

Customers' View of Agility: The Expectation-confirmation Theory Perspective

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ABSTRACT

Contemporary organizations strive for customer agility through the deployment of digital technologies on customer-focused operations to build enduring customer relationships, with mobile apps being one of its prominent examples. Drawing on prior agility and ECT literature, this study proposes a model to examine customers' view of a firm's customer agility. Our empirical test of conceptual model from data collected in a field study from 128 customers demonstrated that the conceptual model offers good explanation for customers' view of a firm's customer agility through relationships among customer expectations-customer perceived firm's responsiveness-satisfaction. Data were analyzed using PLS, polynomial modeling, and response surface methodology to examine the relationships between customers' digital interactions with the firm, influence of digitized interactions on customer expectations, customers' evaluation of firm's responsiveness, and subsequent customer satisfaction.

Keywords: Agility, Mobile Apps, Expectation Confirmation Theory, Customer Satisfaction, Competitive Advantage

1. Introduction

Achieving sustained competitive advantage is elusive in highly volatile contemporary business environments, thus firm success is heavily determined by its agility; that is, the ability to constantly sense the rapidly changing customer demands and respond quickly to opportunities and threats (Atapattu and Sedera, 2014a; Overby et al., 2006; Roberts and

Grover, 2012a; Tallon and Pinsonneault, 2011). In consequence business agility and speed to market were ranked as the top two management concerns in 2011-2012 globally, whilst business intelligence, mobile wireless applications (apps) and customer relationship management were featured in five most influential technologies recently (Luftman et al., 2012). These novel technologies are now influencing agility by driving the proliferation of dynamic service

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delivery channels (Weinhardt et al., 2009), and inventing novel interactive customer touch-points, thus presenting organizations with a great opportunity to connect with techno-powered digital natives through ubiquitous smart technology whilst the digital natives, and ubiquitous technologies, networks and associated systems are also increasingly weaving themselves into the very fabric of everyday life of both individuals and firms (Vodanovich et al., 2010b). Such dynamics not only allow organizations to better deliver services through their traditional use, but more importantly allow innovative ways of connecting with profitable techno-powered digital native customers to identify their needs and wants better than ever before (Atapattu and Sedera, 2014b), possibly better than the competitors through the resultant user generated actionable intelligence (Susarla et al., 2012). Roberts and Grover (2012b) referred to this trait as a 'firm's customer agility'. Whilst firm's customer agility relates to positive organizational outcomes, how customers perceive firm's agility ultimately defines the positive outcomes that a firm is ultimately able to achieve (e.g., competitive advantage, customer satisfaction, market share) (Atapattu and Sedera, 2014a). Thus, this discussion investigates the customer's view of firm's agility and firm performance, which is absent in extant agility discussions.

In the broadest sense, enterprise agility is defined as the firm's ability to sense environmental change and respond rapidly (Overby et al., 2006). While the definition of agility consists mainly of two components - sensing and responding - a firm may articulate its agility in many areas such as in customer-based processes, in supply-chain interactions or in its day-to-day operations (Roberts and Grover, 2012b) ultimately leading to customer agility. The notion of customer agility have been mentioned in the literature for some time (Kidd, 2000; Sambamurthy et

al., 2003) but it has not been discussed in detail until recently (Roberts and Grover, 2012a; Roberts and Grover, 2012b). Whilst Kidd (2000) defined the two types of agility - internal agility and external agility, Sambamurthy et al. (2003) classified the external agility into two forms - customer agility and partnering agility, where they used the concept of operational agility to describe a firm's internal agility. In the interim, Roberts and Grover (2012a) have discussed firm's customer agility taking the firm's viewpoint. However, the customers appraisal of organizational agility, or the customers' view of firm's agility remains largely absent in the current agility literature (Atapattu and Sedera, 2012; Atapattu and Sedera, 2013b; Atapattu and Sedera, 2013a). However, understanding customer agility from customers' standpoint is important as how customers perceive firms would ultimately define the competitive position (advantage) of the firm. Simply because unless its customers do not recognize that the firm is responding well to their needs the firm run the risk of losing its customers hence the competitive position.

Taking the firm standpoint, Roberts and Grover (2012a) defined a firm's customer agility as "the degree to which a firm is able to sense and respond quickly to customer-based opportunities for innovation and competitive action". Capturing the customer perspective, we define the customers' view of a firm's agility as "*the degree to which a firm is able to identify customers' needs and wants, and how well the firm is able to fulfil those requirements quickly and effectively*". The first half of our definition is about the customers' view of firm's sensing capabilities. It showcases the extent to which a firm is able to identify customers' expectations. The latter part of the definition focuses on the firm's responsiveness, which symbolizes how a customer views a firm's responsiveness through customer's experience. The

sensing component of agility fundamentally focuses on identifying and interpreting customer expectations, while the responding component of agility focuses on fulfilling such expectations quickly, efficiently and expertly. In other words, the notion of a firm's customer agility can be explained with a priori customer expectations and a posteriori customer experiences.

Prior customer expectations and post-experience evaluations provide the contextual underpinning for this discussion thus, this study apply the notion of expectation-confirmation theory (ECT) (Oliver, 1980a) to appreciate firm agility from the customers' perspective. ECT is widely used in the consumer behaviour and service marketing literature to examine customer satisfaction and post-purchase behaviour (Brown et al., 2012; Dabholkar et al., 2000; Oliver, 1980a; Patterson et al., 1997). Different models of expectation confirmation, with varying underlying theoretical explanations, have been put forth in organizational behaviour, marketing, psychology and information systems research (Anderson, 1973; Klein, 1999; Oliver, 1977; Oliver, 1980a; Yi, 1990). Meanwhile, a stream of research within the IS context has been conducted to understand expectations and IS outcomes multiple contexts; such as system continuance (Bhattacharjee, 2001), implementation-related issues (Ginzberg, 1981), evaluation of received benefits (Staples et al., 2002), benefits realization time series (Wang and Sedera, 2011), user performance (Szajna and Scamell, 1993), and technology use and satisfaction (Brown et al., 2012). Given the widely accepted importance of happy, satisfied, positive customer perceptions for business success and superior firm performance (Kumar and Reinartz, 2012; Liang and Tanniru, 2007; Wagner and Majchrzak, 2007), the challenge of delivering superior customer responsiveness and understanding the expect-

ation-experience gap and its implications for customer satisfaction will be of great value to both research and practice. This becomes even more significant and important in contemporary business environment as the firms are increasingly deploying new technologies to sense customer needs and wants, the customer expectations are heavily influenced by the amount of sensing these firms.

Advancements in IT offer organizations more options (Adomavicius et al., 2013), for innovative customer engagements, and allow firms to know their customers retail expectation better (sensing), while customers expect that their 'unique' needs are met by the retailer with ease, speed and deftness (responding). In other words, the customers are expecting these firms to know their unique requirements better and to that the firm responds to their individual needs are personalized. While the organizations' objective with the mobile shopping systems is to better connect with their customers to gain insights about their shifting needs, customers expect that organizations be more knowledgeable about their individual requirements through specific deals, discounts and promotions that are tailored for them. As such, the context of this research provides an ideal opportunity to gauge agility through the perceived customer viewpoint. We position the customers' perceived sensing and responding of the firm in relation to the growing mobile sensing and responding technologies, and we argue that the customers are better positioned to determine how well the firm is responding to their expectations.

