



Website Information Security and Privacy Concerns in 4IR: The Moderating Role of Trust in B2C e-Commerce

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Abstract

The technology devices introduced in recent years are not only vulnerable to Internet risks but are also unable to elevate the growth of B2C e-commerce. These concerns are particularly relevant today, as the world transitions into the Fourth Industrial Revolution. To date, existing research has largely focused on obstacles to customer loyalty. Studies have tested e-commerce models guided by the establishment of trusting, satisfied and loyal consumers in various international contexts. In South Africa, however, as an emerging market, there has been limited research on the success factors of online shopping.

This study examines the influence of security and privacy on trust, seen as a moderator of customer satisfaction, which in turn, has an effect on loyalty towards websites. Based on an exhaustive review of literature, a conceptual model is proposed on the relationships between security and privacy on the one hand, and customer trust, satisfaction and loyalty on the other. A total of 250 structured, self-administered questionnaires was distributed to a purposively selected sample of respondents using face-to-face surveys in Johannesburg, South Africa. A multivariate data analysis technique was used to draw inferences from the data. With an 80.1% response rate, the findings showed that privacy and security do influence customer trust; security strongly influences customer trust and weakly influences satisfaction. In South Africa, customer loyalty towards websites is strongly determined by satisfaction and weakly determined by trust. Trust significantly moderates the effect of customer satisfaction on loyalty. The study implications and limitations are presented and future research directions are suggested.

1 Introduction

E-commerce websites can be grouped into various types, notably, Internet presence, online store, incentive website, shopping mall, content and search agent (Yang, Cai, Zhou & Zhou, 2005). With the arrival of various types of devices (i.e. laptops, tablet PCs, personal digital assistants, smart phones, etc.), together with the popularisation of mobile computing (Bluetooth and Wi-Fi), e-commerce websites are now able to facilitate online payments through the use of credit cards. However, these new technologies are vulnerable to potential risks on the Internet (Dlamini, Eloff & Eloff, 2009).

Many e-commerce businesses fail to simplify their website application processes for their customers and lack strategies to retain their customers' trust (Angus, 2018). Website managers would do well to examine each step in the online shopping process, such as information searches, product orders, delivery, online payment methods, and after sales service. Most importantly, they should improve the security and privacy features on their websites to engender customers' trust to increase online sales (Belanger, Hiller & Smith, 2002).

From a global marketing perspective, in 2017, 84.3% South African consumers purchased from South African websites, 27.1% purchased from US websites and 14.6% from European websites (Mkhosi, 2017). Thus, the US global e-commerce market share is expected to decline from 22.2% to 16.9% in 2020 due to the rapid shift of consumers from Western to Eastern markets in the next decade. For instance, China, with an estimated population of 1.404 billion, has reached \$5.8 trillion from retail sales in 2017, with 19.6% of this total derived from online shopping (Goldstuck, 2019).

In South Africa, Gauteng is the most densely populated province (StatsSA, 2015). The Quarterly Bulletin report (2012) from this province shows that the sales of online retail goods reached 30% in 2010, aided by the constantly growing number of experienced Internet users. In 2017, industry reports estimated that e-commerce transactions would contribute 1% to total gross domestic product (GDP) and that the penetration of online consumer would increase from 44.5% to 60.1% in 2021 (Budree, 2017). Currently, the 2019 online retail sales in South Africa are expected to reach 1.4%, accumulated from R1 trillion consumer spending on traditional retail websites, with an estimated 2% increase by 2022 (Goldstuck, 2019).

The growth of the B2C e-commerce industry in South Africa has attracted the entrance of online stores. These stores seek to establish superior image to position themselves as market leaders. For example, the most popular online stores are Takealot.com, Amazon, Spree, Bid or Buy.co.za and Zando, which have emerged to compete directly with well-established and recognisable brands such as Hyperli (Budree, 2017). Pick n Pay and Woolworths are amongst the first independent retail stores to dominate online retail, obtaining less than 1% of their total retail sales from Internet shopping (Rudansky-Kloppers, 2014). As competitors in this industry are just a mouse click away, competition is strong; this makes building customer loyalty the biggest challenge, requiring companies to develop distinctive attributes to distinguish themselves from competitors.

Understanding the antecedents of consumer loyalty is important for website marketers, in terms of developing marketing strategies to build customer trust and satisfaction as determinants of loyalty (Faraoni, Rialti, Zollo & Pellicelli, 2018). Among the various predictors of customer loyalty, trust and satisfaction are viewed as the two key determinants of B2C e-commerce patronage (Eid, 2011). Pavlou (2003) concurs, stating that customer satisfaction and trust are preconditions for customers' patronage.

Although customer satisfaction is a determinant of loyalty in B2C e-commerce (Nasimi, Nasimi & Basit, 2018; Tunali & Aytekin, 2018; Ahmad, Rahman & Khan, 2017; Ismail & Safa, 2014; Luarn &

Lin, 2003), the important role of trust in growing B2C e-commerce has been identified in many studies (Faraoni *et al.*, 2018; Anderson & Swaminathan, 2011; Lee & Chung, 2009; Cyr, 2008; Flavian & Guinaliu 2006; Chiou & Droge, 2006). The e-commerce literature also explains the direct effect of customer trust on loyalty (Tunali & Aytakin, 2018; Ismail & Safa, 2014; Kim, Chung & Lee, 2011; Luarn & Lin, 2003). Further, studies in B2C e-commerce have confirmed the key role of trust in moderating the influence of customer satisfaction on customer loyalty (Faraoni *et al.*, 2018; Anderson & Swaminathan, 2011; Flavian & Guinaliu, 2006; Anderson & Srinivasan, 2003).

Despite the relevance of this topic and a growing body of empirical data on the key success factors of B2C e-commerce (Nasimi *et al.*, 2018; Tunali & Aytakin, 2018; Ahmad *et al.*, 2017), there is scant research on customer loyalty in the B2C e-commerce market in South Africa (Rudansky-Kloppers, 2014; Beneke, Scheffer & Du, 2010; Brown & Jayakody, 2008). This study examines the nature and antecedents of trust as a moderator of customer satisfaction and its effect on loyalty, particularly among the main e-commerce competitors in South Africa. It is important to identify the challenges of B2C e-commerce, considering not only the marketing strategies but also the technology characteristics of a website (Fortes & Rita, 2016).

