



## E-service quality in m-Health applications: The moderating effect of gender and domicile area

 Cindy Mayori <sup>(a)\*</sup>  Radityo Putro Handrito <sup>(b)</sup>



<sup>(a,b)</sup> Faculty of Economic and Business, University of Brawijaya, Malang, Indonesia

### ARTICLE INFO

#### Article history:

Received 26 May 2024

Received in rev. form 25 June 2024

Accepted 24 July 2024

#### Keywords:

e-service quality, loyalty, satisfaction, demographic, m-health

#### JEL Classification:

O15

### ABSTRACT

*This study aims to investigate the effect of e-service quality (ESQ) in m-Health application on loyalty (LOY), focusing on the mediating customer satisfaction (SAT) and the moderating role of gender and domicile area on user loyalty. The study used quantitative research and the population of this study was m-Health application users with 260 respondents using the purposive sampling method. The analysis method used is PROCESS Macro Mediated Moderation Model 14 by SPSS 29. The results indicate that e-service quality positively and significantly affects user loyalty. Additionally, e-service quality has a positive and significant impact on consumer satisfaction and also the quality of consumer satisfaction has a positive and significant impact on loyalty. The study also found that customer satisfaction mediates the relationship of e-service quality on user loyalty. However, the demographic variables, gender, and domicile area were found have no impact on the relationship between consumer satisfaction and loyalty.*

© 2024 by the authors. Licensee SSBFNET, Istanbul, Turkey. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

## Introduction

Health service providers are currently utilizing technology and information by innovating in creating electronic health systems that make it easy to access various information and health services for the wider community, which is called electronic health or e-Health. One of the benefits of the presence of e-Health is the development of health service applications that can be accessed via cell phones or are called mobile health applications or m-Health. The World Health Organization (WHO) defines m-Health as medical and public health practices using mobile devices such as cell phones, patient monitoring devices, personal digital assistants (PDAs), tablets, and other handheld wireless devices (World Health Organization, 2011).

Since the COVID-19 pandemic, the global usage of m-Health applications has increased. Currently, there are over 100,000 m-Health applications available on iOS and Android platforms, making this industry highly competitive. Indonesia ranks third in the world for the largest number of m-Health application users, following China at 65% and India at 63%. M-Health services are utilized for accessing hospital information systems, drug delivery services, teleconsultation services, and as a source of health and lifestyle information. Start-up companies are actively developing m-Health applications, the private sector has introduced numerous m-Health applications, such as KlikDokter, Halodoc, Alodokter, and many others.

Moreover, even though the trend of using m-Health is developing rapidly, there is still a tendency for users who have registered with the m-Health application service to stop using it if they experience various obstacles such as too much data to be filled in such takes a long time, loss of interest in using the application, as well as difficulty in using the application, even 45% of users stop using the application after downloading it (Krebs & Duncan, 2015). Therefore, m-Health application business providers need a strategy to maintain user loyalty so they do not switch to other m-Health applications. Loyal users of the m-Health application who are satisfied with the application tend to share their positive reviews with others (Handayani et al., 2020). Another research conducted by Opong

\* Corresponding author. ORCID ID: 0009-0004-3379-5580

© 2024 by the authors. Hosting by SSBFNET. Peer review under responsibility of Center for Strategic Studies in Business and Finance.

<https://doi.org/10.20525/ijrbs.v13i5.3565>

et al., (2021) found that service quality indicators have an impact on the continuance use and satisfaction of the m-Health application in rural communities.

Even though the m-Health application offers innovative features for providing health services, studies show that men are more enthusiastic about accepting new technology compared to women. Literature shows that women tend to show expectations for service quality and are more likely to rate service quality as worse than men (Talukder et al., 2023). Furthermore, the impact of gender as a moderating variable on the relationship between satisfaction and user loyalty shows inconsistent result (Chawla & Joshi, 2023). Therefore, this research also examines gender as a moderating variable, influencing the relationship between satisfaction and user loyalty.

In addition to reducing inequality in healthcare facilities access, while urban areas already have access to these applications, remote areas face difficulties and limitations in accessing m-Health services. One of the major challenges is the lack of stable internet connection in over 12,000 villages in Indonesia (Aditya & Indradjaja, 2022). Hence, this study investigates whether the relationship between satisfaction and loyalty is moderated by the domicile area. Based on the background, this study investigates the impact of e-service quality on user loyalty which is mediated by satisfaction. It also explores how demographic factor such as gender and domicile area may moderate this relationship. The current research provides three main contributions. Firstly, it explains the relationship between e-service quality and loyalty among m-health application users. Secondly, this study examines the mediating role of user satisfaction in the relationship between e-service quality and user loyalty. Lastly, this research investigates moderating role of gender and domicile area on user satisfaction and user loyalty.

