Brown et al. 2012; Davis et al. 1989; Venkatesh et al. 2008; Venkatesh and Davis 2000; Venkatesh et al. 2003; Venkatesh et al. 2012). This has resulted in a rich understanding of the construct, differentiating the types of system use measures (Burton-Jones and Gallivan 2007; Burton-Jones and Straub 2006). For example, new conceptualizations such as extended use (Po-An Hsieh et al. 2011) and effective use (Burton-Jones and Grange 2013) provide insights of individual use patterns.

Our focus herein is not just to understand an individual's use of a smart mobile shopping application; rather on the Smart mobile app usage that connects an individual to a firm. In other words, our aim is to understand the firm-customer digital connectedness based on a customer's use of mobile shopping app. Use in this research is not about a simple reflexion of use or presence of use, but use here refers to deep use as per Burton-Jones and Straub (2006), where for an example, a customer's use of functionalities such as online shopping, browsing products or creating shopping lists will provide ample amount of rich customer insights for the firm to form a relationship with the individual. Also, a customer's frequent utilization of such functionalities to perform tasks that allow a firm to sense their requirements, would provide more chances for the firm to sense those customers' requirements. As such, the usage measures that are relevant to the construct digital connectedness herein should capture what functionalities of the app he/she used, tasks performed by an individual, and at what frequency. So, such measures reflect the degree to which a customer is mimicking his/her daily shopping related routines in a firm's customer focused mobile app. Hence, in this research we capture the regularity which an individual's employment of one or more features of a mobile app to perform tasks that supports a firm to acquire meaningful insights about the user. One way to capture deep usage that we have mentioned above is to analyze panel data (Verkasalo et al. 2010) but is comparatively difficult for an academic research. However, for the purpose in an academic research, it is possible to obtain reliable self-reported data using very rich measures of system usage. Hence, in this research we capture the regularity which an individual's employment of one or more features of a mobile app to perform tasks that supports a firm to acquire meaningful insights about the user from self reported data.

Constructs Development

The appropriate constructs for the study were developed following the two-staged approach of Burton-Jones and Straub (2006). The definition stage (stage 1) defines the distinguished characteristics of system usage that is relevant to a particular study. Then, the second stage – selection stage selects the elements of usage that are most relevant for the study model and the measures in relation to the nomological net. The following discussion elaborates the detailed procedure of two staged approach that we have followed in this exercise.

According to Burton-Jones and Straub (2006), one could conceive a system usage using any combination of three elements: (1) subject using the system (i.e. user) (2) Object being used (i.e. system) and (3) the function being performed (i.e. task). What it explains is that a researcher could choose the best measures for the part of the usage activity that is of interest based on the objectives of the study, using only a subset of the aforementioned three elements that are relevant to the specific study. As such, a researcher should

define the context of the study in order to capture the most relevant usage content for a specific context. As our focus in this discussion is to study firm-customer digital connectedness through the customers' use of Smartmobile shopping app we define the context of our study based on the Figure 1 below. The figure summarizes the scope of the usage measures, types of systems and the type of evaluation we are interested in studying firm-customer digital connectedness in relation to the prior technology use related studies in IS discipline.

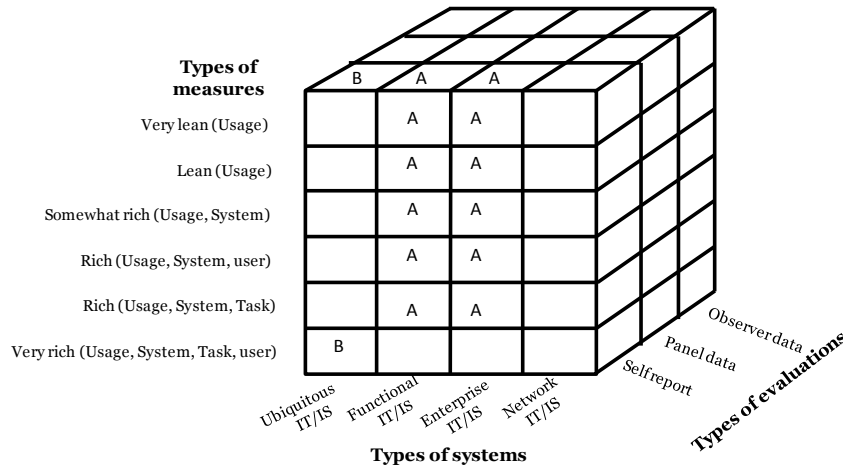


Figure 1: System usage framework

Cubes marked 'A' in figure 1, denote where extant studies of system usage in IS success, IS/IT acceptance and use, IS for decision making and IS implementation domains, which the cubes marked 'B' denotes the scope of system usage in this research. Further, the existing system use related research predominantly were on the traditional systems used in the organizations (marked 'A'), whereas in this research we focus on the Smartmobile app use by the consumers (Marked 'B'). Also, similar to the usage measures employed in prior research we too use self-reported data in this investigation. This defines the study context and the system usage that we are interested in this investigation.

As a researcher could conceive system usage using any combination of the three considerations depicted in Figure 1, as a rule-of-thumb, we suggest that a researcher should distinguish and define the domain of the study first by selecting the specific cells therein. So, we suggest the selection of cells (i.e. the scope of the study) be based, first on the type of the system, next on the type of the measures (measurement construct) and then the measurement approach. When selecting the scope of the usage measures the dimensions and measures of system usage can be diverse primarily due to the contextual differences of system use (Burton-Jones and Straub 2006). Thus, it is essential to develop a context specific conceptualization in order to develop measures for a context specific system usage, simply because, it is not possible to have a single, generally accepted conceptualization of system usage that can be applied in all contexts. So, for this study, we have defined the scope based on the type of the system, objectives of the study and the type of the measurements. Now that we have fulfilled the definition stage, next, we proceed with the selection stage to develop content valid, contextualized usage measures to understand firm-customer digital connectedness in the context of mobile shopping apps as below.

As the first step of the second stage, we select the usage elements that are most relevant for our study context. The usage measures that are relevant to the construct digital connectedness in this study needs to capture the functionalities of the mobile shopping app being used, tasks performed, and at what frequency. Also, the firms' objective of digital connectedness herein is to sense its customer's shifting requirements, the usage measures we are interested here are not the ones simply symbolizes presence of use but the usage that reflect a complex assortment of activities. In other words, a customer's use of the mobile shopping app that we incorporate into the measures here should reflect the use that enables firm's customer sensing, as the usage we are interested here make possible the connection between the firm and the customer. Hence, for the elements of usage that are most relevant for firm-customer digital connectedness we consider all three key elements of usage – user, system and task in our measures.

Next, we select the measures for the chosen elements that tie closely to the other construct/s in the nomological network as the step two of stage 2. Our concern here is on the affiliation of two constructs, system usage and connectedness. Thus, we select measures that are most suitable to capture context specific usage behavior by chaining backwards from connectedness measures to usage measures. As connectedness herein refers to the degree of association between a customer and a firm through the Smartmobile shopping app, usage in this discussion refers to the customers mimicking of their shopping related behavior using the Smart shopping app (i.e. customer's use of the shopping app). A customer frequently mimicking of his/her shopping related activities on Smart mobile app (more digitally connected), offers more chances for a firm to understand the customer's unique requirements through the unique customer intelligence that firm can capture through the app. The quality, validity and uniqueness of the information would depend on the tasks, functionalities and at the frequency (consistency) of engagement that a customer maintains through the Smart shopping app. As such, degree of connectedness will vary based on the tasks performed, functionalities used and the frequency or the consistency which a customer performs tasks using such functionalities. As a consequence, we incorporate the usage component (i.e. frequency/extent of use) alone with three elements of usage into the measures, as it is not only the tasks a user performs using a system but the frequency, consistency and the extent to which a user employs the system also an important component of the usage measures that we are interested in this research.

