The Impact of E-Service Quality on E-Loyalty: In the case of Online Shopping Mobile Applications in Malaysia

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Abstract
In recent decades, advancements in technology and mobile internet have greatly improved the effectiveness of mobile applications as retail channels and shopping platforms. The pandemic, along with better internet access and improved facilities, has elevated the online shopping landscape. This study emphasizes the critical role of e-service quality in fostering e-loyalty among users of mobile applications for online shopping. It is crucial because it addresses the increasing reliance on mobile apps for online shopping in Malaysia, highlighting the importance for retailers to understand the factors that enhance customer loyalty. Unlike most studies that focus on online shopping websites, this research specifically targets mobile shopping applications. It provides valuable insights for current and future online retailers on how to enhance e-service quality in mobile apps, which is essential for their development, strategy, and management. By offering a better customer experience through mobile shopping apps, retailers can more easily attract and retain customers in the future. The data used in the analysis comes from a sample of 151 participants, and descriptive and multiple regression analyses were conducted. The impact of six independent variables - efficiency, privacy, fulfillment, responsiveness, contact, and application design - on consumer loyalty was tested, and the results show that three hypotheses were accepted while the other three were rejected. Some limitations have been identified, and recommendations for future studies have been provided. Based on the findings, it is suggested that future research should explore other factors that influence e-loyalty, such as cultural and generational differences, to provide a comprehensive understanding of consumer behavior in the context of mobile applications for online shopping.
Keywords: E-Loyalty, E-Service Quality, Efficiency, Privacy, Fulfilment, Responsiveness, Contact and Application Design.

Introduction

The internet offers many services such as information to collect data, promotes products and services, and systems for ordering online with adaptability for users. According to Swoboda and Winters (2021), the integration of offline and online reduces marketing costs and improves competitiveness. Due to that overall, the internet has changed the lifestyle of individuals, and the company must adapt to the changes to better manage their business, especially in information communication, conversion strategies, and transaction processes of their products and services (Saghiri & Mirzabeiki, 2021). This is also impacted by the pandemic of Covid-19 situation w, staying at home and government movement restrictions have highly inclined the online shopping trends (Moorthy et al., 2022). These events have led to the development of a virtual way of doing business and transactions known as e-commerce. E-commerce is defined as conducting business transactions electronically via the internet, such as purchasing, ordering, and advertising, as the powerful media for business models (Putri, 2017). In short, it is defined as buying and selling products and services through the internet using a specific medium and platform. Most companies use e-commerce transactions to compete with competitors for their Omni-channel online. Thus, e-commerce has become a phenomenon in the past few years for customers, individual shoppers, and business sellers to sell through the online shopping platform for them (Gulc, 2021).

As reported by Malaysian Communications and Multimedia Commission (MCMC, 2021), the penetration rate of smartphone users in Malaysia for 2021 was 94.8%. Moreover, it is expected that nearly 100% will be in 2022 or 2023. The data also stated that 4 out of 10 smartphone users (41.1%) claimed that they shopped using their smartphones, with 44.1% doing so at least once a month. The data gathered shows that users with the range of age between 16 years and 64 years are already shopping online through mobile applications in Malaysia. Shopee, Lazada, Taobao and other online mobile shopping applications have become Malaysia's most preferred. Exclusive deals are offered for customers who always look for free shipping; convenience services, easy navigation and an informative delivery process have motivated online shoppers to purchase.

Furthermore, the rise of online mobile shopping applications is supported by telco companies' availability of internet facilities and technological innovation from many smartphone producers in the market (MCMC, 2021). Therefore, it gives a tremendous opportunity for online retailers to target avid smartphone users and other mobile devices to effectively enlarge their reach of users in promoting mobile retails, thus making investments from that reach. As revealed by many scholars, such as Khan et al (2019); and Al-Khayyal et al (2020), traditional service quality has received extensive study by researchers over the past three decades but studying the electronic service quality characteristics can be considered a novel era of research, especially in an online mobile platform. The new revolutions for e-service quality through mobile applications need to be mindful because it has become a virtual store of online retailers worldwide.