We employed the notions of agility (Nazir and Pinsonneault, 2012; Overby et al., 2006; Roberts and Grover, 2012a; Roberts and Grover, 2012b) to understand firm agility and to define the customers' perspective of agility. We further drew from expectation-confirmation theory (Bhattacharjee, 2001;

Brown et al., 2012; Oliver, 1980a; Venkatesh and Goyal, 2010) to develop our conceptual model of the customers' version of agility, underpinned through Expectation-Conformation Theory. Against this backdrop, this study is designed to achieve the following key objectives; first, we discuss the firm's agility from the customers' point of view; second, we discuss the methodological and analytical limitations of prior agility research. Subsequently, we develop a conceptual model to measure and understand firm agility from the customer perspective, through ECT. Lastly, we intend to empirically validate the proposed model using polynomial regression and response surface methodology.

II. Theoretical background

2.1. Customers' View of Agility

Taking a broader perspective, Overby et al. (2006) defined enterprise agility as a firm's ability to sense environmental change and respond rapidly. There exists a range of definitions that describe the notion of agility (Bititci et al., 1999; Day, 2000; Goldman et al., 1995; Roberts and Grover, 2012b; Sambamurthy et al., 2003; Setia et al., 2008; Sharifi and Zhang, 1999; Yusuf et al., 1999), but they all share some key common attributes. For example, the two attributes of sensing and responding appear in multiple definitions of agility (Overby et al., 2006; Roberts and Grover, 2012a; Roberts and Grover, 2012b; Sambamurthy et al., 2003) wherein these two components form the two main constituents of organizational agility. Sensing explains the firm's intellectual ability in finding appropriate opportunities and/or threats to act upon (Dove, 2001) and represents the knowledge component of agility (Overby et al., 2006).

On the other hand, 'responding' is described as the firm's physical ability to act quickly and accurately on opportunities and/or threats at its disposal (Dove, 2001; Overby et al., 2006). Another main attribute posited in the literature is the environmental turbulence which focuses on various change drivers such as competitor actions, changing customer requirements, technological changes, legislative or regulatory changes, and economic shifts (Overby et al., 2006). As prior research has established, agility is an important determinant of success in competition when agility is defined, operationalized and measured using the two main constituents of the sensing and responding components (Overby et al., 2006; Roberts and Grover, 2012a; Roberts and Grover, 2012b).

Moreover, several different aspects of agility have been discussed in the literature (Huang et al., 2012; Roberts and Grover, 2012a; Yusuf et al., 1999), indicating that a firm may display its agility in many different areas such as customer-based processes, supply chain interactions, and day-to-day operations (Roberts and Grover, 2012b). Traditionally, agility research observes agility by asking the management about the firm's sensing and responding capabilities. To date, all the studies have evaluated agility by asking managers of the organizations what they thought were their capabilities of sensing and responding. For example, Roberts and Grover (2012a) requested managers to comment on how well their organization sensed as compared to their competitors. However, according to our knowledge, no studies to-date has attempted either to comprehend or to measure a firm's agility from the customers' perspective.

The customer perspective of the firm's abilities is not new to management science. For example, Kaplan et al. (1992) in their balanced scorecard approach appreciated the importance of customers' viewpoint by introducing the dimension "how cus-

tomers see the firm?", as a key strategic performance indicator. Moreover, the significance of customer perception for branding, business relationships and firm performance is well evident in the business, management, and marketing literature (Langerak, 2001; Niemuth, 2005; O'Loughlin et al., 2004; Sullivan et al., 2012). Hence, we argue here that, how customer's view the firm's agility is an important phenomenon for both research and practice. Following the definition, customer agility is the process of understanding customer requirements and responding to them with appropriate and quick responsive actions (Roberts and Grover, 2012a). In other words, it is the process by which a firm understands the prior customer expectations and satisfies them with appropriate post-purchase customer experiences. By looking at firm's customer agility from the customers' standpoint (i.e., customer perceived firm's agility), what customers experience indicates the firm's ability in responding to customer requirements. Since the customers can recognize the firm's capabilities to respond to their needs in the form of customer-based competitive actions, the customers' perceptions of the firm's responsiveness are a valid indicator of the firm's agility. Hence, in this discussion we propose that the customer-perceived firm responsiveness is an important component in understanding agility. We do not intend to undermine the employees' role in assessing a firm's responsiveness, but our aim here is to highlight the importance of customers' participation in an organization's agility audit. Also, we argue here that to comprehend a firm's agility entirely one should also consider the customers' standpoint as one of the dimensions. While the organizational perspective provides the internal view of the firm's customer agility, the proposed customer perspective has the potential to provide the much required external view of the firm's customer agility.

2.2. Expectation Confirmation Theory (ECT)

The instigation of ECT can be traced back to consumer behaviour and marketing research streams (Oliver, 1977; Oliver, 1980a). The theory presumes that satisfaction is a function of prior expectations and a posteriori dis-confirmation¹⁾ (Oliver, 1980a; Susarla et al., 2003). Oliver (1980a) elaborated on the process which consumers go through in forming repurchase intentions using the ECT framework. First, consumers form initial expectations of a specific service or a product prior to purchase (in this discussion we refer to this as a priori expectations/customer expected firm's agility). Then, they agree and consume/use that service or the product and they form perceptions about its performance based on the experience following its initial consumption (we refer to this as customer perceived firm's agility / a posteriori experiences). Third, they evaluate its perceived performance against their original expectations (customers' evaluation of firm's agility) and determine the extent to which their expectation is confirmed. Subsequently, based on the level of confirmation and the expectation upon which the confirmation was based, they form satisfaction or affection. Finally, the consumers form a repurchase intention when they are satisfied, and dissatisfied consumers discontinue use.

The predictive ability of the theory is demonstrated across a number of different contexts, and a stream of literature affirms that satisfaction is a key determinant of repurchase decisions (Oliver, 1980a), and continuance intentions (Bhattacharjee, 2001; Brown et al., 2012; Venkatesh and Goyal, 2010). A common theme in the ECT literature is that satisfaction is

1) Also labelled "confirmation" in the extant literature where the theory is called "expectation-confirmation" or "expectation-disconfirmation", interchangeably.

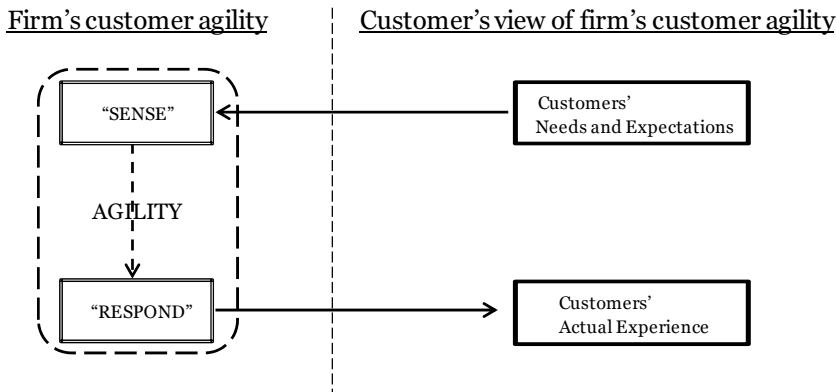
a function of the magnitude and direction of disconfirmation, whereby the customers are satisfied in the case of positive disconfirmation whilst dissatisfied in the case of negative disconfirmation. The variation in satisfaction is also higher as the degree of disconfirmation increases (Venkatesh and Goyal, 2010). The initial conceptualization (Oliver, 1980a) of ECT posits that prior expectations and disconfirmation are the only determinants of satisfaction, whereas some subsequent research (Churchill and Surprenant, 1982) shows that actual experience exerts effects independently on satisfaction in addition to the impact it makes via disconfirmation, whilst according to some others (Brown et al., 2012), experience is the sole determinant of satisfaction.