## **Literature Review**

### **Theoretical and Conceptual Background**

#### **E-Service Quality in m-Health**

E-Service quality refers to how well an online store facilitates all customer interactions in an online context, including shopping, purchasing, to delivery activities effectively (Blut, 2016). According to Sheu & Chang, (2022) consumers assess the quality of electronic services based on the characteristics of the website interface because of limited face-to-face interactions with service providers. The evaluation of e-service quality is subjective and is based on the characteristics and functions of the virtual market as perceived by application of web users. As mobile services gain popularity, there has been widespread research on the e-service quality measurements that consider the characteristic of mobile devices, such as mobility, anytime and anywhere computing, and sociality. Based on previous research, the hypothesis proposed:

H1: e-service quality has a positive effect on loyalty among m-Health application users

H2: e-service quality has a positive effect on satisfaction among m-Health application users

#### **User Satisfaction in Digital Health**

The concept of satisfaction in this study pertains to the experience of using m-Health applications. Yum & Yoo, (2023) defines satisfaction as the cognitive evaluation made by a customer regarding the variance between the anticipated quality or performance and the actual quality or performance achieved. In an electronic context, satisfaction relates to a customer's satisfaction with their purchasing experience from a specific e-commerce company. Customer expectations are recognized as a primary cognitive factor influencing satisfaction within the realm of technology and information systems. It is observed that when customers perceive the anticipated benefits of using the application, their level of satisfaction tends to increase (Al-Okaily, 2023). Based on previous research, the following hypothesis is worth testing:

H3: Satisfaction has a positive effect on loyalty among m-Health application users

#### **Demographic Factors in Technology Adoption**

Demographic variables has an important part in influencing user behaviors (Talukder et al., 2023). Although previous literature on mHealth has provided significant insights into behavior, analysis of the moderating effect of demographic variables are still limited. Therefore, the proposed model expected to influence between satisfaction and user loyalty are gender and domicile area.

Gender has an crucial role in predicting consumer behavior when it comes to usign technology. According to (Talukder et al., 2023), women tend to have higher expectations regarding service quality and are more likely to rate service quality as lower than men when using m-Health applications. Additionally, women demonstrate stronger evaluations of perceived service quality, satisfaction, trust, and loyalty in the context of online financial services. Furthermore, women are highly involved in information search and decision-making processes (Ladhari & Leclerc, 2013).

The main goal of m-Health is to reduce inequality in people's access to healthcare facilities. It is expected to benefit people in disadvantaged rural areas. Currently, m-Health applications are accessible in several urban areas in Indonesia, but there are still difficulties and limitations in remote areas that hinder the development of the m-Health application. There is limited research on m-

Health that discusses the user's city as a moderating variable. This study categorized domicile area into two types: those the m-Health application users who live in the provincial capital and in the district city. Therefore, the following hypothesis is formulated:

H4: Gender moderates the relationship between user satisfaction and loyalty to m-Health application and the effect is higher for women

H5: Domicile area moderates the relationship between user satisfaction and loyalty to m-Health application users and the effect is higher for users who live in provincial capitals than in districts