Hypothesis Development

We take the example, deployment of Smart mobile shopping applications in FMCG retail to connect with customers ubiquitously and pervasively to discuss the notion digital connectedness and its implications – raising customer expectations, customer experiences and their satisfaction. When customers digitally interact with a firms using Smart mobile shopping app, they leave information footprints as a by-product (Chi et al. 2010; Zuboff 1988). They include not only customers' personal information, but also all the data relating to their unique shopping requirements. As such, firms now have the potential to derive unique intelligence on each customer's needs and expectations, which can then be used to provide tailor-made, unique shopping experiences for each customer. However, the amount of sensing that a firm can achieve depends upon the quality and the amount of such high quality digital interactions in a mobile shopping environment, because such high quality frequent interactions have a greater potential to provide richer customer insights compared to the inferior and less frequent interactions. In other words, it explains that the degree of digital engagement; "digital connectedness", would defines the amount of customer sensing that a firm can achieve.

Customers, on the other hand seem to be well aware of firms' sensing abilities through the inherent smart capabilities of the mobile apps (Gao et al. 2010; Kaplan 2012; Lamarre et al. 2012; Rohm et al. 2012; Shankar et al. 2010). As customers are aware of the sensing that is possible through Smart mobile shopping apps they raise their expectations and anticipate firms to respond with unique, individualized products or services in a timely fashion in exchange of their daily routines being captured through mobile apps. As firms have more opportunities to sense customer requirements when the firm is well connected to its customers digitally, customers with greater digital connectedness to a firm would expect more personalized and unique responsiveness from the firm on their unique expectations as opposed to the lesser connected ones. In other words the firm-customer's digital connectedness raises customers' expectations; hence the level of customer expectations goes up as the customers increase their level of digital connectedness to a firm. On the flipside, failure to provide customers with a unique experiences through tailor-made responses could possibly lead to lower customer satisfaction, and eventually leading to disengagement (Brown et al. 2012; Choi and Mattila 2008) as contemporary customers less likely to tolerate mediocre tardy experiences as they seek immediate gratifications (McMahon and Pospisil 2005). Thus, customer connectedness via mobile apps though easy to deploy, must be carefully managed to obtain desired results. As customers aware that firms have more customer sensing opportunities when their digital connectedness is more, customers with greater digital connectedness to a firm would expect more responsiveness from the firm on their unique expectations as opposed to the customers with lesser digital interactions. Thus, we hypothesize:

H1: *The degree of firm-customer digital connectedness is positively associated with the customer's expectations, such that customers with higher degree of digital connectedness expect firms to respond with highly personalized responses their unique needs.*

In parallel to the increase of firm-customer digital connectedness, firm's potential to sense its customer's needs and expectations also increases as customers interact more frequently and leave more information footprints on their shopping requirements as a byproduct (Chi et al. 2010; Zuboff 1988). As such firms are then being able to make use of the unique intelligence that derived on each customer to provide tailor-made unique shopping experience for each customer. Hence, with greater digital connectedness to a firm would experience better responsiveness from the firm and will have superior shopping experiences compared to the lesser engaged customers. Thus, we hypothesize:

H2: *The degree of firm-customer digital connectedness is positively associated with the customer's experiences, such that customers with higher degree of digital connectedness will receive highly personalized responses their unique needs hence the superior experiences.*

As discussed above the digital connectedness allow firms sensing customer needs better and responding to them with unique way providing superior customer experiences. Hence, we argue here that customers with greater digital connectedness to a firm would experience greater shopping experiences hence are more satisfied than the customers that are not well connected. Thus, we propose a classification and three groups of customers – well, modest and weak, based on the degree of their digital connectedness on a continuum, where the customers are well connected with richer and increased interactions termed as wells, and the customers with poorer and lesser interactions we termed as moderate and the customers have no digital interactions as weak. Thus, we hypothesize:

H3: *The degree of firm-customer digital connectedness is positively associated with customer satisfaction; such that customers with higher degree of digital connectedness (well-connected) are more satisfied than customer with lesser degree of digital connectedness (moderate and weak).*

Now we have hypothesized three different relationships between firm-customer ubiquitous and pervasive digital connectedness and expectations, experiences and satisfaction. Next we use the notions of expectations, confirmations theory (ECT) (Oliver 1977; Oliver 1980) to investigate two tripartite relationships, (1) firm-customer digital connectedness, customer expectations, customer satisfaction and (2) firm-customer digital connectedness, customer experience and customer satisfaction. As posited in ECT (See...Oliver 1980) expectation, experience and satisfaction has a temporal relationship where a customer first forms his/her initial expectations and then evaluates his/her actual experience against the initial expectations to form satisfaction or dissatisfaction. Thus, expectation-experience-satisfaction is a process. As we hypothesized earlier in this discussion (H1) customers form expectations as they digitally connect to a firm (digital connectedness) and then they evaluate their actual experience against their initial expectations/needs to form either satisfaction or dissatisfaction. Also ECT conceives customers evaluate their experiences against their initial expectations to for satisfaction. As such, firm-customer digital connectedness, customer expectations and customer satisfaction becomes a process. Hence, raising customer expectations intervene the relationship between firm-customer digital connectedness and customer satisfaction. Thus, we hypothesize:

H4: *Customer expectations mediate the relationship between the degree of firm-customer digital connectedness and customer satisfaction.*

As we discussed above the customers who are well connected would have a superior experiences they would me more satisfied whilst the customers who has moderate or weak digital connectedness would either less satisfied or dissatisfied. Thus, digital connectedness-experience-satisfaction has a temporal relationship and represents a process. Hence, actual customer experience mediates the relationship between firm-customer digital connectedness and customer satisfaction. Following which we hypothesize:

H5: *Customer experience mediates the relationship between the degree of firm-customer digital connectedness and customer satisfaction.*

Further, ECT also posits that satisfaction is defined by the level to which the expectations are confirmed (Oliver 1977; Oliver et al. 1994). In other words, it explains that the level of satisfaction is depends on the initial expectations on which that confirmation was based upon (Bhattacharjee 2001b; Brown et al. 2008). Following which, in this discussion, the customer assesses their actual shopping experience to determine

the extent to which their initial expectations that have been formed as a result of their ubiquitous pervasive digital connectedness with the firm through the smart shopping app, were confirmed before forming their satisfaction / dissatisfaction. We argue here that the firm should align their customers' unique shopping expectations resultant due to their ubiquitous digital engagement with matching, personalized experiences to achieve higher levels of customer satisfaction. Essentially, firms need to provide superior levels of customer experiences analogous to the raising customer expectations (that resulted due to the increased levels of digital connectedness) in order to make their customers satisfied. In other words firm should align their customers' expectations with unique, personalized, pleasant customer experiences, where the experiences either should match or exceed their expectations if they were to be satisfied. Whilst a-priori expectations provide the baseline or the reference level for consumers to form evaluative judgments about their actual experience of the firm's responsiveness(Bhattacharjee 2001b), making it difficult for a firm to satisfy their customers when they raise their expectations, firms with greater firm-customer digital connectedness will have more opportunities to sense their customers' unique needs/expectations better; hence they are better positioned to provide more personalized, unique and satisfying customer experiences. Thus taking the tripartite relationships, customer expectations-experiences-satisfaction and digital connectedness-experiences-satisfaction, we propose the two hypothesized relationships as below.

