

Reconceptualizing integration quality dynamics for omnichannel marketing

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Abstract

Omnichannel marketing, the notion of seamless integration between channels to provide consistent service experience for customers, has become one of the most crucial aspects of multichannel management for companies in recent years. Although many companies have embraced omnichannel strategies, there remains a gap of understanding factors influencing integration quality (INQ) within all these channels. Drawing on omni and multi channel services research, this paper develops and validates the dimensions and sub-dimensions of omnichannel integration quality. This research further examines how the perceived INQ impacts cross-buying behavior and value in an omnichannel environment. This research is based on 20 in-depth interviews, two focus group discussions (n=18) and 301 survey data from

multichannel banking customers in Australia. PLS path modeling was used to test hypothesized relations and validate the hierarchical INQ model and its effects on outcome constructs. The findings of this research confirm that INQ is a hierarchical construct consisting of four primary dimensions and ten sub-dimensions. Furthermore, this research provides evidence of cross-buying intentions as a behavioral outcome of INQ, which acts as a partial mediator between INQ and perceived value.

Keywords Service Quality, Integration Quality, Cross-buying Intention, Omnichannel Marketing, PLS Hierarchical Model.

Paper type: Research paper

1 Introduction

Research on omnichannel management is gaining momentum as reports show implementing an omnichannel system results in 250% higher purchase frequency, 13% more order value, 90% higher customer retention, and 13.5% more engagement rate compared to a single-channel system (Collins 2019). At Myer, one of Australia's largest department stores, omnichannel implementation resulted in a 41.1% increase in online sales in 2017 (Cameron 2017). In a B2B context, Hansen and Sia (2015) showcase the importance of omnichannel strategy using insights of Hummel, a Denmark based sports and lifestyle apparel. Hummel's omnichannel strategy is built on a B2B network of distributors, licensed partners, and online-offline retailers. Developing an omnichannel strategy helped Hummel to increase its total sales from \$170 million in 2010 to \$240 million in 2013 (Hansen & Sia 2015). Additionally, its online sales grew from 5% to 21% from 2010 to 2013.

Customers nowadays use several channels such as physical stores, websites, direct mail and catalogs, social media sites, review sites, call centers, mobile devices, kiosks, home services, networked appliances, and so on to complete even a single purchase. Omnichannel management refers to the integration of all these channels of a firm and customer touchpoints, which ultimately results in customer satisfaction through a seamless service experience (Barwitz & Maas 2018; Hossain et al. 2019; Huré et al. 2017; Shareef et al. 2016ab; Shi et al. 2020; Van De Wijngaert et al. 2011; Yang et al. 2019). Seminal academic and industry research have showcased the importance of omnichannel in today's retail and service sectors (i.e., Brynjolfsson et al. 2013; Dennis 2018; Mcglynn & Conlan 2017; McKinsey 2017; O'Grady et al. 2018). Recent academic studies on channel management has focused on omnichannel marketing, where definitions (Rigby 2011; Verhoef et al. 2015), dimensions (Akter et al. 2019; Lee et al. 2019; Shen et al. 2018), effects (Huré et al. 2017; Lee et al. 2019; Picot-Coupey et al. 2016; Shen et al. 2018) and strategies (Barwitz & Maas 2018; Blom et al. 2017; Hübner, Holzapfel, et al. 2016; Hübner, Wollenburg, et al. 2016) involving omnichannel system has been discussed.

Despite its importance, there is little evidence of the effect of omnichannel on firms and customers. Specifically, there is a paucity of studies in regards to the integration of various channels and their effects on customers (Banerjee 2014; Trenz 2015). Although integrated/seamless experience of using various channels is one of the vital foundations of omnichannel marketing (Huré et al. 2017; Lee et al. 2019; Li et al. 2018; Shen et al. 2018; Verhoef et al. 2015), the extant literature often used a siloed approach in this stream by viewing offline and online channels separately (Herhausen et al. 2015; Huré et al. 2017). This siloed approach is no longer appropriate as customers frequently use more than one channel these days. A recent study reports that organizational silos are still the most significant barriers in

creating a customer-centric business (Harvard Business Review Analytic Services 2018). For example, H&M reported a loss of its share price in late 2017 which was mainly because of the lack of online-offline integration and customer dissatisfaction resulting from inconsistent information between channels (Sharma 2017). Other retailers such as Debenhams and Marks and Spencer announced store closure due to being unable to change store portfolio (O'Grady et al. 2018). Hence, integration of physical and virtual channels through omnichannel service delivery is the key to the enhanced service quality (Rizzi & Taraporevala 2019).

To address the critical issue of integration within channels, several studies suggest *integration quality* (INQ) or synchronizing service elements within channels as the key to rendering seamless experience (Banerjee 2014; Montoya-Weiss et al. 2003; Sousa & Voss 2006). However, despite its importance, addressing integration quality (INQ) of omnichannel services remains fragmented and mostly conceptual. Only a few studies have conceptualized and tested dimensions of integration quality (Hsieh et al. 2012; Lee et al. 2019; Oh & Teo 2010; Shen et al. 2018; Wu & Chang 2016). The findings of these studies make it apparent that there remains scope for developing and validating an integration quality model in the context of omnichannel services delivery. Additionally, there is a lack of studies investigating the effects of INQ on cross-buying intention and perceived value. Whereas cross-buying intention refers to customers' intent to purchase additional products from the same firm (Kumar & Venkatesan 2005), perceived value refers to the perception of net benefit against the cost associated with receiving a service (Zeithaml 1988). To address these gaps, we utilize dynamic capabilities theory (Helfat et al. 2009; Teece et al. 1997) to relate integration quality with dynamic capabilities and put forward the research questions: ***What are the dimensions of omnichannel integration quality and how does this quality perception determine cross-buying intentions and perceived value?***

There are several areas where this study makes original, theoretical, and practical contributions to INQ research. First, using the integration quality concept, we conceptualize and empirically test the dimensions and sub-dimensions of INQ. Second, we develop a hierarchical quality model for omnichannel services, which extends current research by adding several new dimensions and provides empirical evidence for proposed conceptual dimensions (Banerjee 2014; Sousa & Voss 2006). Finally, we examine the behavioral impact of INQ on service outcome by linking cross-buying intention and perceived value to address the high priority research call by Kumar and Venkatesan (2005) and Ngobo (2004). The paper is structured in the following manner: Section 2 presents a thorough literature review, and Section 3 demonstrates a conceptual model and hypotheses developed from the findings of the literature review and qualitative study. The methodology (Section 4) is discussed and followed by the data analysis (section 5) and summary of finding (Section 6) of this research. Based on the analysis, a theoretical (Section 7) and managerial contribution (Section 8) and future research directions are presented in Section 9.

2 Literature Review:

2.1 Omnichannel Marketing

The disruptive change brought by smartphone and other mobile devices (Shankar et al. 2010) has induced customers to expect more enriched and seamless shopping experience in terms of channel scope (increasing number of channels and touchpoints) and focus (the overall customer brand experience) (Picot-Coupey et al. 2016). In this context, research progressed to multichannel integration or cross-channel retailing (Bendoly et al. 2005; Cao & Li 2015) and, recently, to omnichannel retailing (Brynjolfsson et al. 2013; Rigby 2011; Verhoef et al. 2015). Rigby (2011, p. 67) first coined the term *Omnichannel* retailing to address the current and rapid proliferation of digital retailing by defining omnichannel as “*an integrated sales experience*

that melds the advantage of physical stores with the information-rich experience of online shopping.” Verhoef et al. (2015, p. 176) define omnichannel management as *“the synergetic management of the numerous available channels and customer touchpoints, in such a way that the customer experience across channels and the performance over channels are optimized.”*. Rigby (2011) indicates omnichannel experience as an integrated sales experience combining the advantage of both physical and information-rich online shopping. Omnichannel is not just simultaneous use of channels; instead, it is the integration of all available channels within a company (Lazaris & Vrechopoulos 2014). Also, Levy et al. (2013) define omnichannel as a coordinated offering using all the channels of a retailer to provide a seamless customer experience. Brynjolfsson et al. (2013) foresee omnichannel marketing as an experience which will diminish the distinction between online and offline channels and turn the world into a showroom without walls.

2.2 *Integration Quality and its Dimensions*

As discussed earlier, the notion of integration is of utmost importance for omnichannel marketing. Service quality research has addressed the issue of channel integration within the multichannel environment and termed it as integration quality (INQ) (Banerjee 2014; Lee et al. 2019; Sousa & Voss 2006). These studies of INQ argue a firm which provides services through multiple channels may have a good level of physical and virtual quality. However, because of the inconsistencies between the channels, the overall quality perception may be less. Due to this phenomenon, Sousa and Voss (2006, p. 365) suggest INQ as a significant factor of multichannel services and is defined as *“the ability to provide customers with a seamless service experience across multiple channels.”* The focus of INQ is to capture the essential characteristics of physical and virtual channels as a whole and to provide a consistent customer experience through all the channels that a company utilizes.

Although there is a dearth of research conceptualizing INQ, several views on dimensions and consequences of integration quality exist. The earliest conceptualization of channel integration by Saeed et al. (2003) propose informational integration; content integration; and logistical integration as value-added services to create synergy between click and mortar stores. Similarly, several studies have discussed strategies for companies to ensure a well-integrated channel system (Bendoly et al. 2005; Berman & Thelen 2004; Neslin et al. 2006; Payne & Frow 2004). These studies do not focus on service quality of multichannel services; instead, propose the directions and strategies to create a synchronized multichannel system.

Sousa and Voss (2006)'s research is among the first studies to address multichannel service quality. They coined the term integration quality within service quality literature and proposed specific dimensions of INQ. Dimensions of INQ suggested by Sousa and Voss (2006) include channel-service configuration and integrated interactions. Furthermore, Sousa and Voss (2006) propose breadth of channel choice and transparency of the existing channel-service configuration as sub-dimensions of channel-service configuration, while content consistency and process consistency as sub-dimensions of integrated interactions. Banerjee (2014) extends the work of Sousa and Voss (2006) by using a qualitative, case study research data from banking customers and propose two new dimensions; namely, appropriateness of channel-service configuration and transaction data and interaction data integration.