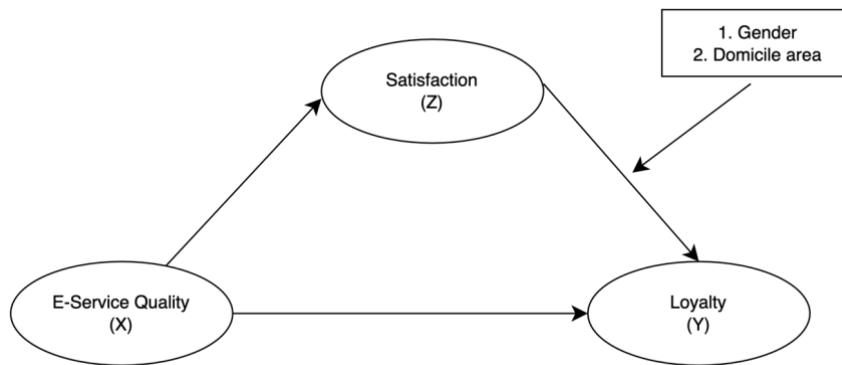
**User Loyalty**

Loyalty in the context of digital health is defined as an attitude or reaction towards a long-term electronic health system (Azad et al., 2022). Loyalty is a big perspective towards electronic goods that is reflected in purchase intention. Loyalty to m-health is a psychological preference and determination to continue using the service (Santos-Vijande et al., 2022). According to Xu et al., (2015), there are two parameters that describe loyalty to service providers: 1) User retention: individual intention to continue using the application 2) User attraction: intention to recommend. Cognition and affection have different roles in forming these two loyalty behaviors. The affective aspect is related to the behavior of recommending application services to other people, meanwhile the cognitive aspect is related to the willingness to use the application continuously.

H6: Satisfaction mediates the relationship of e-service quality on loyalty among m-Health application users

**Theoretical Framework**

Based on the theoretical study presented in the previous chapter, this research constructs a research framework or research conceptual framework as follows.



**Figure 1:** Conceptual Model of the Study; *Source:* Authors

Research related to digital health has been widely carried out over in various aspects that can be described as follows.

**Table 1:** Research Related to m-Health

Author	Variables	Findings
<b>Pramudita et al., (2023)</b>	expectancy, user satisfaction, behavioral intention	The findings reveal that customer satisfaction positively influences behavioral intention. Performance expectancy, effort expectancy, price value, and social influence positively impact customer satisfaction.
<b>Azad et al., (2022)</b>	e-service quality, e-satisfaction, repurchase intention of e-health	The findings established satisfaction as a prominent mediator for digital health.
<b>Handayani et al., (2020)</b>	quality argument, source credibility, satisfaction, m-health loyalty	This study also indicated that health consciousness and user satisfaction influence users' routine use intention and loyalty in relation to m- health application use
<b>Zagita et al., (2019)</b>	service quality, reputation, perceived usefulness, perceived ease of use, satisfaction, loyalty	This research show that perceived usefulness, perceived ease of use, satisfaction and trust in the application influence the intention to continue using Alodokter services, and satisfaction and trust in the application influence loyalty in using Alodokter services.

**Source:** Authors (2024)

## Research and Methodology

### Population and Sample

In this study, the population consists of users of m-Health applications who have used the application at least once. The gender distribution analysis categorizes the population into men and women, while the analysis of domicile distribution categorizes users into those living in provincial capitals and those living in districts. Since the number of m-health application users is uncertain, the study included in an infinite population and according to Ferdinand (2006), when population is not known with certainty can be estimated by 10 times the number of research variable indicators. So, this research was conducted to 260 respondent who have used m-Health applications in Indonesia such as Halodoc, Alodokter, KlikDokter, Grab Health and others at least once in the last twelve months.

### Data Collection

A structured questionnaire was developed for the purpose of collecting quantitative data and distributed online. Scale for e-service quality was adapted from Yum & Yoo, (2023) and Akter et al., (2013). User satisfaction scale was adapted from (Pramudita et al., (2023) and Kalinić et al., (2020). The user loyalty was adapted from Handayani et al., (2020) and Xu et al., (2015). All constructs are measured on a five point scale, where 1 represents “strongly disagree” and 5 represents “strongly agree”. Data analysis was executed using PROCESS Macro Mediated Moderation Model 14 by SPSS 29.

### Measurement

This research consists of 3 variables such as e-service quality, user satisfaction, and user loyalty, where the measurements for all these variables refer to previous research as follows.

**Table 2:** Measurement

Variable	Measurement	Sources
<b>E-service quality</b>	Usefulness	Yum & Yoo, (2023), Akter et al., (2013)
	Convenience	
	Design	
	Layout	
<b>User satisfaction</b>	Satisfaction level of m-health application users	Pramudita et al., (2023), Kalinić et al., (2020)
<b>User loyalty</b>	App continuance intention	Handayani et al., (2020), Xu et al., (2015)
	Intention to recommend	

Source: Authors (2024)

## Finding and Discussion

### Findings

Table 1 shows the results of 260 data collected, which can be categorized into several demographic figures for respondents.