H6: *Alignment between expectations and experiences of the customers' is positively related to their satisfaction, such that customers become satisfied when the difference between expectations and actual experiences is at its lowest or when experience exceeds expectations.*

H7: *Firm-customer digital connectedness is positively related to customer satisfaction, such that firms with higher levels (lower) of digital connectedness with their customers are able to provide unique and superior (standard/average) customer experiences, hence they will have more (less) satisfied customers.*

Research method

To test our hypothesized relationships above, we develop measures for following the guidelines proposed by Churchill (1979) and Burton-Jones and Straub (2006). Following the two staged approach prescribed in Burton-Jones and Straub (2006), we first have conceptualized, defined and developed measures for firm-customer digital connectedness earlier in this discussion. In this exercise the sub-measures and measurement items for digital connectedness were developed based on previous 'system use' related literature (Barki et al. 2007; Burton-Jones and Grange 2013; Burton-Jones and Straub 2006; Venkatesh et al. 2008; Venkatesh et al. 2003). Following which we developed sub-measures and measurement items for customer expectations, customer experiences and customer satisfaction based on previous validated measures of similar constructs from ECT (Bhattacharjee 2001b; Brown et al. 2012; Brown et al. 2008), agility (Roberts and Grover 2012a; Roberts and Grover 2012b), organizational responsiveness (Jayachandran et al. 2004) and market orientation (Kohli et al. 1993) literature. Where possible, the existing measures of constructs were adapted to the context of this study. For new measures and those that required significant changes, we followed the standard scale development procedures stipulated in Burton-Jones and Straub (2006) and Mackenzie et al. (2011). Then we conducted a pretest and pilot study to assess the reliability and validity of our measures. Our pilot analysis comprising 30 respondents and subsequent follow-up discussion with a subset of respondents created sufficient confidence in the scales to proceed with the full-scale survey administration of the target sample frame. Table 2 below lists the sources and sample items for our construct measures.

Construct	Items	Measure source ^b
Digital connectedness (Customer's use of Smartmobile app)	e.g. I frequently use this mobile app to..... - prepare my regular grocery shopping list - place orders	(Barki et al. 2007; Burton-Jones and Straub 2006; Venkatesh et al. 2008; Venkatesh et al. 2003)

Customer expectations (What customer's expect from the firm)	e.g. I expect [retailer] to... - provide information about discounts and promotions based on my specific requirements - provide personalized offers based on products that I purchase regularly	(Brown et al. 2011; Brown et al. 2008)
Customer experience (Visible responsiveness to their expectations/needs)	e.g. - [Retailer] quickly react to the essential basic changes in my product requirements by providing me with relevant personalized information - When I continue to purchase a new product (e.g. Baby nappies) repetitively, [retailer] quick to respond to it by providing other associated product information (e.g. other baby products)	(Jayachandran et al. 2004; Kohli et al. 1993; Roberts and Grover 2012a; Roberts and Grover 2012b)
Customer satisfaction	e.g. I am satisfied with... - the personalized promotions/offers I receive from [retailer] - the [retailer's] responsiveness to my changing needs and wants	(Bhattacharjee 2001a)

Sampling frame and characteristics

We administered our anonymous surveys both online and offline, yet seeking a customer sample of the two main retailers (Coles Supermarkets and Woolworths) in Australia, who have launched Smart mobile apps offering on-line shopping, shop locators, recipes, preparation of shopping lists and special offers to their customers. As such the online data collection survey was posted on social media community pages of the two retailers. The paper-based survey was administered at multiple locations (e.g. shopping mall, commercial organizations, etc.). Our data collection yielded a total of 431 respondents. Our online survey yielded 174, with a response rate of 41% (from 422 who actually accessed the URL). The off-line survey yielded 257 responses with a response rate of 39.5% (from 650 questionnaires distributed). Our subsequent screening for missing data left us with 427 usable respondents (4 of the responses omitted due to missing values). We employed the wave analysis (Armstrong and Overton 1977) to assess the impact of non-respondent bias, whereby the respondents were grouped into early and late respondents, online and off-line respondents and comparisons were made according to the respondents' age and gender. Our analysis revealed no significant differences between early and late respondents or between the other combinations. Based on our findings, non-response bias did not appear to impact on our study.

Reliability tests

Following Barclay et al. (1995) we examined individual measurement item reliability, internal consistency, and discriminant validity using the partial least square (PLS) technique of structural equation modeling in SmartPLS 2.0 (Ringle et al. 2005). Our examination of individual item reliability confirmed that all of the measurement items were within the ideal tolerance threshold of 0.70 (Barclay et al. 1995; Chin 1998). Moreover, the test of discriminant validity by comparing the loadings of a given construct's indicators against the loadings of any other, and the same indicator's load against the intended construct also lend support to the discriminant validity. Further, the composite reliabilities too have affirmed the overall reliability as the values were greater than the tolerance threshold of 0.70. The test of discriminant and convergent validity through the Average Variance Extracted (AVE) and communalities both were higher than the suggested tolerance limit of 0.50. Further, the composite reliability and Cronbach's alpha for each construct too have confirmed the internal consistency of the constructs where all met the suggested tolerances of >0.70 (Fornell and Larcker 1981).

Our examination of the standardized path coefficients, path significances and variance explained (R²) to test the predictive power of the model using PLS technique of SmartPLS software, showed significant relationships between the paths in each construct and our conceptual model explains 56.3% of the variance (R²) of customer satisfaction for the post-hoc model. Notably, the paths between digital connectedness and customer expectation ($\beta = 0.3$, $p < 0.0001$) and customer experiences and customer

satisfaction ($\beta=0.413$, $p<0.0001$) both showed strong and significant relationships lending support for our hypothesized relationships. Although, our analysis using PLS provide reasonable support for our hypothesized relationships, it neither provide insights on to the non-linear relationships between the constructs that expectation confirmation theory suggests, nor the tripartite relationships between digital connectedness, expectations, expectation and satisfaction work in combination. In order to address this issue we relax linearity assumptions and use non-linear quadratic postulations using SPSS together with polynomial regression analysis and response surface methodology to test our hypothesis further.

Testing hypothesis

To test our first hypothesized relationship, degree of firm-customer digital connectedness and customer expectations, we assessed the correlation between digital connectedness and customer expectations with non-linear quadratic postulations using SPSS (Figure 2a). The quadratic representation demonstrates that the heightened levels of firm-customer digital interactions raises customer expectations leading support to our first hypothesized relationship. The non-linear assumption portrays an upward curvilinear relationship, where the level of expectation peaking as digital connectedness reaches moderate levels. As shown in the graph in Figure 2a the level of expectations reduces when the digital connectedness increases beyond moderate levels.