Dimensions proposed by Sousa and Voss (2006) and Banerjee (2014) are conceptual, and no empirical evidence has been offered in their papers. Banerjee (2014) suggests generating scale items for a research instrument as the way forward for service quality and integration quality research. Hence, within this scope, the current study explores new dimensions and even transform existing conceptual dimensions of previous studies to contribute to the overall knowledge of service quality literature.

A few studies have addressed channel integration using quantitative analysis. Dimensions proposed by Oh and Teo (2010) are integrated product and pricing information, integrated transaction information, integrated promotion information, integrated information access, integrated customer service, and integrated order fulfillment. Wu and Chang (2016) purport transparency of service configuration, information consistency, process consistency, and business ties as dimensions of integration quality. Finally, Lee et al. (2019) and Shen et al. (2018) use the context of omnichannel retailing to provide empirical evidence of dimensions proposed by Sousa and Voss (2006).

From the above literature, this study has identified that only a few dimensions of INQ have been conceptualized and empirically validated in the context of multichannel and omnichannel marketing. There is a scope of conceptualizing and providing empirical evidence of new dimensions such as privacy, security, system consistency, service recovery, image consistency, system consistency and so on, which have not been addressed within multichannel or omnichannel services in prior studies. Furthermore, the extant literature on INQ focuses only on two channels, i.e., physical and website. There is a scope to address INQ considering mobile as a separate channel, as defined by omnichannel management.

2.3 Outcome of Integration Quality, Cross-buying Intentions and Perceived Value

Several articles have discussed different behavioral outcomes due to the integration of channels. Integration quality leads to perceived value (Oh & Teo 2010; Wu & Chang 2016), purchase intention (Herhausen et al. 2015; Wu & Chang 2016), sales growth (Cao & Li 2015), overall satisfaction (Hammerschmidt et al. 2015), search intentions (Herhausen et al. 2015), and loyalty (Schramm-Klein et al. 2011). Within the omnichannel context, channel integration has been found to impact omnichannel usage intentions (Shen et al. 2018), customer engagement, repurchase intentions and positive word-of-mouth (Lee et al. 2019).

From the above analyses, it is apparent that only a few behavioral aspects have been analyzed in the context of channel integration. There is a scope to conceptualize other behavioral aspects as outcomes of INQ. According to Banerjee (2014), the measure of consumer perception on integration quality has not been addressed adequately.

Research has indicated the possible relation of service quality with cross-buying intention and customer value (Kumar & Venkatesan 2005). Cross-buying is defined as the total number of different products that a customer has bought from a business, calculated from the first purchase (Kumar et al. 2008). Reinartz and Kumar (2003) argue that cross-buying is related or unrelated sets of products or services that a customer buys from a firm. From a service marketing point of view, cross-buying is purchasing additional products from the same service provider (Ngobo 2004). Several multichannel studies have focused on cross-buying intentions as service quality perception influenced by multichannel services (Kumar & Venkatesan 2005; Neslin et al. 2006).

In an omnichannel setting, cross-selling is more applicable as a retailer's various channels are leveraged for the selling purpose. This leads to a convenient shopping experience for shoppers. Customers feel more satisfied as they can purchase additional items from a trusted retailer, which saves their time and enhances the overall shopping experience. One omnichannel customer experience that fits naturally with cross-selling is BOPIS ("buy online, pick up in-store"). Within this context, Cummins et al. (2016) propose further research to be conducted on omnichannel marketing efforts and analyze its results on customer retention or up- and cross-selling aspects.

In addition to cross-buying intentions, there is a growing body of literature that recognizes the importance of customer's perceived value in marketing and consumer behavior literature

(Overby et al. 2004; Reynolds & Gutman 1988; Vinson et al. 1977). Zeithaml (1988) defined customer value as the utility that consumers receive from a product or service, perception of the net gain from what is given compared to what is received. It is the trade-off between price and quality, better described as value for money (Sweeney & Soutar 2001). Additionally, multichannel literature has also focused on perceived value as an outcome of service quality perception (Oh & Teo 2010; Wu & Chang 2016).

There is a lack of research that focuses on cross-buying as a service quality perception of integration quality. Furthermore, the relation between cross-buying and perceived value is absent in extant literature. Hence, there is a scope for measuring cross-buying intention and customer value as INQ outcomes.

2.4 Dynamic Capabilities and Dimensions of Integration Quality:

A dynamic capability is defined as “the capacity of an organization to purposefully extend, create, or modify its resource base” (Helfat et al. 2009, p. 1). Dynamic capabilities initially appeared in the work of Teece et al. (1997) as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al. 1997, p. 516). Most definitions of dynamic focus on a firm’s ability to reconfigure its resources. For instance, Teece et al. (1997) define dynamic capabilities as a firm’s ability to reconfigure in order to address environmental changes. While Eisenhardt and Martin (2000) argue dynamic capabilities as the processes by which a firm reconfigures its resources to respond/create changes in the market.

Using the firm’s resources through internal processes is the key to dynamic capability (Eisenhardt & Martin 2000; Helfat et al. 2009). There can be different types of processes. Out of which two processes are more significant, i.e., search and selection, and configuration

(Helfat et al. 2009, p. 4). Search and selection involve all processes and activities of the firm, which are related to looking for alternative solutions to a problem and identifying an appropriate solution to be able to solve the problem and share among organization's members (Zott 2003, p. 104). On the other hand, configuration involves foreseeing how to implement a change by altering the firm's resources (Helfat et al. 2009; Zott 2003).

Based on dynamic capabilities theory, this paper suggests omnichannel integration quality dimensions as dynamic capabilities of a firm. To implement integration within channels, managers need to alter channel configurations, which is a higher-level orchestration of channels' ordinary capabilities. INQ dimensions such as process consistency, channel service configuration and so on are strategies that involve managers to extend their resources beyond ordinary channel functions. Hence, the relation between dynamic subdimensions and INQ are apparent.

3 Exploratory Phase: Conceptual Framework and Hypotheses Development

Based on the analyses of all proposed dimensions within INQ literature, this study proposes a conceptual model of INQ, which includes three principal dimensions and their sub-dimensions. These are channel-service configuration (breadth of channel, transparency of channels, appropriateness of channels), content consistency (information consistency, transaction data integration), and process consistency (system consistency, image consistency).

Drawing on dynamic capabilities (DCs) approach, the research model conceptualizes the three primary capabilities as second-order DCs (routines that reconfigure first-order DCs) and 8 components as first-order DCs (routines that reconfigure the organizational resource base) (Schilke 2014).

Furthermore, to build on the findings of the literature review and extend the limited knowledge of omnichannel integration quality, this study conducted a qualitative analysis. This qualitative study phase aims to: (1) Confirm the dimensions of INQ, which were identified through the literature review, and (2) Identify new dimensions of INQ.

3.1 Method of Qualitative Research

The qualitative research in this phase included twenty in-depth interviews and two focus group discussions (n=18) that allow the researchers to capture the cognitive structure of users' perceptions of integration quality to ascertain how domain knowledge is linked in their mental models in terms of multichannel services usage. Appropriate ethics approval was obtained to conduct this study. Based on the objective of the qualitative research, interview and focus group participants were chosen using a convenience sample for this study. As this current study is concerned with investigating factors influencing omnichannel integration quality, the unit of analysis necessarily is at an individual level. The selection criteria included customers who hold a banking account in Australia and have used three specific channels of the bank, i.e., mobile app, website and physical branch within the last three months. This criterion ensures that all participants have experience of using multichannel of a service provider, hence, they will be able to provide valuable insights regarding factors influencing the quality of using multichannel. Overall, participants' age ranged from 20 – 58 years old and were 42% female and 58% male.

The approach in this study phase is confirmatory (deductive), therefore, a semi-structured approach to the questions was adopted. The questions were based on each construct, including the new constructs of assurance quality and value of the INQ model.

3.2 *Coding and mapping*

The interviews were recorded, transcribed, and examined using Nvivo and manual thematic analysis (Dagger et al. 2007; Lincoln & Guba 1985). The primary responses were highlighted, and causal statements were identified. Afterward, primary dimensions of INQ were obtained based on the discussion and excerpts. To identify the recurring themes under relevant primary dimensions, the excerpts were analyzed by two academic judges to calculate inter-rater reliability using Nvivo and Microsoft Excel. The inter-rater reliability was 0.82 passing the cut-off point of 0.70 (Straub et al. 2004).

3.3 *Results*

First, our theoretical framework is based on several seminal articles on integration quality (Banerjee 2014; Oh & Teo 2010; Sousa & Voss 2006). This research identified three dimensions and their subdimensions as discussed earlier. Through the qualitative data analysis, the fourth dimension of omnichannel integration, i.e., assurance quality and its sub-dimensions: privacy, security, and service recovery accessibility, are identified as factors influencing INQ. The qualitative analysis played a vital role in confirming the dimensions and subdimension. We further used q-sorting of two experts (interrater reliability scores) to confirm which subdimensions were part of which dimensions that is explained below and discussed earlier.

Throughout the analyses, INQ has been found to be a higher-order multidimensional construct. Figure 1 presents the proposed INQ model. The findings of the exploratory phase are discussed in the next sections to develop the hypotheses for the quantitative phase.