In the IS literature, Ginzberg (1981) examined the impact of unrealistically high user expectations on satisfaction in the information systems context and found that the users with realistic prior expectations were more satisfied than the users with unrealistic prior expectations. In another study, Staples et al. (2002) argued that unrealistically high expectations will result in a lower level of perceived benefit when compared to realistic expectations. Further, some researchers in IS used ECT to examine how and why the attitudes and beliefs towards IT use changed over time when the users gained experience with a particular system (Bhattacharjee, 2001; Bhattacharjee and Premkumar, 2004). They found that satisfaction with the system usage was the strongest predictor of intention to continue. Furthermore, they highlighted the role of disconfirmation and satisfaction in driving the change in attitudes and beliefs over time, which shows why it is important for an organization to be continuously responsive to their customer needs all the time. Recent work on ECT focuses on the methodological and analytical shortcomings associated with prior ECT research

(Venkatesh and Goyal, 2010). Venkatesh and Goyal (2010) recently discussed the issues relevant to the direct measurements and the analytical limitations associated with the use of linear models. Drawing from cognitive dissonance theory, realistic job preview, and prospect theory they proposed a polynomial model of expectation-(dis)confirmation in information systems to better understand expectation-(dis)confirmation in IS and to deal with the shortcomings associated in prior ECT research. A more recent work by Brown et al. (2012) further demonstrated that the employment of polynomial modelling and response surface methodology presented a better explanation of the relationships between expectations, experiences and use in information systems. In this discussion, we also employ ECT to understand organizational agility and to explain the relationship between customer expectations (customer expected firm's agility), customer-perceived firm's agility (customer experiences), customers' evaluation of firm's agility and customer satisfaction.

2.3. ECT Perspective of Firm's Agility

Roberts and Grover (2012b) defined a firm's customer agility as the "degree to which a firm is able to sense and respond quickly to customer-based opportunities for innovation and competitive action". As such, in customer agility, sensing focuses on the firm's ability to identify and interpret customer-based opportunities, while responding focuses on the firm's ability to respond quickly to the customer-based opportunities the firm has sensed for innovation and competitive action; thus, it focuses on how well the firm is able to act on the requirements of its customers. Précis, a firm's customer agility denotes how well a firm is capable of sensing its customers shifting



<Figure 1> Customer's Perspective of Firm's Customer Agility

needs and expectations and responding to such changes with precision quick and timely manner to gain competitive advantage making its customers' satisfied. Thus, the *customers' view of firms' agility* corresponds to how a firm's customers evaluate the firm's customer agility through the evaluation of customers' actual experiences against the firm's responsiveness that the customers expect from the firm. Thus we employ the expectation confirmation theory (ECT) (Oliver, 1977; Oliver, 1980b) to further investigate the firm's customer agility from customers' standpoint. The <Figure 1> depicts the customers' take of firm's agility.

Taking the expectation-confirmation theory perspective, a firm's sensing capability demonstrates how well the firm is able to identify what their customers *expect* from them, while the firm's responding capability is about how well the firm is able to act on what is expected. How customers experience the firm's responsiveness indeed symbolizes how well the firm responds customer's individual needs. In other words, a firm's agility, from the ECT perspective (Oliver, 1980a), explicates the firm's ability to understand the customers' expectations via the pervasive interactions ongoing basis and respond to them with

superior customer experiences with ease, speed and deftness. When observing from the customers' viewpoint, the customers experience firm responsiveness through the customer-based competitive actions that a firm performs based on what it senses about its customers. Hence, through their experience (customer perceived firm's agility), the customers are able to recognize that the firm is responding to their unique individual requirements. Consequently, the customers will be satisfied as the firm is agile and is able to meet their pre-consumption expectations. If the firm fails to deliver what their customers expect, they would not be satisfied. As ECT hypothesizes, customers' repurchase or continuance intentions are primarily determined by their post-consumption satisfaction (Oliver, 1980a), and in this discussion customer satisfaction is defined by the goodness of the experience that they perceive. As discussed in regard to the notion of agility (Roberts and Grover, 2012a), repurchase or continuance intention is an important determinant in sustaining the customers' loyalty; hence, it is an important determinant of competitive advantage. The expectation-confirmation theory posits that satisfaction is a function of prior expectations and disconfirmation (Oliver, 1980a; Susarla et al.,

2003), where satisfaction is considered to be a key determinant of repurchase intentions (Oliver, 1980a; Oliver et al., 1994b), hence the sustained customer loyalty. As a result, understanding the expectation-experience gap and its implications for customer satisfaction in light of organizational agility will be of great value for both research and practice.

2.4. ECT, Satisfaction and Limitations in Prior Research

Based on met expectation research (Porter and Steers, 1973), Brown et al. (2008) introduced three models to study satisfaction, namely, the disconfirmation, ideal point, and experience only models. The disconfirmation model suggests that satisfaction is influenced by the degree to which the expectations are unmet or the level of disconfirmation. In that model, disconfirmation suggests that either the experiences fall short of expectations (it reduces satisfaction due to the effect of disappointment) or the experiences exceed the expectations (it influences satisfaction through the positive surprise effect) (Brown et al., 2008). Which indicates that satisfaction is a function of the difference between experience and expectations, wherein the degree to which expectations are exceeded leads to greater satisfaction while the degree to which expectations are falling short leads to lower satisfaction (Brown et al., 2008; Porter and Steers, 1973). This suggests that the expectations should be understated in order to increase the degree to which the experiences exceed expectations (by maximizing the expectation-experience gap in the positive direction) (Brown et al., 2008).

The ideal point model proposes that any difference between expectations and experiences will result in a lowered evaluation, and hence result in a lowered satisfaction regardless of the direction of incon-

gruence (Brown et al., 2008). Contrasting to the disconfirmation model, this model anticipates negative outcomes for both unmet expectations and exceeding expectations. The experience only model suggests that the outcome (satisfaction) depends solely on the actual experience, rendering expectations inconsequential to the satisfaction outcome (Brown et al., 2008).

All three models view satisfaction as a function of expectations and experiences. Brown et al. (2008) analysed the three competing models through three different graphical and analytical representations. The subsequent empirical tests suggested that the equal role of expectations and experiences posited in the disconfirmation and ideal point models was not evident; that is, the influence of experience on satisfaction was comparatively stronger as depicted in the experience only model (Brown et al., 2008). A strong role of expectation in determining satisfaction is evident in previous research (Ginzberg, 1981; Szajna and Scamell, 1993) but the overall influence of expectation appears to be less prominent in more current work (Brown et al., 2008). Brown et al. (2008), for example, cautioned that flawed empirical techniques such as the use of linear models and the limitations associated with different scores may have led to the overemphasizing role of expectations where, in reality, it only had a marginal influence on satisfaction.