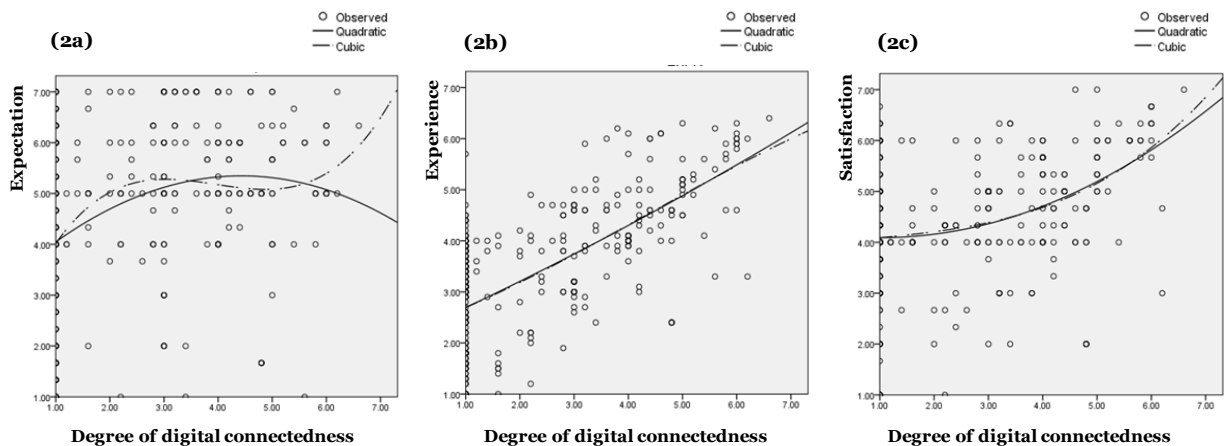


Figure 2: non-linear representations of the relationships between digital connectedness versus customer expectation, experience and satisfaction

Next, to test our second hypothesized relationship, degree of firm-customer digital connectedness and customer experience we test the correlation between customers' digital connectedness to the firm and respective experiences as in Figure 2b. As seen therein, increased levels of firm-customer digital connectedness and customer experience are positively associated, thus, lending support to our second hypothesized relationship 'degree of firm-customer digital connectedness is positively associated with the customer's experiences, such that customers with higher degree of digital connectedness will receive highly personalized responses their unique needs hence the superior experiences'.

Our test of third hypothesized relationship between the degree of firm-customer digital connectedness and customer satisfaction, with non-linear assumptions (2c) supports the notion that increased levels of firm-customer digital connectedness is positively associated with customer satisfaction, thus, lending support to our third hypothesized relationship 'degree of firm-customer digital connectedness is positively associated with customer satisfaction; such that customers who are well-connected are more satisfied than customer with lesser degree of digital connectedness.

The analysis next focuses on the mediating effect of customer expectation on customer satisfaction to test our fourth hypothesized relationship; 'customer expectations mediate the relationship between the degree of firm-customer digital connectedness and customer satisfaction'. As mediation in general entails the intervening effect of an antecedent variable on a dependent variable, in this discussion we test the intervening effect of experience on the relationship between firm-customer digital connectedness and

customer satisfaction. To test our fourth hypothesis we use two approaches: several regression analysis (Baron and Kenny 1986) and Sobel's (1982) product of coefficients method.

Test	R ²	Adjusted R ²	Std. error	Significance of Change
Firm-Customer digital connectedness-Expectations	0.9030	0.9000	0.0603	0.000
Firm-Customer digital connectedness -Satisfaction	0.1470	0.1468	0.0838	0.000
Expectation-Satisfaction	0.1363	0.1360	0.0919	0.000

In several regression analysis, we test the effect of the independent variable (firm-customer digital connectedness) on the dependent variable (satisfaction) with and without the mediating variable (customer experience) and compared the significance of the coefficients at each step. As Table 3 summarizes the results of three regressions support the idea that customer experience mediates the relationship between firm-customer digital connectedness and their satisfaction.

Next, the test of product of coefficients approach signified the change in the outcome variable (customer satisfaction) for every unit change in the independent variable (firm-customer digital connectedness) that is mediated by the intervening variable (customer experience). Our results demonstrated that the customer experiences mediates the relationship between firm-customer digital connectedness and customer satisfaction (Sobel test statistic = 2.2445, $p < 0.05$). The mediation herein also portray as partial mediation since the direct effect between the independent variable and dependent variable decreases from 0.383 to 0.303 with t-statistics greater than 1.96 ($t = 3.16$). Both several regression analysis and product of coefficients tests above confirm our hypothesized relationship H4 is true.

To test our next hypothesized relationship (H5), we repeated the procedure above. The several regressions analysis (See Table 4) supports the idea that customer experience mediates the relationship between firm-customer digital connectedness and their satisfaction. Our results of product coefficient approach also demonstrated that the customer experiences mediates the relationship between firm-customer digital connectedness and customer satisfaction (Sobel test statistic = 5.630, $p < 0.0001$). The mediation herein portray complete mediation as the direct effect between the independent variable and dependent variable decreases from 0.383 to -0.109 with t-statistics lesser than 1.96 ($t = 0.880$). Both several regression analysis and product of coefficients tests herein confirm our hypothesized relationship H5 is true.

Test	R ²	Adjusted R ²	Std. error	Significance of Change
Firm-Customer digital connectedness-Experience	0.4923	0.4916	0.0454	0.000
Firm-Customer digital connectedness -Satisfaction	0.1470	0.1468	0.0838	0.000
Experience-Satisfaction	0.3700	0.3768	0.1116	0.000

Next, we examined our sixth hypothesis: 'Alignment between expectations and experiences of the customers' is positively related to their satisfaction, such that customers become satisfied when the difference between expectations and actual experiences is at its lowest or when experience exceeds expectations', using the following polynomial equation.

$$\text{Customer Satisfaction} = f(\text{Customer Expectations}^*, \text{Customer Experience}^{**}) \text{ ---(1)}$$

$$Z = \beta_0 + \beta_1 \text{CExpt}^* + \beta_2 \text{CExpr}^{**} + \beta_3 \text{CExpt}^2 + \beta_4 (\text{CExpt} \times \text{CExpr}) + \beta_5 \text{CExpr}^2 + e$$

Where, in this study *CExpt = Customer expectations, **CExpr = Customer experience.

And finally, we examine our seventh hypothesis 'Firm-customer digital connectedness is positively related to customer satisfaction, such that firms with higher levels (lower) of digital connectedness with their customers are able to provide unique and superior (standard/average) customer experiences, hence they

will have more (less) satisfied customers' involving firm-customer digital connectedness, customer experience and customer satisfaction using the polynomial equation below.

$$\text{Customer Satisfaction} = f(\text{Firm-customer digital connectedness}^{***}, \text{Customer Experience}^{**}) \text{ ---- (2)}$$

$$Z = \beta_6 + \beta_7 DC^{***} + \beta_8 CExpr^{**} + \beta_9 DC^2 + \beta_{10} (DC \times CExpr) + \beta_{11} CExpr^2 + e_1$$

Where, in this discussion ***DC = Firm-customer digital connectedness, **CExpr = Customer experience.

Then, we followed the procedure outlined by Atwater et al. (2005), to perform the polynomial regression analysis to obtain the coefficients. However, the resultant higher order polynomial equations that often results in a polynomial model are difficult to interpret (Edwards 2001). For example, simply inspecting the signs and magnitudes of the coefficients reported in analysis reveals very little as to the shape of the surface they represent. However, the response surface methodology (Khuri and Cornell 1987) provides the basis required for testing and interpreting the features of surfaces corresponding to polynomial quadratic regression equations, where the response surface is considered a visual aid to get a richer and meaningful deeper understanding of complex polynomial equations. The combination provides the sophisticated statistical nuance required to examine the extent to which the combination of two predictor variables relates to an outcome variable, in particular when the discrepancy (or match) between the two predictor variables is a fundamental consideration (Shanock et al. 2010). Figures 5 (a) and 5 (b) depict the two response surfaces for the two quadratic polynomial equations for firm-customer digital connectedness, customers experience and satisfaction; and for customer expectations, experience and satisfaction.