**Table 3:** Respondent Demographics

	Categories	Frequency	%
<b>Gender</b>	Male	110	42%
	Female	150	58%
<b>Domicile Area</b>	Capital Province	66	25%
	District	194	75%
<b>Age</b>	17-25 years	68	26%
	26-35 years	115	44%
	36-45 years	48	18%
	> 45 years	29	11%
<b>Occupation</b>	Student	42	16%
	Private sector employee	107	41%
	Civil Servant	42	16%
	Entrepreneur	62	24%
	Others	7	3%
<b>Education level</b>	High School	57	22%

	Diploma	48	18%
	Bachelor degree	124	48%
	Master degree	29	11%
	Doctoral degree	2	1%
<b>Income / month</b>	< Rp. 4.500.000	179	69%
	Rp. 4.500.001 – Rp. 10.000.000	58	23%
	> Rp. 10.000.001	23	8%
<b>The most used m-Health applications</b>	Alodokter	52	20%
	GrabHealth	35	13%
	Halodoc	124	48%
	KlikDokter	36	14%
	Good Doctor	8	3%
	Yesdok	5	2%
<b>The most used features</b>	Buy medicine	88	34%
	Online health consultation	62	24%
	Looking for information/ health articles	73	28%
	Make an appointment with a doctor/hospital	31	12%
	Insurance	5	2%

Source: Authors (2024)

Based on Table 1, it can be seen that in terms of gender, respondents were dominated by women. With 44% of the respondents being in the 26-35 years age group, and 41% of the respondents who works as private sector employee. The high level of education among respondents, with 48% holding Bachelor's degrees, indicates that the sample is well-educated. The most used m-Health application among the respondent is Halodoc with 48% and the most used feature is online health consultation.

### Hypothesis Testing

To test the hypotheses of the study, PROCESS Macro Mediated Moderation Model 14 have been applied.

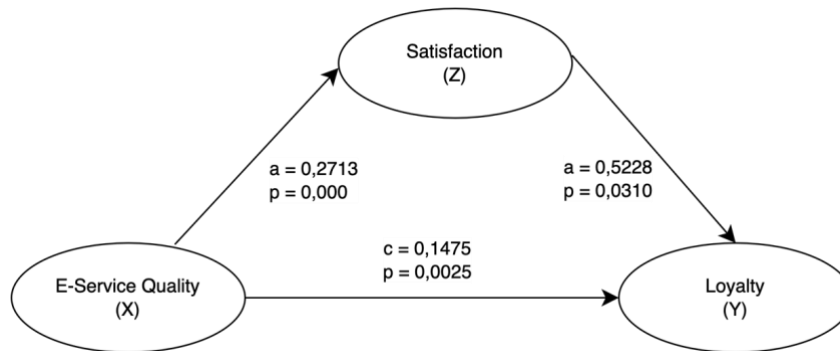
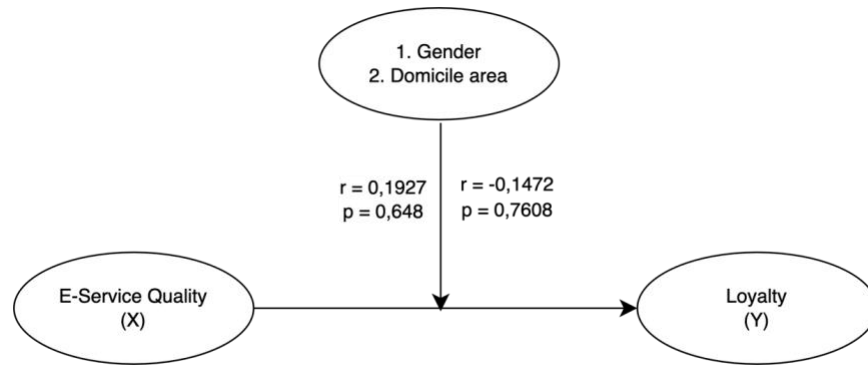


Figure 2: Result of Direct Effect Test

Based on the test results as shown in Figure 2, it can be seen that the results of the path “c” have a positive and significant influence on the e-Service Quality and Loyalty, with a coefficient value of 0.1475 and  $p < 0.05$  (0.0025). This suggests that the higher the perception of e-service quality, the greater the loyalty of m-Health application users, and vice versa. Therefore, we can conclude that the first hypothesis (H1) is accepted. The test results on the path “a” demonstrate a positive and significant influence on the variable e-Service Quality and Consumer Satisfaction, with a coefficient 0.2713 and  $p < 0.05$  (0.000). This indicates that higher perception of e-Service Quality among m-Health application users impact to higher consumer satisfaction. Consequently, the second hypothesis (H2) is accepted. Furthermore, on path “b”, it can be seen that there is a positive and significant influence on the variable Consumer Satisfaction with Loyalty with a coefficient 0.5228 and  $p < 0.05$  (0.031). This means that Consumer Satisfaction influences Loyalty. Therefore, we can conclude that the third hypothesis (H3) is accepted.