In South Africa, the primary reason why many consumers avoid online shopping is because they fear fraudulent credit card usage, theft, hacking and dishonest sales staff (Rudansky-Kloppers, 2014). Major Internet operators and suppliers should improve the security and sense of information protection by promptly tackling the issues of cybercrime and fraudulent purchases and introducing technology programmes to educate consumers on the various mechanisms of Internet security to increase their level of confidence in website transactions (Goldstuck, 2012). Those consumers who are regular visitors of a website, as well as others who visit it for the first time, will be better protected when the website security endorses a mark that is well-known and inspires a greater level of confidence (Al Rawabdeh, Zeglat & Alzawahreh, 2012).

Lack of confidence or distrust is the most frequently cited reason that discourages consumers from purchasing products or services from websites (Oliveira, Alhinho, Rita & Dhillon, 2017). Upon establishing customers' trust, there is a greater likelihood that those customers will become loyal (Angus, 2018). This means that by securing greater trust, there is likely to be a significant increase in the degree of commitment (e.g. customers' brand loyalty, attitudinal loyalty, percentage of customers who visit the website, the number of transaction exchanges, etc.) (Cyr, Hassanein, Head & Ivanov, 2007). By reducing the gaps in current knowledge, effective website mechanisms can be identified to correctly establish customer trust and promote satisfaction (Pavlou, 2003). In the long term, these factors could help build customer loyalty (Tunali & Aytakin, 2018; Eid, 2011; Kim *et al.*, 2011).

The structure of the paper is as follows: the literature review is presented in Section 2. Section 3 describes the theories and the development of conceptual model and hypotheses. Section 4 outlines the research method and techniques for data collection and analysis. Section 5 reports the study findings. Section 6 discusses the results and presents theoretical and managerial implications. Section 7 concludes with the limitations of this study and future research directions.

2 Literature Review

2.1 Customer Loyalty

In the traditional marketing literature, Aaker's (1991) brand equity process describes the role of loyalty. Specific emphasis is placed on ways in which brand loyalty could translate into marketing

advantages such as lower marketing costs associated with the acquisition of new customers and greater leverage of trade. From a broader perspective, loyal customers spend more money, which supports the growth of a firm in the long term (Eid, 2011). Oliver (1999) defines customer loyalty as a consumer's deeply held commitment to repatronise a brand or to keep repurchasing a product or service that they prefer, which results in repeat purchases of that brand or brand set. This occurs despite situational or competitive marketing seeking to trigger a switch in purchasing behaviour.

Developing customer loyalty is essential in the e-commerce market (Ahmad *et al.*, 2017; Bertozzi & Krishnan, 2017; Wang, Wang, Cheng & Chen, 2009). Customer loyalty is a key principle in management activities in online settings, especially in area of online shopping; it is therefore important for website managers to understand how or why a consumer develops a sense of loyalty. Loyalty is particularly important in e-commerce as the customer cannot interact with the brand in a face-to-face setting (Luarn & Lin, 2003). Customer loyalty in B2C e-commerce is seen as a person's intention to make repeat visits to the website of a specific e-retailer (Anderson & Srinivasan, 2003). This results in a favourable attitude towards that website and predisposes the customer to repeat purchase behaviour (Chang & Chen, 2009; Yen & Lu, 2005). In this context, loyalty thus refers to a customer's long-term psychological attachment to a website (Cyr *et al.*, 2007).

Chaudhuri and Holbrook (2001) distinguish between behavioural loyalty and attitudinal loyalty. Luarn and Lin (2003) state that behavioural loyalty involves repurchases of the brand, whereas attitudinal loyalty refers to a person's dispositional commitment based on some unique value of the brand. Such long-term psychological commitment towards an e-commerce store or brand (i.e. attitudinal loyalty) can be witnessed from the value driven by the psychological involvement, favouritism and a consumer's sense of goodwill to preferred products or a specific brand (Dharmesti & Nugroho, 2012).

This study adopts Anderson and Srinivasan's (2003:125) definition of e-loyalty which is defined as "the customer's favorable attitude toward an electronic business resulting in repeat buying". According to this perspective, customers evaluate the e-service websites based on their consumption experience which is influenced by their willingness to be vulnerable and to rely on the e-service marketer's promise to satisfy their needs better than competitor. This, in turn, influences both the attitude and the intention to consistently repurchase from the same website in the future. Customer trust can therefore be viewed as a moderator of the effect of customer satisfaction on loyalty towards a website.

2.2 Antecedents of Customer Loyalty

Rooted in traditional marketing, the empirical evidence on B2C e-commerce has revealed that customer satisfaction has a direct and positive effect on customers' trust of a e-service vendor or a website (Goutam & Gopalakrishna, 2018; Pratminingsih, Lipuringtyas & Rimenta, 2013; Dabholkar & Sheng, 2012; Kim *et al.*, 2011; Yeh & Li, 2009; Kim, Zhao & Yang, 2008; Ha & Perks, 2005; Ribbink, van Riel, Liljander & Streukens, 2004). To remain competitive in the market, e-retailers must therefore strive to better satisfy their customers' needs and wants. Studies in online shopping, (Faraoni *et al.*, 2018; Anderson & Swaminathan, 2011; Flavian & Guinaliu, 2006; Anderson & Srinivasan, 2003) show a significant contribution of the moderating role of trust on customer satisfaction and its effect on loyalty towards a website. This indicates that gaining the customer's trust is a key strategy in the growth of an e-commerce business.

Customer satisfaction is closely related to interpersonal trust (Eid, 2011). There is growing consensus in the literature that trust in a website is a strong determinant of customer satisfaction with

online shopping (Faraoni *et al.*, 2018; Chen, Ling, Ying & Meng, 2012; Lee & Lin, 2005). Customer trust in a website plays a significant role in promoting satisfaction (Faraoni *et al.*, 2018). Gummerus, Liljander, Pura and van Riel (2004) report that customer satisfaction is determined mainly by their trust. This result is supported in previous studies (Anderson & Swaminathan, 2011; Lee & Chung, 2009; Cyr, 2008; Flavian *et al.*, 2006; Chiou & Droge, 2006). Developing trust is a better way of improving customer satisfaction (i.e. meeting customers' shopping needs or expectations) (Goutam & Gopalakrishna, 2018). High levels of trust in a website will stimulate a positive experience which improves customer satisfaction (Dharmesti & Nugroho, 2012).