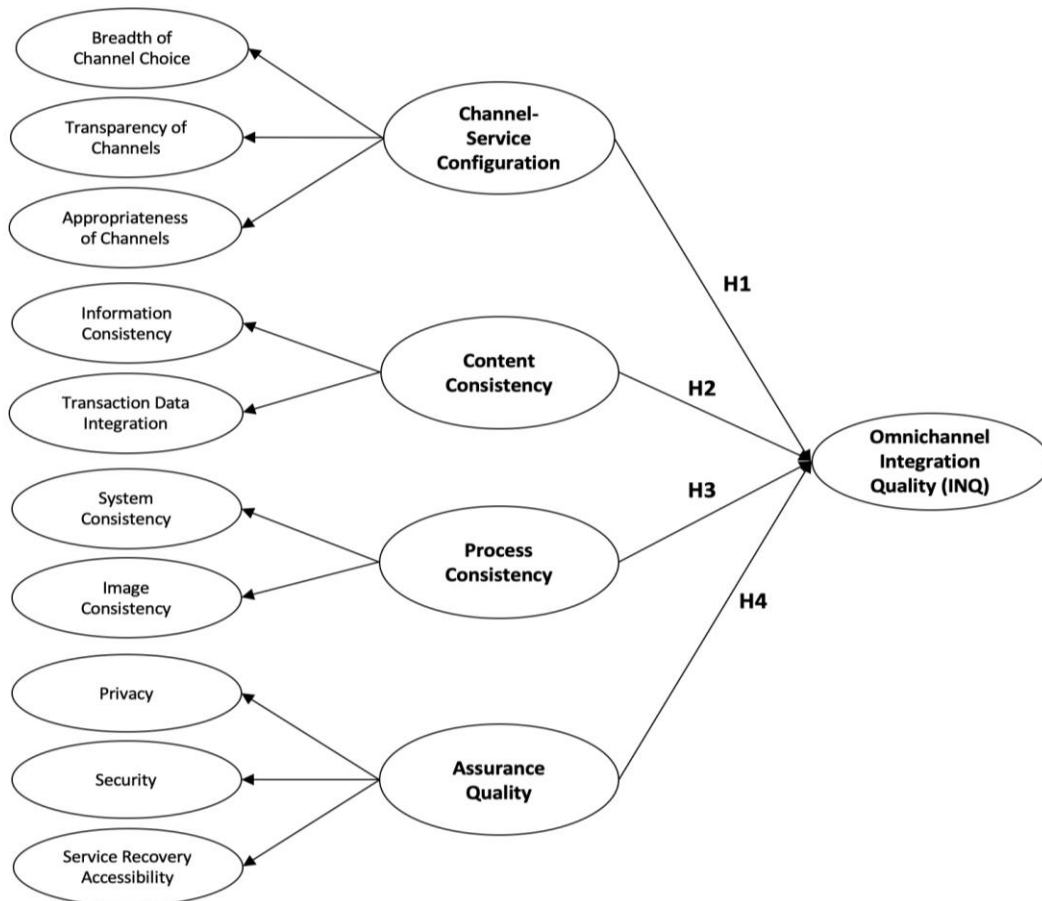


Figure 1 Dimensions of Omnichannel Integration Quality

3.4 Channel-Service Configuration

Channel-service configuration (CSC) refers to channel performance in terms of providing services at the same level of quality and consistency (Banerjee 2014). It is mainly the association between services and channels within a firm (Sousa & Voss 2006). CSC consists of three sub-dimensions, i.e., *breadth of channel*, *transparency of channels*, and *appropriateness of channels*.

Breadth of channel refers to the availability of different channels through which a customer can avail various services (Lee et al. 2019; Sousa & Voss 2006). Customers' purchase process includes search, purchase, delivery arrangement, and in some instances return. Breadth of

channel ensures the availability of different channels through which customers can perform these tasks conveniently. (Lee & Kim 2010). Breadth of channel can be achieved by ensuring different channels such as website, mobile app, physical stores and so on are available for customers to avail services from. Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Transparency of channels refers to customer knowledge of existing channels. It is related to the awareness level of customers regarding the available channels and channel capabilities of the firm (Sousa & Voss 2006). Transparency of channels can be achieved through informing the customers about the firm's channels through advertisements, emails or face to face interactions. Informing customers about channels and channels attributes are essential to determine multichannel service quality for customers. Firms can utilize different communication campaigns to make customers aware of available channels which in turn will lead to increased channel usage intention (Shen et al. 2018). Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Appropriateness of channels refers to the suitability of the channel in providing the service (Banerjee 2014). Banerjee (2014) argues that firms can easily introduce new channels. However, if the channels are not appropriate to deliver specific services, then the overall service quality perception may decline. Appropriateness of channels can be achieved by providing services through channels which are appropriate and by not enforcing customers to use channels which they do not prefer for a service. Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Based on the above discussion the following hypothesis is postulated:

H1: Channel-service configuration (CSC) positively influences omnichannel integration quality (INQ).

3.5 Content Consistency

Content consistency (CNC) refers to the consistency of outgoing and incoming information through different channels of the firm (Lee et al. 2019; Sousa & Voss 2006). Content consistency consists of *information consistency and transaction data integration* as its sub-dimensions.

Information consistency refers to the consistency and uniformity of information within all the service delivery channels of the firm (Banerjee 2014; Oh & Teo 2010). In an omnichannel setting inconsistent information about product or service features will confuse and frustrate customers (Hsieh et al. 2012; Rangaswamy & Van Bruggen 2005). Information consistency can be achieved by ensuring price, details of product assortment, delivery details and so on are consistent within all the channels. Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Transaction data integration refers to collecting customers' transaction data and integrating it within all the channels to provide seamless service (Banerjee 2014). Transaction data integration can be achieved by gathering customers' purchase preference, order, and delivery data, with demographic data such as mail and email address, age, occupation and so on through different channels and integrating them in a central database to be accessed and used by all the channels. Using transaction data, firms can offer personalized services to customers at an individual level (Godfrey et al. 2011). Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

The following hypothesis is postulated based on the above discussion:

H2: Content consistency (CNC) positively influences omnichannel integration quality (INQ).

3.6 Process Consistency

Process consistency (PRC) is related to service design, which refers to the consistency of various customer-facing elements that are relevant and comparable within different channels. Service's feel, waiting time, image, employee discretion level gauge the quality of process consistency (Banerjee 2014; Shen et al. 2018; Sousa & Voss 2006). This research identifies *system consistency and image consistency* as sub-dimensions of process consistency.

System consistency, which is derived from electronic service quality research and information systems refers to the technical issues of service delivery process, which are required to ensure all the channels of the firm perform at a consistent level (Akter et al. 2016; Delone & McLean 2003). Consistent ease of navigation, search, order, payment and return using all the service delivery channels are required to ensure system consistency. In an offline context, design, layout, convenience of finding products, and ease of payment, are related to consistent system (Kim et al. 2005; Parasuraman et al. 1985), while in an online context, website or mobile app layout, functionality, search capability, flow, and ease of payment facilities are related to consistent system quality (White et al. 2013). Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Image consistency refers to consistent use of the store's brand name, logo, slogan, and color within all the channels (Oh & Teo 2010). To ensure image consistency, ambient cues of a physical facility such as logo, surrounding colors, music, and overall feel should be reflected through typesetting, graphics, and display colors in websites and mobile apps (White et al.

2013). Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

Thus, from the above discussions, this research posits that:

H3: Process consistency (PRC) positively influences omnichannel integration quality (INQ).

3.7 Assurance Quality

Assurance quality (ASQ) refers to different channel attributes that convey confidence and trust within customers. Assurance of service while using multichannel has been conceptualized as a dimension of channel integration by Hossain et al. (2019). Furthermore, this research conceptualizes ASQ through qualitative data analysis, and it confirms *privacy, security, and service recovery accessibility* within all the channels is required to ensure ASQ.

Privacy and Security have been researched expansively within e-service quality research (Parasuraman et al. 2005; Wolfinbarger & Gilly 2001; Yoo & Donthu 2001). However, this construct is neglected in the INQ context. *Privacy* refers to the protection of customers' personal information in different channels. *Security* refers to the safe use of different channels of the firm (Parasuraman et al. 2005). Privacy and security are not confined to online channels only but also are essential components of multichannel usage (Montoya-Weiss et al. 2003). Consumers provide personal information online via websites and mobile apps, as well as in-store via self-service technology such as kiosks, and touchless payment. Similarly, security of using both online and offline channels is essential to customers. Online security can be ensured by making website and mobile app free of malware and bugs, while physical security can be ensured by installing security cameras and taking other security measures (Swaid & Wigand

2012). Analysis of the qualitative study indicates the importance of these dimensions and is explained in Appendix A Table A1.

Service recovery accessibility refers to offering customers with channels and incorporated systems through which they can conveniently raise their service-related issues to the firm. Research related to service recovery has always emphasized gathering customer feedback (Hart et al. 1990; Zemke & Bell 1990). Collecting customer feedback is vital for organizations, as without that service recovery cannot be even attempted. Companies should utilize different channels to enable customers to inform service issues easily. Analysis of the qualitative study indicates the importance of this dimension and is explained in Appendix A Table A1.

As such, this research hypothesizes that:

H4: Assurance quality (ASQ) positively influences omnichannel integration quality (INQ).

3.8 *Integration Quality and Cross-buying Intention*

Several studies within multichannel literature have focused on cross-buying intention as a behavioral outcome influenced by multichannel services (Kumar & Venkatesan 2005; Neslin et al. 2006). Cross-buying (CRB) is when customers buy additional products from the same firm (Kumar & Venkatesan 2005). Omnichannel integration enables consumers to purchase from different channels, which enables them to sell additional products by encouraging cross-buying (Berry et al. 2010; Neslin et al. 2006). For example, firms can use different direct marketing methods such as catalogs, emails, e-commerce sites to make consumers purchase products online and also funnel them in-store to buy additional products (Zhang et al. 2010). Another perspective of using multiple channels is firms can cross-promote within channels and increase the opportunity to cross-sell, in that marketing efforts in one channel may enhance

sales through another channel (Berry et al. 2010). Findings suggest catalogs increase sales not only through the catalog channel but also through online and store channels (Pauwels & Neslin 2015). Finally, by integrating customer data using different channels, a firm can offer personalized service to customers and profit through cross-selling products and services. (Godfrey et al. 2011; Payne & Frow 2004; Stone et al. 2002). Within this context the following hypothesis is postulated:

H5: Omnichannel integration quality (INQ) positively influences cross-buying intention (CRB).

