Customer Loyalty Based On Internet Service Providers-Service Quality

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Abstract—**Evaluating user loyalty attitudes and behavior based on perceived service is a strategy for internet service providers to survive and win the competition. This study aims to analyze customer attitudinal and behavioral loyalty based on the service quality of internet service providers, namely network quality, customer service, information quality, security, and privacy. Data was collected using a questionnaire distributed to 397 users who subscribe to fixed broadband in five major cities in Indonesia (DKI Jakarta, Tangerang, Depok, Bekasi, and Bogor). The purposive sampling technique was determined from the research area with the criteria of one year of subscription to fixed broadband internet. The author uses a quantitative method with Structural Equation Modeling based on variance (PLS) to answer the hypothesis. The study results prove that all hypotheses have a positive and significant effect. Security and privacy are the most potent factors in explaining customer attitudinal and behavior loyalty.**

Keywords—ISPs Service Quality, Attitudinal Loyalty, Behavioral Loyalty, Internet Fixed Broadband

I. INTRODUCTION

The necessity for an internet connection is increasing, and the growth of communication devices used to surf the virtual world and access social networking sites. Until 2020, Indonesia's fixed broadband internet users reached 10.71 million and was third among the six ASEAN member countries. The number of fixed broadband internet users is minimal compared to Indonesia's population of 270 million [1]. This phenomenon indirectly shows competition between fixed broadband internet service providers in capturing the market and attracting users' attention. In addition, mobile broadband service companies are also enlivening the competition, although the speed of fixed broadband is more stable than mobile broadband.

Every internet service provider company has several offers to its users, such as competitive prices, stable internet speeds, and entertainment services bundled with the internet. Service quality is essential for companies to compete and survive in a competitive market in the internet service industry. In addition, it is a determining factor in increasing customer trust and commitment to using the company's services continuously [2].

Service quality is a differentiating strategy in a competitive business climate, primarily in service-based businesses [3]. Enhancing service quality can improve user loyalty attitudes and behavior [2, 4]. Internet service providers (ISP) must focus on maintaining user loyalty. For sustainability in a competitive market, winning user loyalty is essential in the internet-based telecommunication industry [5]. The output of service quality is satisfaction and ultimately affects customer loyalty [6]. Customer loyalty attitudes and behavior determine their intention to repurchase and use the service continuously. Of course, this is very dependent on the quality of the products and services provided by the company compared to its competitors [7]. Even if switching costs are low, satisfied customers will stay committed due to exchange costs [8]. Therefore, ISP's can benefit from credible information about customer ratings of the quality of service received. The company's service managers use this information to formulate the right business strategy to perform a competitive advantage and achieve long-term profitability.

Several previous studies have proven that the quality of ISP's services affects customer loyalty [2, 9-11]. They believe that by maintaining customer loyalty through improving customer quality, they will get more attention from customers. Therefore, this study aims to examine the role of ISP's service quality further to maintain customer loyalty so that they can win a business competition. Finally, this research can contribute to internet service providers developing customer loyalty strategies.

II. LITERATURE REVIEW

A. Internet Service Provider-Service Quality

For more than a decade, fixed broadband internet services in developing and developed countries have continued to experience significant improvements. This condition encourages researchers to examine the concept of service quality in the internet service industry to contribute to practitioners. Parasuraman, et al. [12] have developed the concept of e-service quality to capture service quality in the technological era. However, service quality in the internet service industry is not the same. It is ineffective when measured by service quality or e-service quality [13] because the dimensions cannot address specific problems in fixed-broadband internet services. Quach, et al. [9] explain that service quality only applies to general services. In contrast, e-service quality focuses on service providers operating through internet platforms, not those providing internet connections for B2B and B2C platforms. In their study, Quach, et al. [9]

explain that there are four dimensions to measure service quality for ISP's: network quality, customer service, information quality, security, and privacy.

In the internet service industry, network quality is a part of signal strength [14], stable connection, coverage [15], number of network errors, and download and upload speed [16]. When the internet connection is lost, customers react adversely, perceiving that the ISP's service quality is terrible. Furthermore, customers will seek assistance and technical support from customer service staff to resolve their problems. On this basis, customer service staff are at the forefront of the service function. They must be responsive, fast, reliable, and consistently follow procedures in providing quality customer service [17]. Recent research on the telecommunications industry in Iraq shows that handling customer complaints affects corporate image, trust, and switching costs [15].