It is important to note that consumers who do not trust a particular website are unlikely to repurchase from that website in the future, even after a satisfactory shopping experience (Anderson & Srinivasan, 2003). In other words, satisfaction does not necessarily translate into loyalty, however, customer loyalty does lead to satisfaction. This is because the dissatisfied customer can buy from competitors, hence e-stores must satisfy customers and make them loyal (Shafiee & Bazargan, 2018). Building trust is the first step in the development of customer satisfaction (Goutam & Gopalakrishna, 2018; Luarn & Lin, 2003). Since website users associate a perceived significant risk and uncertainty with e-service firms (Fortes & Rita, 2016; Roca, Garcia & de la Vega, 2009), trust succeeds in removing consumer uncertainty and perceptions of risk (Pavlou, 2003). The higher the risk, the greater importance of trust towards the e-service provider and a website itself (McKnight, Choudhury & Kacmar, 2002). This indicates the importance for website marketers to invest in solutions that could encourage consumers to purchase from their websites.

For these reasons, trust is viewed as a key determinant of e-commerce growth (Fortes & Rita, 2016), and a key success component for online stores (Farah, Ahmad, Muqarrab, Turi & Bashir, 2018). However, only a handful of studies in e-commerce (Faraoni *et al.*, 2018; Anderson & Swaminathan, 2011; Anderson & Srinivasan, 2003) have emphasised the essential role of trust in moderating the effect of customer satisfaction on loyalty. This creates gaps in understanding the nature of trust as an antecedent of customer loyalty. This lack of understanding further limits the opportunities for website managers to obtain insights on how to improve customer trust as an instrumental factor in increasing customer satisfaction, making it difficult to develop customer loyalty in the long term.

2.2.1 Customer Satisfaction

In traditional marketing theory, Oliver (1997) defines satisfaction as a consumer's summary evaluation of psychological behaviour resulting from their evaluation of emotions, accompanied by disconfirmed expectations, with the feelings prior the consumption experience. Satisfaction involves an emotional or cognitive customer response to a stimulus (i.e. customer expectations, a product or a service, consumption experience, etc.), at a particular point in time (i.e. following the consumption of a product or after a service experience, etc.) (Dharmesti & Nugroho, 2012). Chang and Chen (2009:412) refer to satisfaction as "affective customers' responses to a purchase", which is a primary objective of marketing.

Oliver's (1980:460) Expectancy Disconfirmation Theory (EDT) explains that if the experience with the service largely meets or exceeds the customer's expectations prior to the service, then satisfaction will be high. In B2C e-commerce, satisfaction refers to overall contentment with an online consumption experience, ranging from access to website information to navigation and perception of a well-designed website (Cyr, 2008; Anderson & Srinivasan, 2003).

Customer satisfaction involves two important concepts, namely (i) the transaction-specific concept, which reflects the emotional response of a person their specific website transaction experience with an

e-service provider, and (ii) the general or cumulative concept, which reflects on the customer's overall experience in interacting with a website of a particular e-service provider over time (Dharmesti & Nugroho, 2012:38; Chang & Chen, 2009). According to Massad, Heckman and Crowston (2006:75), satisfaction refers to the customer's evaluation of their consumption experiences during the various website encounters, together with repeated series of discrete transactions.

If a customer has experienced a series of discrete, satisfying online shopping experiences, they will elevate into the stage of loyalty (Massad *et al.*, 2006). The empirical data (Eid, 2011; Anderson & Srinivasan, 2003) shows that customer satisfaction with a website has a positive significant relationship with customer loyalty. Cyr (2008) reports that satisfaction is strongly correlated with customer loyalty of the Canadian, German and Chinese. Previous studies have emphasised that customer satisfaction has a significant effect on loyalty in B2C e-commerce (Nasimi *et al.*, 2018; Tunali & Aytekin, 2018; Ahmad *et al.*, 2017).

2.2.2 Customer Trust

From the traditional marketing perspective, trust defines a person's willingness to enter into an exchange partnership in which they feel confident (Moorman, Zaltman & Deshpande, 1992:315). Morgan and Hunt (1994:23) define to trust as the confidence of a person in the reliability and integrity of an exchange partner. Doney and Cannon (1997:36) state that trust refers to a person's perceptions of credibility and benevolence of an exchange partnership.

While trust has been measured in previous studies on brand trust (Delgado-Ballester & Manuera-Aleman, 2001:1245; Chaudhuri & Holbrook, 2001:83), it has only received average consideration in the online shopping context. In B2C e-commerce, trust refers to a consumer's willingness to be vulnerable to an online retailer, after evaluating the circumstances and the channel through which the transaction is to be facilitated (Pavlou, 2003). Online trust is described as a person's confidence in the expectation surrounding an online situation of risk and the belief that their vulnerabilities will not be exploited (Bertozzi & Krishnan, 2017).

Building customer trust in B2C e-commerce is influenced by a variety of obstacles. First, the lack of touch and direct evaluation of the product, together with the absence of face-to-face interaction with the e-service provider can lead to feelings of uncertainty and the perception of high risk in the consumer's purchase decision (Fortes & Rita, 2016). Second, although customers interact only with the website, without the opportunity to interact with the e-service provider (Fortes & Rita, 2016; Bart, Shankar, Sultan & Urban, 2005; McKnight *et al.*, 2002), their interaction with a website does share some similarities with their interaction with a physical store. This occurs as customers develop a perception of trust based on their interaction with the website, which suggests that the extent to which customers develop positive impressions and accept their vulnerability helps them to develop trust in that website (Bart *et al.*, 2005). This shows that trust has a greater value in B2C e-commerce as customers have to relinquish their vulnerabilities and trust in the behaviour of the e-service provider (Moorman *et al.*, 1992). Lastly, customers' interactivity with the website has a strong relationship with customer loyalty (Eid, 2011). This means that establishing customer trust in a website is a serious challenge facing many firms as consumers purchase only from those websites that they are willing to trust (Bilgihan, 2016). If customers trust a website and e-service provider, they demonstrate greater willingness to be loyal to that particular e-retailer. This suggests that customer trust has a direct effect on loyalty towards a website (Bertozzi & Krishnan, 2017). Previous studies confirm that trust towards e-retailers has a strong, significant and positive influence on customer loyalty (Tunali & Aytekin, 2018; Luarn & Lin, 2003).