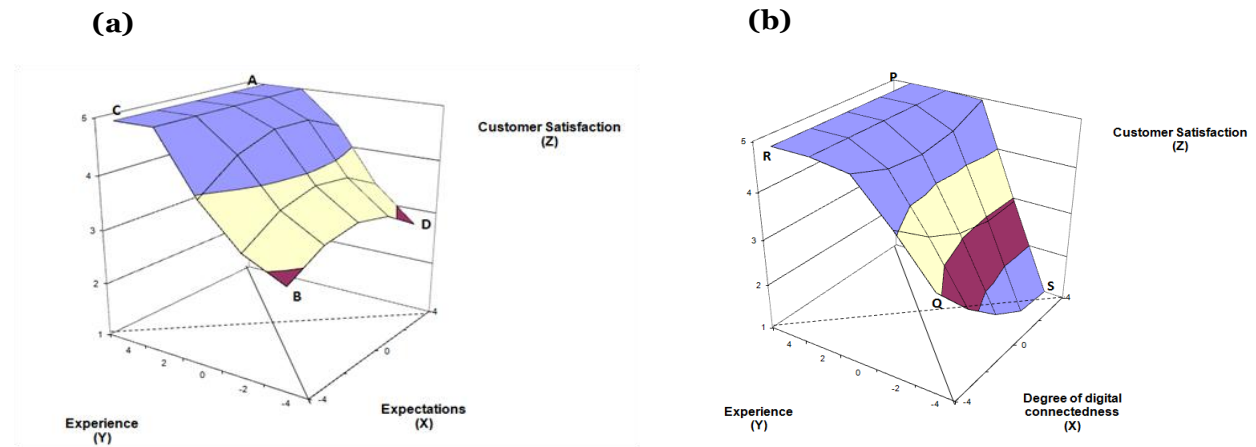


Figure 5: (a) Alignment between customer expectations and customer experiences as it relates to customer satisfaction. (b) Relationship between firm-customer digital connectedness and customer experience as it relates to customer satisfaction.

Table 5: Results of the regression analysis – Testing slopes and curves between the three variables customer expectations, experiences and satisfaction					
Effect	Coefficient	Standard Error	Test stat (t)	p-value	
a1: Slope along x=y (as related to Z)	0.59	0.11	5.507	0.000	Significant
a2: Curvature on x=y (as related to Z)	0.03	0.03	1.186	0.236	
a3: Slope along x= -y (as related to Z)	-0.48	0.03	-14.286	0.000	Significant
a4: Curvature on x= -y (as related to Z)	0.00	0.04	-0.119	0.905	

Table 6: Results of the regression analysis – Testing slopes and curves between the three variables firm-customer digital connectedness, customer experience and customer satisfaction					
Effect	Coefficient	Standard Error	Test stat (t)	p-value	
a1: Slope along x=y (as related to Z)	0.69	0.06	11.412	0.000	Significant
a2: Curvature on x=y (as related to Z)	0.09	0.02	4.567	0.000	Significant
a3: Slope along x= -y (as related to Z)	-0.67	0.14	-4.860	0.000	Significant
a4: Curvature on x= -y (as related to Z)	-0.07	0.06	-1.182	0.238	

To test our sixth hypotheses: Alignment between expectations and experiences of the customers' is positively related to their satisfaction, such that customers become satisfied when the difference between expectations and actual experiences is at its lowest or when experience exceeds expectations, we first investigated the relationship between customer expectations, experiences and their satisfaction using response surfaces for the first polynomial regression equation above. Figure 5(a) and Table 5 provide the graphical representation and results of the regression analysis above respectively.

The solid line on the floor of the graph represents the line A-B on the three dimensional surface of the Figure 5(a), where it depicts the perfect agreement between the two independent variables customer expectations and experience (i.e. $X=Y$). As suggested by the hypothesis H6 above, the alignment between expectations and experience positively related to customer satisfaction where the line of alignment has a positive slope through the line from B to A. Thus, the agreement between customer expectations resulted due to the digital connectedness and their experience matters to the ultimate customer satisfaction. The level of customer satisfaction is lowest at the front corner of the graph along the line of agreement where customer expectations and customer experience are both low, and satisfaction becomes increasingly higher towards the back of the graph as customer expectations and experience, both reach higher levels.

Alternatively, the dashed line on the floor of the graph depicts the line of incongruence (the X and Y variables are not in agreement, i.e. $X \neq Y$) and represents the surface along the line C to D. Moving away from the interception of two lines to either the left or right direction shows the degree of discrepancy between expectation and experience and how they relate to customer satisfaction. As seen therein the customer satisfaction is relatively higher when superior customer experience is combined with low expectations, whilst customer satisfaction becomes relatively low when common customer experiences is combined with higher levels customer expectations. What it shows is that customers become satisfied when the difference between expectations and actual experiences is at its lowest or when experience exceeds their initial expectations.

Additionally, the expectation curve (surface along the line B-D) and experience curve (surface along the line B-C) also suggest the value of aligning customer expectations and experiences to achieve superior customer satisfaction. Expectation curve explains how customer expectations relate to customer satisfaction. Alignment between customer expectations and actual experience increases when moving along the dotted line on the floor towards the intersection of two lines. Whilst the match between expectation and experience reaches maximum when it reaches the solid line A-B, towards the point C from the A-B solid line illustrates the experience that exceeds the customer expectations.

Next, we test our seventh hypothesis: 'Firm-customer digital connectedness is positively related to customer satisfaction, such that firms with higher levels (lower) of digital connectedness with their customers are able to provide unique and superior (standard/average) customer experiences, hence they will have more (less) satisfied customers', we used the response surfaces of the second polynomial regression equation above. Figure 5(b) represents the graphical representation between the three variables firm-customer digital connectedness, customer experience and customer satisfaction whilst Table 6 provide the results of the regression analysis.

The solid line on the floor of the graph represents the surface along P-Q line of three dimensional plane in Figure 5(b), where it describes the congruence between firm-customer digital connectedness and customer experience. The line Q-S shows that customer satisfaction gets lowered as the firm-customer digital connectedness increases. This is in line with the notions of expectation confirmation theory and our first hypothesis as we have predicted the expectations to be raised as they engaged digitally with the firm intimately. Further, the response surface shows a positive slope along the line P-Q towards P, staying true to our hypothesized relationship depicted in H7. Towards Q it represents the combination lower degree of firm-customer digital connectedness (weak) and lower levels of experiences whilst towards point P the response surface represents the combination higher level firm-customer digital connectedness (well-connected) and superior levels of experiences resulting in an increased levels of customer satisfactions towards point P.

Summary and conclusions

This study sought to (1) conceptualize (2) operationalize and then (3) apply, the notion of mobile digital connectedness to study the ubiquitous firm-customer mobile digital connectedness and its implications in

FMCG consumer retail. Our discussion of the mobile digital connectedness, its implications on firm's agility, customers' expectations, experiences and ultimate satisfaction highlight the need to revisit the notions of digital connectedness and the its business implications in contemporary business environment. Thus, we conceptualized the digital connectedness in the context of contemporary Smart mobile shopping apps in consumer retail in relations to the system use construct in prior IS research. Most past studies of system/technology use has focused on the use of simple functional applications such as word processing, spreadsheets (known as functional IT) or enterprise IS/IT such as enterprise resource planning solutions or decision support systems mainly focusing on the traditional IS/IT use by individuals for professional use in office environments. Also, the discussions of connectedness in IS/IT predominantly discussed the digital divide and one's dependency to a technology (e.g. connectedness to internet, TV, mobile phones etc.). However, the ubiquity of technology, rise of digital natives, their engagement with technology and innovative deployments of ubiquity of technology such as in Smartphone shopping apps in industry highlights the need to re-conceptualize IT/system use in light of digital connectivity and its implications to both research and practice. Essentially, digital connectedness in this discussion refers to the degree of connectedness between a firm and a customer through a digital technology (Smartmobile shopping app) as opposed to a customer's connectedness to a digital technology. We conceived the construct firm-customer digital connectedness as a formative construct whilst its respective measures derived from prior system/technology use studies, as reflective. We followed a structured, theoretical approach suggested by Burton-Jones and Straub (2006) to ensure complete, content valid and contextualized measures development that fits our study objectives, theory as well as the methods therein. Conceived primarily through 'Smartmobile shopping apps in consumer retail', this study presented a conceptual framework for which digital connectedness and its implications to both research and practice can be understood where we then tested the model with empirical data obtained through a field study.