When users connect with technology devices, companies must convey detailed and easy-to-understand information [9] because it helps customers get information and make decisions [18]. In addition, customers will have a positive attitude towards companies that can present quality, relevant information [9, 19]. Although companies have provided accurate information and support websites with a high-security level, there are still concerns about security and unethical behavior [20]. Customers tend to look for service providers with a good reputation for minimizing risk and security [21]. Perceived security refers to customer confidence that all transactions are safe, including payment methods and the confidentiality of personal information [22]. Privacy is the customer focus of ISP's, and this dimension relates to customer perceptions of the quality of the processes used to transmit and store personal information [23]. Prior studies have informed that security and privacy are part of service quality [6, 24].

B. Customer Loyalty

Researchers in marketing science have widely studied the concept of customer loyalty, each of which has defined customer loyalty. Thakur [25] explains loyalty as a repeat purchase and a function of commitment's psychological process. Meanwhile, Yadav and Singh [26] explain customer loyalty as a customer's psychological feeling related to a product, service, or business organization. In addition, it is a promise to repurchase the selected product or service continuously in the future [27]. Therefore, numerous service industries regard customer loyalty as the key to success. Due to the high volatility of user attitudes in the telecommunications sector, maintaining the loyalty of existing consumers appears to be a significant challenge [2, 9]. There are two main approaches to defining and measuring customer loyalty based on attitudes and behavior [28]. The actual purchase frequency expresses customer buying behavior. Furthermore, attitude loyalty is measured by referring to attitude components such as beliefs, feelings, and purchase intentions of products or services. [28]. This study examines customer loyalty which consists of attitudes and behavior to identify customer lifetime.

C. ISP's Service Quality Dimension with Customer Loyalty

Service quality pushes customer loyalty and business profitability [29]. This research indicates attitudes and behavior loyalty from the point of view of network quality, customer service, information quality, and security and privacy as dimensions of ISP service quality [9]. Internet network quality,

including network quality, signal stability, and speed, are considered essential characteristics in high-tech services that affect customer retention [9, 30]. Researchers agree that network quality is a driver of customer loyalty when dealing with prepaid internet services [11]. Furthermore, customer service is the primary factor of repurchase intention and customer loyalty, while weaknesses in customer service quality are the primary reason for switching clients [31]. Customer service positively impacts customer loyalty in several industry-based technologies [32, 33]. The responsiveness of technical staff and customer service significantly affects behavioral loyalty [34].

Information quality is the primary benchmark for evaluating customer relationship management systems and is considered an effective tool for companies to understand better customer needs [35]. Information quality determines user satisfaction and directs future use intentions [36]. Information privacy is one of the issues that must be considered in today's world developments. Today, companies can easily share customer data without the customer's permission. In addition, customers' data, such as names and passwords, are also vulnerable to hackers. Security and privacy are associated with customers' feelings about protection and security during transactions and their use [37]. Transparent and reliable security and privacy policy will result in a good perception of the overall quality of internet service providers. In some technology-based industries, security and privacy can motivate customers to be loyal to the company [38].

Based on the explanation of the relationship between the dimensions of ISP's service quality and customer loyalty, this study formulates the following hypothesis:

H1-H2: Network quality significantly influences ISP's customer attitude and behavior loyalty

H3-H4: Customer service significantly influences ISP's customer attitude and behavior loyalty

H5-H6: Information quality significantly influences ISP's customer attitude and behavior loyalty

H7-H8: Security-privacy significantly affect ISP's customer attitude and behavior loyalty

H9: Attitude loyalty significantly affects ISP's customer behavior loyalty

D. Previous Study

Based on Table I, few researchers have focused on studying customer service and security-privacy factors in the ISP's sector during the last five years. These two factors become essential when companies offer services to customers. Therefore, we need to examine these factors in this study.