Recent debates on ECT in the IS context reveal several key limitations associated with prior ECT applications (Brown et al., 2008; Brown et al., 2012; Venkatesh and Goyal, 2010; Venkatesh et al., 2008). The first group of limitations relate to the predominant use of linear models and associated analytical techniques (Churchill and Surprenant, 1982; Szajna and Scamell, 1993) in ECT research when the theoretical propositions of ECT (Brown et al., 2008; Brown

et al., 2012; Venkatesh and Goyal, 2010) and satisfaction (Anderson and Sullivan, 1993; Cheung and Lee, 2009) predict nonlinear effects. For example, Anderson and Sullivan (1993) reported that negative disconfirmation affects consumer satisfaction more than positive disconfirmation, and this nonlinearity has been well documented and empirically demonstrated in consumer-behavior research (Cheung and Lee, 2009). The linearity in general implies similar effects of expectations and experiences on an outcome, whereas some prior research hints that the assumption of linearity possibly masks the true relationship among the variables (Edwards and Rothbard, 1999; Staples et al., 2002). As Edwards (2001) argues, higher-order terms in curvilinear representations have the potential to explain substantial variance over and above linear representations.

The second group of limitations highlighted in the extant ECT studies includes the use of difference scores in analysis. As previous studies suggest, the difference scores carry significant statistical flows (Brown et al., 2008; Peter et al., 1993; Venkatesh et al., 2008). For example, the use of difference scores in expectation research suggests that expectations and experiences possess equal and opposite effects on the outcome variable, but it does not always hold true and is likely to impose constraints in some representations of ECT models (Brown et al., 2008; Hom et al., 1999).

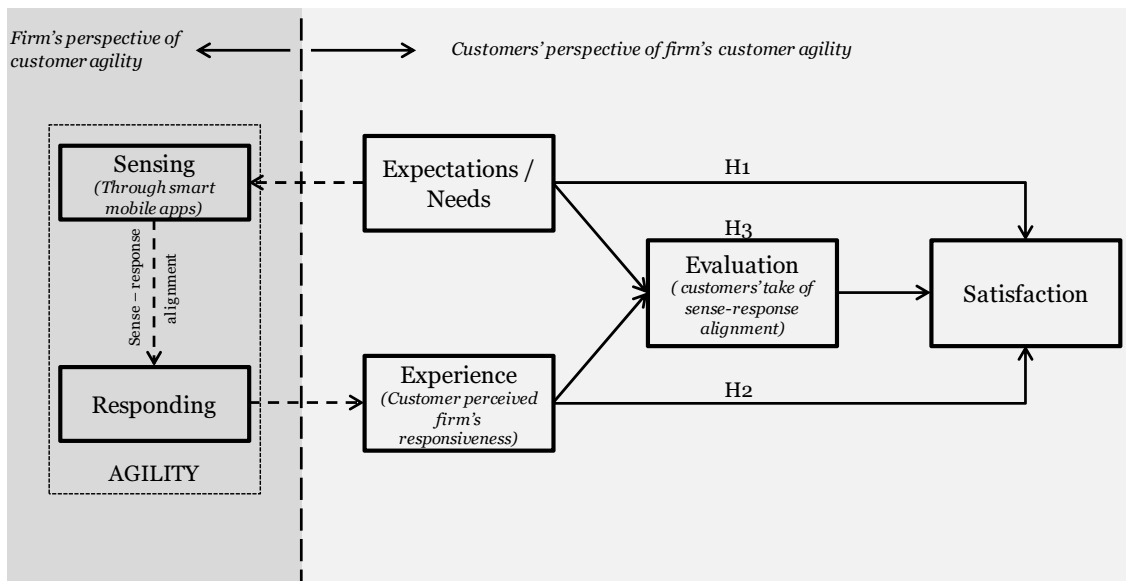
The third measurement issue is associated with the use of direct measures of disconfirmation (Bhattacharjee and Premkumar, 2004; Bhattacharjee, 2001; Brown et al., 2008; Oliver, 1977; Venkatesh and Goyal, 2010) instead of using the measures of expectations and experiences separately. In this approach, a researcher is essentially measuring the degree to which a participant's expectations were met, but it does not support the understanding of the

relative impact of expectations and experiences on satisfaction (Brown et al., 2008; Irving and Meyer, 1995). As Irving and Meyer (1995) reported, responses on met expectations questions are likely to be excessively influenced by current experiences. More recent work on ECT suggests polynomial regression analysis and response surface methodology (Edwards, 2001) as an alternative approach to counter these limitations of prior research (Brown et al., 2008; Venkatesh and Goyal, 2010).

III. Research Model

Following the notions of agility (Overby et al., 2006; Roberts and Grover, 2012a), ECT (Oliver, 1980a), competing models of ECT and the paucity of research that investigated customers perspective of firm's agility in prior research, we propose a model (See <Figure 2>) to understand the notion of customer agility from the perspective of firm's customers. Whilst ECT posits that satisfaction is a function of prior expectations and disconfirmation (Oliver, 1980a; Susarla et al., 2003), in this discussion we relate firm's customer agility to customers' perceived firm's agility (experience) and customer expected firm's agility (expectations) taking the customers' stand point. Thus we relate the firm's sensing and responding capabilities to customer expectations, experiences and customer satisfaction using ECT.

Expectation researchers both in IS and other areas examine expectations, experiences and outcomes (Brown et al., 2008; Brown et al., 2012; Porter and Steers, 1973). By definition, expectations are a set of beliefs of products, services or the experiences that prevail prior to the consumption /experience (Olson and Dover, 1979; Susarla et al., 2003; Venkatesh and Goyal, 2010), whilst disconfirmation



<Figure 2> Customer's View of Agility - ECT Perspective

is the discrepancy between prior expectations and the actual experience (Venkatesh and Goyal, 2010). When the experience exceeds the expectations (better-than-expected outcomes), it leads to positive disconfirmations; when the experience falls short (worse-than-expected outcomes), it results in negative disconfirmation (Churchill and Surprenant, 1982; Oliver, 1980a; Oliver et al., 1994b; Venkatesh and Goyal, 2010) and that defines the overall satisfaction or the dissatisfaction of the customer. In this discussion, the expectations portray a customer expected firm's responsiveness on the requirements that are unique to him/her. As the firms now have the potential to sense such requirements that are unique to each individual customer and respond to them in tailored and timely manner exhibiting greater customer agility. As such the customers could evaluate a firm's agility by evaluating the actual experience that they perceive during their interactions with the firm. Upon which the customers form their satisfaction or dissatisfaction thus defines the firm's

competitive position in the market. Consequently, the recent research in IS highlights the existence of nonlinear relationships between the constructs of expectation, experience and satisfaction (Brown et al., 2008; Staples et al., 2002; Venkatesh and Goyal, 2010), whilst the original manifestations of ECT also suggest non-linear propositions.

3.1. Hypotheses Development

As conceived in ECT (Oliver, 1977; Oliver, 1980b), the expectations defined as the set of beliefs of products, services or anticipated experiences that are formed prior to the consumption /actual experience. Whilst a firm's customer expectations are typically developed based on the firm's marketing communication activities and/or, during the customers' pre-purchase interactions with the organization, contemporary firm's now have the potential to sense such expectations through smart devices such as smart mobiles and associated apps. As such, the cus-

customer expectations also influenced heavily by the amount of sensing firms do with novel ubiquitous customer engagements knowing that the firms are sensing more about their individual preferences. Then the customers evaluate how the firm is able to fulfil their individual shopping needs. In doing so they evaluate their actual experience against the initial expectations they have formed. In other words, as argued in ECT, customers form their satisfaction based on the level to which they confirm their expectations, or in other words, the satisfaction is based on the level of expectation on which that confirmation was based (Bhattacharjee, 2001; Brown et al., 2008).