First, we tested the relationship between firm-customer digital connectedness and customer expectations empirically with non-linearity assumptions. Our analysis reveals that non-linear assumption demonstrates an upward curvilinear relationship, where level of expectation peaking as digital connectedness reaches moderate levels and then lowering of customer expectations as firm-customer digital connectedness increases beyond midrange. Then, we tested the firm-customer digital connectedness against customer experience and customer satisfaction with non-linear postulations. Our analysis has shown a positive relationship between the degree of digital connectedness to the customer experiences and customer satisfaction. The non-linear relationship between firm-customer digital connectedness and customer satisfaction indicated that when firm-customer connectedness reached higher levels customer satisfaction increases exponentially. This probably due to the dual effect of much improved personalized shopping experiences and lowered customer expectations (as revealed above in non-linear test of the relationship between firm-customer digital connectedness and customer expectations) associated to the increased levels of firm-customer digital connectedness.

Following which, we have investigated the mediating or the intervening effect of customer experiences and customer expectations on the relationship between firm-customer digital connectedness and customer satisfaction, using two approaches, (1) several regression analysis (Baron and Kenny 1986) and (2) Sobel's (1982) product of coefficients method. Both methods above supported the idea of mediation role of customer experiences and customer expectations on the relationship between firm-customer digital connectedness and customer satisfaction. The second analysis, the Sobel's test affirms that the mediation of customer experience on the relationship between customer expectations and customer satisfaction as a complete mediation, whilst the mediation role of customer expectations in the relationship between the degree of firm-customer digital connectedness and customer satisfaction as partial mediation.

Next, taking the matching perspective of alignment, we analysed two tripartite relationships between (1) customer expectations, their experience and customer satisfaction and (2) firm-customer digital connectedness, customer experience and customer satisfaction, using the lens of expectation confirmation theory and employment of polynomial regression together with response surface methodology in the analysis. Our investigation of the relationship between customer expectations, experiences and their satisfaction reveals that (1) the alignment between expectations and experience positively related to customer satisfaction such that heightened customer expectations resulted due to the intensified digital interactions needs careful management in order to make their customers satisfied, and (2) firms at least need to manage their customers' expectations with matching experiences or ideally they need to exceed

their customers' expectations in order to make them happy and satisfied. Further, our investigation of the relationship between firm-customer digital connectedness, customer experiences and their satisfaction tells that the congruence between firm-customer digital connectedness and customer experience is important determinant of customer satisfaction whilst the firm-customer digital connectedness increases the firm has more chances to know their unique needs better and provide unique customer experiences hence to achieve higher levels of customer satisfaction.

Implications, limitations and follow-on research

This study provides several contributions to both research as well as practice. First, this research provides a logical, systematic framework to conceptualize digital connectedness taking the example of ubiquitous firm-customer digital engagements in fast moving consumer goods retail. Next, we developed new measures of system usage to measure firm-customer digital connectedness using two step approach suggested by Burton-Jones and Straub (2006), with careful attention to the characteristics of system usage that matters for firm-customer digital connectedness. As such, this discussion also contributes to the cumulative progress of measuring system / technology usage, as the method used herein to conceptualize usage and to develop measures, clarified the subset of usage being measured, and theoretically justified the measures employed for digital connectedness. Then, we employed our conceptualization of digital connectedness in a real world example and empirically tested a conceptual model involving digital, connectedness, customer expectations, customer experience and customer satisfaction using polynomial regression and response surface methodology. Further, using two methods of analysis (several regression analysis and Sobel's test) we highlighted the mediation of customer expectations and experience on customer satisfaction where we have shown the importance of aligning heightened customer expectations that resulted as a result of increased firm-customer digital connectedness with better managed, pleasant customer experiences in achieving customer satisfaction. Our non-linear assumptions and application of polynomial regression and response surface methodology in this study also contributes to the research methodology as not many of the previous studies in IS have employed these two techniques before.

As mentioned above this study have several implications for both research and practice. For research, we relaxed the traditional linearity assumptions and demonstrated that in doing so it is possible to uncover complex interactions between the constructs in a research model. So, we suggest future researchers to relax the linearity assumptions and to use new analytical methods such as three dimensional modeling techniques polynomial regression and response surface methodology, specifically when they use theoretical viewpoints that suggest non-linear relationships. Whilst, we discussed the implications of a firm's customer focused digital strategy in the case of firm-customer ubiquitous digital connectedness, its influence of customer expectations, customer experiences and customer satisfaction we suggest future research to look at business-IT alignment in a new light- alignment between digital business strategy (IT and business strategy as one) and customers expectations, customer experiences and customer satisfaction taking the customers perspective of IT alignment. Also, since our non linear assumption reveals customers raise their expectations initially, peaked when the engagement reaches moderate levels and drops down as they engage more with the firm, we suggest future research to investigate this oscillation perspective deeply, as it is important for both research and practice to deeply understand the underlying phenomenon behind this oscillation. This understanding has the potential to provide novel insights on how a firm should manage firm-customer digital connectivity, customer expectation as well as the way a firm should be responding to unique individual expectations. Also, this suggests that the customers anticipate greater responsiveness and agility from the firm as their digital connectedness with the firm increases, highlighting the importance of a firm's ability in responding to unique individual needs/requirements in an agile and unique manner to make them satisfied. So, we suggest future research to look at how firms use the customer intelligence generated through such digital interactions and the factors that inhibit / promote such mechanisms.

For practice, this study provides a meaningful way of understanding firm-customer digital connectedness and its practical implications. As our empirical investigation suggests that a firm to be successful in their digital strategy they should align their customer's expectations with matching or exceeding customer experiences in order to achieve business benefits and sustained competitive advantage through superior customer satisfaction. So we suggest firms to put equal (or more) emphasis on nurturing the capabilities that supports improvisation and responsiveness required in providing superior customer experiences. As

we see, an increased firm-customer digital connectivity and heightened customer expectations go hand in hand we suggest that firms should find the ideal level of digital interactivity to set customer expectations at more manageable levels as very high, unrealistic levels or very low mediocre levels of expectations, both not healthy for a firm as they more likely to produce relatively unhappy customers (as evident in our analysis). Further, as there is a possibility of losing customer interest in continuing digital engagement with a firm due to lack of uniqueness in their experience, customers may decide to opt out from the digital interactions. Whilst the customers' continued use of mobile app is important for firms to sense shifting customer needs better, firms need to find a better balance (alignment) between customer digital interactions and firm's responsiveness to them in order to promote further adoption and continuation. Whilst, firm's deployment of micro-applications to connect with customers and/or business partners could possibly reveal its strategic posture/direction to its competitors in the long run hence run the risk of eroding their competitive position unless managed properly (See.....Grover and Kohli 2013). Hence, a firm's digital initiatives have its implications both short-term as well as on the long-run. So, we propose future research to study the implications of a firm's digital connectedness with multiple stakeholder groups in the short and long run.