2.2.3 The Effects of Security and Privacy on Trust, Satisfaction and Loyalty

Security refers to a person's beliefs concerning the protection of their financial data and the belief that it will not be made available or used by unauthorised parties (Flavian & Guinaliu, 2006). Privacy refers to a person's beliefs concerning the risks and potential negative consequences linked to sharing personal information on a website (Baruh, Secinti & Cemalcilar, 2017; Bulgurcu, Cavusoglu & Benbasat, 2010). Despite ongoing debate about the distinction, if any, between privacy and security (Gogus & Saygin, 2019; van den Braber, Singaram & van Reekum, 2016; Smith, Dinev & Xu, 2011), Belanger *et al.* (2002:262) confirm that emphasising website security to consumers is the most relevant attribute, as opposed to the privacy statements on the website. They recommend that security and privacy should be treated as distinct factors.

Adopting this distinction, the present study questions (i) how can website marketers position their websites as being safe and secure (e.g. security) in terms of protecting consumers' personal information from unauthorised parties (e.g. privacy)?; (ii) are these factors the determinants of trust towards the e-service vendor and the website? (iii) will trust improve customers' satisfaction with the online purchase experience? and (iv) how will customer trust and satisfaction help website marketers in South Africa to build loyalty towards their websites in the era of the Fourth Industrial Revolution?

While studies have examined the general nature of online trust (Goutam & Gopalakrishna, 2018; Martin, 2018), there is a scarcity of studies presenting a specific theoretical model that demonstrates the effect of information security on privacy concerns. Few insights exist on the relationship between security and privacy issues (Smith *et al.*, 2011). Shin (2010) found a strong positive significant effect of privacy on information security, and a weak reversed influence of perceived security on privacy concerns. The present study focuses on the effect of information security on privacy concerns. Security has a significant and positive influence on customer privacy concern (Shin, 2010; Kim, Steinfield & Lai, 2008).

Information security significantly influences customer satisfaction (Vasic, Kilibarda & Kaurin, 2019; Szymanski & Hise, 2000; Chang & Chen, 2009). Perceived privacy is also a significant factor influencing customer satisfaction (Mpinganjira, 2014; Schaupp & Belanger, 2005). However, studies confirming a significant effect of customer satisfaction on trust (Dabholkara & Sheng, 2012; Yeh & Li, 2009; Kim *et al.*, 2008; Ha & Perks, 2005; Ribbink *et al.*, 2004) have used measurements that did not incorporate both the individual factors of security and privacy. Eid (2011:86) found that security and privacy factors become increasingly unreliable in influencing customer satisfaction and instead, they tend to show a significant contribution to customer trust. In other words, customers' perceptions of security and privacy risks are strong determinants of trust but weak antecedents of satisfaction. This result corroborates prior studies (Faraoni *et al.*, 2018; Kim *et al.*, 2011). Empirical evidence shows that security and privacy significantly and directly influence online trust (Fortes & Rita, 2016; Ganguly, Dash & Cyr, 2009; Belanger *et al.*, 2002). The direct influence of customers' perceived security on trust is significant and echoed in many studies (Smith *et al.*, 2011; Flavian & Guinaliu, 2006; Bart *et al.*, 2005).

Therefore, as commonly stated in the online shopping literature, a key strategy of e-service providers is to improve trust by displaying security and privacy seals on their websites (Subramaniam & Andrew, 2016). The literature has focused strongly on the direct effect of security and privacy concerns on e-trust (Pi, Liao & Chen, 2012) and the direct influence of security and privacy concerns on satisfaction (Vasic *et al.*, 2019; Wang & Le, 2015; Ludin & Cheng, 2014; Liu, He, Gao & Xie, 2008). Bertozzi and Krishnan (2017:113) report that privacy positively impacts B2C e-commerce customer loyalty. Hence,

a betrayal of customer personal privacy could result in customer disloyalty (Mpinganjira, 2014). Durable e-business models strongly emphasise trust since perceptions of security and privacy are essential factors in building customer loyalty (Farah *et al.*, 2018).

3 Theory Grounding the Study

The Information System (IS) Success Model conceptualised by DeLone and McLean (1992) helps businesses to measure their investment in information technologies and e-commerce investment. In 2004, the IS Success Model was revised to incorporate dimensions of system quality, information quality, service quality, usability, customer satisfaction and the size of a business's net profit. System quality refers to consumer perceptions of a website's performance in retrieving and delivering information. It is a system attribute involving the physical structure of website system such as security features, webpage loading speed as well as components that operate outside of website information (Azam, Qiang & Abdullah, 2012). The ease of access, interaction, page navigation, hyperlinks, online entertainment and security and privacy are the measures of IS success that are most frequently researched (Yang *et al.*, 2005).

The relationship marketing theory that was developed by Morgan and Hunt (1994:22) is based on elements of commitment and trust, and is viewed as the traditional theory in relationship marketing studies. Due to capturing the general principle of exchanged relationships, trust, commitment and satisfaction are viewed in the literature as the critical elements of relationship marketing (Park & Kim, 2003; Garbarino & Johnson, 1999). Park and Kim (2003) report that information quality, website interface quality and consumers' security perceptions influence their information satisfaction and relationship benefit. In turn, these factors have a significant relationship with a consumer's website commitment and their actual purchase behaviour.

The Information System (IS) Success Model and relationship marketing theories are adopted in this study to examine the effects of information security and privacy concerns on trust, which moderates the effect of customer satisfaction on loyalty. Tunali and Aytakin (2018) adopted the IS Model to develop the conceptual e-loyalty models that measure consumer perceptions of a website's performance in facilitating activities related to online transactions. Goutam and Gopalakrishna (2018) studied the development of customer loyalty in online shopping by integrating e-service quality models and commitment-trust theory. Therefore, it is hypothesised that:

- H1.** Information security has a significant and positive influence on customer privacy concerns.
- H2.** Information security has a significant and positive influence on customer trust.
- H3.** Information security has a significant and positive influence on customer satisfaction.
- H4.** Privacy concerns have a significant and positive influence on customer trust.
- H5.** Privacy concerns have a significant and positive influence on customer loyalty.
- H6.** Trust has a significant and positive influence on customer satisfaction.
- H7.** Trust has a significant and positive influence on customer loyalty.
- H8.** Satisfaction has a significant and positive influence on customer loyalty.