As conceived in ECT, customers assess their actual experiences (i.e., perceived firm's responsiveness) in relation to their initial expectations (i.e., customer expected firm's responsiveness) in order to determine the extent to which their expectations were confirmed to form their level of satisfaction (Bhattacharjee, 2001). In other words, the level of a priori expectations will influence the outcome, in this discussion, referred to as customer satisfaction. Herein, the a-priori expectations provide the baseline or the reference level for consumers to form evaluative judgments about the firm's responsiveness based on their actual experience (Bhattacharjee, 2001), so it is reasonable to presume that when customer expectations (customer expected firm's agility towards their shopping needs and wants) are lower it is easier for the firm to satisfy those customers compared to the customers with higher expectation levels. Thus, we propose our first hypothesis:

H1: Prior customer expectations are negatively associated (inversely proportional) to customer satisfaction, such that customers with high (low) a-priori expectations will be less (more) satisfied with the firm's responsiveness to their requirements.

As discussed in the extant ECT literature, customers can either be satisfied or disappointed based on the level to which they confirm their initial expectations (Bhattacharjee, 2001; Venkatesh and Goyal, 2010). In other words, the level of satisfaction depends on the actual performance of the firm or the responsiveness of the firm. The firm's responsiveness then defines the level of experiences that perceived by the customers (i.e., perceived firm's customer agility). As conceived in ECT literature (Oliver, 1977; Oliver, 1980b; Oliver et al., 1994a) the level of disconfirmation defines the ultimate satisfaction where initial level of expectations and the actual experiences provides the two reference points for such evaluations. Thus, it is reasonable to argue that the superior customer experiences (higher levels of firm's customer agility) form higher levels of customer satisfaction, whilst the inferior customer experiences form comparatively lower levels of satisfactions. Thus, we propose our second hypothesis:

H2: Superior customer experience (firm's customer agility) is positively associated (directly proportional) to customer satisfaction, such that customers with superior (mediocre) perceived firm's agility will be more (less) satisfied.

Following the notion that customers form their satisfaction based on the level of expectation confirmation (Bhattacharjee, 2001) and the idea of congruence (Brown et al., 2008), we predict the satisfaction to be increased when the difference between customer expectations (customer expected firm's agility) and experiences (customer perceived firm's agility) is minimized. In this discussion, customer expectations serve as an anchor which the customers evaluate their perceived experience against. There is an ideal point of experience where the mismatch

between expectation and experience is at its minimum. The agility literature also suggests that the firm's sensing capability (identifying what the customer wants or expects) should be aligned to its responding capability (meeting what the customer wants or expects with appropriately matching customer experiences) to deliver better firm performance (customer satisfaction being one of the performance indicators) (Overby et al., 2006; Roberts and Grover, 2012a; Roberts and Grover, 2012b). Bhattacharjee (2001) also argued and empirically tested that satisfaction is a function of the degree to which expectations are confirmed, whilst Staples et al. (2002) affirmed that user satisfaction is at its most optimal when the difference between prior expectations and experiences is at its minimum. Following this, we propose our third hypothesis:

H3: Alignment of a-priori customer expectations to perceived customer experiences is positively related to customer satisfaction, such that customers are more satisfied when the difference between expectations and actual experiences is at its lowest.

IV. Study Context

The study context represents the exiting use of novel, ubiquitous and smart use of technology for sensing and responding. It is based on the mobile-Customer Relationship Management (mobile shopping) application for virtual retailing in two of the largest retailers in Australia, namely, Woolworths²⁾ and Coles³⁾. Together, they hold 80% of the Australian retail market (Boley, 2012), with fierce

competition to attract better market share. As the retailing landscape is heavily influenced by evolving technologies such as Smartphones and Smartphone applications (Narayanaswami et al., 2011), the industry is making a global shift towards 'everywhere retailing', and 'everywhere ubiquitous sensing and responding', thus the two retail giants too are trying to exploit such technological advancements. These firms are now able to tap in to digitized heterogeneous data bases (Krishnan et al., 2001) to extract insights on individual customer preferences based on the information footprint left by customers (Wagener et al., 2010) and strategically capitalize on such customer interactions and understand untapped market potential (Dou et al., 2013; Niculescu et al., 2012). These organizations in general are now able to discover customer buying patterns through understanding how customers create shopping lists prior to reaching the retail outlet, observing recipes that the customers are navigating through, and combining statistics with location maps. Alternatively, customers can compare fuel prices, find out what fruit and vegetables are in season, check available specials, receive exclusive daily offers and specials centered around the things they buy most, sort their shopping list by aisle order, and find the location of their nearest store and its opening hours. They also can shop easily with secure mobile checkout and instantly send their shopping list to an online store - simply and safely - to have the groceries delivered fresh to their door, at a time that suits them. They also can share their shopping list between app users on different handsets.

2) Woolworths / Woolworths Ltd

3) Coles Supermarkets / Westfarmers

V. Research Method

5.1. Development of Measures

The study followed the guidelines of Churchill (1979) and MacKenzie et al. (2011) for developing the measures of our constructs. We conducted a literature search on firms' customer agility first, in order to define the domain of the study construct, namely, firm's agility (See <Appendix A>). Following the definition, we then reviewed the literature on agility and expectation-confirmation theory to comprehend agility from the ECT lens and to develop the sub-measures and measurement items for each construct of our conceptual model taking the customers' view of firm's agility. Based on this literature review and validated measures of similar constructs (Kohli et al., 1993; Roberts and Grover, 2012a), we then generated sample items to measure customer expectations, experiences and satisfaction. 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 MacKenzie et al. (2011). Following this, we conducted a pre-test and pilot study to assess the reliability and validity of our measures. Our pilot analysis 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 1> lists the sources and some items for all the construct measures (For the complete set of items please refer to the <Appendix B>).

5.2. Sampling Frame and Characteristics

We operationalized the study model using data

from customers of two market-leading Australian retailers, whereby they used a mobile shopping app in their routine shopping engagements, in order to measure the constructs in our research model from the customer perspective. We administered our anonymous surveys online, with the invitations sent to multiple sources in order to capture a sufficient number of respondents who actually used the mobile shopping app in their shopping. Alternatively, an online survey was posted on the user community pages on the social media sites of the two case organizations, in addition to invitation emails sent to a selected sample of current and potential users of the mobile shopping app, comprising of students, faculty members and other staff in one of the leading universities in Australia. Our exercise yielded a total of 129 respondents who actually used the mobile shopping apps, with a response rate of 40% (from 324 who actually accessed the URL). Our subsequent screening for missing data left us with 128 usable respondents (one of the responses omitted data). The demographics of our sample revealed that they were mostly young (born 1965-1989 = 45%) and male (64%).

We used wave analysis (Armstrong and Overton, 1977) to assess the impact of non-respondent bias, whereby the respondents were grouped into early and late respondents, and comparisons were made according to the respondents' age and gender. Our analysis revealed no significant differences between early and late respondents. Based on our findings, non-response bias did not appear to impact on our study. Further, to check the extent to which common method variance - spurious variance that is attributable to the measurement method rather than to the constructs may be a problem, we first conducted the marker variable technique. The results had shown no significant correlations between the marker varia-

<Table 1> Construct Measures

Construct	Items ^a	Measure source ^b
Customer expectations (Customer-expected firm's agility)	e.g., ... I expect [retailer] to ...provide information [about] discounts and promotions based on my specific requirements. ...be responsive to my changing needs and wants	(Bhattacharjee, 2001; Jayachandran et al., 2004; Kohli et al., 1993; Roberts and Grover, 2012a; Roberts and Grover, 2012b; Venkatesh and Goyal, 2010)
Customer experience (Customer-perceived firm's agility)	e.g., ... [Retailer]..... - quickly react to the fundamental changes in my product requirements by providing me with relevant customized information - is fast to provide information about discounts and promotions based on the shopping list created in the mobile app	(Jayachandran et al., 2004; Kohli et al., 1993; Roberts and Grover, 2012a; Roberts and Grover, 2012b)
Customer evaluation of firm's agility	e.g., ... - [Retailers] responsiveness on my shopping requirements is better than what I anticipated - Overall, most of my expectations from using the [retailers] mobile app were confirmed or exceeded.	(Bhattacharjee, 2001; Jayachandran et al., 2004; Kohli et al., 1993; Roberts and Grover, 2012a; Roberts and Grover, 2012b; Venkatesh and Goyal, 2010)
Customer satisfaction	e.g., ... - I am satisfied with... - the purchasing products functionality provided by the app - my overall experience of the [retailer's] mobile app use	(Bhattacharjee, 2001)

Note: ^a 1= Strongly disagree, 7= Strongly agree.