Despite having followed the guidelines proposed by Churchill (1979), and Burton-Jones and Straub (2006) in developing measures and having employed the rigorous research approach suggested by Mackenzie and House (1979), and the validity and reliability demonstrated in the results, we recognize several limitations that required attention which is beyond the scope of this study and the discussion. First, our use of Smart mobile shopping apps as the sole context of digital connectivity, and model validation through the data collected from customers in fast moving consumer goods retail as the sole context limits our ability to fully understand the notion firm-customer digital connectedness. Also, these limitations raise the questions about the completeness and representativeness of the construct digital connectedness and measures, as well as the generalizability of the final measures used herein to the other contexts. Also, the study context (Smartmobile shopping apps in FMCG retail) limits our ability to explain how customer expectations behave in other forms of digital connectedness (e.g. customers' digital /online involvement in product / service innovation, service delivery as in automated banking and airline industry etc) and appropriateness of the measures we have employed herein to study firm-customer digital connectedness. So, we propose future studies to consider other contexts of digital engagements to confirm our findings, and to develop more rigorous measures for firm-customer digital connectedness taking the constant advancements of digital technologies, nature of digitized applications, interactivity and their use in the organizational context in to account. Even though this study captured different combinations of firm-customer digital connectedness and corresponding levels of customers' expectations from the customers' who are at different stages of the adoption life cycle our ability to fully explain the changes in customer expectations as they increase their digital engagement hindered as our survey only provides a snapshot view of the digital connectedness-customer expectations relationship. So, we suggest future research to consider longitudinal study/ies that employ a mix/multitude of different methods (interview, experiment, longitudinal survey...etc.) to explore and explain the relationship better. Whilst our investigation provide insights on how individual customers change their expectations as the digital connectedness varies, it is not adequate enough to explain the implications of digital connectedness in B2B (i.e. firm to firm) scenarios. So, we suggest future research to consider digital connectedness, expectations, responsiveness and satisfaction relationship in B2B settings.

In conclusion, an extensively validated and widely-adopted model of firm-customer digital connectedness and meticulously developed measurement items derived from system usage related constructs would facilitate cumulative research, and have the potential to provide a benchmark for organizations to track their customer focused digital strategic initiatives on check. We believe that this study offer a significant step in this direction.

References

- Armstrong, J.S., and Overton, T.S. 1977. "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research* (14:3), pp. 396-402.
- Atwater, L., Waldman, D., Ostroff, C., Robie, C., and Johnson, K.M. 2005. "Self-Other Agreement: Comparing Its Relationship with Performance in the U.S and Europe," *International Journal of Selection and Assessment* (13), pp. 25-40.

- Barclay, D., Higgins, C., and Thompson, R. 1995. "The Partial Least Squares (Pls) Approach to Causal Modelling: Personal Computer Adoption and Use as an Illustration," *Technology Studies* (2:2), pp. 285-324.
- Barki, H., Titah, R., and Boffo, C. 2007. "Information System Use-Related Activity: An Expanded Behavioral Conceptualization of Individual-Level Information System Use," *Information Systems Research* (18:2), pp. 173-192.
- Baron, R.M., and Kenny, D.A. 1986. "The Moderator–Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology* (51:6), pp. 1173-1182.
- Bhattacharjee, A. 2001a. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS quarterly* (25:3), pp. 351-370.
- Bhattacharjee, A. 2001b. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (28:2), pp. 229-254.
- Brown, S.A., Venkatesh, V., and Goyal, S. 2011. "Expectation Confirmation in Technology Use," *Information Systems Research* (23:2), pp. 474-487.
- Brown, S.A., Venkatesh, V., and Goyal, S. 2012. "Expectation Confirmation in Technology Use," *Information Systems Research* (23:2), pp. 474-487.
- Brown, S.A., venkatesh, V., Kuruzovich, J., and Massey, A.P. 2008. "Expectation Confirmation: An Examination of Three Competing Models," *Organizational Behavior and Human Decision Processes* (105), pp. 52-66.
- Burton-Jones, A., and Gallivan, M.J. 2007. "Toward a Deeper Understanding of System Usage in Organizations: A Multilevel Perspective," *MIS Quarterly* (31:4), pp. 657-679.
- Burton-Jones, A., and Grange, C. 2013. "From Use to Effective Use: A Representation Theory Perspective," *Information Systems Journal* (24:3), pp. 632-658.
- Burton-Jones, A., and Straub, D.W. 2006. "Reconceptualizing System Usage: An Approach and Empirical Test," *Information Systems Research* (17:3), pp. 228-246.
- Chi, L., Ravichandran, T., and Andrevski, G. 2010. "Information Technology, Network Structure, and Competitive Action," *Information Systems Research* (21:3), pp. 543-570,655,657.
- Chin, W.W. 1998. "The Partial Least Squares Approach for Structural Equation Modelling," in *Modern Methods for Business Research*, G.A. Marcoulides (ed.). Mahwah, NJ: Lawrence Erlbaum, pp. 295-336.
- Choi, S., and Mattila, A.S. 2008. "Perceived Controllability and Service Expectations: Influences on Customer Reactions Following Service Failure," *Journal of Business Research* (61:1), 1//, pp. 24-30.
- Churchill, G.A. 1979. "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research* (16:1), pp. 64-73.
- Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. 1989. "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science* (35:8), pp. 982-1002.
- DeLone, W.H., and McLean, E.R. 1992. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), pp. 60-95.
- DeLone, W.H., and McLean, E.R. 2003. "The DeLone and Mclean Model of Information Systems Success: A Ten-Year Update," *Journal of Management Information Systems* (19:4), Spring2003, pp. 9-30.
- DeSanctis, M. 2013. "When a 16-Year-Old Says Some Day He Wants to Learn How to Have a Conversation - That's What I'm Worried About'," in: *Stella*. London: Telegraph Media Group Limited, p. 42.
- Edwards, J.R. 2001. "Alternatives to Difference Scores: Polynomial Regression Analysis and Response Surface Methodology," in *Measuring and Analyzing Behavior in Organizations: Advances in Measurement and Data Analysis*, F. Drasgow and N. Schmidt (eds.). San Francisco, CA: Jossey-Bass/Pfeiffer, pp. 350-400.
- Fornell, C., and Larcker, D.F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of marketing research*, pp. 39-50.
- Gao, T.T., Sultan, F., and Rohm, A.J. 2010. "Factors Influencing Chinese Youth Consumers' Acceptance of Mobile Marketing," *Journal of Consumer Marketing* (27:7), pp. 574-583.
- Grover, V., and Kohli, R. 2013. "Revealing Your Hand: Caveats in Implementing Digital Business Strategy," *MIS Quarterly* (37:2), pp. 655-662.
- Jayachandran, S., Hewett, K., and Kaufman, P. 2004. "Customer Response Capability in a Sense-and-Respond Era: The Role of Customer Knowledge Process," *Journal of Academy of Marketing Science* (32:3), pp. 219-233.
- Jiang, Q.L. 2014. "Internet Addiction among Young People in China Internet Connectedness, Online Gaming, and Academic Performance Decrement," *Internet Research* (24:1), pp. 2-20.
- Jung, J.-Y. 2008. "Internet Connectedness and Its Social Origins: An Ecological Approach to Postaccess Digital Divides," *Communication Studies* (59:4), pp. 322-339.