TABLE I.   PREVIOUS STUDIES

Authors	Construct					
	NQ	CS	IQ	SP	AL	BL
Quach, et al. [9]	X	X	X	X	X	X
Kim, et al. [6]	N.A	N.A	X	X	X	X
Prasetyo, et al. [39]	N.A	N.A	X	N.A	X	X
Chee and Husin [40]	X	N.A	N.A	N.A	X	X
Anwar, et al. [41]	X	X	X	X	N.A	N.A
Rajeswaran, et al. [42]	X	N.A	N.A	N.A	N.A	X
Shi, et al. [43]	N.A	X	N.A	N.A	N.A	X

Noted: N.A = Not Available

III. METHOD

This study is a quantitative study with a survey method of broadband internet users in five cities in Indonesia (DKI Jakarta, Tangerang, Depok, Bekasi, and Bogor), the cities with the highest number of internet users. The population of broadband internet users in the survey locations is infinite, so we determined a minimum sample size of 180 (10 × 18 indicators = 180). Sampling using purposive, only customers who have subscribed to broadband internet for at least one year. All variable measurements were adopted from previous research using a Likert five scale [9]. The questionnaire was distributed online by providing URLs to the target sample via social media (WhatsApp, Facebook, Instagram, and Twitter). Survey data that are valid and meet the criteria are 397 and exceed the minimum sample target. Then, the survey data was tabulated, filtered valid answers, and entered into a CSV file for analysis using the PLS-SEM technique using SmartPLS.

PLS-SEM consists of two models: the outer model and the inner model. The outer model is tested to evaluate the measurement model and the inner model to evaluate the structural model. All measurements use a reflective model. Evaluation of the measurement model using the PLS algorithm technique consists of an internal consistency test (Composite Reliability) and a validity test (convergent validity, discriminant validity, and Average Variance Extracted – AVE). The limits for assessing convergent validity are the standardized loading factor value > 0.7 and the AVE value > 0.5. While the measurement of discriminant validity using the HTMT method with the provision that the correlation value of each variable is less than 0.9.

Evaluation of the structural model using bootstrapping technique consisting of R^2, Q^2 – predictive relevance, size, and significance of the path coefficient, and f^2 – effect size. The value of R^2 is the contribution of exogenous variables in explaining endogenous variables. The value of R^2 has a range of 0.75, 0.5, and 0.25, categorized as a strong, medium, and weak, respectively. The value of f^2 is an extensive explanation of the effect of exogenous variables on endogenous ones. The range of f^2 values is 0.02, 0.15, and 0.35, categorized as weak, moderate, and strong, respectively. The model has an excellent predictive value if the total value of $Q^2 > 0$. Finally, the acceptance of the research hypothesis refers to the value of Sig < 0.05 and t-value > 1.96.

IV. RESULT

A. Profile Respondent

Based on Table II, 52.80% of the total respondents were males, while 47.20% were female. They have an average monthly income of 4 to 15 million rupiahs (65%), and most of them have a bachelor's degree. The average number of internet users at home is more than four people (55.30%).

B. Evaluation of Measurement Model

In the early stages, the assessment of the PLS-SEM model focuses on the measurement model. Based on Table III, each item in the measured variable produces an SLF value > 0.7 with a range of 0.748 – 0.936. Likewise, the AVE value for each variable produces a value of more than 0.5 with a range of 0.754 – 0.867. This study's SLF and AVE values prove that each indicator can measure its variables [44], so the convergent validity is satisfactory. Furthermore, the value of internal consistency - composite reliability produces the

lowest - highest value (0.901 - 0.950), so the questionnaire is declared reliable—furthermore, discriminant validity testing using the HTMT method [45]. If the correlation between constructs produces a value less than 0.9, the latent construct is proven to be different when measuring other constructs.

Based on Table IV, the correlation values between variables (AL, BL, CS, IQ, NQ, and SnP) yielded less than 0.9, with the lowest and highest ranges (0.739 and 0.868). Therefore, the discriminant validity in this study was satisfactory.

TABLE II. PROFILE RESPONDENT

	Characteristics	Freq	%
Gender	Male	210	52.80
	Female	187	47.20
Age	< 19	3	0.80
	20 – 29	265	66.70
	30 – 39	103	26
	40 – 49	26	6.50
Income/month (Rp)	2.500.000 - 4.000.000	97	24.40
	4.100.000 - 8.000.000	158	39.80
	8.000.000 - 15.000.000	100	25.20
	> 15.000.000	42	10.60
Level education	Senior high school	87	22
	Diploma	42	10.60
	Undergraduate	245	61.80
	postgraduate	23	5.60
Number of Users in Family	1	33	8.10
	2	77	19.50
	3	68	17.10
	4	116	29.30
	> 5	103	26