^b Although we drew our survey items from well-established measurement constructs in marketing and IS, we only adapted items that corresponded to the conceptual definitions of our constructs.

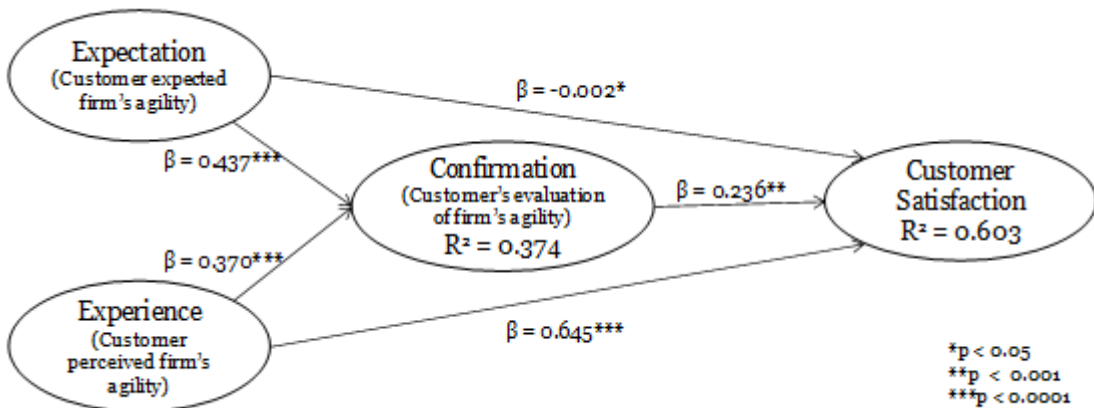
ble and the other variables in the model that are theoretically unrelated instilling more confidence in the research findings (see <Appendix C>).

5.3. Model Testing

According to Barclay et al. (1995), an assessment of a measurement model should examine: a) individual measurement item reliability, b) internal consistency, and c) discriminant validity. We used the partial least square (PLS) technique of structural equation modelling in SmartPLS 2.0 (Ringle et al.,

2005) software to evaluate our research model and the measurement properties of the constructs and individual items. PLS also allows a researcher to test the psychometric properties of the scales used to measure variables in a measurement model, and the estimation of the structural model on the strength and direction of the relationships between the variables, simultaneously (Xu et al., 2011).

To support individual item reliability, we checked the loadings of the individual measurement items on their intended constructs and compared them against the recommended tolerances of 0.60, or ideal-



<Figure 3> PLS Analysis of The Research Model

ly 0.70, as stipulated in the extant research (Barclay et al., 1995; Chin, 1998). All of the measurement items except one met the ideal tolerance threshold of 0.70. Moreover, as seen in <Appendix B>, the loadings of a given construct's indicators were higher than the loadings of any other, and the same indicator's load was higher on the intended construct than on any other, lending support to the discriminant validity. Alternatively, we created a post-hoc model of expectations-experiences-satisfaction for which all the individual measurement items met the ideal tolerance limit of 0.70 (Barclay et al., 1995; Chin, 1998). The Average Variance Extracted (AVE) also suggested that overall the discriminant and convergent validity of the model were acceptable (see <Appendix D>). Further, we calculated the composite reliability and Cronbach's alpha for each construct to examine the internal consistency of the constructs and all met the suggested tolerances of > 0.70 (Fornell and Larcker, 1981).

We next analysed the structural model to see the significance and strength of the relationships between the constructs using a PLS model using SmartPLS software. We examined the standardized path co-

efficients, path significances and variance explained (R^2) to test the predictive power of the model. The paths between each of the constructs of the research model showed a strong and significant positive relationship (expectation-satisfaction, $\beta = -0.002$, $p < 0.05$, experience-satisfaction $\beta = 0.645$, $p < 0.0001$), with the confirmation of expectations and experiences explaining 60.3% of the variance (R^2) of customer satisfaction for the post-hoc model (<Figure 2>). The predictive power of the dependent variable in our research is in line with those reported in expectation confirmation and satisfaction research (ECT applications) in the past studies (Liao et al., 2009; Thong et al., 2006; Venkatesh et al., 2011). The high R^2 of the current study can be explained through (i) immediate gratification between the two conditions, where the respondent seeks retailer's intervention to their expectation without delay (ii) the likelihood that the scenario depicted in the research model demonstrates the reality, (iii) the better alignment between the experience and expectations and (iv) the general fit of data with the model. Whilst PLS analysis shows support for our hypothesis but, it doesn't provide information on how the three main

constructs expectation, experience and satisfaction behave in combination, nor does it explain the non-linear relationships that suggest the theory. So we use polynomial regression analysis together with response surface methodology to test our hypothesis further.

5.4. Hypotheses Testing

Following the theoretical perspectives that suggested nonlinear relationships, we used polynomial modelling, coupled with response surface methodology to study agility and to interpret organizational agility from the viewpoint of customers by understanding how agility relates to customer expectations, customer experiences and customer satisfaction. So, we propose:

$$\text{Satisfaction} = f(\text{customer expectations}^*, \text{customer experiences}^{**})$$

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

Where, in this study *EFA = Customer expectations (i.e., customer expected firm's agility, **PR = Customer experiences (i.e., customer perceived firm's agility).

Hierarchical analysis of polynomial equations in polynomial modelling can be applied in both confirmatory as well as exploratory approaches (Edwards, 2001). In conducting the analysis, the data at both points of measurements (i.e., dependent and independent) were calculated with the scale-centered item measures. Scale centering is done by subtracting the scale midpoints from the actual score which reduces the multi-collinearity problems and allows meaningful interpretations of the coefficients of the polynomial equations (Edwards, 2001). <Table 2> reports the results of the polynomial equation.

