The Digital Service Innovation of Access by KAI Application on Customer Perceived Value

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Abstract

This study examines the effect of digital service innovation on customer perceived value (CPV) of the Access by KAI application. The population in this study were consumers of the Access by KAI application. This study uses the Partial Least Squares-Structural Equation Modeling (PLS-SEM) method with SmartPLS 3 to analyze data and bootstrapping techniques to test hypotheses. Data were collected based on judgmental sampling through an online survey of 266 consumers who have transacted in the Access by KAI application. The results showed that digital service innovation significantly positively affects customer perceived value. These findings provide important insights for similar applications to continue optimizing their digital features to create better-added value for users. The study also provides valuable lessons learnt to enhance digital learning based on CPV.

Keywords: *Digital Service Innovation, Customer Perceived Value, Access by KAI*

I. Introduction

Information and communication technology development has brought a wave of digital disruption sweeping the world, creating fundamental changes in various sectors of life. Digital media has greatly influenced the way people interact, communicate and get information [1]. In Indonesia, digital disruption has become essential in transforming the economy and shaping people's behaviour patterns [2]. The existence of digital platforms, e-commerce, and fintech has changed the way business is done, allowing easier and faster access for consumers [3]. One sector that has been significantly affected is the railway industry, especially PT Kereta Api Indonesia (KAI), which has carried out digital

transformation to improve efficiency and service quality, as seen in the launch of the "Access by KAI" application [4].

Digital transformation at PT KAI through the "Access by KAI" application is essential in facing the digital disruption era. This application provides four main features that stand out. First is the live location, followed by loyalty points, hotel reservations to provide customers with lodging services, and trip planners to help customers plan their trips. Then there is the waiting room, which is only done when there is a significant increase in booking traffic [5]. The number of train passengers during the Christmas and New Year 2024 holidays increased by 27 percent to 3,505,7887, ranking it first among other modes of transportation[6]. The majority of train ticket bookings were made through the application during the January-June 2023 period, reaching 9.17 million tickets or around 61.77% [4]. Better user experience and more accessible access are expected to increase customer perceived value, a crucial factor in maintaining competitive advantage in an increasingly competitive market [7]. However, complaints about new features, such as waiting rooms, slow down the ticket booking process [8], indicating the need for further improvements.

Customer perceived value results from an overall evaluation of the benefits customers receive compared to the sacrifices made to obtain those benefits [9][10]. DSI contributes to customer satisfaction through value offerings [11]. A qualitative study [12], found that CPV can provide value to consumers. Meanwhile, according to [13], service innovation creates customer value. Meanwhile, according to [14], service innovation results in higher customer value. Research that reveals DSI related to CPV has a limitation. DSI research is rarely seen from a consumer perspective but more from a company perspective. As for research on DSI from a consumer perspective and CPV researched by Deryana [15], the results show DSI affects CPV. In the context of PT KAI, DSI has been implemented through the Access by KAI application, which offers new features such as live location, loyalty points, and hotel reservations.

To address user complaints and increase customer perceived value, this study will explore how innovative features in the Access by KAI application affect customer value perceptions. By identifying the factors influencing customer perceived value, PT KAI can improve and optimize its digital features to increase customer value. This research examines the influence of digital service innovation on the perceived value by customers of the Access by KAI application. Specifically, this study will evaluate how new features in the application affect the utilitarian, hedonic, and social aspects of customer perceived value.

II. Method

This study used a cross-sectional design method with a quantitative approach by conducting online surveys of 266 respondents located in Indonesia. The online survey was carried out using a Google Form. The sampling method used is non-probability sampling with a judgmental sampling technique. The instrument measurement scale uses a Likert scale (1-5). The modes of DSI were adopted to measure digital service innovation [16]. DSI also plays a role in shaping positive customer views [16]. Adopting the modes of consumption, the measurement for DSI includes three dimensions: customer-oriented innovation, technological innovation, and co-creative innovation. Customer-oriented innovation is a company's effort to understand customer needs and expectations to create superior value [17] (three items). Technological innovation is the application of innovative technology to create new services, with the aim of improving customer experience and engagement [18] (four items). Co-creative innovation is a process in which customers and business actors participate in product development, reflecting customer experiences and stories to develop new services [19] (four items).