TABLE III. MEASUREMENT MODELS

Contructs	Item	SLF	CR	AVE
Customer Service	CS1	0.892	0.923	0.799
	CS2	0.896		
	CS3	0.895		
Info. Quality	IQ1	0.927	0.939	0.836
	IQ2	0.899		
	IQ3	0.916		
Network Quality	NQ1	0.802	0.910	0.772
	NQ2	0.921		
	NQ3	0.909		
Security-Privacy	SnP1	0.926	0.950	0.867
	SnP2	0.939		
	SnP3	0.928		
Att. Loyalty	AL1	0.868	0.905	0.761
	AL2	0.864		
	AL3	0.885		
Behavioral Loyalty	BL1	0.922	0.901	0.754
	BL3	0.748		
	BL2	0.925		

Noted: SLF: Standardized Loading Factor; CR: Composite Reliability; AVE: Average Variance Extracted

TABLE IV. DISCRIMINANT VALIDITY (HTMT)

	AL	BL	CS	IQ	NQ	SnP
AL						
BL	0.835					
CS	0.782	0.824				
IQ	0.792	0.827	0.868			
NQ	0.761	0.803	0.821	0.795		
SnP	0.772	0.809	0.810	0.848	0.739	

Noted: AL: Attitude Loyalty; BL: Behavioral Loyalty; CS: Customer Service; IQ: Information Quality; NQ: Network Quality: SnP: Security-Privacy
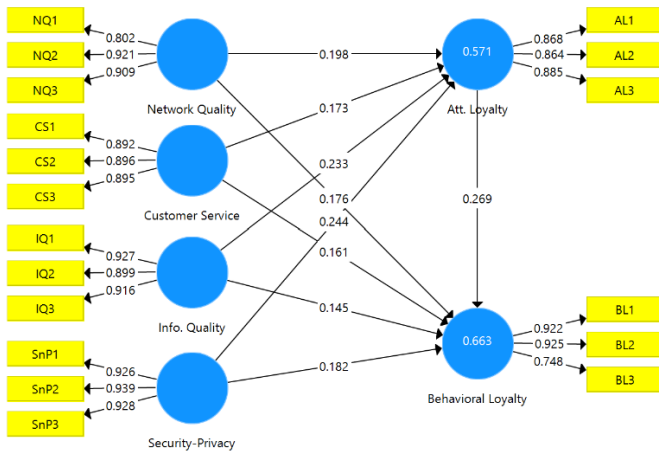
Fig. 1. Structural Model

TABLE V. SUMMARY OF STRUCTURAL MODEL

	STD	t.Val	p.Values	f^2	R^2	Q^2
NQ→AL	0.198	4,233	0.000	0.039	0.571	0.424
CS→AL	0.173	2,312	0.021	0.022		
IQ→AL	0.233	2,854	0.005	0.036		
SnP→AL	0.244	3,527	0.000	0.048		
AL→BL	0.269	5,513	0.000	0.092		
NQ→BL	0.176	3,226	0.001	0.038	0.663	0.487
CS→BL	0.161	3,394	0.001	0.024		
IQ→BL	0.145	2,511	0.012	0.017		
SnP→BL	0.182	3,095	0.002	0.033		

Noted: AL: Attitudinal Loyalty; BL: Behavioral Loyalty; CS: Customer Service; IQ: Information Quality; NQ: Network Quality: SnP: Security-Privacy

C. Evaluation of Structural Model

The second stage in the PLS-SEM analysis is to evaluate the goodness of the structural model. Fig. 1 and Table III present information on testing the goodness of the structural model and research hypotheses.

In Table V and Fig. 1, the value of R^2 attitudinal loyalty with customer service, information quality, network quality, and security and privacy are 0.571. This value indicates that the ISP's customer loyalty attitude can explain customer service, information quality, network quality, and security and privacy by 57.1% in the medium category (0.34 – 0.66). While the value of R^2 behavioral loyalty with customer service, information quality, network quality, and security and privacy are 0.663. This value explains that 66.3% of customer behavior loyalty is influenced by customer service, information quality, network quality, and security and privacy in the medium category (0.34 – 0.66).

The subsequent evaluation is Stone-Geisser's Q^2 value to assess the level of relevance of the conceptual model predictions [44]. As a result, the Q^2 value for the attitudinal loyalty model is 0.425 > 0. The behavioral loyalty model produces a Q^2 value of 0.487 > 0. Overall, the Q^2 value for this research model is 0.705. In conclusion, the conceptual models of attitudinal and behavioral loyalty are partially and simultaneously relevant in predicting the model.