3.9 Integration Quality and Perceived Value

Within omnichannel marketing, the importance of customer value has been conceptualized in both offline (Babin et al. 1994; Holbrook 1999) and online (Wolfenbarger & Gilly 2001) context. Customer value is the perception of net benefit against the cost associated with receiving a service (Zeithaml 1988). Research has shown that providing services through multichannel results to utilitarian and hedonic value (Dholakia et al. 2010; Kwon & Jain 2009). Multichannel services facilitate utilitarian value by allowing customers to search for product information, find different product details, and compare products easily through various channels offered by the firm (Noble et al. 2005). From the hedonic perspective, multichannel services enable customers to view themselves as “Smart Shoppers” (Verhoef et al. 2007) and facilitate consumers’ “Variety Seeking Behavior” (Kwon & Jain 2009).

Perceived value has been studied as an outcome of service quality in numerous studies (Parasuraman et al. 2005; Prebensen et al. 2013; Swaid & Wigand 2012), while other studies have included it as a process towards buying intentions (Sweeney et al. 1999; Yu et al. 2011).

Following Parasuraman et al. (2005), this study examines perceived value as an outcome of service quality or more specifically omnichannel integration quality.

Hence, this research examines the impact of INQ and cross-buying intention on customer value by postulating the following hypotheses:

H6: Omnichannel integration quality (INQ) positively influences perceived value (VAL).

H7: Cross-buying intention (CRB) positively influences perceived value (VAL).

3.10 The Mediating Role of Cross-buying Intention

Cross-buying is associated with perceived value. Kumar and Venkatesan (2005) argue that customers who utilize multiple channels, provide higher revenue, are more active, and perceive higher value. Therefore, cross-selling can add value to customers as cross-selling increases customer value through maintaining relationships with existing customers, establish credibility and increase revenue (Slingerland 2018). Providing multichannel facilitates customer value, as customers find purchasing through different channels more convenient and less risky (Schoenbachler & Gordon 2002). Besides, being aware of the different channels and buying different products from the same firm provide value to customers. Hence, cross-buying intention, in turn, will increase perceived value. This research investigates the influence of cross-buying as a mediator of integration quality and perceived value because, first, INQ (predictor) influences CRB (mediator), second, CRB influences VAL (criterion variable), and finally, INQ affects the criterion variable even if the mediator's influence is not present (Akter, D'Ambra, et al. 2013; Baron & Kenny 1986). The following hypothesis is postulated in this regard:

H8: Cross-buying intention (CRB) mediates the relationship between omnichannel integration quality (INQ) and perceived value (VAL).

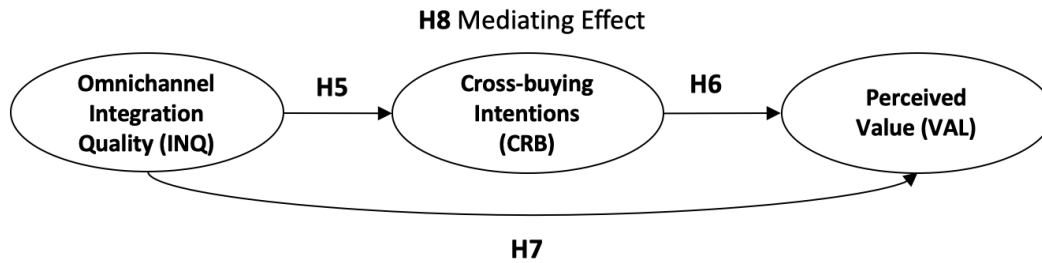


Figure 2: Effects of INQ on Service Outcomes.

4 Method

4.1 Instrument development

Through extant literature review and analyzing qualitative data, this research has come up with multi-item scales within the context of omnichannel marketing. Qualitative data analysis led to the identification of assurance quality and its sub-dimensions privacy, security and service recovery accessibility as dimensions of INQ. Items of privacy and security are adapted from electronic service quality literature (Akter, D’Ambra, et al. 2013; Bansal & Zahedi 2014; Parasuraman et al. 2005), while service recovery accessibility items are adapted from service recovery literature (Smith et al. 2009).

Table 1 provides the scales of each construct including the sources for the items. To measure the items, 7-point Likert scales were used. To confirm the question-wording, format, and understandability of instructions, a pre-test with a convenience sample of 30 was conducted. Some revisions were undertaken according to pre-test results.

4.1 Sampling

The primary survey data were collected using the support of a leading market research company in April 2018. In Australia, this research company holds a database of approximately 250,000 Australian consumers with various demographic profiles (Pureprofile AU 2017). Random sampling was used to obtain customer responses. The unit of measurement was the customers of one of the largest banks in Australia providing banking services through multiple channels. Screening criteria for the sample included customers who are above 18 years old, hold a bank account with the selected bank, and have used mobile app, website, and physical branch of the bank in the last three months. The screening questions were further discussed in section 4.3 to ensure the suitability of the sample.

4.2 Pilot Study

A "full-scale" pilot study was conducted before the main study data was collected following the instrument development process (MacKenzie et al. 2011; Moore & Benbasat 1991; Straub et al. 2004). After instruments were refined in the pre-test stage, the pilot-test stage was conducted to assess the likely response rates and to confirm the scales' reliability (MacKenzie et al. 2011; Straub et al. 2004; Straub 1989). For this stage, the questionnaire created in the Qualtrics platform was circulated to a small sample (smaller than the respondents of the main study). The participants' background and selection criteria were the same as the main study (Hinkin 1998).

The questionnaire was circulated using a marketing research panel, as discussed in section 4.1. 217 potential respondents attempted the survey and 54 of them met the qualifying criteria. The data was then gathered from the Qualtrics platform and exported in excel to perform data analysis. Speeders and flatlines were selected manually. Finally, a sample of 52 respondents

was selected for pilot-test analysis. The sample consisted of diverse group of respondents having 77% Female and 23% Male and from different locations of Australia such as 27% from New South Wales, 21% from Victoria, 13% from Queensland, 10% from Western Australia, 7% from South Australia, 10% from Tasmania and 4% from Northern Territory.

This pilot study conducted the confirmatory factor analysis (CFA) to assess the measurement quality of first-order constructs based on their reliability, convergent validity, and discriminant validity (MacKenzie et al. 2011; Straub 1989). A few items were dropped to improve the reliability of relevant constructs. In general, the measurement assessment for all first-order factors was considered adequate with the confirmation of satisfactory reliability (α and CR > 0.70) and convergent validity (AVE > 0.50, significant loadings > 0.70, $p < 0.001$) and discriminant validity AVE > correlations. Thus, all constructs were confirmed as satisfactory.

Table 1 Operationalization of Constructs

Constructs	Sub-construct	Definitions	Example	Studies
Channel-Service Configuration	Breadth of Channel	Refers to having different channels available for the customer to obtain a particular service.	Banking customers can pay their bills through different channels of the bank, i.e., mobile app, website, ATM, and so on.	(Lee et al. 2019) (Oh & Teo 2010) (Madaleno et al. 2007) (Hsieh et al. 2012) (Seck & Philippe 2013) (Sousa & Voss 2006) (Banerjee 2014)
	Transparency of Channels	Refers to consumer awareness of different attributes of the channels.	Bank tellers inform the customers about all the channels of the bank and the capability of individual channels when the customers first open their banking accounts.	(Wu & Chang 2016) (Sousa & Voss 2006) (Bendoly et al. 2005) (Wu & Chang, 2016) (Lee et al. 2019) (Seck & Philippe 2013) (Oh & Teo 2010) (Banerjee 2014)
	Appropriateness of Channels ¹	Refers to the appropriateness of services provided through specific channels.	Call center agent of the bank asks customers to visit the branch for finalizing loan details, as a call center is inappropriate to provide that service.	(Banerjee 2014) and Qualitative data analysis from interviews
Content Consistency	Information Consistency	Refers to the degree where information transmitted from the company is uniform across its channels.	Information on the website is consistent with the mobile app and physical branch when the customers look for availing different services of the bank.	(Wu & Chang 2016) (Lee & Kim 2010) (Oh & Teo 2010) (Hsieh et al. 2012) (Sousa & Voss 2006) (Lee et al. 2019)
	Transaction Data Integration	Refers to customers' transaction information held and used by the company are integrated and consistent within channels.	The bank offers a tailored credit card after analyzing a customer's high-volume transaction in different channels.	(Wu & Chang 2016) (Oh & Teo 2010) (Berman & Thelen 2004) (Sousa & Voss 2006) (Banerjee 2014) (Hsieh et al. 2012)
Process Consistency	System Consistency	Refers to the system incorporated with all the channels are consistent with each other and easy to use.	Customers find most services offered at the physical branch is available in the mobile app. Availing those services are hassle-free, and the channels are easy to use.	(Akter, D'Ambra, et al. 2013) (Parasuraman et al. 2005)
	Image Consistency	Refers to the store's brand name, slogan, color, and logo are consistent with all other service delivery channels.	Customers can find ATM booths of the bank easily as the color and logo are the same across all channels.	(Oh & Teo 2010)
Assurance Quality	Privacy ²	Refers to the level of protection of personal information incorporated within all the channels.	Customers trust the bank's mobile app, website and also physical facility to disclose personal information.	(Akter, D'Ambra, et al. 2013) (Parasuraman et al. 2005) (Bansal & Zahedi 2014)
	Security ²	Refers to the safety of using different channels of the company.	Bank's website and mobile app are free of malware and other security threats. Similarly, the physical branch is secured	(Bansal & Zahedi 2014) (Montoya-Weiss et al. 2003)

			with security cameras and experienced staffs.	
	Service Recovery Accessibility ³	Refers to providing open lines of communication to customers so that they can voice their service issues easily.	Customers can use their mobile app to report lost credit card; they can also do this by visiting the branch or calling the bank's helpline.	(Smith et al. 2009)
	Cross-buying intention	Refers to the purchase of additional products from the same service provider.	Upon receiving an email from the bank, customers who just have personal accounts, apply for an award credit card by visiting the branch.	(Ngobo 2004) (Kumar & Venkatesan 2005)
	Perceived Value	Refers to the perception of net gain from what is given compared to what is received.	Customers find the omnichannel facility is convenient as it saves their time.	(Sweeney & Soutar 2001) (Parasuraman et al. 2005)

Note: ¹ Items adapted from qualitative interviews and FGDs; ² Items adapted from electronic service quality literature; ³ Items adapted from service recovery literature.