Customer perceived value is measured by three dimensions [20]. CPV refers to the overall evaluation of the utility of a product or service obtained by customers based on their perceptions [9]. Adopting the modes of consumption, the measurement for CPV includes three dimensions: utilitarian value (3 items), social value (3 items), and hedonic value (3 items) [20]. Utilitarian value is an external value related to practical concepts such as price and functionality [21]. Social value differs from utilitarian and hedonic value in that it can vary between being essential and related to external interests [22]. Hedonistic values include some more abstract and intrinsic aspects rooted in emotions [21].

This study used Structural Equation Modeling (SEM) to analyze the data. The SEM method is used to evaluate and estimate the causal relationship between two variables by combining path analysis and factor analysis [23]. Research with this SEM model refers to previous research that uses modelling in testing relationships with the support of Smart-PLS software. This study compares the correlation value of all corrected items with the r table value to test the validity level of each indicator against its latent variable; the accepted significance level is 0.05, and the r table value is 0.176. Cronbach's Alpha value of 0.6 is used as the limit for test reliability. A significance level below 0.05 at the 95% confidence level is used to test the hypothesis. Aligned with the prior studies and this study's phenomena, this paper aims to determine and analyze that digital service innovation positively and significantly affects customer perceived value

III. Results and Discussion

The data shows that 67,9% of respondents are female and 32,1% are male. Of the research respondents, 88,8% were in the age range of 20 to 30 years. As many as 9,4% of respondents were less

than 20, and the rest were over 30 years old. The occupation of 88,8% of research respondents are students.. Furthermore, 45,3% are dominated by respondents with an average monthly expenditure of Rp1,000,000 to Rp 4,000,000, and respondents with income below Rp dominate 44,6%. 1,000,000. Furthermore, 59,9% of respondents who filled out the questionnaire were domiciled in West Java, and 12,7% were domiciled in DKI Jakarta. At the same time, other respondents are domiciled outside Jakarta and West Java.

Table 1.

Respondent Profile

Description	Frequency	
	N=266	%
Gender:		
Male	84	31.5%
Female	183	68.9%
Age:		
<20 years old	25	9,4%
20-30 years old	237	88.8%
others		
Occupation:		
Student	237	88.8%
Employee	16	5.9%
Entrepreneur	10	3.7%
others		
Domicilie:		
West Java	160	59,9%
East Java	30	11.2%
Central Java	13	4.8%
DKI Jakarta	34	12.7%
Others		
Average Earning Per month:		
< Rp 1000.0000	119	44.6%
Rp 1000.000 – Rp 4000.0000	121	45,3%
Rp. 4000.000 – RP 10.000.000	21	7.7%
> Rp 10.000.0000	8	3%
Frequency of using the train in the last three months:		
<5	186	68.6%
5-10	66	24.4%
10-20	10	3.7%
>20	9	3.3%
Domicile of using train service:		
JABODETABEK	82	30.3%
Non-JABODETABEK	180	66.4%
Non-Java	9	3.3%

Resource: Google Form,2024

The results of the descriptive analysis of the Digital service innovation (DSI) variable show that the average value of the mean calculation of 3,763 is classified as high. Signalling that the Access by KAI application has successfully implemented practical digital service innovation in customer

perceived value. The results of the descriptive analysis of customer perceived value show that the Access by KAI application has succeeded in providing high value in various aspects to customers, which can increase their perception of the value received from using the application. Descriptive analysis results can be seen in Table 2.

Table 2.

Descriptive statistics

Variable	Mean	Information
Digital Service Innovation	3,763	High
Customer Perceived Value	3,588	High