The final evaluation is testing the effect size (f^2). The relationship between variables has a weak, moderate, and strong influence if the f^2 value is 0.02 – 0.14; 0.15 – 0.34; and greater than 0.35 [44]. Based on the study results, the f^2 values of customer service, information quality, network quality, and security-privacy on the customer's attitudinal loyalty were

categorized as weak with a range of 0.022 - 0.092. Likewise, customer behavioral loyalty, customer service, information quality, network quality, and security-privacy also have a weak influence with a range of f^2 values from 0.017 - 0.038. Lastly, attitudinal customer loyalty has a weak effect on customer behavioral loyalty because f^2 values 0.092 < 0.15.

Refer to the Table V, the results of hypothesis testing prove that the first model is network quality (β=0.198; t=4.233; p=0.000), customer service (β=0.173; t=2.312; p=0.021), information quality (β=0.233; t=2.854; p=0.005), and security and privacy (β=0.244; t=3.527; p=0.000) positively and significantly affect customer attitudinal loyalty because t-value > 1.96 and sig. < 0.05. Furthermore, the second model is network quality (β=0.176; t=3.226; p=0.001), customer service (β=0.161; t=3.394; p=0.001), information quality (β=0.145; t=2.511; p=0.012), and security and privacy (β=0.182; t=3.095; p=0.002) positively and significantly affect customer behavioral loyalty because each t-value > 1.96 and sig. < 0.05. Lastly, attitudinal customer loyalty affects customer behavioral loyalty because t-value > 1.96 and sig. < 0.05 (β=0.269; t=5.513; p=0.000)

D. Discussion

This study's results accept the hypothesis that customer service, information quality, network quality, and security and privacy positively and significantly affect customer attitudinal and behavioral loyalty. Furthermore, customer attitudinal loyalty positively and significantly affects customer behavioral loyalty. Previous research only accepted the hypothesis of network quality, information quality, and privacy and security on customer attitudinal loyalty. Meanwhile, network quality, customer service, information quality, and privacy and security do not affect customer behavioral loyalty. Therefore, this study fills the gaps of previous researchers [9].

Practically, network quality affects customer attitudinal and behavioral loyalty. The author believes that ISPs that can meet customer needs and expectations with fast and stable network quality can increase customer attitudinal and behavioral loyalty. Customers want the network to remain stable even under any conditions, so there is no reason for the ISP to make the network slow and disappoint customers. With network quality that matches customer expectations, ISPs can increase customer satisfaction, encouraging customers to be loyal and use the service in the long term.

Customer service affects customer attitudinal and behavioral loyalty. Customer attitudinal and behavioral loyalty is highly dependent on customer service. Customers want customer service staff to be able to solve customer problems correctly. Therefore, customer service staff are expected to have extensive knowledge about products and services because it will determine the continuity of the relationship with the ISP. On the other hand, the quality of information also significantly impacts customer attitudinal and behavioral loyalty. The information provided must be accurate and relevant. Customers want all the information they need to be easily accessible. When customers know the latest and most up-to-date information about their services, they will feel benefited and satisfied. The ability of ISPs to provide information that is easily accessible and understandable can motivate customers to be loyal to the company.

The quality of security and privacy significantly influences customer attitudinal and behavioral loyalty. Customers who

trust ISPs by providing personal data and transaction data hope that their data is well protected and protected from irresponsible people. Protection of customer data with technology will minimize the occurrence of data leaks that can harm customers. The customer's data security guarantee will increase the customer's confidence in using the service. The trust gained will make customers more loyal and will make customers use the service in the long term.

V. CONCLUSION, LIMITED AND FUTURE RESEARCH

This study concludes that customer service, information quality, network quality, and security and privacy affect attitudinal and behavioral loyalty. Furthermore, attitudinal affect behavioral loyalty. Therefore, to build attitudinal and behavioral loyalty, ISPs need to properly manage and re-evaluate service quality. The better the quality of service provided, the stronger the customer's intention to have an attitude and be loyal to the ISP in the future.

This study has many limitations, such as the research location, which focuses on big cities identical to the high demand for internet services. Future research can consider locations with low internet uptake. In addition, this study focuses on the dimensions of ISP service quality; further research can be elaborated on the reasonableness of the price and customer experience.