4.3 Main Study

In total, 1888 responses were obtained. After the eligibility and screening check, 596 responses were retained. Respondents aged below 18 years old and customers who did not have experience of using all three channels, i.e., mobile app, website and physical branch of Commonwealth Bank Australia (CBA) in the last three months were eliminated. Furthermore, two attention check questions (ACQs) were placed in between the questionnaire to ensure the data quality. Recent studies have shown that ACQs are used to screen out inattentive respondents or to increase the attention of respondents, they are therefore useful in improving the quality of data collected (Aust et al. 2013; Buhrmester et al. 2011; Oppenheimer et al. 2009; Peer et al. 2014). 254 respondents failed to answer the ACQs correctly. Hence, there were 342 respondents who completed the full questionnaires. Flatlines and speeders were checked manually. Finally, a list of 301 (15.9%) valid responses were used for the final analysis. Therefore, through a rigorous selection process, this research ensured that all the respondents have multichannel experience using all three channels, i.e., mobile app, website and physical branch of the bank making responses suitable for the research.

Respondent's demographic profile represents diverse groups as illustrated in Table 2.

Gender		Age		Annual Income (in AUD)	
Male	52%	Under 18 years old		Under \$18,200	15.61%
Female	48%	18 - 24	13.3%	\$18,201 – \$37,000	22.92%
		25 - 34	29.6%	\$37,001 – \$87,000	36.21%
		35 - 44	19.9%	\$87,001 – \$180,000	22.92%
		45 - 54	16.9%	180,000 and above	2.33%
		55-64	11.0%		
		Over 64 years old	9.3%		

Employment		Education	
Employed full time	46.50%	Year 11 or below	15.00%
Employed part-time	18.90%	Year 12	16.90%

Unemployed looking for work	3.00%	Certificate III/IV	13.30%
Unemployed not looking for work	7.30%	Advanced Diploma and Diploma	27.20%
Retired	12.00%	Bachelor's Degree	7.00%
Student	7.30%	Graduate Diploma and Certificate	9.00%
Other	5.00%	Master's Degree	9.30%
		Doctorate	2.30%
Distribution of Location of Participants			
New South Wales	28%	South Australia	7%
Victoria	31%	Tasmania	4%
Queensland	18%	Northern Territory	3%
Western Australia	10%		

Table 2 Respondents' Demographic Profile

4.4 Data Analysis

INQ is considered as a higher-order construct with ten first-order dimensions (i.e., breadth of channel, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security and service recovery accessibility) and four second-order dimensions (i.e., channel-service configuration, content consistency, process consistency, assurance quality). Meanwhile, the outcome of INQ, customer perceived value (VAL) and the mediator cross-buying intention, (CRB) serve as first-order dimensions.

The research uses a repeated indicator approach as guided by Becker et al. (2012). It estimates the entire constructs simultaneously as an alternative of having separate estimates for lower-order and higher-order constructs (Becker et al. 2012). The mode of measurement is specified as reflective-formative as the first-order dimensions are reflective (Mode A), and higher-order dimensions are formative (Mode B) (Chin 2010; Ringle et al. 2012). Becker et al. (2012) argue that for reflective-formative models, repeated indicator approach produces the best results.

Based on several challenges for this study, we used structural equation modeling using Partial Least Squares (PLS) for data analysis purposes. We used PLS-SEM since PLS-SEM is well-

suited for predictive analysis (Chin 2010; Hair et al. 2012), which is the primary objective of this study. Additionally, this study proposes a model of INQ, which is hierarchical and complex. Hence the use of PLS-SEM is justified as it is suitable for such analysis (Chin 2010; Edwards 2001; Wetzels et al. 2009). Furthermore, PLS-SEM is applicable for a relatively small sample size and does not require data to be normally distributed (Chin 1998; Fornell & Bookstein 1982; Hair et al. 2011), which is observed in this study. To apply PLS-SEM method, we utilized the SmartPLS software package v3 (Ringle et al. 2015). Non-parametric bootstrapping with 5000 replications were used to test statistical significance and path coefficients (Hair, J.F. et al. 2017). As our proposed model of INQ is hierarchical, we used the repeated indicator approach suggested by Becker et al. (2012) to calculate the parameters of the latent variables.

Finally, to address the common method variance (CMV), this study applied a range of research design and statistical procedures following the guidelines of Hair Jr et al. (2017), Henseler et al. (2016), and Hulland et al. (2018). First, as part of establishing causality through research design, this study established a psychological separation between predictors and criterion variables; Second, to encourage the free flow of responses, this study applied anonymity of survey responses; and finally, to reduce social desirability bias, this study revised wording and format of the items at the pre-test phase. As part of statistical procedures, we applied the marker variable technique (Lindell & Whitney 2001; Williams et al. 2010), which clearly shows an insignificant relationship ($r=0.02$, $p>0.047$) between the original research model and the revised marker variable based research model.

5 Analysis and Results

5.1 Measurement Model

For the measurement model, we assessed the reliability and validity of each of the first-order constructs (Appendix B Table B1). All item loadings of the first-order model were above .70, while most of them were above .80 at significance level $p < 0.001$, indicating a strong association with respective constructs (Chin 2010; Hair, J.F. et al. 2017). To measure the reliability of the constructs, we used composite reliabilities (CR) and average variance extracted (AVE). All CRs and AVEs were above the threshold level of 0.80 and 0.50 respectively, demonstrating convergent validity (Chin 2010; Hair, J.F. et al. 2017).

Next, we assessed the first-order constructs for discriminant validity. The square root of the AVEs (in the diagonals of Appendix C Table C1) were higher than all the inter-construct correlations (Appendix C Table C1) confirming discriminant validity. (Chin 1998; Fornell & Larcker 1981). Overall, the finding of this study confirmed the measurement model with convergent validity (item loadings > 0.80), scale reliability (AVE > 0.50 , CR > 0.80) and discriminant validity ($\sqrt{\text{AVE}} > \text{correlations}$) meeting all the criteria of acceptance.

5.1 Second and Third-order Measurement Model

For the higher-order measurement model, we calculated the relation between different inter-order, i.e., 1st order with 2nd order and 2nd order with 3rd order relationships. The second-order channel-service configuration consisted of 8 items (3 + 3 + 2), and the degree of explained variance was explained by breadth of channel (67%), transparency of channels (67%), and appropriateness of channels (62%). Similarly, content consistency consisted of 8 items (4+4), and the degree of explained variance was explained by information consistency (71%) and transaction data integration (68%). Process consistency consisted of 6 items (3+3), and the

degree of explained variance was explained by system consistency (79%) and image consistency (77%). Finally, assurance quality consisted of 8 items (3+2+3), and the degree of explained variance was explained by privacy (77%), security (71%), and service recovery accessibility (49%). The third-order INQ construct consisted of 30 items (8+8+6+8), and the degree of explained variance was explained by the second-order channel-service configuration (74%), content consistency (77%), process consistency (74%) and assurance quality (68%). INQ resulted in $R^2=1.0$ because the second-order formative constructs, i.e., channel-service configuration, content consistency, process consistency, and assurance quality explained all the variance of the third-order formative INQ construct (Becker et al. 2012; Wetzels et al. 2009). The strength among inter-order constructs was shown using beta coefficients in Table 3. All these path coefficients from the first-order to second-order to third-order constructs were significant at $p < 0.001$.

Since higher-order constructs were formative, the study calculated the weights of items of both the third-order INQ construct and the second-order constructs (channel-service configuration, content consistency, process consistency, and assurance quality). These were significant at $p < 0.001$. The study also conducted a collinearity test on the index, and the results showed the evidence of minimum collinearity among the formative items as the variance inflation factor (VIF) of all items range between 1.972 and 2.497, far below the common cut-off threshold of 5-10. Therefore, the results confirmed H1, H2, H3, and H4.

Table 3 Inter-order Relations

Third-order formative construct	Weights of items ^a	P-Value	Third – Second-order relationship	β	t-value
INQ	0.040 – 0.066	P<0.001	Channel-Service Configuration	0.285	16.5
	VIF		Content Consistency	0.305	18.9
			Process Consistency	0.257	17.3

	1.972 2.497	–		Assurance Quality	0.323	16.8
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Second-order constructs	Weights of items		Second – First order relationship	β	t-value
Channel-Service Configuration	0.154 0.206	P<0.001	Breadth of Channel	0.818	24.105
			Transparency of Channel	0.834	37.198
			Appropriateness of Channel	0.791	30.209
Content Consistency	0.156 0.188	P<0.001	Information Consistency	0.84	48.4
			Transaction Data Integration	0.82	36
Process Consistency	0.184 0.227	P<0.001	System Consistency	0.89	79.9
			Image Consistency	0.88	49.5
Assurance Quality	0.138 0.196	P<0.001	Privacy	0.88	55.1
			Security	0.84	39.8
			Service Recovery Accessibility	0.70	19.7

Note: ^aWeights of items of the higher-order formative construct, i.e., third-order integration quality (30 items) and second-order channel-service configuration (8 items), content consistency (8 items), process consistency (6 items) and assurance quality (8 items)

5.2 Structural Model

Within the structural model, we calculated the relationship strength between INQ, CRB, and VAL. The results showcased a standardized beta of 0.608 (INQ - VAL), 0.452 (INQ - CRB) and 0.347 (CRB - VAL), respectively (Figure 3). These were significant at $p < 0.001$ (Table 4). The model explained the overall variance through R^2 , which was 0.204 for CRB and 0.465 for VAL. R^2 value was considered having a large effect size according to Cohen (1988). Thus, H5, H6, and H7 were confirmed stating the quality of overall integration quality had a significant positive impact on cross-buying intention and perceived value ensuring the validity of the overall research model.

Furthermore, we analyzed the impact of control variable (COV) on VAL. Our results indicate, there is no significant impact of control variable, i.e., as R^2 values have not been affected due to the addition of COV.