According to Mehra et al (2021), the mobile application provides several benefits compared to the traditional website. It offers more significant security features and allows consumers to go directly to the marketer's self-contained environment, bypassing the competitors' nformation. When mobile service providers evaluate by customers, the focus on the e-service quality dimensions becomes crucial, especially to see the impact of service quality on

consumers' behaviour. Thus, the researcher believed that improving mobile commerce service quality provides a safer and more enjoyable shopping experience and offers more significant benefits to company operators.

However, according to Lee & Lee (2020), customers still need help with shopping online. Unfriendly mobile app navigation, poor payment gateway, inefficient customer services and not updated shipping information may lead to customers' disloyalty and affect their later or other purchase behaviour. There are various risks bear by consumers when it comes to online and electronic transactions. Indirect contact with online sellers and providing personal information like credit card numbers are among the privacy issues to be considered (Xu et al., 2017). The dissatisfaction that might result from the improper risk management by online sellers creates disloyalty in future shopping thru mobile apps. Therefore, in this study researcher intend to examine the impact of e-service quality dimensions on consumer e-loyalty of online shopping mobile application. The outcomes will change the current strategy for developing and managing online mobile shopping applications.

Literature Review
E-Loyalty
Based on Pee et al (2018), loyalty implies the growing value of supportive consumer behaviour based on their positive post-purchase satisfaction towards services thru online experience. The study explains that customers' loyalty towards the e-commerce platform can be seen when they return to that website for repeat transactional purposes and are willing to recommend it to other potential buyers. This positivity and favourability are translated into a human attitude towards something. Therefore, attitudinal loyalty is the foundation of commitment and trust, while behavioural loyalty is grounded in repeat purchases. Due to that, the definition of customer loyalty has permanently been related to a combination of customer attitudes and buying behaviour (Krishnan, 2021). A previous study by Zeithaml et al (2002), found that the satisfaction and positive outcome of service quality dimensions significantly influence customer loyalty.

Conversely, customer defections are believed to result from poor service quality experiences that lead to disloyalty among online users. Based on this fact, for any business's survival growth, customer loyalty is essential for companies (Kampani & Jhamb, 2020). Thus, e-service quality is vital in retaining customers, especially for mobile shopping app companies, to make profitable and sustainable growth of market share. Previous research findings stated that many customer relationships become unprofitable due to the high cost of acquiring customers (Buttle & Maklan, 2019). Failure to tackle this might result in inefficient online mobile shopping application development for providers.

On the other hand, Gao et al (2015), found other factors that affect the customer's e-loyalty in the mobile purchase: system quality, information quality, privacy and security trust, flow and satisfaction. Due to that, the post effect of e-loyalty be grasped through repeated visits to the mobile shopping app and purchasing made by customers could result in a positive word of mouth of good experience (Rezaei et al., 2017). Consequently, companies can reduce the operating costs or advertisement budget in creating awareness of their brand and products.

E-Service Quality Dimensions

The anchor in building-up customer loyalty is ensuring a proper service quality delivery. The root of the service quality foundation has been developed by Parasuraman et al (1988), using the fundamental of traditional "consumer's judgment about entity's overall excellence or superiority". However, the service quality revolution to an electronic platform known as e-service quality comprises dimensions that can increase the value of services in terms of the practical, efficient shopping experience, delivery process, and refund of goods through a mobile application. (Zeithaml et al., 2002). According to Rita et al (2019), online businesses are more challenging to retain customers than offline, especially when delivering excellent e-service quality via less tangible-to-be-specific virtual platforms. Therefore, it is believed that customers will only return to online mobile shopping applications if they have an exceptional level of services provided by the company. Subsequently, the relationships between e-service quality and e-loyalty are well documented in the past literature (Zeithaml et al., 2002, Ladhari, 2010; Kim & Lennon, 2017; Shankar & Datta, 2020).