Resource: PLS-SEM Report,2024

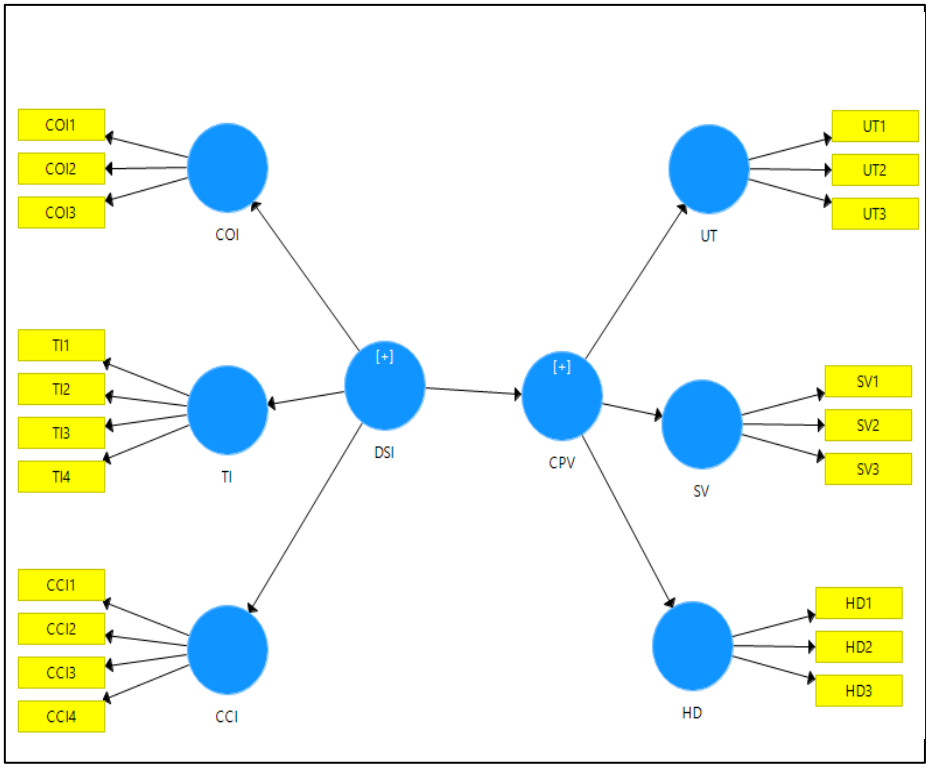

Figure 1. Outer Model Evaluation Result

Resource: PLS-SEM Report,2024

In this study, a model fit analysis was conducted to assess the extent to which the developed model reflects the relationship between indicators. SRMR assessment below 0.10 indicates a fit model (suitable) [24]. The results of the SRMR value in Table 3 show that the SRMR value is 0.090, so the model in this study is included in an acceptable fit model.

Table 3.

Results of feasibility mode

Model-of-fit-indices	Acceptable Fit	Model Result	Information
SRMR	Value < 0.10	0,093	Fit

Resource: PLS-SEM Report,2024

PLS-SEM in this study includes testing the measurement model (outer model), consisting of convergent and discriminant validity and reliability tests. The convergent validity test is carried out by looking at the loading factor value and the average variance extracted (AVE) value, where the indicator can be said to fulfil validity if the AVE value has a value of more than 0.5 and the loading factor is above 0.7 [23].

Table 4.

Validity and Reliability Result

Variables and Indicators	Loading factor	Composite Reliability	Cronbach's Alpha	AVE
Digital Service Innovation				
Customer Oriented Innovation (R^2 = 0.847)		0.917	0.865	0.787
Innovation in problem-solving	0.881			
Innovative idea	0.908			
Different solutions	0.872			
Technological Innovation (R^2 = 0,817)		0.908	0.864	0.711
Services with the latest technology	0.863			
Latest integrated system	0.855			
latest integrated technology	0.849			
Technology leader	0.805			
Co-Creative Innovation (R^2 =0,826)		0.916	0.878	0.733
Customer participation	0.800			
Performance responsibility	0.874			
Communicate in real time	0.865			
Providing feedback	0.883			
Customer Perceived Value				
Utilitarian Value (R^2: 0,746)		0.924	0.876	0.801
Price matching quality	0.886			
Appropriate purchase	0.889			
Appropriate economic value	0.911			
Social Value (R^2: 0,737)		0.926	0.880	0.806
Feel accepted	0.898			
Positive impression	0.888			
Social approval	0.908			
Hedonic Value (R^2: 0,795)		0.880	0.795	0.710
Feel distracted	0.874			
Feel entertained	0.865			
Feel positive	0.787			

Resource: PLS-SEM Report,2024

The results showed that the overall AVE value obtained was above 0.5 and a loading factor above 7 (valid). The results showed that all dimensions showed a composite reliability value above 0.7, and the alpha coefficient exceeded 0.6, which means it is reliable. Then, the Fornell-Larcker Criterion is performed to test discriminant validity. Based on the Fornell-Larcker criterion, the root AVE value of each construct must be greater than the highest correlation between that construct and other constructs in the model [23]. Thus, all variables and indicators used in these variables are valid and meet the criteria.

Table 5.