Table 4 Results of Structural Model

Main Model	β /Path Coefficients	Standard Error	T-Statistics	P-Value
INQ - VAL	0.608	0.039	15.719	0.00
INQ - CRB	0.452	0.049	9.201	0.00
CRB - VAL	0.347	0.051	6.848	0.00
Control Model	β /Path Coefficients	Standard Error	T-Statistics	P-Value
INQ - VAL	0.432	0.048	9.052	0.00
INQ - CRB	0.452	0.051	8.929	0.00
CRB - VAL	0.348	0.051	6.832	0.00
COV-VAL	-0.098	0.096	1.013	0.311

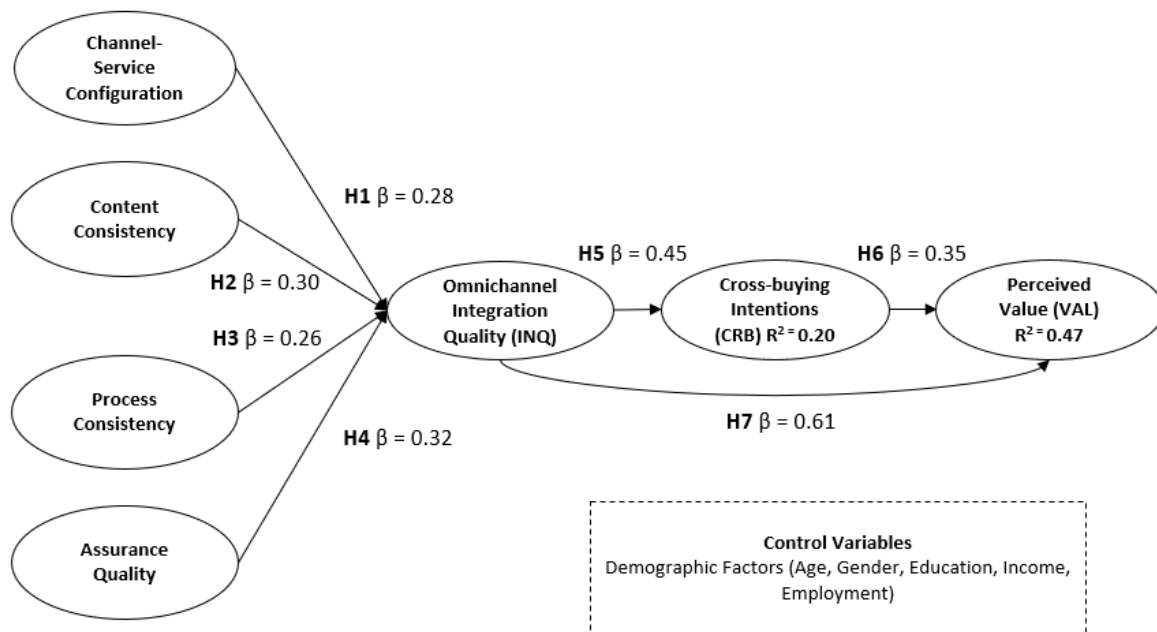


Figure 3 Structural Model

We also analyzed the mediating effect of CRB within the INQ-CRB-VAL link using the procedure suggested by Preacher and Hayes (2008), Hayes et al. (2011). The study bootstrapped the sampling distribution of indirect effects using a 95% confidence interval. The mediating path from INQ via CRB to VAL was the product of the path coefficients from INQ to CRB and from CRB to VAL, which was 0.157, significant at $p < 0.001$ (Table 5). Additionally, the direct effects of INQ-CRB and CRB-VAL were also significant at $p < 0.001$

(Table 5). Hence, H8 was also confirmed, providing strong support for CRB as a partial mediator (Hair, Joseph F et al. 2017).

Table 5 Results of Mediation Testing

		β /Path Coefficients	Standard Error	T-Statistics	P-Value
Direct Effects	INQ - VAL	0.608	0.039	15.719	0.00
Indirect Effects	INQ - VAL	0.157	0.028	5.665	0.00

6 Summary of Findings

The current findings support the relevance of INQ in encouraging cross-buying and increasing perceived value for services provided within an omnichannel environment. Based on integration quality dimensions proposed by Sousa and Voss (2006), Banerjee (2014), and Oh and Teo (2010), we developed and empirically tested a model of INQ dimensions and its behavioral outcomes. Overall, this study proposed a higher-order INQ model consisting of four primary dimensions and ten sub-dimensions.

The first dimensions of INQ, channel-service configuration, consists of three sub-dimensions, i.e., breadth of channel, transparency of channels and appropriateness of channels. Breadth of channel choice enables consumers to select from different channels of the firm. Omnichannel service providers should focus on utilizing all possible channels starting from physical outlet to the mobile app and even mobile kiosks to provide its services to the customers. Transparency of channels has the highest impact on channel-service configuration $\beta=0.83$ (see Table 3) as it signifies the firm's efforts to make consumers aware of different attributes of the channels. It is essential that the customers are informed of existing channels and the service capability of each channel so that they can determine which channel to avail service from. Finally, appropriateness of channels offers the right services suited to the channel of choice. Firms should ensure channels that are used to deliver service are appropriate for the service context.

The second dimension of INQ, content consistency, consists of two sub-dimensions, i.e., information consistency and transaction data integration. Information consistency has the highest impact on content consistency $\beta=0.84$ (see Table 3) as it ensures all kinds of information transmitted from the company to its consumers is uniform across its channels. Firms should ensure information regarding price, product descriptions, assortment details, delivery details, and promotions are consistent within all its channels. Transaction data integration enables companies to collect customer transaction data and integrate it with all its channels to provide superior customer service. Customers' transaction data such as search, purchase, order, delivery, and special request in addition to demographic data, mailing and email addresses, telephone numbers, and purchase preferences should be retained within a central database to be accessed and used by all the channels.

Process consistency consists of two dimensions, i.e., system consistency and image consistency. System consistency is the most impactful on process consistency $\beta=0.89$ (see Table 3) as it enables companies to ensure the technical issues of service delivery processes within all the channel such as operation time, ease of use, system flexibility, service experience and so on are consistent within all the channels. User experience regarding technical issues of channels should be easy to use, convenient, and overall consistent within all the channels of the company. Image consistency enables companies to project a consistent image of the company through all its channels. The overall brand image of the firm should be reflected in all its channels to ensure INQ.

Finally, assurance quality consists of three dimensions, i.e., privacy, security and service recovery accessibility. Privacy, which is the most essential aspect of assurance quality $\beta=0.88$ (see Table 3) protects the customer's personal information, and security ensures the safety of

using all the channels of the company. Service recovery accessibility offers customers the mean to voice service issues easily through different channels.

Concerning the primary dimensions, assurance quality was found to have the highest impact on INQ $\beta=0.323$ (see Table 3 and Figure 3), evidencing that assurance of promised quality, ensuring privacy and security and providing open channels to raise service issues are the most critical factors for customers using multiple channels. In a close second, content consistency $\beta=0.305$ (see Table 3 and Figure 3) was found to be almost equally important for omnichannel integration quality as it ensures the consistency and integration of information within the offered channels. Although the results for channel-service configuration $\beta=0.285$ and process consistency $\beta =0.257$ (see Table 3 and Figure 3) were lower, these factors were found as significant in influencing omnichannel integration quality.

Furthermore, the outcomes of the structural model confirm that INQ is a significant predictor of cross-buying intention and perceived value. It also confirms that cross-buying intention is a partial mediator of INQ and VAL. Hence, ensuring INQ will lead to the perception of higher value through being able to avail other services from the same provider.

Holistically, the proposed INQ model can be used as a diagnostic tool to identify the contribution of a particular dimension towards integration quality. For example, the results reflect that customer perceived assurance quality is the most important dimension ($\beta = 0.32$), followed by content consistency ($\beta = 0.30$), channel service configuration ($\beta = 0.28$) and process consistency ($\beta =0.26$). Although the magnitude of differences among these dimensions is very small, each is statistically significant towards forming INQ.

7 Theoretical Implications

The theoretical implications of these findings have a significant impact within the field of *emerging multi/omni channel services* literature. Drawing on the service quality and DC perspectives, this paper extends omnichannel research by proposing and validating a third-order INQ model, which is based on four second-order dynamic capabilities, that is, channel service configuration, content consistency, process consistency and assurance quality. INQ has been identified as a considerably important multichannel service quality component (Sousa & Voss 2006). However, throughout the years, there remains a lack of research which substantiates and validates dimensions of INQ. Most research related to INQ is conceptual (Banerjee 2014; Neslin et al. 2006; Neslin & Shankar 2009; Sousa & Voss 2006; Van Bruggen et al. 2010). Several studies (e.g., Banerjee 2014; Oh & Teo 2010; Wu & Chang 2016) have indicated the importance of generating scaled items for INQ constructs and providing empirical evidence. However, only a few dimensions of INQ have been validated using quantitative measures (Hsieh et al. 2012; Lee et al. 2019; Oh & Teo 2010; Shen et al. 2018; Wu & Chang 2016). Additionally, most research on INQ focuses on the phenomenon from the lens of only two channels, i.e., physical and website. This research addresses INQ focusing on three specific channels, i.e., physical, web, and mobile, which address the current consumer trends. This study extends INQ by proposing and validating four dynamic capability dimensions, i.e., channel-service configuration, content consistency, process consistency, assurance quality, and ten sub-dimensions: breadth of channel, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security and service recovery accessibility. Despite its importance, constructs such as system consistency, image consistency, privacy, security, and service recovery accessibility have not been conceptualized within multichannel or omnichannel services before. This

research not only conceptualizes these constructs but integrates them with existing constructs to demonstrate its relationship with INQ. According to Whetten (1989, p. 491), “the mission of theory-development is to challenge and extend existing knowledge.” The model of INQ proposed in this study achieves that mission and is more comprehensive than the ones suggested to date.