REFERENCES

[1] V. B. Kusnandar. "Jumlah Pelanggan Fix Broadband Indonesia di Bawah Vietnam dan Thailand pada 2020." Katadata. https://bit.ly/39BVMfk (accessed December 30, 2021.

[2] P. Thaichon and T. N. Quach, "The relationship between service quality, satisfaction, trust, value, commitment and loyalty of Internet service providers' customers," *Journal of Global Scholars of Marketing Science,* vol. 25, no. 4, pp. 295-313, 2015/10/02 2015, doi: 10.1080/21639159.2015.1073419.

[3] Y. L. Zhao and C. A. Di Benedetto, "Designing service quality to survive: Empirical evidence from Chinese new ventures," *Journal of Business Research,* vol. 66, no. 8, pp. 1098-1107, 2013/08/01/ 2013, doi: https://doi.org/10.1016/j.jbusres.2012.03.006.

[4] N. Slack, G. Singh, and S. Sharma, "The effect of supermarket service quality dimensions and customer satisfaction on customer loyalty and disloyalty dimensions," *International Journal of Quality and Service Sciences,* vol. 12, no. 3, pp. 297-318, 2020, doi: 10.1108/IJQSS-10-2019-0114.

[5] P. Kalia, R. Kaushal, M. Singla, and J. Parkash, "Determining the role of service quality, trust and commitment to customer loyalty for telecom service users: a PLS-SEM approach," *The TQM Journal,* vol. 33, no. 7, pp. 377-396, 2021, doi: 10.1108/TQM-04-2021-0108.

[6] Y. Kim, Q. Wang, and T. Roh, "Do information and service quality affect perceived privacy protection, satisfaction, and loyalty? Evidence from a Chinese O2O-based mobile shopping application," *Telematics and Informatics,* vol. 56, p. 101483, 2021/01/01/ 2021, doi: https://doi.org/10.1016/j.tele.2020.101483.

[7] R. Saroha and S. P. Diwan, "Development of an empirical framework of customer loyalty in the mobile telecommunications sector," *Journal of Strategic Marketing,* vol. 28, no. 8, pp. 659-680, 2020/11/16 2020, doi: 10.1080/0965254X.2019.1569110.

[8] N. U. Hadi, N. Aslam, and A. Gulzar, "Sustainable Service Quality and Customer Loyalty: The Role of Customer Satisfaction and Switching Costs in the Pakistan Cellphone Industry," *Sustainability,* vol. 11, no. 8, p. 2408, 2019. [Online]. Available: https://www.mdpi.com/2071-1050/11/8/2408.

[9] T. N. Quach, P. Thaichon, and C. Jebarajakirthy, "Internet service providers' service quality and its effect on customer loyalty of different usage patterns," *Journal of Retailing and Consumer Services,* vol. 29, pp. 104-113, 2016/03/01/ 2016, doi: https://doi.org/10.1016/j.jretconser.2015.11.012.

[10] A. O. Dandis and M. B. Al Haj Eid, "Customer lifetime value: investigating the factors affecting attitudinal and behavioural brand loyalty," *The TQM Journal,* vol. 34, no. 3, pp. 476-493, 2022, doi: 10.1108/TQM-12-2020-0311.

[11] B. H. Khoi and N. Van Tuan, "Using SmartPLS 3.0 to Analyse Internet Service Quality in Vietnam," in *Econometrics for Financial Applications*, Cham, L. H. Anh, L. S. Dong, V. Kreinovich, and N. N. Thach, Eds., 2018// 2018: Springer International Publishing, pp. 430-439.

[12] A. Parasuraman, V. A. Zeithaml, and A. Malhotra, "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality," *Journal of Service Research,* vol. 7, no. 3, pp. 213-233, 2005/02/01 2005, doi: 10.1177/1094670504271156.

[13] H. He and Y. Li, "Key service drivers for high-tech service brand equity: The mediating role of overall service quality and perceived value," *Journal of Marketing Management,* vol. 27, no. 1-2, pp. 77-99, 2010/12/16 2010, doi: 10.1080/0267257X.2010.495276.

[14] D. Madariaga, J. Madariaga, J. Bustos-Jiménez, and B. Bustos, "Improving Signal-Strength Aggregation for Mobile Crowdsourcing Scenarios," *Sensors,* vol. 21, no. 4, p. 1084, 2021. [Online]. Available: https://www.mdpi.com/1424-8220/21/4/1084.