**Figure 3:** Result of Moderating Test

Based on the picture above, it was found that gender does not significantly moderate the relationship between consumer satisfaction and loyalty among m-Health application users. The test results showed an insignificant interaction with a coefficient value of 0.1927 and  $p > 0.05$  (0.649), leading to the rejection of the fourth hypothesis (H4). Similarly, the domicile area was also found to have an insignificant moderating influence on the relationship between consumer satisfaction and loyalty among m-Health application users. The test revealed an insignificant interaction with a coefficient value of -0.1472 and  $p > 0.05$  (0.7608), leading to the rejection of the fifth hypothesis (H5).

In this study, we examined the mediation hypothesis using the Sobel Test method, which examines the strength of the indirect influence between the independent variable and the dependent variable through the mediating variable. The calculation results showed 2.1121. This indicates that the t-count value (2.1121) is greater than the t-table value (1.650). Therefore, we can conclude that the consumer satisfaction variable can mediate the influence of loyalty on m-Health application users. As a result, the sixth hypothesis (H6) is accepted.

## Discussion

The results of hypothesis testing prove that e-service quality has a positive influence on loyalty. E-service quality is essentially the outcome of a service delivery system that directly impacts users. As such, it can be interpreted as a reflection of the customer's evaluation of the m-Health application service provider (Chan et al., 2022). In alignment with Azad et al., (2022) research on the determinants of digital health service loyalty, it was revealed that there exists a positive correlation between service quality, customer satisfaction, and loyalty. Loyalty is measured by how likely users are to continue using an application compared to other applications. Therefore, maintaining the quality of an application is a very important factor in retaining users, ensuring that they continue to use the application, thereby creating loyalty. Thus, high e-service quality has the potential to persuade users to continue utilizing the electronic service.

In line with the research conducted by Rita et al., (2019), customer satisfaction reflects positive customer expectation towards a service. In the realm of online services, satisfaction serves as a key indicator of the success of business-to-consumer (B2C) relationships. Past literature has consistently highlighted a positive correlation between e-service quality and satisfaction. Furthermore, Sheu & Chang, (2022) study revealed that all dimensions of e-service quality impact user satisfaction with applications. The findings of this research align with previous research conducted by Handayani et al., (2020), which found that when users are satisfied with the services provided by m-health, they are more likely to use m-health regularly. Users tend to use the m-health application when they trust it and believe it has successfully addressed their health concerns.

Satisfaction refers to a state of positive emotions and behavior. In the context of online health services, users are more satisfied when they receive greater benefits from the service and find it easier to use. According to research by Zagita et al., (2019), satisfaction has a positive impact on user loyalty to m-Health applications. This means that satisfied users are likely to continue using the service. When users' expectations of the technical functions of an m-Health application are met, they tend to have a positive evaluation of the service.

From the research results, it is found that gender does not have a role as a moderating variable between the relationship between consumer satisfaction and loyalty among m-Health application users. This contrasts with previous studies that suggest gender to be a significant predictor of consumer behavior in technology usage. For example, a study by Talukder et al., (2023) revealed that women have higher expectations of service quality and are more likely to rate service quality lower than men. In the context of acceptance of m-health application technology, it is evident that the moderating effect is greater for women than for men in the relationship between service quality and usage behavior. Therefore, health service providers do not need to prioritize developing unique e-service qualities such as platform quality, interaction quality and personalized result quality based on gender. This is because referring to the results of this study, gender does not have a moderating effect.

It is also known that the domicile area does not have a role as a moderating variable between the relationship between consumer satisfaction and loyalty among m-Health application users. This may happen due to several things, such as 95% of respondents domiciled in Java and only 5% of respondents domiciled outside Java, where currently access to the internet on the island of Java has reached above 80%, making the level of public literacy in using technology to access health services has become quite high, so they are able to access and use m-Health applications when needed. Apart from that, referring to the age demographics of respondents, the majority of whom are of productive age, namely aged 17 to 35 years with a percentage of 70% and respondents with a higher education level of 78%, even though they live in capital province or district, respondents can still access m-Health application and has the same level of satisfaction and loyalty as respondents who live in the capital province. The unequal distribution of respondents' age and education could be a limitation of this study.