Furthermore, there is a gap in addressing the impact of omnichannel service quality on consumer perception. Banerjee (2014) argues that future research on INQ should focus on customer perception. Based on Kumar and Venkatesan (2005)’s and Ngobo (2004)’s research, this study adds further theoretical rigor by framing cross-buying intention and perceived value as an essential outcome of INQ. This research also validates *cross-buying intention* as a mediator of INQ and perceived value, which adds valuable knowledge in service quality literature.

Methodologically, the qualitative phase of this research has enabled the authors to understand the research dimensions better and allowed adding or modifying dimensions of INQ. The quantitative phase enabled to test and generalize the proposed model of INQ. Overall, this study develops and validates an instrument for capturing the dynamics of INQ in omnichannel services. It also supports the theme that individual dynamic capabilities as a manifestation of INQ, contributing to cross-buying intentions and customer value. Hence, this research makes significant contributions to theory, method, and practice by putting forward the higher-order INQ instrument. This framework can be a starting point for further empirical research.

8 Managerial Implications

An integrated channel system is one of the crucial aspects of omnichannel management. Based on dynamic capabilities theory, this research has shown how INQ dimensions as dynamic

capabilities of a firm lead to cross-buying and customer value. Managers need to alter channel configurations, which is a higher-level orchestration of channels ordinary capabilities to achieve integration within channels.

Numerous seminal academic and industry research from McKinsey, Forrester, Accenture, Forbes, and so on are based on omnichannel management and the importance of channel integration to create a successful omnichannel system (i.e., Dennis 2018; McGlynn & Conlan 2017; McKinsey 2017; O'Grady et al. 2018). This research tackles one of the most critical issues in current managerial practice by signifying several dimensions and sub-dimensions of INQ. The findings of this research dig into the sub-dimensional level of INQ. Allocating resources and managing these areas will lead to the successful development of omnichannel strategies. These dimensions of INQ provide managers with a diagnostic tool through which they can assess the performance of the company's omnichannel system according to different factors discussed in this research. This research has collected data from the financial industry. Hence, the dimensions proposed in this research might be contextual. Application of these dimensions in other industries may require further research. Nevertheless, dimensions proposed in this research is a starting point to focus on for managers in financial industries and other industries. Managerial implication resulting from this research can be categorized in the following areas:

8.1 Design of Supply Chain

Logistic capabilities remain one of the biggest concerns for multichannel managers to be able to provide seamless services across channels. Hübner, Wollenburg, et al. (2016) investigate how an integrated multichannel system evolves from a separated channel system. Managers of an omnichannel system need to ensure the complete distribution, logistics, and shipping solutions so that the retailers can use their supply channel in the most effective manner to

deliver products/services to customers on time. It is never desirable that a customer order a product online and it is delivered from a store 50km away, whereas the product was available in a store 10km away. Successful companies have been utilizing the logistic capabilities effectively and efficiently, i.e., Tesco, the U.K. retail giant, offers delivery and return within 90-minutes in London as a free service (Heckmann et al. 2012). This study sheds light on some areas of logistics fulfillment. Dimensions of omnichannel integration such as system consistency and transaction data integration would facilitate overall supply chain decisions of a firm and help to analyze issues related to assortment and inventory management, IT system, delivery and return, and so on.

8.2 *Marketing Strategies*

This research puts forward several areas where managers can alter their marketing strategies. For example, managers might be tempted to offer services through all its available channels. However, the appropriateness of channels according to the services is an important issue for managers to address. This research has shed light on this important factor.

Furthermore, transaction data integration remains a critical success area for businesses. Managers need to analyze customer data collected from all the channels and understand what insights to extract from these data to utilize within all the channels. The challenge for retailers is how they can use this data to create personalized offers and dynamic pricing and offer the appropriate channel for customer value. The idea is to provide customers with intelligent product suggestions like Amazon is doing, but in this instance across all the channels. Managers can use location-based mobile marketing to provide special offers to customers visiting certain shopping malls. Likewise, managers can email customers a related online product after they complete a purchase in-store. American Express (Amex) utilized this strategy when they used joint promotion with Twitter and other merchants. For example, an

Amex customer using Twitter hashtag to share their purchase from selected merchants would get special offers from those merchants and credit from Amex a few days later.

8.3 *Information Technology Approach*

As customers are using several channels to complete a purchase, a massive amount of customer data is being generated within all these touchpoints. Firms are grappling with this enormous amount of data. Managers need to build an integrated information technology (IIT) system through which customer transaction data and interaction data can be linked from all the channels. To achieve this, companies need to establish a centralized data warehouse. Customer demographics, shopping, and purchase data, in addition to interaction data such as customer feedback, reviews, complaints, phone calls, and so on should be collected from all the channels and stored in the data warehouse. According to Zhang et al. (2010), traditional data collection and analysis are still centered around individual channels. Hence, firms are yet to develop the ability to collect transaction data across channels and analyze profitability from a multichannel customer perspective. Dimensions addressed in this research, such as transaction data integration, information consistency, system consistency, privacy and security, have significant implications for developing the IT system to deal with customer data.

Despite its popularity and obvious importance in the field, many largescale companies were unable to integrate their service delivery channels successfully. Hence, this research provides valuable information regarding omnichannel management. Factors proposed and validated in this research provides managers with a greater understanding of areas for successful omnichannel design and planning.

Additionally, the findings showcase the significance of INQ as a predictor of cross-buying intention and perceived value. Cross-buying pushes growth and profitability. The strong

mediating role of cross-buying intention suggests that managers should emphasize channel strategies that lead to greater cross-selling and in turn increase customer value. Increased attention in these areas will help managers to deal with complex omnichannel service situations.

Overall, the findings of this research provide managers with valuable guidelines for creating a blueprint of service management processes.

9 Limitations & Future Research Directions

The limitations of this study are as follows. First, the data of this research has been collected only from one country, Australia. Hence, external validity, i.e., the ability to generalize results in other countries, remains a limitation. Second, this research has collected cross-sectional data or data which captures respondents' views only at a single point of time (Malhotra 2014), which remains a limitation of this study. Third, the data of this research is based on only one financial institution and thus may not be sufficient to generalize the conclusion when applied in other industries.

One of the crucial avenues for future research is to understand the implications of omnichannel integration on B2B markets. Studies have shed some light on firm performance (Oh et al. 2012) and retailer's sales growth (Cao & Li 2015) due to integration of channels. However, these studies are not entirely geared towards understanding factors affecting channel integration within a B2B context; rather, the impact of channel integration has been the central focus. Giant online retailers such as Amazon and Alibaba are continuously partnering with other businesses to create online marketplace, reseller, or hybrid e-commerce model (Tian et al. 2018). While online marketplace enables suppliers to sell directly to customers via online platform, reselling occurs when the online platform buys from supplier and resell to customers (Tian et al. 2018).

Furthermore, platforms such as Airbnb, Uber, Booking.com and so on are networking with thousands of small and large businesses to bring their services to the end consumers. Likewise, numerous online/offline retailers are selling their products through Walmart, BestBuy and Staples online stores which can be ordered and picked up in-store by customers. All these business models are tremendously increasing the number of B2B interactions with suppliers and resellers. Seamless integration of price, inventory details, shipping, product and service information are crucial for both parties in these situations.

Although this study addresses INQ dimensions in a B2B service situation, similar dimensions could be appropriate for B2B context. Oh et al. (2012) address certain issues involving channel integration within B2B context. But still this scant information of INQ within B2B calls for gathering qualitative data from business managers and generating scale items for a research instrument to understand the organization's perspective of channel integration and its impact on businesses.

In addition, future research can focus on data collection from different countries and test the model of integration quality in other industries such as healthcare, tourism, and hospitality or retailing. Furthermore, future research can focus on distinct constructs such as customer lifetime value, loyalty, and so on, as the outcome of integration quality on service quality perception. Similarly, future research can focus on modeling integration quality utilizing different moderators.

10 Conclusion

In conclusion, the results of this study showed omnichannel integration quality as a hierarchical construct with several dimensions and sub-dimensions. Additionally, this study has empirically tested the relationships between INQ, cross-buying intentions, and customer value. The

findings confirm that omnichannel integration quality and its dimensions have a significant impact on consumer's perception of service quality. These results on the dynamics of service quality should help managers in creating a blueprint of an effective multichannel system beneficial for both customers and companies. Finally, from a theoretical perspective, this research has a significant contribution to existing knowledge on service quality, omnichannel management, and multichannel service quality research.

11 Appendices

Appendix A Table A1 INQ Dimension Interview Excerpts and Analysis from Qualitative Study

Channel-Service Configuration		
Sub-Dimensions	Interview Excerpts	Analysis
Breadth of Channel	<i>“I guess one of the main advantages is convenience, like withdrawing money. If you are around at the supermarket and you happen to not have your wallet with you, you can still walk to the nearest ATM and withdraw money using cardless cash, so that’s pretty cool. Even if you are out and about, if you are shopping and all of a sudden you need to pay rent or whatever, you don’t have to go home and log into your computer. You can do it on your mobile phone. So, that is pretty convenient. So, having all these different channels, to me personally as a consumer I think it is useful because it’s convenient”.</i> (Interviewee # 13, Male 30s).	It is apparent that having multiple channels available to customers is essential. Customers find it convenient to be able to use any channel of their choice to perform the same task. Overall service quality of using multichannel services depends on the number of channels available to customers. Customers use the channels which they prefer the most for given circumstances and even combine two or more channels to avail one service.
Transparency of Channel	<i>“When we open the account, on the day they (bank tellers) tell you what sort of banking you can do. So, they will explain to you like they did to me and they do to everybody else, services that you can perform online, you set your online password on the bank, then you can change afterward. You set your phone banking password, and they send you the debit or credit card which you can use in any of the ATMs or in the branches. So, it’s basically on the day you open the account, they show you the ways of banking you can do with them. It was helpful. It was good enough”.</i> (Interviewee # 5, Male 20s).	The excerpt indicates that taking measures to inform customers about firm’s different channels and channel features, specifically when customers start their transactions with the service provider are perceived helpful by customers.
Appropriateness of Channel	<i>“I don’t think I would feel completely okay with applying for a home loan through online or call centers. I guess, well personally, when you talk about home loans and things like that I would prefer to sit down and talk with a physical person and going through the different conditions of terms and the financing packages. I guess it really depends on the situation as well as the nature of the transaction”.</i> (Interviewee # 13, Male 30s).	The excerpt indicates that customers judge channels according to their service capabilities. Having inappropriate channels for services causes a waste of time and loss of trust from a customer’s perspective.
Content Consistency		
Sub-Dimensions	Interview Excerpts	Analysis
Information Consistency	<i>“Most important thing is that information has to be integrated because if one channel gives you a different answer to the other one, that is when you start thinking which is reliable, which one should you go to. You wouldn’t want that, given the fact that it is about your funds and savings, so that is definitely something you wouldn’t want, you would want transparency and you would want them to be consistent across all the channels you are dealing with”.</i> (Interviewee # 7, Female 20s).	The statement shows the consistent information through all the service delivery channels of the firm is associated with reliability. Inconsistent information within channels reduce trust and frustrate consumers.