Nevertheless, many previous studies investigating e-service quality cover the website as a platform. Although this study focuses on mobile applications, the same variables will be studied in website e-service quality since the function and its concepts work similarly. According to Taylor and Levin (2014), the mobile application provides several benefits compared to a traditional mobile website. It offers greater security features and allows consumers to go directly to the marketer's self-contained environment to bypass the competitors' information. A previous study by Tam and Wa (2003), stated that there is a significant target to prove a better understanding of the relationships between e-service quality and loyalty when using an online mobile application. Plus, previous studies found that the service quality of mobile commerce can be improved when it provides a safer and more enjoyable shopping experience and offers greater benefits to operators of the companies. Based on the above discussion, it is evident that e-service quality strategically enhances a company's operational efficiency and profitability (Gull et al., 2020).

Thus, past researchers have proposed and tested various dimensions since its main establishment by Zeithaml et al in 2002. In 2005, Lee and Lin introduced the e-service quality measurement using the dimensions of website design, reliability, responsiveness, trust and personalization. The study focuses on online shopping, which a website as the central platform. Results revealed that the dimensions of website design, reliability, responsiveness, and trust influence overall service quality and customer satisfaction. In addition, the dimensions are significantly related to customer purchase intentions. However, personalization is not significantly related to overall service quality and customer satisfaction. In the same year, Parasuraman et al (2005), used seven (7) dimensions; efficiency, availability, fulfilment, privacy, responsiveness, compensation and contact to measure e-service quality. However, the focus of their study is on general electronic service settings. On the other hand, Finn in 2011 has used fourteen (14) attributes in measuring the non-linear effects of e-service quality dimensions on customer satisfaction named as; ease of use, navigation, site design, information, reliability, intuitiveness, security, responsiveness, customer support, returnability, personalization, aesthetics, assurance and accessibility. Those attributes were inspired by Kano et al. in 1984, which emphasized that service attributes are classified as attractive, one-dimensional, or must-be.

In 2016, with a wealthy literature review on the establishment of the current association of e-service quality and e-loyalty within online shopping, Ting et al (2016), utilized a framework constructed based on an e-service quality instrument developed by Parasuraman et al. (2005), Lee and Lin (2005), and Bukhari et al (2012), in order to test the e-service quality and its relationship with e-satisfaction and e-loyalty to understand better the Malaysian's scenario when shopping online. Twenty-four (24) items of e-SQ Dimensions using six (6) main variables: efficiency, privacy, fulfilment, responsiveness, contact and website design, have been used for this study. Therefore, the adaptation of mobile applications setting will be made in explaining the following e-service quality dimensions.

Efficiency is related to an application's ability to help consumers obtain the desired products by offering relevant information with minimal effort (Zeithaml et al., 2002, Sathiyavany & Shivany, 2018). This dimension reflects the navigation process, fast page loading, accurate transaction completion, and the site's organization (Kaur et al., 2020). The next dimension, privacy, is considered one of the primary important aspects of e-SQ. When it comes to online, there are fewer interactions between customers and retailers (Reichheld & Schefter, 2000). Consequently, trust must be established in other ways to have privacy for customers to make an online purchase. There are rapid developments in electronic commerce, and most customers perceive insecurity when making or receiving payments over the mobile app. Hammoud et al (2018), also reported privacy as a vital concern even after the post-purchase of e-services. The third dimension, fulfilment, is the extent to which the site fulfils its promises about order delivery and the availability of items (Sabri et al., 2022). In addition, delivery systems must be on time, accurate and consistent with the indications on the shopping app. The next dimension is known as responsiveness. Without considering the usage of the responsiveness scale in physical services or mobile services, this dimension is defined as the willingness to help customers and provide prompt services (Li & Suomi, 2009).