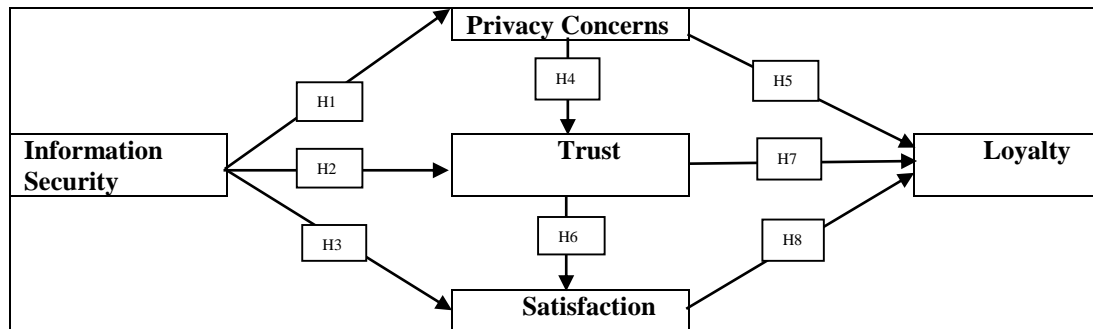


Figure 1: Conceptual framework of the study

4 Research Methodology

This research study is quantitative in nature (Malhotra, 2007). Pilot study of (N50) checking sample errors and measurement errors was gathered to acquire holistic ideas about online shopping factors, seeking to cross-validate the selection of factors in the B2C ecommerce literature. This was in order to improve knowledge on contextual key factors and provide direction on the method of survey. Respondents were briefed on the objectives of the study and were asked to brainstorm and write down their thoughts on security, privacy, trust, satisfaction and loyalty on the websites of the traditional retailers and online stores, and then to group and connect the five concepts of the study.

Constructive feedback was gathered from the pilot on difficulties such as length, ambiguous terms and double-barrel questions as well as general opinions on the survey. Finally, the discipline experts and quantitative study experts reviewed the results and simplified the sequence, wording and logic of each scale item based on the pre-test findings. This helped to develop a final version of the questionnaire which was distributed in the initial survey.

The sample was selected from Johannesburg, Gauteng, which is the most densely populated province in South Africa (StatsSA, 2015), and have an enhanced technology infrastructure and the Internet (Department of Communication, 1999). Data was collected through face-to-face surveys conducted in shopping malls (Hawkins & Tull, 1994). Purposive sampling was used. This method allows insights to be gathered from the respondents using a specific requirement (Hair, Celsi, Ortinau & Bush, 2017), such as a consumer must have purchased a product or a service in online shopping in the previous six months. This ensured that the respondents were similar to online shoppers from a holistic perspective (Dillion, Madden & Firtle, 1993). Male and female respondents ranging from 18 to 60 years of age were selected for the sample.

Similar to sample sizes used in prior studies (Brilliant & Achyar, 2013; Eid, 2011), 250 questionnaires were distributed for self-administering after the consumer had given verbal consent for participation in the study. Instructions for participation were explained. To measure perceptions of online shoppers in a face-to-face survey, the study asked a screening question to depict consumers who had purchased a product or a service online in Section 1. This was followed by the demographic questions on gender, age and income after tax. Customers were asked to indicate a website they used to make purchases, a product they liked to purchase, and the length of time they had been purchasing from that website. A request was made to respondents to link their answers to their preferred websites when answering questions in section 2.

Section 2 of the questionnaire consisted of 20 questions adopted from item scales used in the prior studies which had been validated and had good internal consistency reliability. Privacy (three items), trust (five items) and satisfaction (four items) were all adopted from Chen *et al.* (2012:173). Security (four items) was adopted from Guo, Ling and Liu (2012:45) while loyalty (four items) was adopted from Eid (2011:93). These item scales were modified to fit the purpose of the study. Respondents were required to score each item on a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

The well-trained fieldworkers collected data from the respondents over a period of two weeks, restricting any conflicts, anxiety or animosity which may have occurred. Strict ethical principles and behaviour guidelines (e.g., privacy and honesty, respect, etc.) were followed (Wiid & Diggins, 2016). After eliminating illegible questionnaires, 201 questionnaires remained, yielding an 80.1% response rate. This data was entered into the Statistical Package of Social Science (SPSS) Version 25.0 for Windows. A multivariate statistical technique was used to analyse data.

5 Results

5.1 Sample Description

Statistics of 201 valid and usable responses showed that there were more female (N = 117; 58.2%) than male respondents (N = 83; 41.3%), and the majority of them (N = 125; 62.2%) were between 18 to 24 years of age. Many respondents (N = 58; 28.9%) indicated that they spent between R 1000 to R 2000 on online shopping, and a large percentage of respondents (N = 78; 35.9%) preferred to purchase from Takealot.com. Although most of them (N = 64; 31.8%) had less than six months purchasing experience from their favourite website, many respondents (N = 95; 47.3%) frequently purchased apparel from their favourite websites.

5.2 Descriptive Statistics of the Factors and Reliability Test

Table 1 shows the reliability of the items, arithmetic mean, standard deviation and the inter-item correlation. All the constructs were tested for reliability and convergent and discriminant validity. Cronbach alpha coefficients ranged from 0 to 1 (Malhotra, 2007). The closer the alpha coefficient is to 1, the higher the internal consistency reliability (Pallant, 2010). The Cronbach alpha coefficients of the factors in Table 1 exceeded 0.7, showing good reliability (Hair *et al.*, 2017). The alpha coefficients exceeding 0.8 showed a high internal consistency reliability of the factors in the conceptual model (Wiid & Diggins, 2015). Customer satisfaction had the highest internal consistency (.925) while privacy concerns had the lowest (.725).

Customer trust had one item with the highest mean value (CT5; M = 4.20) while customer loyalty had one item with the lowest mean value (CL3; M = 3.17). All the items had the arithmetic mean above the average score of 3 and were included in the item total correlation and reliability assessments. Information security had an item with the highest standard deviation (IS1; SD = 1.163) while customer trust had an item with the lowest standard deviation (CT5; SD = .796). The item-to-total correlation assessed convergent validity, with consistency values ranging from .2 to .4 (Pallant, 2010). The inter-item correlation values ranged from information security (3.794), customer loyalty (3.935), privacy concerns (4.045) customer trust (4.084) and customer satisfaction (4.114) which all fitted the acceptable range between .2 to .4. This showed the convergent validity and internal quality of the data, enhancing the external quality of the findings.