Transaction Data Integration	<i>“When my wife was overseas in India. She had a supplementary card, and she was spending money. She asked me while she was spending the local currency of the country ‘can you check how much Australian dollar was spent?’ She was asking to know the exchange rate. I couldn’t tell her even in a week’s time. It was not updated anywhere, neither online nor through the mobile app. Then I had to finally call the manager and ask about the amount of money spent and the exchange rate. So, I don’t think those channels are integrated in terms of different services I have. So obviously, when you don’t get this information that you require, you feel frustrated. I think they are inefficient”. (Interviewee # 2, Male 50s).</i>	From the interview data, it is evident that firms should focus on collecting real-time customer data and integrating it within all its channels. Customers look for convenience. They want firms to provide them personalized offers from which they can easily select the best product or service option, thus, reducing the hassle of doing research on all the products and service by themselves. Customers also look for convenience by being able to manage services through one channel. Research indicates that proper utilization of real-time customer data leads to enhanced firm performance
Process Consistency		
Sub-Dimensions	Interview Excerpts	Analysis
System Consistency	<i>“Internet wise, it’s very easy, it’s very straightforward. The mobile banking is also very easy to use, they explain the key steps in very simple terms. And also, the physical channel, as soon as you walk in there, someone greets you and you are being directed to the next available counter; so, in a way I think they have taken really good care of me as a customer. They try to make things not so complicated for me, easier to manage for me, which I do appreciate which is why I’m still with the bank that I’ve been with for the past few years”. (Interviewee # 13, Male 30s)</i>	It is apparent from the excerpt that customers want a firm’s service delivery channels to be easy to use, self-sufficient in performing all the task and free of technical issues.
Image Consistency	<i>“All the images in all the channels are quite similar. And especially the color and everything, like when you go and when you want to find an ATM. You can like see, since it has a distinct color and helps to differentiate”. (Interviewee # 8, Female 30s).</i>	It is evident from the excerpt that firms should focus on delivering a consistent image through all its service delivery channels.
Assurance Quality		
Sub-Dimensions	Interview Excerpts	Analysis
Privacy and Security	<i>“I consider privacy very valuable thing to myself. Because using different channels you send personal information. Anybody can misuse it and can access it without our knowledge and stuff. It is vital to me that my bank protects these important data”. (Interviewee #6, Female 20s).</i> <i>“... Depositing the money in ATM at night is of course risky. If you go to Ingleburn branch for example, it is just by the roadside, and that’s when it is late night, and you feel a bit insecure, and I felt as well because also people roaming around is near the station. I think it is a bit risky to deposit and withdraw from there”. (Interviewee # 16, Male 50s).</i> <i>“...I would probably be more concerned about the browser than the app because I know the results of dialers and viruses online and with some browsers I feel like, are more susceptible to hackers rather than</i>	The transcripts make it clear that security of using different channels and privacy of personal information which are disclosed within channels are important to customers. It is not only one channel that these concerns are raised, but privacy and security issues are also of concern within all the channels the customers use.

	<i>the iPhone or the Apple IOS. I am really happy with IOS in terms of safety and security. But in websites, Software, malware that sort of plug itself into my computer". (Interviewee # 15, Female 30s).</i>	
Service Recovery Accessibility	<i>"... I understood that I forgot my debit card inside the machine. Then I went inside the bank I asked the lady inside to check this ATM machine if my card is stuck there. We checked both machines, and my card wasn't inside. Then she told me to block my card using the app because it's lost or stolen. In the app, there is at the bottom that says if your card is stolen, can block it here. App helps really well, gets too many things very easy and also website is good, because when you don't have the application, but having more channels is always a good idea to resolve problems, I think". (Interviewee #20, Female 20s).</i>	From the transcript it is apparent that firms should focus on integrating channel features which enable customers to interact with the firm and voice their service-related issues easily.

Appendix B Table B1 Results of First-Order Constructs.

Constructs	Items	Loadings	CR	AVE
Breadth of Channel	The bank offers me multiple channels to access its services.	0.854	0.908	0.767
	I can choose amongst a range of channels when dealing with the bank.	0.884		
	I can always use some other channels when I cannot access a certain channel of the bank.	0.889		
Transparency of Channel	I am aware of the service features provided by the bank's multiple channels (website, physical branch and mobile app).	0.862	0.870	0.691
	I know how to utilize the features of the bank's multiple channels to meet my needs (website, physical branch and mobile app).	0.895		
	The bank informed me well about various features of their multiple channels (website, physical branch and mobile app).	0.728		
Appropriateness of Channel	The bank does not force me to use a specific channel for a specific purpose.	0.864	0.880	0.785
	Services provided through the bank's different channels are appropriate for those channels.	0.908		
Information Consistency	The bank provides consistent information about its service features across multiple channels (website, mobile app and physical branch).	0.837	0.924	0.752
	The bank provides consistent information about its service fees across multiple channels (website, mobile app and physical branch).	0.868		
	The bank provides consistent information about its promotional offers across multiple channels (website, mobile app and physical branch).	0.864		
	Overall, information across the bank's multiple channels is consistent.	0.900		
Transaction Data Integration	After making a transaction, my transaction data are updated in all the channels of the bank (website, mobile app, physical branch).	0.848	0.912	0.721
	The bank keeps a history of transactions that I make through its different channels.	0.853		
	When I make a transaction through one channel (physical branch, website or mobile app), I can keep track of it through another channel of the bank.	0.875		
	Regardless of the channel I use, the bank is aware of my past transactions with them.	0.819		

System Consistency	All the channels (website, mobile app and physical branch) of the bank are easy to use.	0.883	0.917	0.785
	All the channels (website, mobile app and physical branch) of the bank has a flexible system to meet my needs.	0.901		
	The service experience is consistent across all the channels of this bank (website, mobile app and physical branch).	0.874		
Image Consistency	The bank's brand name, slogan, and logo are consistent across all its channels (website, mobile app and physical branch).	0.823	0.917	0.787
	I have a consistent impression of the bank regardless of the channel I use.	0.904		
	The bank maintains a consistent brand image through all its channels (website, mobile app and physical branch).	0.931		
Privacy	My personal information across various channels of the bank (website, mobile app and physical branch) is protected.	0.883	0.937	0.832
	My personal information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	0.931		
	My financial information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	0.921		
Security	All the channels of the bank have adequate security features.	0.960	0.960	0.924
	I feel secure about using this bank's multiple channels.	0.962		
Service Recovery Accessibility	If there is any service problem, I can use multiple channels of the bank to report service failure. (e.g., website, telephone, mobile app, in-person).	0.823	0.888	0.727
	The bank provides the means whereby I can voice my complaints.	0.883		
	I am aware of the channels through which I can report service issues to the bank.	0.850		
Cross-buying Intention	I intend to avail more banking services from this bank through any of its multiple channels.	0.838	0.911	0.719
	For future banking related services, I will look into this bank's multiple channels first.	0.880		
	I will consider offer from any of this bank's channels when it proposes new/additional services to me.	0.891		
	I will accept offer from any of this bank's channels when it proposes new/additional services to me.	0.778		
Perceived Value	Using multiple channels of this bank saves my time	0.840	0.877	0.641
	Using multiple channels of this bank provides me value for money.	0.803		
	Using multiple channels of this bank provides me convenience.	0.817		
	Using multiple channels of this bank makes me feel good.	0.738		

Appendix C Table C1 Correlations and AVEs*

	Appropriateness of Channel	Breadth of Channel	Cross-buying Intention	Image Consistency	Information Consistency	Perceived Value	Privacy	Security	Service Recovery	Transaction Data Integration	Transparency of Channel	Control Variables (COV)
Appropriateness of Channel	0.886											
Breadth of Channel	0.478	0.876										
Cross-Buy	0.361	0.220	0.848									
Image Consistency	0.448	0.361	0.222	0.887								
Information Consistency	0.522	0.404	0.360	0.424	0.867							
Perceived Value	0.451	0.314	0.551	0.375	0.415	0.800						
Privacy	0.469	0.301	0.362	0.372	0.405	0.423	0.912					
Security	0.485	0.364	0.458	0.425	0.467	0.535	0.668	0.961				
Service Recovery	0.536	0.331	0.300	0.383	0.442	0.387	0.386	0.394	0.852			
Transaction Data Integration	0.588	0.431	0.240	0.509	0.392	0.460	0.353	0.379	0.374	0.849		
Transparency of Channel	0.548	0.471	0.374	0.424	0.504	0.465	0.334	0.403	0.442	0.481	0.831	
Control Variables (COV)	0.024	0.019	-0.23	-0.063	-0.151	-0.222	-0.145	-0.157	-0.001	-0.052	-0.066	n/a

Note: * $\sqrt{\text{AVE}}$ on the diagonal.

Appendix D Table D1 Control Variable COV (Formative Construct) Results

Items	Weights	t-value	VIF
Age	0.892	1.529	1.133
Gender	-0.281	0.858	1.139
Education	-0.186	0.616	1.035
Employment	-0.049	0.198	1.458
Income	-0.164	0.575	1.449

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