In a specific definition of e-commerce services, responsiveness refers to the fast response when a technical issue happens or when the question needs to be answered and the opportunity to get technical support (Jameel et al., 2021). Therefore, from the perspective of mobile shopping applications, this is highly related to the effectiveness of the company's problem-handling process, query, and return policy. The fifth dimension used by the researcher in this study is contact. In general, contact is a medium provided by the company to conduct easy access to communicate with customers online or offline (Ardiansyah & Handrijaningsih, 2021). However, in an online context, contact refers to the service provider's ability to help and assist customers via online services or phone calls when problems occur while using an application or website (Puranda et al., 2022). Thus, this finding shows that multiple contacts provided and available enable better customer reach, thus contributing to a better company and customer relationship. The last dimension explored by the researcher is application design. Application design provides the customer's first impression, builds consideration, and lets them interact when they enter the application. The design method also attracts customers, indirectly increasing their conviction and satisfaction. Due to that, this understanding seems appropriate for mobile services applications because it has the same characteristics and interface as retailers' websites (Pitchayadejanant et al., 2019).

Conceptual Framework

Based on the above-discussed literature review, a research model in Figure 1 is developed to investigate the e-service quality dimensions towards e-loyalty. The e-service quality dimensions are the independent variables, and e-loyalty is the dependent variable. The illustration below shows the factors that influence e-loyalty. Subsequently, the hypothesis then examined based on a literature review with an appropriate analysis technique from the data gathered by the researcher in the next section.
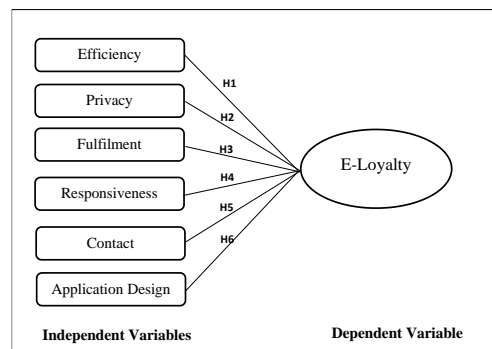

Fig. 1: Conceptual Framework adapted from Ting et al. (2016)

Research Methodology

According to Zikmund et al (2013), getting a better, systematic, and more efficient way is providing the required information to collect and interpret the data. Using quantitative research to achieve this, the researcher can examine other relationships for hypothesis testing between independent and dependent variables (Basri et al., 2018).). As for data collection, the researcher used purposive sampling in gathering the data from respondents. Purposive sampling can be beneficial for situations where one needs to reach a targeted sample quickly and where sampling for proportionality is not the primary concern (Oribhabor & Anyanwu, 2019). Preliminary questions have been asked of each respondent to see their eligibility to answer further questions. One hundred fifty-one (151) respondents of young adults and senior citizens with the range of age below 20 years old until above 50 years old as a sample has been chosen for this study. The sample size is believed enough for this study to get highly reliable and representative data from respondents, as Kang and Lee (2018), suggested in their study focusing on customer experience and e-service quality. In terms of the instrument used, according to Rahi, Alnaser and Abd Ghani (2019), the questionnaire should be clear, simple, specific and relevant to the research objective. The point of the questionnaire is to design in a simple format to make it easier for the respondent to understand and answer the questions.

Meanwhile, the questionnaire design is an essential process because it will come out with accurate data from respondents to answer the questions and will affect the validity of the data, response rate and others (Saunders et al., 2009). The researcher modified the questionnaire to be adaptive to the mobile application setting and fit the target respondents. Twenty-four (24) items of e-SQ Dimensions (Efficiency, Privacy and Trust, Fulfilment, Responsiveness, Contact and Application Design) constructed based on E-SERQUAL instruments and eight (8) items of e-loyalty for online mobile shopping applications in the

questionnaire were adapted from (Ting et al., 2016). Structured question for dependent and independent variables is measured using five-point Likert scales, and the data is analyzed using descriptive and multiple regression.