User loyalty in m-health technology refers to a long-term user attitude reflected in the purchase or reuse of a digital health platform. This study also examines the indirect impact of e-service quality on user loyalty through the mediating variable of consumer satisfaction. Satisfied users are more likely to use the application service in the future, recommend it to others, and provide positive feedback. Conversely, dissatisfied users are less likely to repurchase and do not recommend the service. Consumer assessments and attitudes towards e-service quality drive the decision to reuse m-Health applications. The relationship between satisfaction and loyalty is viewed as a response to user satisfaction, leading to customer retention.

## Conclusion

This study developed research framework that integrates traditional factors with user demographic factors on m-Health application users. The overall e-service quality in m-Health applications have a significant role in influencing user loyalty. This research has several recommendations for evaluating effective marketing strategies in the field of m-Health applications. One such recommendation is to enhance collaboration with hospitals, pharmacies, or laboratories, so all of application features are accessible for all regions. For example, m-health providers can collaborate with pharmacies or small clinics in the small cities, so people who live in small cities can access m-health features. Additionally, to increase user loyalty, companies can establish referral programs to encourage users to recommend the application to others. M-health provider are expected to establish partnership with financial institution, such as bank, to enable users to access preferential fees when conducting a transactions. Therefore, in order to provide a variety of user age categories, m-Health application companies should consider simplifying the application interface to ensure convenience to ensure m-health application caters to both young and old users.

Similar to other studies, this research has certain limitations. Firstly, it was conducted on the population residing on the island of Java. Future research needs to encompass the entire Indonesia region to ensure the generalizability of the results. Secondly, the study involved a limited number of demographic variables, and future research could use additional demographics such as education level, age, and income to enhance the applicability of the findings. Lastly, the majority of participants in this study were young, so the findings may not be representative of the entire population, particularly older individuals and those who are less adept with technology. Therefore, further research should aim to include users from various age groups.

## Acknowledgments

All authors have read and agreed to the published version of the manuscript.

**Author Contributions:** by authors with equal participation and responsibility.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

- Aditya, S., & Indradjaja, B. (2022). *Digitizing Indonesia's Health Care Sector*. <https://www2.deloitte.com/id/en/pages/life-sciences-and-healthcare/articles/id-tmt-lshc-digitalhealth-2022.html>
- Akter, S., D'Ambra, J., Ray, P., & Hani, U. (2013). Modelling the impact of mHealth service quality on satisfaction, continuance and quality of life. *Behaviour and Information Technology*, 32(12), 1225–1241. <https://doi.org/10.1080/0144929X.2012.745606>
- Al-Okaily, M. (2023). The influence of e-satisfaction on users' e-loyalty toward e-wallet payment apps: a mediated-moderated model. *International Journal of Emerging Markets*. <https://doi.org/10.1108/IJOEM-08-2022-1313>
- Azad, M. A. K., Rummman, N. S., Connolly, R., Wanke, P., & Mumu, J. R. (2022). Towards an improved understanding of the antecedents of digital health service loyalty during a pandemic: An fsQCA approach. *Socio-Economic Planning Sciences*, 84. <https://doi.org/10.1016/j.seps.2022.101423>
- Blut, M. (2016). E-Service Quality: Development of a Hierarchical Model. *Journal of Retailing*, 92(4), 500–517. <https://doi.org/10.1016/j.jretai.2016.09.002>