Constructs	N	Cronbach α	No. Items	S. Items	Arith. M	Std. Dev.	Item-T- Corr
Information Security	201	.894	4	IS1.	3.59	1.163	3.794
	201			IS2.	3.88	.938	
	201			IS3.	3.87	.945	
	201			IS4.	3.84	.984	
Privacy Concerns	201	.725	3	PC1.	3.93	.857	4.045
	201			PC2.	4.05	.801	
	201			PC3.	4.15	.817	
Trust	201	.874	5	CT1.	4.08	.847	4.084
	201			CT2.	3.97	.959	
	201			CT3.	4.04	.913	
	201			CT4.	4.11	.826	
	201			CT5.	4.20	.796	
Satisfaction	201	.925	4	CS1.	4.12	.932	4.114
	201			CS2.	4.11	.884	
	201			CS3.	4.05	.910	
	201			CS4.	4.17	.867	
Loyalty	201	.860	4	CL1.	4.07	.957	3.935
	201			CL2.	4.19	.919	
	201			CL3.	3.17	.974	
	201			CL4.	3.78	1.084	

Table 1: Reliability analysis results

Table 2 shows the reliability of the constructs, arithmetic mean, standard deviation, skewness and kurtosis. The data from the 201 respondents ranged from 2.00 to 5.00 on privacy concerns. The mean values of the factors were all above the mid-point value of 2.5. The arithmetic mean values all exceeded 3, with the standard deviation values of ranging from .66306 to .88157, thus, indicating the symmetric distribution of values around the mean. The arithmetic mean values ranged from information security

($M = 3.7935$), customer loyalty ($M = 3.9353$), privacy ($M = 4.0448$), customer trust ($M = 4.0836$), and customer satisfaction ($M = 4.1144$). The results show a strong convergent validity, confirming the quality of the data.

Factors	No. Items.	Min.	Max.	Arith. M	Std. Dev.	Skewness	Kurtosis
Security	4	1.00	5.00	3.7935	.88157	-.483	-.072
Privacy	3	2.00	5.00	4.0448	.66306	-.407	-.374
Trust	5	1.00	5.00	4.0836	.70977	-.905	1.405
Satisfaction	4	1.00	5.00	4.1144	.81007	-1.194	2.026
Loyalty	4	1.00	5.00	3.9353	.82662	-.947	1.208

Table 2: Reliability analysis of the constructs results

A distribution curve indicated negative skewness values clustering at the upper right-hand side of the curve, with a standard error of (St. Error = .172) ranging from privacy concerns (-.407), information security (-.483), customer trust (-.905), customer loyalty (-.947), and customer satisfaction (-1.194). Kurtosis values with a standard error of (Std. Error = .341) ranged from information security (-.072), privacy concerns (-.374), customer loyalty (1.208), customer trust (1.405), and customer satisfaction (2.026). Positive kurtosis values indicate that scores cluster at the centre of the distribution curve (Pallant, 2010). In a perfect normal distribution, the skewness and kurtosis values will be equal to 0. When the values are positively skewed, the scores cluster at the left-hand margin with lower values but when values are negatively skewed, the scores cluster on the right-hand side of the distribution (Pallant, 2010; Wegner, 2000). A larger sample size (200+ cases) may be used to lower the risk of kurtosis to result in an underestimation of the variance (Pallant, 2010). The data in Table 2 may be relevant when referring to the variances in the sample for the purpose of reporting technique (Pallant, 2010).

Multiple regression analysis tested the relationship between the independent factors and dependent factors in the conceptual model (Hair *et al.*, 2017). Table 3 indicates the findings of the linear multiple regression for the hypotheses. Parametric statistical techniques were conducted for *t*-test values and analysis of variance (ANOVA) (Pallant, 2010). Linear regression analysis tested the overall fit of the conceptual model to the data set (Pallant, 2010). Variance inflation factor (VIF) implies the difference of the tolerance value (dividing 1 by value of tolerance), and suggests that values higher (or exceeding 10) show the existence of multicollinearity of the factors in the model (Pallant, 2010). Multiple regression analysis does not accept multicollinearity, which exists when the independent factors strongly correlate ($R = .9$ and above) and result in singularity (e.g. one independent factor interacts with other independent factors) (Pallant, 2010). The assessment of multicollinearity shows ($R = .517$) for the first regression equation, ($R = .447$) for the second regression equation, ($R = .737$) for the third regression equation and ($R = .757$) for the fourth regression equation, thus showing that multicollinearity did not exist in the conceptual model.

Hypotheses	Std. Error	Standardised β	t-value	Sig.	Tolerance	VIF	Result
Privacy < Security	.091	.115	1.681	.094	.789	1.268	Reject
Trust < Security	.107	.287***	3.331	.001	.501	1.994	Accept
Satisfaction < Security	.092	.206**	2.419	.016	.515	1.941	Accept
Trust < Privacy	.083	.330***	3.726	.000	.517	1.936	Accept
Loyalty < Privacy	.071	.150	1.698	.091	.517	1.936	Reject
Satisfaction < Trust	.064	.373***	5.064	.000	.426	2.345	Accept
Loyalty < Trust	.063	.413***	5.612	.000	.426	2.345	Accept
Loyalty < Satisfaction	.045	.757***	16.360	.000	1.000	1.000	Accept

Table 3: Multiple regression analysis results

* One-tailed probabilities: $P < .05$.

** One-tailed probabilities: $P < .01$.

*** One-tailed probabilities: $P < .005$.

The ANOVA tested the F-ratios which indicated the statistical significance of the regression models (Hair *et al.*, 2010). The R^2 range from 0 to 1; the linear relationship between the factors is stronger when the R^2 is closer to 1 (Dillion *et al.*, 1993). The first regression equation tested the relationships between the dependent factor of information security and three independent factors of privacy, trust and satisfaction. The results showed ($F = 23.914$; $p < .000$) and had the R^2 of = .267. The second regression equation tested the relationships between the dependent factor of privacy and the independent factors of trust and customer loyalty. The results showed ($F = 23.914$; $p < .000$) and had the $R^2 = .447$. The third regression equation tested the relationships between the independent factors of satisfaction and loyalty and the dependent factor of trust. The results showed ($F = 117.467$; $p < .000$) and had the $R^2 = .737$. The fourth regression model assessed the relationship between the independent factor of customer satisfaction and the dependent factor of loyalty. The results showed ($F = 267.649$; $p < .000$) with the $R^2 = .757$, which was closer to 1.

The first linear regression model revealed that 26.7% of the variation in information security was explained by privacy concerns, trust and satisfaction. The second linear regression model revealed that 44.7% of the variation in privacy concerns (dependent factor) was explained by the two independent factors of trust and loyalty. The third linear regression model revealed that 73.7% of the variation in trust (dependent factor) was explained by the two independent factors of satisfaction and loyalty. The fourth linear regression model revealed that 75.7% of the variation in loyalty (dependent factor) was explained by the independent factor of customer satisfaction.