Findings and Discussions

Respondents Background

Respondents' proportion consists of 41.7% male and 58.3% female. 9.3% were 20 years and below, while 70.9% were 21 to 30 years. 17.2% were 31 to 40 years old, while 2% of respondents were aged between 41 and 50 years. Only one respondent aged above 51 years. Therefore, this statistic shows that people aged between 21 to 30 years are the ones who are likely to shop using the mobile application. The majority of respondents are Degree holders, with 42.4%, 41.7% are diploma holders, and the remaining are SPM, Master's Degree and PhD holders. Most respondents work in the private sector, representing 44.4%, and the rest are government servants, students and housewives. Furthermore, 35.1% of respondents have a monthly income range from RM 1,101 to RM 3,000, followed by a range of income less than RM 1,100 with 33.8%. The next group of respondents' incomes that ranges from RM 3,001 to RM 5,000 is 21.9%, while income range from RM 5,001 to RM 7,000 and respondents with income more than RM 7,001 is 5 6% and 3.3% respectively.

General Purchase Behavior

Other than the respondent's data using Likert Scale to investigate the variables, the researcher asked a few questions related to consumers' purchase behaviour to better understand mobile application usage among consumers in Malaysia. The top mobile shopping application used by most respondents is Shopee with 58.3%, followed by Lazada with 24.5% and Zalora with 8.6%. The remaining belonged to GoShop, Taobao, and 11Street. This finding is consistent with what has been reported in the Malaysian Hand Phone Users Survey (MCMC, 2021). On the other hand, the percentage of respondents visiting or logging in to the mobile shopping application between 1 to 3 times is 37.7%, between 4 to 6 times is 27.8% and less than once visiting online is 25.2%. Lastly, the respondents who visit more than seven times is 9.3%. Apart from that, most respondents made purchases online between 1-2 times and spent below RM100 for a total purchase in a month.

Reliability Analysis

The point of conducting a reliability test is to measure all variables conforming to their stability, validity and consistency for this study. There were 151 respondents included in this reliability test using Cronbach Alpha as an output for each independent and dependent variable. E-loyalty has the highest with 0.959, followed by Application design and privacy with 0.946. Next in order is Responsiveness with 0.926 and Fulfilment with 0.903. The least are Efficiency and Contact, with 0.897 and 0.891, respectively. In general, the value for each independent and dependent variable exceeded the minimum value of 0.6 for the Cronbach Alpha reliability range. Therefore, according to Hair et al. (2003), all the variables are valid to be used by the researcher in conducting this study for further findings investigation. The strong establishment of service quality and loyalty studies previously might influence this.

Table 1
Cronbach's Alpha Values

Variables	*Cronbach's Alpha N=151*
Efficiency	*0.897*
Privacy	*0.946*
Fulfilment	*0.903*
Responsiveness	*0.926*
Contact	*0.891*
Application Design	*0.946*
E-Loyalty	*0.959*

Regression Analysis Results

The model summary below (Table 2) shows the overall relationship between the dependent and independent variables projected to influence consumers' perceptions of service quality on their loyalty towards mobile shopping applications in Malaysia. The R-square value for the whole model is 0.825, representing 82.5% of the variance in factor influence, which has been significantly explained by consumers' loyalty towards a specific brand of mobile shopping application. The statistics also reveal that the remaining 17.5% were explained by other factors not included and tested in this study. The R-square result is expected since most e-service quality dimensions used in this study have been tested well by various studies before (Guluwita & Sapukotanage, 2020, Al-Dmour et al., 2019.). Furthermore, this mobile application setting result shows consistency with the web-based setting (Juwaini et al., 2022). This proved that the dimensions in the whole model have a consistent impact regardless of mobile applications or websites.

Table 2
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.908[a]	.825	.818	.36503	.825	113.363	6	144	.000

Table 3
Anova Table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	90.632	6	15.105	113.363	.000[b]
Residual	19.188	144	.133		
Total	109.819	151			

In any Anova table, the p-value is the most crucial for the researcher in analyzing the whole data set and becomes a decision rule to see the impact of independent variables tested. Referring to the Anova table above (Table 3), F-statistics, also known as F-test, with a value of

113.363 and a p-value less than 0.05, signifies that this model is statistically significant. Thus, the data explained that all independent variables, such as efficiency, privacy, fulfilment, responsiveness, contact and application design, are generally significant and related to the respondent's e-loyalty as a dependent variable. As mentioned earlier, when the p-value < 0.05, the result then permits further data analysis using the Coefficients table to see the impact of each variable in a specific manner.