- Chan, V. H. Y., Chiu, D. K. W., & Ho, K. K. W. (2022). Mediating effects on the relationship between perceived service quality and public library app loyalty during the COVID-19 era. *Journal of Retailing and Consumer Services*, 67. <https://doi.org/10.1016/j.jretconser.2022.102960>
- Chawla, D., & Joshi, H. (2023). Role of Mediator in Examining the Influence of Antecedents of Mobile Wallet Adoption on Attitude and Intention. *Global Business Review*, 24(4), 609–625. <https://doi.org/10.1177/0972150920924506>
- Ferdinand, A. (2006). *Metode Penelitian Manajemen: Pedoman Penelitian Untuk Penulisan Skripsi, Tesis, dan Disertasi Ilmu Manajemen*. Badan Penerbit Universitas Diponegoro.
- Handayani, P. W., Gelshirani, N. B., Azzahro, F., Pinem, A. A., & Hidayanto, A. N. (2020). The influence of argument quality, source credibility, and health consciousness on satisfaction, use intention, and loyalty on mobile health application use. *Informatics in Medicine Unlocked*, 20, 100429. <https://doi.org/10.1016/j.imu.2020.100429>
- Kalinić, Z., Marinković, V., Djordjevic, A., & Liebana-Cabanillas, F. (2020). What drives customer satisfaction and word of mouth in mobile commerce services? A UTAUT2-based analytical approach. *Journal of Enterprise Information Management*, 33(1), 71–94. <https://doi.org/10.1108/JEIM-05-2019-0136>
- Krebs, P., & Duncan, D. T. (2015). Health App Use Among US Mobile Phone Owners: A National Survey. *JMIR MHealth and UHealth*, 3(4), e101. <https://doi.org/10.2196/mhealth.4924>
- Ladhari, R., & Leclerc, A. (2013). Building loyalty with online financial services customers: Is there a gender difference? *Journal of Retailing and Consumer Services*, 20(6), 560–569. <https://doi.org/10.1016/j.jretconser.2013.07.005>
- Oppong, E., Hinson, R. E., Adeola, O., Muritala, O., & Kosiba, J. P. (2021). The effect of mobile health service quality on user satisfaction and continual usage. *Total Quality Management & Business Excellence*, 32(1–2), 177–198. <https://doi.org/10.1080/14783363.2018.1541734>
- Pramudita, E., Achmadi, H., & Nurhaida, H. (2023). Determinants of behavioral intention toward telemedicine services among Indonesian Gen-Z and Millennials: a PLS–SEM study on Alodokter application. *Journal of Innovation and Entrepreneurship*, 12(1). <https://doi.org/10.1186/s13731-023-00336-6>
- Rita, P., Oliveira, T., & Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon*, 5(10). <https://doi.org/10.1016/j.heliyon.2019.e02690>
- Santos-Vijande, M. L., Gómez-Rico, M., Molina-Collado, A., & Davison, R. M. (2022). Building user engagement to mhealth apps from a learning perspective: Relationships among functional, emotional and social drivers of user value. *Journal of Retailing and Consumer Services*, 66. <https://doi.org/10.1016/j.jretconser.2022.102956>
- Sheu, P. L., & Chang, S. C. (2022). Relationship of service quality dimensions, customer satisfaction and loyalty in e-commerce: a case study of the Shopee App. *Applied Economics*, 54(40), 4597–4607. <https://doi.org/10.1080/00036846.2021.1980198>
- Talukder, M., Aroos-Sheriffdeen, S., Khan, M. I., Quazi, A., & Abdullah, A. B. M. (2023). Usage behavior of mHealth service users in Australia: do user demographics matter? *Journal of Services Marketing*, 37(7), 801–816. <https://doi.org/10.1108/JSM-08-2021-0287>
- World Health Organization. (2011). *mHealth New Horizon for Health Through Mobile Technologies*. [https://iris.who.int/bitstream/handle/10665/44607/9789241564250\\_eng.pdf?sequence=1](https://iris.who.int/bitstream/handle/10665/44607/9789241564250_eng.pdf?sequence=1)
- Xu, C., Peak, D., & Prybutok, V. (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations. *Decision Support Systems*, 79, 171–183. <https://doi.org/10.1016/j.dss.2015.08.008>
- Yum, K., & Yoo, B. (2023). The Impact of Service Quality on Customer Loyalty through Customer Satisfaction in Mobile Social Media. *Sustainability*, 15(14), 11214. <https://doi.org/10.3390/su151411214>
- Zagita, T. C., Handayani, P. W., & Budi, N. F. A. (2019). Analysis of Factors Affecting the Loyalty of Using Online Health Services: Case Study of Alodokter. *2019 International Conference on Advanced Computer Science and Information Systems (ICACSIS)*, 279–284. <https://doi.org/10.1109/ICACSIS47736.2019.8979973>

**Publisher's Note:** SSBFNET stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2024 by the authors. Licensee SSBFNET, Istanbul, Turkey. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

International Journal of Research in Business and Social Science (2147-4478) by SSBFNET is licensed under a Creative Commons Attribution 4.0 International License