Table 3 shows the standardised beta coefficients revealing that information security did not have a significant influence on privacy concerns, with a coefficient of ($\beta .115$; $p < .094$), but information security had a significant and positive influence on customer trust with a coefficient of ($\beta .287$; $p < .001$). This was followed by customer satisfaction with a coefficient of ($\beta .206$; $p < .016$). This means that H1 is rejected while H2 and H3 are accepted. Privacy concerns had a strong significant and positive influence on customer trust with a coefficient of ($\beta .330$; $p < .000$), but privacy did not influence customer loyalty with a coefficient of ($\beta .150$; $p < .091$). This reveals that H4 is accepted while H5 is rejected.

Customer trust had a significant and positive influence on customer satisfaction with a coefficient of (β .373; $p < .000$) while customer loyalty had a coefficient of (β .413; $p < .000$). This indicates that H6 and H7 are accepted. Customer satisfaction had a significant and positive influence on customer loyalty with a coefficient of (β .757; $p < .000$), meaning that H8 is accepted.

In practice, privacy is a strong significant determinant of trust of e-commerce websites. Trust significantly and positively moderates the influence of satisfaction on loyalty in the highly competitive and growing South African e-commerce market. The results support the important effects of privacy and information security on strengthening customer trust in the online purchasing process, which improves satisfaction with online shopping experience. Customer trust plays a critical role in determining the satisfaction of online shoppers. In turn, this feeling of satisfaction strongly predicts loyalty towards the website. The results substantiate the moderating effects of trust on the influence of satisfaction on customer loyalty as shown in Figure 2 below.

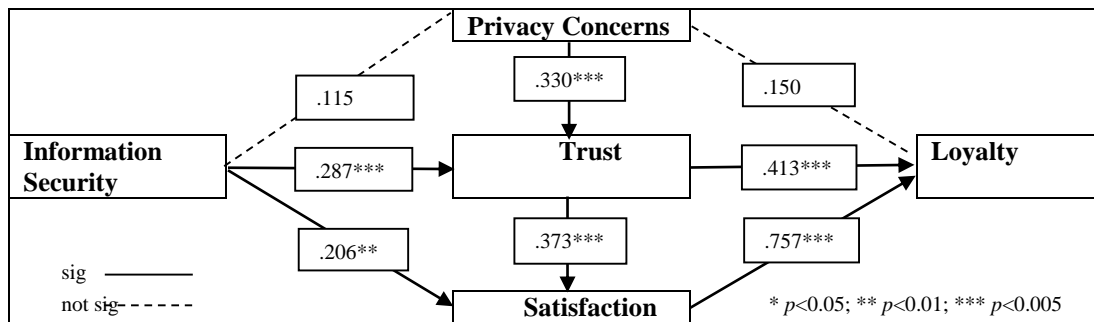


Figure 2: Findings of the conceptual model

Table 4 outlines the findings of the Pearson correlation analysis showing that the factors in the study significantly related above the p value of 0.5 (as shown in Table 4). The correlation coefficient value of .757 between customer satisfaction and customer loyalty shows that these factors are strongly related (p value < 0.5). Privacy and security correlated strongly with trust (p value < 0.5) while information security weakly correlated with satisfaction. Trust was strongly correlated with satisfaction, which suggests that trust is the moderator of effects of privacy and information security on satisfaction and loyalty.

Variables	Security	Privacy	Trust	Satisfaction	Loyalty
Security	1.000				
Privacy	.324**	1.000			
Trust	.478**	.434**	1.000		
Satisfaction	.449**	.408**	.685**	1.000	
Loyalty	.386**	.379**	.695**	.757**	1.000

Table 4: Correlation matrix results

** Correlation is significant at the 0.01 level (2-tailed).

6 Discussion of Results

This paper contributes theoretical and managerial implications in terms of information security and privacy and their role in establishing customer trust. In turn, trust moderates the effect of customer satisfaction on loyalty towards websites in South Africa's online shopping market. This paper adds insights to the B2C e-commerce literature by examining the Information System Success and Relationship Marketing theories. These were used to develop a conceptual model explaining the influence of customers' privacy concerns and information security on trust, which moderates the relationship between customer satisfaction and loyalty. Privacy had a strong significant effect on customer trust while security weakly influenced customer trust. Satisfaction strongly influenced customer loyalty while trust weakly influenced customer loyalty. The strong significant effect of customer satisfaction on customer loyalty was moderated by customer trust in online shopping.

6.1 Theoretical Contribution

From the theoretical overview, the findings indicate that the scale items used to examine customer trust as a moderator of the relationship between customer satisfaction and loyalty in B2C e-commerce fitted the reliability and validity of the conceptual model. The results revealed meaningful insights into the theories of Information System Success (IS) and relationship marketing when adopted in e-commerce to explain the relationship between website attributes and customer trust, satisfaction and loyalty.

The contribution of this study to the literature is multidimensional. It was found that although privacy concerns were not a significant factor in determining customer loyalty, as reported by Bertozzi and Krishnan (2017), privacy had a strong significant effect on customer trust in the South African online shopping market. Privacy is therefore a critical factor strongly evaluated by online shoppers in South Africa. The study contributes to the literature by explaining the importance of privacy concerns in e-commerce (Barth & de Jong, 2017; Malhotra, Kim & Agarwal, 2004). Information security was the second factor predicting customer trust in this study. The results show that privacy concerns and information security are antecedents of customer trust in e-commerce. Customers value the privacy of their personal information more than the security of the website. These results corroborate the findings of Eid (2011), who showed that privacy and security have a significant and positive influence on customer trust.

The study contributes to consumer behaviour literature describing the relationship of customer trust and satisfaction. A growing body of research confirms the effects of trust and satisfaction on e-loyalty (Nasimi *et al.*, 2018; Hidayat, Saifullah & Ishak, 2016; Eid, 2011). The study found that trust was a significant determinant of satisfaction of online shoppers. This result corroborates prior research (Faraoni *et al.*, 2018; Lee & Chung, 2009; Nusair & Kandampully, 2008; Lee & Lin, 2005; Gummerus *et al.*, 2004). The study found that satisfaction with online shopping was a strong determinant of loyalty towards the website, which supports prior research (Nasimi *et al.*, 2018; Eid, 2011). The results concur with the traditional view that high levels of customer satisfaction contribute to a higher degree of loyalty.