Table 4
Coefficients Statistics

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval For B	
	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	.095	.145		.653	.515	-.192	.381
Efficiency	.293	.070	.288	4.213	.000	.156	.431
Privacy	.222	.059	.247	3.746	.000	.105	.339
Fulfilment	.129	.081	.122	1.599	.112	-.030	.288
Responsiveness	.225	.073	.227	3.083	.002	.081	.369
Contact	.003	.060	.004	.058	.954	-.114	.121
Application Design	.116	.065	.121	1.788	.076	-.012	.245

The above Coefficients table has outlined the statistics enabling the researcher to identify each variable's impact. The data allow the researcher to decide on the hypothesis proposed in the conceptual framework. The summary is as follows:

1. The p-value of efficiency (0.000) is lesser than 0.005; thus, it is found that efficiency significantly impacts users' loyalty towards online mobile shopping application usage.
2. The p-value of privacy (0.000) is lesser than 0.005; thus, it is found that privacy significantly impacts users' loyalty towards online mobile shopping application usage.
3. The p-value of fulfilment (0.112) is greater than 0.005; thus, it is found that fulfilment has an insignificant impact on users' loyalty towards online mobile shopping application usage.
4. The p-value of responsiveness (0.002) is lesser than 0.005; thus, it is found that responsiveness significantly impacts users' loyalty towards online mobile shopping application usage.
5. The p-value of contact (0.954) is greater than 0.005; thus, it is found that contact has an insignificant impact on users' loyalty towards online mobile shopping application usage.
6. The p-value of application design (0.076) is greater than 0.005; thus, it is found that application design has an insignificant impact on users' loyalty towards online mobile shopping application usage.

Although the framework, when tested as a whole model, resulted as significant, a detailed impression of individual variables dictates different scenarios and impacts. From the coefficient table above, only three (3) variables, efficiency, privacy, and responsiveness, are

significant. This result is almost similar to Puranda et al (2022), findings in their study of using online food mobile apps. Hassle-free and easy-to-use applications seem to give users a good impact on loyal to certain online mobile shopping application brands. Apart from that, companies' effort to protect their privacy, such as personal and payment information, increases their trust to the service providers, thus making them loyal to the mobile application. This is consistent with Rita et al (2019), where they found that privacy is associated with overall service quality. In addition, this implies that most online mobile shopping applications providers had successfully made convenient and promptly responded to the users with regards to any problems that the users are facing, be it technical payment problems or returning items. Hence, to maintain this performance, companies should take advantage and devote more investment in adopting more features to ensure users' e-loyalty (Al-Khayyal et al., 2020)

In contrast, this study finds another three (3) variables: fulfilment, contact and application design, insignificant towards e-loyalty. This is possible because most mobile shopping applications such as Shopee and Lazada rely on the vendor or registered sellers; thus, issues such as availability of stocks, direct contact with sellers and attractiveness of offerings are not significant in defining customers' total loyalty towards the mobile shopping applications. However, this result seems quite inconsistent with Al-Adwan and Al-Horani (2019), where in their study, website design is found significantly contribute to e-loyalty via e-satisfaction as a mediation. However, the researcher's result for application design in this study is consistent with Ludin and Cheng (2014), who found that application design is insignificant to e-loyalty.

Conclusion and Recommendation for Future Research
In conclusion, the study indicates that online retailers with mobile applications should focus more on enhancing the application's efficiency, privacy, and responsiveness. Companies should make changes and utilize the latest technology compatible with current and future needs. This is important to anticipate fast technology evolution and changing consumer behaviour. Apart from that, due to these changes, it is believed that other unexplored factors exist outside there that possibly influence how e-service quality impacts customers' e-loyalty in an online mobile shopping application setting. For instance, culture and generational differences should be included in future research. Furthermore, in terms of research methodology, future research should widen the sample size and the locality to get more feedback and perceptions to analyze the e-service quality further.

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