[15] A. Demir, T. Budur, and A. Heshmati, "Antecedents of trust, corporate image, and switching costs: a case in telecommunication services in the Kurdistan region of Iraq," *International Journal of Mobile Communications,* vol. 19, no. 1, pp. 53-74, 2021/01/01 2020, doi: 10.1504/IJMC.2021.111892.

[16] T. Daengsi, S. Chatchalermpun, P. Praneetpolgrang, and P. Wuttidittachotti, "A Study of 4G Network Performance in Thailand Referring to Download Speed," in *2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE)*, 18-19 April 2020 2020, pp. 160-163, doi: 10.1109/ISCAIE47305.2020.9108819.

[17] M. Rod and N. J. Ashill, "The impact of call centre stressors on inbound and outbound call-centre agent burnout," *Managing Service Quality: An International Journal,* vol. 23, no. 3, pp. 245-264, 2013, doi: 10.1108/09604521311312255.

[18] P. L. Hsieh, "Perceived opportunism (PO) in e-return service encounters," *Managing Service Quality: An International Journal,* vol. 23, no. 2, pp. 96-110, 2013, doi: 10.1108/09604521311303390.

[19] A. K. Jaiswal, R. Niraj, C. H. Park, and M. K. Agarwal, "The effect of relationship and transactional characteristics on customer retention in emerging online markets," *Journal of Business Research,* vol. 92, pp. 25-35, 2018/11/01/ 2018, doi: https://doi.org/10.1016/j.jbusres.2018.07.007.

[20] A. M. Y. Chu and M. K. P. So, "Organizational Information Security Management for Sustainable Information Systems: An Unethical Employee Information Security Behavior Perspective," *Sustainability,* vol. 12, no. 8, 2020, doi: 10.3390/su12083163.

[21] A. AlHogail, "Improving IoT Technology Adoption through Improving Consumer Trust," *Technologies,* vol. 6, no. 3, p. 64, 2018. [Online]. Available: https://www.mdpi.com/2227-7080/6/3/64.

[22] V. Soodan and A. Rana, "Modeling Customers' Intention to Use E-Wallet in a Developing Nation: Extending UTAUT2 With Security, Privacy and Savings," *Journal of Electronic Commerce in Organizations (JECO),* vol. 18, no. 1, pp. 89-114, 2020, doi: 10.4018/JECO.2020010105.

[23] N. Özgüven, "Analysis of the relationship between perceived security and customer trust and loyalty in online shopping," *Chinese Business Review,* vol. 10, no. 11, 2011.

[24] J. Hammoud, R. M. Bizri, and I. El Baba, "The Impact of E-Banking Service Quality on Customer Satisfaction: Evidence From the Lebanese Banking Sector," *SAGE Open,* vol. 8, no. 3, p. 2158244018790633, 2018/07/01 2018, doi: 10.1177/2158244018790633.

[25] R. Thakur, "Understanding Customer Engagement and Loyalty: A Case of Mobile Devices for Shopping," *Journal of Retailing and Consumer Services,* vol. 32, pp. 151-163, 2016/09/01/ 2016, doi: https://doi.org/10.1016/j.jretconser.2016.06.004.

[26] B. K. Yadav and V. Singh, "Customer relationship management (CRM), relationship quality and customer loyalty in the Indian banking sector: A conceptual approach," *BHU Management Review,* vol. 6, no. 1&2, pp. 12-25, 2018.

[27] D. Suhartanto, M. Helmi Ali, K. H. Tan, F. Sjahroeddin, and L. Kusdibyo, "Loyalty toward online food delivery service: the role of e-service quality and food quality," *Journal of Foodservice Business Research,* vol. 22, no. 1, pp. 81-97, 2019/01/02 2019, doi: 10.1080/15378020.2018.1546076.

[28] F. Buttle and S. Maklan, *Customer Relationship Management: Concepts and Technologies*. Taylor & Francis, 2019.

[29] P. M. Madhani, "Rewards Strategy: A Key Driver of Service–Profit Chain," *Compensation & Benefits Review,* vol. 51, no. 4, pp. 162-172, 2019/09/01 2019, doi: 10.1177/0886368719898310.

[30] U. Manzoor, S. A. Baig, M. Usman, and M. I. Shahid, "Factors Affecting Brand Switching Behavior in Telecommunication: A Quantitative Investigation in Faisalabad Region," *Journal of Marketing and Information Systems,* vol. 3, no. 1, pp. 63-82, 2020.