Fornell-Lacker Criterion Result

	CCI	COI	HD	SV	TI	UT
CCI	0,856					
COI	0,774	0,887				
HD	0,645	0,671	0,843			
SV	0,641	0,620	0,666	0,898		
TI	0,696	0,765	0,727	0,640	0,843	
UT	0,687	0,722	0,692	0,586	0,748	0,895

Resource: PLS-SEM Report,2024

After the validity and reliability tests, researchers conducted hypothesis testing based on the bootstrapping results. The R^2 test results show that the CPV variable has a value of 0.731, which indicates that the effect of DSI on CPV is 73.1%, while other variables outside this study explain the other 26.9%. Table 6 shows a positive and significant influence between DSI and CPV. Based on the results of the path coefficient, the original sample is 0.853, and the p-value of 0.000 is smaller than the significance level of this study, namely 0.05. Besides that, the T Statistics or T Value shows a value of 38.004, which is greater than the critical value of this study, namely 1.96. Therefore, the first hypothesis can be accepted. The results of this study are in line with research conducted previously [15].

Table 6.

Hypothesis Test Result

Hypothesis	Variables	Original Sample	Standard Deviation	T Statistics	P Values	Conclusion
H1	DSI -> CPV	0,853	0,022	38,004	0,000	(+) Significant

Resource: PLS-SEM Report,2024

This study additionally employs lower-order construct testing to enhance the accuracy of its findings. The assessment of the lower-order model involves multiple measurement criteria, namely internal consistency, discriminant validity, and convergent validity (Sarstedt et al., 2019). The internal consistency and convergent validity of lower-order construct measurements are presented in Table 7.

Table 7.

Lower-Order Construct Result

Variables and Indicators	Indicator Reliability	Composite Reliability	Cronbach's Alpha	AVE
Customer Oriented Innovation	0.868	0.917	0.865	0.787
Technological Innovation	0.864	0.916	0.864	0.711
Co-Creative Innovation	0.881	0.908	0.878	0.733
Utilitarian Value	0.876	0.924	0.876	0.801
Social Value	0.882	0.880	0.880	0.806
Hedonic Value	0.796	0.795	0.795	0.708

Resource: PLS-SEM Report,2024

Internal consistency can be assessed by examining the values of Cronbach's alpha and composite reliability, both of which should exceed 0.7 [25].The results reveal that after doing the tests, all dimensions have values that above 0.7, indicating that these values are deemed acceptable. Convergent validity can be evaluated by analyzing the consistency of indicators and the Average Variance Extracted (AVE), the indicators must exhibit reliability values that are greater than 0.7, while the AVE should surpass 0.5 [25]. According to the data gathered from the test results, all the values are higher than 0.7. Furthermore, all AVE scores surpass 0.5, indicating their acceptability.

Discriminant validity is evaluated through the Fornell-Larcker criterion, which is acceptable if each construct's AVE root value criterion must be greater than the highest correlation between the construct and other constructs in the model. The results show that all AVE root values of each construct are more significant than the highest correlation between the construct and other constructs in the model. Therefore, discriminant validity on the lower order construct of this study is acceptable. It is concluded that the lower-order construct in this study with all dimensions, both in the independent and independent variables, is classified as valid and reliable. The results of discriminant validity are presented in Table 8.

Table 8.

Lower-Order Construct Discriminant Validity Result

	CCI	COI	HD	SV	TI	UT
CCI	0,856					
COI	0,773	0,887				
HD	0,650	0,677	0,842			
SV	0,642	0,621	0,665	0,898		
TI	0,697	0,765	0,733	0,641	0,843	
UT	0,688	0,722	0,701	0,586	0,748	0,895

IV. Conclusion

Based on the results of the study, there is a positive and significant influence between digital service innovation and customer perceived value. This finding is supported by the original sample of 0.853 and a p-value of 0.000, which is smaller than the significance level of this study, namely 0.05. besides that, the T Statistics or T Value shows a value of 38.004, which is greater than the critical value of this study of 1.96. In addition, the mean results show that the Access by KAI application successfully implements practical digital service innovation, provides high value in various aspects to customers, and increases their perception of the application's value.

A. Implication for Educational Context

This research has important implications for management and teaching in the context of digital service innovation and customer value. Management should continue to innovate and use the latest technologies, such as AI and big data, for service personalization, conduct regular measurements and evaluations to improve customer satisfaction and invest in employee training to be ready for technological changes. For management teaching, real case studies such as the Access by KAI app can be used to teach the concepts of digital service innovation and customer value. The integration of technology into the curriculum is highly relevant, and collaborative projects with the industry provide students with valuable practical experience. The findings of this study help management be more effective in improving customer value and enriching management teaching with relevant materials and experiences.

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