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 <Table 2> reveals very little as to the shape of the surface they represent. 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. The response surface is 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

<Table 2> Results of Polynomial Regression Analysis

	Beta coefficient / Unstandardized regression coefficients
Intercept / Constant	5.526
Customer Expected Firm's Agility (EFA)	-0.278**
Customer Perceived Firm's Agility (PFA) (i.e., Customer Experience)	0.663*
EFA ²	-0.116
EFA*PFA	0.019**
PFA ²	0.031

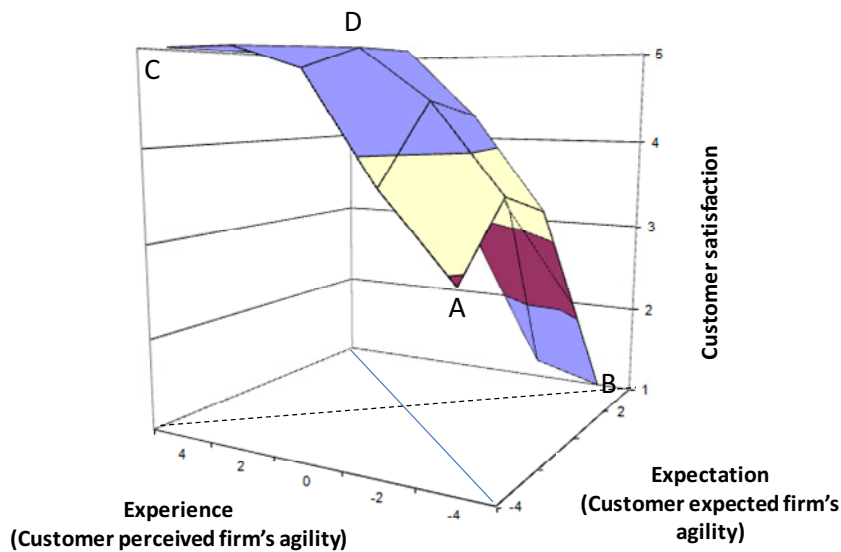
* $p < 0.0001$, ** $p < 0.05$

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). <Figure 2> depicts a response surface for customer expectations and customer experiences (we refer to the customer-perceived firm's responsiveness here) as it relates to customer satisfaction.

To test our first and second hypotheses, we first examined the two curves, namely, the expectation curve (line along A-B) and experience (customer perceived firm's agility) curve (line along A-C) against the outcome variable, namely, customer satisfaction. H1 suggested that prior customer expectations are negatively associated (inversely proportional) to customer satisfaction and in fact it does behave the way we assumed however in a curvilinear manner. The expectation curve suggests that the customer satisfaction is greatest when the customer expectations are modest/modest level of firm's agility (along line A-B, closer to the midpoint of line A-B).

Customer satisfaction reaches its minimum when the customers set their expectations (expect firm's to be highly agile) at its maximum (Point B), while lower levels of customer expectations (expect very little or no agility from the firm) yield somewhat moderate levels of customer satisfaction (Point A). It also suggests that the moderate levels of customer expectations (i.e., better managed customer expectations) are more likely to yield higher levels of customer satisfaction compared to lower levels of expectations and specifically the higher levels of expectations.

Our second hypothesis, H2, suggested that customer experiences (i.e., customer perceived firm's agility) are positively associated (directly proportional) with customer satisfaction. As shown in the graphical representation in <Figure 4> above, in fact the findings support our arguments as the customer satisfaction is positively associated to customer experiences (line A-C). Customers are highly satisfied when the customer-perceived firm's agility reaches moderate to high levels (towards point C), while the customer



<Figure 4> Customer Expectations and Experience as It Relates to Customer Satisfaction

satisfaction is at moderate levels when the customer perceived firm's agility (i.e., experience) is mediocre (point A).

Our third hypothesis, H3, suggested that aligning prior customer expectations (i.e., customer expected firm's agility) to actual (perceived) customer experiences (customer perceived firm's agility) would be positively related to customer satisfaction. As elucidated in Olson and Dover (1979), this suggests that the customer satisfaction will be greatest when customer expectations are equal to their actual experience (we refer here to the customer-perceived firm's agility). The solid line on the floor of the graph (<Figure 2>) depicts the line of perfect agreement between customer expectations and customer experience (i.e., perceived agility) ($X=Y$, representing line A-D on the surface of the graph). Moving along the $X=Y$ line from the front of the graph to the back (from point A towards B), the line of alignment of expectation-experience, as related to customer satisfaction (Z), has a positive slope. Thus, agreement between customers expected firm's agility and customer perceived firm's agility matters. The lowest level of customer satisfaction (along line $X=Y$) is at the front corner of the graph where customer expected firm's agility and customers' perceived firm's agility are both low, and increasingly higher towards the back of the graph where both customer expectations (expected agility) and perceived agility (i.e., actual experience) are high.

Additionally, the dashed line on the floor of the graph in <Figure 4>, depicts the line of incongruence (the X and Y variables are not in agreement) between customer expected firm's agility (expectations) and customer-perceived firm's agility (experience) ($X \neq Y$). 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 visible in the graph (also refer to <Appendix E>), customer satisfaction is relatively higher when higher perceived firm's agility (experience) is combined with low expectations (customer do not expect firm's to be highly agile), whilst customer satisfaction is relatively low when inferior customer experiences is combined with higher levels customer expectations.

Overall, this response surface has the following key features: 1) the relationship between customer expected firm's agility and customer satisfaction is curvilinear whereby the relationship is negatively associated (inversely proportional) to customer satisfaction; 2) the relationship between customer experience (customer perceived firm's agility) is positively associated (directly proportional) with customer satisfaction; 3) when customer expected firm's agility are equal to their actual experiences, the customer satisfaction will be greatest when the line of alignment of expectation-experience, as related to customer satisfaction (Z) has a positive slope; and 4) customer satisfaction is relatively higher when higher perceived levels of firm's agility is achieved (experience) in combination with low expectations and *vice versa*.

VI. Discussion

This study proposed a new approach to understand a firm's customer agility from its customers' standpoint, which outlined possible complex interactions between customer expectations, firm's responsiveness and ultimate customer satisfaction. Herein we integrated the expectation confirmation theory and notions of organizational agility to understand customers' perspective of a firm's agility. Thus, we relate customer expectations (needs and wants of customers that matters to the firm) and customer experiences

(firm's responsiveness / customer agility as perceived by customers) and customer satisfaction (in determining a key outcome) to conceive customers' standpoint of a firm's customer agility. We tested the proposed model in a field study that used survey data from customers of the two largest retailers in Australia. The customers responding to the survey instrument were regular users of the retailers' mobile shopping apps. We collected data from the customers who uses the smart mobile shopping apps about their expectations of the firm's responsiveness (customer expected firm's agility on their needs and wants), their actual experience (customers' experience relating to firms ability to respond to their needs and wants that are unique to each individual / firm's customer agility as perceived by customers), and the level of satisfaction that customers attain based on their actual experience. We tested the conceptual model using the PLS technique of structural equation modelling in SmartPLS 2.0 software (Ringle et al., 2005), polynomial modelling and response surface methodology and found that in fact the customer expectations and actual customer experiences did influence customer satisfaction and explained over 60% of variance in customer satisfaction. Additionally we discussed the importance of aligning (achieving or exceeding) customers' expected levels of agility with their actual experiences. In the remainder of this discussion, we focus on both theoretical and practical implications of our findings prior to the concluding comments at the end.

This discussion sought to make contributions to both agility research, particularly in regard to the customers' perspective of firm's customer agility, and expectation confirmation research in the IS context. In this study we conceptualized customers' view of firms customer agility and empirically tested a research model that viewed a firm's customer agility

(Roberts and Grover, 2012a; Roberts and Grover, 2012b) from the customers perspective through the lens of expectation-confirmation theory (Oliver, 1980a; Oliver et al., 1994b). Broadly speaking, our empirical analysis found that customers' expectations and their actual experiences in the form of perceived firm's agility were significantly related to customer satisfaction.

Our study has a number of implications for agility research. As we isolated key attributes and characteristics of agility from the customers' point of view, we suggest that future research is necessary in order to consider the attributes and characteristics we summarized when conceptualizing agility from the customer perspective. Additionally we took two variables, namely, customer expectations and customer experiences, in order to view a firm's agility from the customer perspective; we suggest that future research could consider customer expectations, experiences and satisfaction in a longitudinal study to understand the temporal nature of the customer's evaluation of a firm's agility. We also suggest that future applications of agility research take multiple perspectives when investigating agility-related phenomena.