[31] L. Miranda-Gumucio, I. Gil-Pechuán, and D. Palacios-Marqués, "An exploratory study of the determinants of switching and loyalty in prepaid cell phone users. An application of concept mapping," *Service Business,* vol. 7, no. 4, pp. 603-622, 2013/12/01 2013, doi: 10.1007/s11628-012-0177-3.

[32] I. G. Juanamasta *et al.*, "The role of customer service through customer relationship management (Crm) to increase customer loyalty and good image," *International Journal of Scientific and Technology Research,* vol. 8, no. 10, pp. 2004-2007, 2019.

[33] P. Özkan, S. Süer, İ. K. Keser, and İ. D. Kocakoç, "The effect of service quality and customer satisfaction on customer loyalty," *International Journal of Bank Marketing,* vol. 38, no. 2, pp. 384-405, 2020, doi: 10.1108/IJBM-03-2019-0096.

[34] M. H. U. Rashid, M. Nurunnabi, M. Rahman, and M. A. K. Masud, "Exploring the Relationship between Customer Loyalty and Financial Performance of Banks: Customer Open Innovation Perspective," *Journal of Open Innovation: Technology, Market, and Complexity,* vol. 6, no. 4, p. 108, 2020. [Online]. Available: https://www.mdpi.com/2199-8531/6/4/108.

[35] G. A. Al-Weshah, E. Al-Manasrah, and M. Al-Qatawneh, "Customer relationship management systems and organizational performance: Quantitative evidence from the Jordanian telecommunication industry," *Journal of Marketing Communications,* vol. 25, no. 8, pp. 799-819, 2019/11/17 2019, doi: 10.1080/13527266.2018.1449007.

[36] M. Chae, J. Kim, H. Kim, and H. Ryu, "Information Quality for Mobile Internet Services: A Theoretical Model with Empirical Validation," *Electronic Markets,* vol. 12, no. 1, pp. 38-46, 2002/01/01 2002, doi: 10.1080/101967802753433254.

[37] P. A. Vlachos and A. P. Vrechopoulos, "Determinants of behavioral intentions in the mobile internet services market," *Journal of Services Marketing,* vol. 22, no. 4, pp. 280-291, 2008, doi: 10.1108/08876040810881687.

[38] Z. Ghali, "Motives of customers' e-loyalty towards e-banking services: a study in Saudi Arabia," *Journal of Decision Systems,* vol. 30, no. 2-3, pp. 172-193, 2021/07/03 2021, doi: 10.1080/12460125.2020.1870063.

[39] Y. T. Prasetyo *et al.*, "Factors Affecting Customer Satisfaction and Loyalty in Online Food Delivery Service during the COVID-19 Pandemic: Its Relation with Open Innovation," *Journal of Open Innovation: Technology, Market, and Complexity,* vol. 7, no. 1, p. 76, 2021. [Online]. Available: https://www.mdpi.com/2199-8531/7/1/76.

[40] V. S. Chee and M. M. Husin, "The Effect of Service Quality, Satisfaction and Loyalty toward Customer Retention in the Telecommunication Industry," *International Journal of Academic Research in Business and Social Sciences,* vol. 10, no. 9, pp. 55-71, 2020.

[41] M. Anwar, S. Nawzad, and B. Qadir, "Customer perceptions on internet services in kurdistan region of Iraq," *International Journal of Social Sciences & Educational Studies,* vol. 5, no. 1, pp. 28-51, 2018.

[42] S. Rajeswaran, S. Gali, and S. Soundale, "Factors Influencing Customer Satisfaction of Wireless Mobile Services During the Covid-19 Pandemic Led Lockdown," in *Interdisciplinary Research in Technology and Management*: CRC Press, 2021, pp. 106-114.

[43] S. Shi, R. Mu, L. Lin, Y. Chen, G. Kou, and X.-J. Chen, "The impact of perceived online service quality on swift," *Internet Research,* vol. 28, no. 2, pp. 432-455, 2018, doi: 10.1108/IntR-12-2016-0389.

[44] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2 ed. United States of America: SAGE Publications, 2017.

[45] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," *Journal of the Academy of Marketing Science,* vol. 43, no. 1, pp. 115-135, 2015, doi: 10.1007/s11747-014-0403-8.