The study identified the significant and positive influence of customer trust as a moderator that strengthens the significant influence of satisfaction on B2C e-commerce customer loyalty. This finding is evident in prior research (Anderson & Srinivasan, 2003; Anderson & Swaminathan, 2011). The findings contribute to the literature by describing the significant and positive effect of trust as a moderator of the relationship between customer satisfaction and loyalty in B2C e-commerce. These results confirm the important role of trust in moderating the significant influence of customer

satisfaction on loyalty towards a website (Faraoni *et al.*, 2018; Anderson & Swaminathan, 2011; Anderson & Srinivasan, 2003). Thus, the weak relationship between customer trust and loyalty, as opposed to customer satisfaction and loyalty, could be explained by the view that trust is dependent on privacy and information security. This could be considered by many websites users to be the standard requirements and basic principles for acceptance and usage of e-services (Eid, 2011). The results answered the research questions and objectives. These results represent a critical step in testing the conceptual model in the context of the emerging South African market.

6.2 Managerial Contribution

This paper outlines website marketing strategies regarding the practical website activities of privacy and information security. In the Fourth Industrial Revolution, website designers and marketing managers must understand how to protect the privacy of consumers and strengthen the security of online transactions. This will enable the website designers and marketing managers to establish trust and customer satisfaction, which in turn improve customer loyalty towards the website. It is important for managers to recognise the vital role of trust in stimulating the strong significant effect of customer satisfaction. This indicates that trust is a significant moderator on the influence of customer satisfaction on loyalty from the perspective of customers who shop online.

The results indicate an online market segmentation of more females, aged between 18 – 24. These consumers spend between R1 000 to R2 000 on online shopping and frequently purchase apparel, particularly from Takealot.com. The results emphasise the importance of keeping existing customers, as most of them have only less than six months purchasing experience from this website. The service ratings of online customers in South Africa in terms of their purchasing experience at online stores such as Takealot, Amazon and Spree show a satisfaction rating of 8.2 out of 10 (Prinsloo, 2016). Rudansky-Kloppers (2014) notes that approximately 91% of South Africa's online customers are satisfied with their overall online shopping experience.

Providing mechanisms to protect the privacy of consumers on the website will heighten their levels of trust. Developing customer trust is a key success factor for websites that intend to build customer loyalty. It is important for website marketers to strive to satisfy their customers, which can strongly influence their loyalty towards a website. From a global, continental and South African perspective, documenting the practical business implications for firms using B2C e-commerce will allow website managers to better understand the major obstacles to online shopping success. These barriers can be overcome by protecting customers' privacy through mechanisms which enable them to control their private data. Barriers can also be overcome by improving the security of the website to strengthen customer perceptions of safe online shopping transactions. These marketing strategies have the power to influence customer trust, improving satisfaction and building loyalty towards a website.

To realise B2C e-commerce success, academics must prioritise researching the computer human behaviours in general and developing greater awareness of technology use on how individuals can control their private information on websites. Improving privacy protection perceptions could make customers feel more comfortable to share the required information in the online shopping process, which requires the presence of trust. This shows that privacy, information security and trust are critical determinants of B2C e-commerce success. For website managers in South Africa to develop customer loyalty, they need to stimulate perceptions of privacy protection and information security which could improve customers' trust of the website, product or website service vendor.

The perceived risk of using e-commerce has decreased among online shoppers in South Africa as many people have become more proficient Internet users (Mkhosi, 2017), however, during the Fourth

Industrial Revolution, businesses that will succeed will be those harness information as a valuable resource to reach the highest levels of competencies in the emerging global economy. To achieve this goal, it is imperative to build customer trust. Website marketers in South Africa must place greater emphasis on the privacy of customers. This can be done by avoiding bombarding customers with product information or website advertisements but instead, providing detailed evidence, preferably with pictures or videos demonstrating the processes of supply value chain and fair labour practices. This will stimulate their customers' beliefs about purchasing from the websites by accompanying third-party endorsement which would be appreciated. Showing user satisfaction policies, product returns and refunds and allowing consumers to use pseudonymous or remain anonymous throughout information exchanges and other website transactions could build trust. Another way of building online trust is to show vulnerability and display the true history of the firm, its products and the experiences of its customers, who helped create the firm's success. The protection of personal data, secure transactions and payment processes, maintaining the privacy of the communication on the website are all key specifics that customers expect.

Trust can be built by displaying behaviour that resonates with customers' expectations; in this way, a track record of being trustworthy can help to instil trust. Website managers in South Africa can reduce perceived risks by ensuring that security mechanisms are linked to users' self-data control, authenticity system and supplementary payments methods to enable customers to control the release of their personal information. This would make them feel safer and increase their confidence in the website, since they would perceive that appropriate privacy and security measures have been considered. This would stimulate the use of the Internet for searches and develop trust, motivating customers to provide the required information to complete the online transactions successfully. This would satisfy their shopping needs and build loyalty in the long term.

7 Conclusions, Limitations and Future Directions

This paper examined a conceptual model of the determinants of trust as a moderator of customer satisfaction and its influence on loyalty in B2C e-commerce in South Africa. The conceptual model proposed the key success factors influencing trust and was empirically validated. Privacy concerns, more than security perceptions, had a significant influence on customers' trust. The strong significant effects of privacy and security perceptions on trust and the significant effect of trust on satisfaction indicate that trust moderates the effects of customer satisfaction on loyalty in B2C e-services in South Africa. Customer satisfaction is a strong determinant of customer loyalty in online shopping in South Africa. To gain the benefits and success in the Fourth Industrial Revolution, marketers must reduce consumers' privacy concerns and strengthen the security accompanying the website. This would help to establish customer trust, which would in turn, increase customer satisfaction and loyalty toward websites in South Africa.

Despite the broader insights presented in this study, there are some limitations. The sample largely consisted of females residing in Johannesburg. This is not representative the entire population of online shoppers in South Africa and thus, limits the opportunity to generalise the findings to the broader population. To strengthen the validity and generalisability of the results in future studies, larger sample size surveys could be conducted, that include proportionally equal responses from online shoppers in South Africa. These could include other metropolitan cities in Gauteng as well as other provinces of South Africa. However, as the Johannesburg metropolitan city has the highest population and is the economic hub of Gauteng province and South Africa, the findings may only be generalised to this market. Despite the importance of privacy and information security, other factors such as user interface

and information quality, product variety, payment methods and delivery could be incorporated into future studies in South Africa. Investigating the effects of the factors mentioned above on trust, attitudes and purchase intentions is of interest for future research. Among the top ten global trends, the online customer trust issue is growing, reaching high levels of customer emotional involvement and action (Angus, 2018). This effect of customer trust on emotional involvement could therefore be examined.

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