This research also highlighted an important consideration for both agility and ECT research by relaxing the linearity assumption and the use of polynomial regression with response surface methodology, by staying true to the previous theoretical assumptions of curvilinearity (Staples et al., 2002) among the variables of interest. Although a number of studies have investigated the notion of agility, this is one of the first studies to consider the customers' view of a firm's agility. This is also one of the first such studies in the agility domain to use ECT as the theoretical lens to look at firms' agility.

For practice, our empirical investigation suggests

that a firm should align customer expectations to the actual customer experiences through a better utilization of the firm's responding capabilities in order to achieve business benefits and sustained competitive advantage through superior customer satisfaction. Hence, we suggest that firms place equal (or more) emphasis on nurturing their responding capabilities in order to match or exceed customer expectations (as sensed through the firms' sensing capabilities), by configuring and organizing themselves and aligning their sensing and responding capabilities. We also suggest that firms do not set customer expectations at very high, unrealistic levels or at very low mediocre levels because such levels of expectations are more likely to produce relatively unhappy customers. It is better for firms to set customer expectations at reasonable levels and meet such expectations with superior experiences as perceived by customers and to have happy and satisfied customers.

Our study has several limitations. First, our use of mobile shopping as the context may limit our ability to fully understand customers' view of firm agility from the expectation-experience-satisfaction variables. While the constant advancements of mobile technology, nature of mobile applications, interactivity and their use in the organizational context

poses many challenges for developing meticulous measures, future research should develop more rigorous measures to view agility from the customer standpoint. We believe that this study adds more detail to the agility construct by introducing the missing customer perspective to the extant body of literature. It reflects the importance of the customer perception in today's hypercompetitive business environment. However, in order to understand this critical, yet under-investigated perspective, and to build on this work, more research is required on the nomological network around customers' perspectives of agility. Now that we have investigated firm's agility from the customer perspective using the contemporary mobile shopping context, future research may extend this work to other relevant contexts such as supply chain agility and operational agility in order to further investigate the customers' view of organizational agility.

In conclusion, our study focused on investigating how customers view a firm's customer agility in the context of contemporary mobile shopping systems in retail. In doing so, through the lens of ECT, we showed how customer expectations and their actual experience of a firm's responsiveness relate to customer satisfaction and subsequent business benefits to the firm.

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<Appendix A> Measurement Items

Appendix A: Definitions of Organizational Agility	
Definition	Source
Firm's profitable comprehensive response to the business challenges in faced in rapidly changing, continually fragmenting, global markets for customer-configured, high-quality goods and services.	Goldman et al. (2007)
The firm's ability to change and adapt quickly in response to rapidly changing environmental conditions.	Bititci et al. (2000)
Firm's ability to cope with unexpected external changes, ability to convert and take them as opportunities, and survival ability on unprecedented threats posed by the environment.	Sharifi and Zhang (2004)
Firm's ability to grow and respond quickly in a continuously and unexpectedly changing, competitive market where the value of products and services driven by customer.	Yusuf et al. (2004)
Organizational ability to thrive in a constantly changing, unpredictable environment.	Day (2011)
Firm's ability to sense opportunities and seize them by assembling requisite knowledge, assets, and relationships with speed and dexterity.	Sambamurthy et al. (2003)
Firm's ability to sense environmental changes and respond readily.	Overby et al. (2006)
Organization's ability to discover new opportunities for competitive advantage, tie together the assets, knowledge and relationships to seize them, and adopt abrupt changes in the business environment.	Setia et al. (1977)
The ability to sense and respond to opportunities and threats with ease, speed, and dexterity.	Nazir and Pinsonneault (2012)
Ability of the firm to sense and respond quickly to customer-based opportunities for innovation and competitive action.	Roberts and Grover (2010a)

<Appendix B> Construct Measures

Construct	Items	Source of Measure
Customer expectations (What customers expect from the firm)	I expect [the retailer] to... - provide information about discounts and promotions based on my specific requirements - be responsive to my changing needs and wants - provide personalised offers based on products that I purchase regularly	(Brown et al., 2008; Brown et al., 2011)
Customer experience (Perceived responsiveness)	- [The retailer] quickly reacts to the essential basic changes in my product requirements by providing me with relevant personalised information - After browsing recipes using the mobile app, [the retailer] is quick to provide promotional information for the products required to make that recipe - When I continue to purchase a new product (e.g. baby nappies) repetitively, [the retailer] is quick to respond to it by providing other associated product information (e.g. other baby products) - [The retailer] is fast to provide information about discounts and promotions based on the products I purchase regularly - [The retailer] is quick to provide information on discounts and promotions for my preferred store based on the products I created in my shopping list in the mobile app - [The retailer] is able to recognise changes in my physical location to prompt discounts and promotions on my usual purchases for the store nearby - [The retailer] often recommends products that can easily satisfy my changing needs - [The retailer] can easily satisfy my new and changing needs - The product displayed in the "my specials" section of the mobile app reflects my specific requirements - Overall, the promotions I regularly receive from [the retailer] are useful and match my unique daily requirements	(Jayachandran et al., 2004; Kohli et al., 1993; Roberts and Grover, 2012a; Roberts and Grover, 2012b)
Customer's evaluation (How customers evaluate their actual experience)	- My shopping experience with [the retailer] was better than what I expected - The responsiveness of [the retailer] on my shopping requirements is better than what I anticipated - Overall, [the retailer] was able to confirm or exceed most of my shopping expectations	(Brown et al., 2008; Brown et al., 2011)
Customer satisfaction	- I am satisfied with... - the personalised promotions/offers I receive from [the retailer] - [the retailer's] responsiveness to my changing needs and wants - my overall shopping experience with [the retailer]	(Bhattacharjee, 2001)

<Appendix C> Results of Marker Variable Test for Common Method Variance (CMV)

	Evaluation	Expectations	Experiences	Gender	Satisfaction
Evaluation	1	0	0	0	0
Expectations	0.442	1	0	0	0
Experiences	0.2513	0.2162	1	0	0
Gender (Marker variable)	-0.0702	-0.0331	-0.1747	1	0
Satisfaction	0.6307	0.355	0.3243	0.0996	1

<Appendix D> Internal Consistency, Discriminant Validity of Constructs and Inter-Construct Correlations

	Construct	AVE	Composite reliability	Cronbach's alpha	R square	communality	1	2	3
1	Expectation	0.9477	0.9731	0.9448	0	0.9477	1		
2	Experience	0.6912	0.9569	0.9509	0	0.6912	0.1417	1	
3	Evaluation	0.9548	0.9845	0.9764	0.374	0.9548	0.4896	0.4322	1
4	Satisfaction	0.8574	0.9232	0.8340	0.6027	0.8574	0.2046	0.7468	0.5140

<Appendix E> Results of the Regression Analysis

Testing Slopes and Curves					
	Effect	Coefficient	Standard Error	Test Stat (t)	P-value
	a ₁ : Slope along x = y (as related to z)	0.39	0.57	0.671	0.503
	a ₂ : Curvature on x = y (as related to z)	-0.07	0.31	-0.220	0.827
	a ₃ : Slope along x = -y (as related to z)	-0.94	0.28	-3.367	0.001
	a ₄ : Curvature on x = -y (as related to z)	-0.10	0.12	-0.837	0.404

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