- Jung, J.-Y., Qiu, J.L., and Kim, Y.-C. 2001. "Internet Connectedness and Inequality: Beyond the "Divide"," *Communication Research* (28:4), pp. 507-535.
- Kaplan, A.M. 2012. "If You Love Something, Let It Go Mobile: Mobile Marketing and Mobile Social Media 4x4," *Business Horizons* (55:2), 3//, pp. 129-139.
- Khuri, A.I., and Cornell, J.A. 1987. *Response Surfaces: Designs and Analyses*. New York: Marcel Dekker.
- Kohli, A.K., Jaworski, B.J., and Kumar, A. 1993. "Markor: A Measure of Market Orientation," *Journal of Marketing Research* (4:30), pp. 467-477.
- Lamarre, A., Galarneau, S., and Boeck, H. 2012. "Mobile Marketing and Consumer Behaviour Current Research Trend," *International Journal of Latest Trends in Computing* (3:1).
- Lin, H.-H., and Wang, Y.-S. 2006. "An Examination of the Determinants of Customer Loyalty in Mobile Commerce Contexts," *Information & Management* (43:3), 4//, pp. 271-282.
- Mackenzie, K.D., and House, R. 1979. *Paradigm Development in the Social Sciences*. Santa Monica, CA: Goodyear Publishing.
- Mackenzie, S.B., Podsakoff, P.M., and Podsakoff, N.P. 2011. "Construct Measurement and Validation Procedures in Mis and Behavioral Research: Integrating New and Existing Techniques," *MIS quarterly* (35:2), pp. 293-334.
- McMahon, M., and Pospisil, P. 2005. "Laptops for a Digital Lifestyle: Millennial Students and Wireless Mobile Technologies.," in: *Asclite Conference*. Brisbane, Australia: pp. 421-431.
- Nazir, S., and Pinsonneault, A. 2012. "It and Firm Agility: An Electronic Integration Perspective," *Journal of the Association for Information Systems* (13:3), pp. 150-171.
- Oliver, R.L. 1977. "Effect of Expectation and Disconfirmation on Postexposure Product Evaluations: An Alternative Interpretation," *Journal of Applied Psychology* (62:4), pp. 480-486.
- Oliver, R.L. 1980. "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions," *JMR, Journal of Marketing Research* (17:4), pp. 460-460.
- Oliver, R.L., Balakrishnan, P.V.S., and Barry, B. 1994. "Outcome Satisfaction in Negotiation: A Test of Expectancy Disconfirmation," *Organizational Behavior and Human Decision Processes* (60:2), pp. 252-275.
- Overby, E., Bharadwaj, A., and Sambamurthy, V. 2006. "Enterprise Agility and the Enabling Role of Information Technology," *European Journal of Information Systems* (15:2), pp. 120-131.
- Pavlou, P.A., and El Sawy, O.A. 2010. "The "Third Hand": It-Enabled Competitive Advantage in Turbulence through Improvisational Capabilities," *Information Systems Research* (21:3), pp. 443-471.
- Pavlovich, K., and Krahnke, K. 2012. "Empathy, Connectedness and Organisation," *Journal of Business Ethics* (105:1), pp. 131-137.
- Petter, S., and McLean, E.R. 2009. "A Meta-Analytic Assessment of the Delone and Mclean Is Success Model: An Examination of Is Success at the Individual Level," *Information & Management* (46:3), pp. 159-166.
- Po-An Hsieh, J.J., Rai, A., and Xin Xu, S. 2011. "Extracting Business Value from It: A Sensemaking Perspective of Post-Adoptive Use," *Management Science* (57:11), pp. 2018-2039.
- Ringle, C., Marc/Wende, and Sven/Will, A. 2005. "Smartpls," in: *2.0 (beta)*. Hamburg, Germany: <http://www.smartpls.de>.
- Roberts, N., and Grover, V. 2012a. "Investigating Firm's Customer Agility and Firm Performance: The Importance of Aligning Sense and Respond Capabilities," *Journal of Business Research* (65:5), pp. 579-585.
- Roberts, N., and Grover, V. 2012b. "Leveraging Information Technology Infrastructure to Facilitate a Firm's Customer Agility and Competitive Activity: An Empirical Investigation," *Journal of Management Information Systems* (28:4), pp. 231-270.
- Rohm, A.J., Gao, T., Sultan, F., and Pagani, M. 2012. "Brand in the Hand: A Cross-Market Investigation of Consumer Acceptance of Mobile Marketing," *Business Horizons* (55:5), 9//, pp. 485-493.
- Russell, C.A., Norman, A.T., and Heckler, S.E. 2004a. "The Consumption of Television Programming: Development and Validation of the Connectedness Scale," *Journal of Consumer Research* (31:1), pp. 150-161.
- Russell, C.A., Norman, A.T., and Heckler, S.E. 2004b. "People and "Their" Television Shows: An Overview of Television Connectedness," *The Psychology of Entertainment Media*, p. 275.
- Sambamurthy, V., Bharadwaj, A., and Grover, V. 2003. "Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms," *MIS Quarterly* (2:27), pp. 237-263.
- Setia, P., Venkatesh, V., and Joglekar, S. 2013. "Leveraging Digital Technologies: How Information Quality Leads to Localized Capabilities and Customer Service Performance," *MIS Quarterly* (37:2), pp. 565-590.

- Shankar, V., Venkatesh, A., Hofacker, C., and Naik, P. 2010. "Mobile Marketing in the Retailing Environment: Current Insights and Future Research Avenues," *Journal of Interactive Marketing* (24:2), 5//, pp. 111-120.
- Shanock, L., Baran, B., Gentry, W., Pattison, S., and Heggstad, E. 2010. "Polynomial Regression with Response Surface Analysis: A Powerful Approach for Examining Moderation and Overcoming Limitations of Difference Scores," *Journal of Business and Psychology* (25:4), 2010/12/01, pp. 543-554.
- Sobel, M.E. 1982. "Asymptotic Confidence Intervals for Indirect Effects in Structural Equation Models," *Sociological Methodology* (13), pp. 290-312.
- Townsend, K.C., and McWhirter, B.T. 2005. "Connectedness: A Review of the Literature with Implications for Counselling, Assessment and Research," *Journal of Counselling & Development* (83:Spring 2005), pp. 191-201.
- Venkatesh, V., Brown, S.A., Maruping, L.M., and Bala, H. 2008. "Predicting Different Conceptualizations of System Use: The Competing Roles of Behavioral Intention, Facilitating Conditions, and Behavioral Expectation," *MIS Quarterly* (32:3), pp. 483-502.
- Venkatesh, V., and Davis, F.D. 2000. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (45:2), pp. 186-204.
- Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. 2003. "User Acceptance of Information Technology: Toward a Unified Theory View," *MIS Quarterly* (27:3), pp. 425-478.
- Venkatesh, V., Thong, J.Y.L., and Xu, X. 2012. "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology," *MIS Quarterly* (36:1), pp. 157-178.
- Verkasalo, H., Lopez-Nicolas, C., Molina-Castillo, F., and Bouwman, H. 2010. "Analysis of Users and Non-Users of Smartphone Applications," *Telematics and Informatics* (27:3), pp. 242-255.
- Vodanovich, S., Sundaram, D., and Myers, M. 2010. "Digital Natives and Ubiquitous Information Systems," *Information Systems Research* (21:4), p. 711.
- Walsh, G., Hennig-Thurau, T., Sassenberg, K., and Bornemann, D. 2010. "Does Relationship Quality Matter in E-Services? A Comparison of Online and Offline Retailing," *Journal of Retailing and Consumer Services* (17:2), 3//, pp. 130-142.
- Xu, J., Benbasat, I., and Cenfetelli, R. 2011. "The Effects of Service and Consumer Product Knowledge on Online Customer Loyalty," *Journal of the Association for Information Systems* (12:11), Nov 2011, pp. 741-766.
- Zhang, T.C., Agarwal, R., and Lucas, H.C.J. 2011. "The Value of It Enabled Retailer Learning: Personalized Product Recommendations and Customer Store Loyalty in Electronic Markets," *MIS Quarterly* (35:4), pp. 859-881.
- Zuboff, S. 1988. *In the Age of Smart Machines*. New York: Basic Books.