Analysis of Consumer Preference Evolution Global: Implications for Digital Service Design in Transportation Services Companies

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Abstract: The rapid advancement of digital technologies and shifting market dynamics have significantly transformed consumer preferences in transportation services worldwide. This study aims to analyse the evolution of global consumer preferences towards digital service design in transportation service companies. The method used was descriptive qualitative with in-depth interviews with eight informants, consisting of application users and internal service parties, who were selected purposively based on their involvement in the application. This research demonstrates that consumer preference for digital transportation services has shifted toward faster, more efficient, and app-based solutions. The KAI Access app is considered to simplify ticket purchasing and schedule checking, with added value in its ease of use, simple interface, and e-boarding pass feature relevant to the younger generation. The results showed that most respondents felt KAI Access facilitated ticket booking and provided travel information, with the Local Train/Commuter Line service feature being the most frequently used. However, several obstacles were identified, such as perceived confusing app updates, limited ticket availability, and the lack of direct payment via QRIS. A SWOT analysis identified key strengths as ease of use and compatibility with the lifestyles of the younger generation, along with opportunities stemming from digitalization trends and potential partnerships with digital payment platforms. Thus, KAI Access contributes significantly to the digital transformation of the transportation sector, but still requires feature development, payment integration, and adaptive service strategies to increase user satisfaction and loyalty

Keywords: Consumer preferences, Digital services, KAI Access, App-based transportation

1. Introduction

El Zarwi et al. (2017), user preferences in using digital transportation services can shift gradually and are influenced by both internal and external factors, including feature design, ease of use, and perceived added value. Digital transformation in the transportation sector encourages service providers to continuously improve service quality through digital platforms, such as the KAI Access application owned by PT Kereta Api Indonesia. In areas such as Cicalengka, which is part of the Greater Bandung Commuter Line corridor, the use of this application is an important tool in supporting travel comfort and efficiency. .

Previous studies have shown that the evolution of consumer preferences for digital transportation services is strongly influenced by demographic, socioeconomic, and regional technological factors. Macedo et al. (2021) examined real-time information (RTI) systems in public transportation and found that user preferences varied by age and region. They concluded that people in underserved areas tend to value RTI more, and platforms such as smartphone apps and information panels are preferred. Brakewood and Watkins (2019) conducted a literature review on the benefits of RTI and found that these systems can increase satisfaction, reduce uncertainty, and encourage public transportation use. Specifically, research by Watkins et al. (2011) demonstrated that the use of real-time information through mobile applications can significantly reduce perceived passenger wait times and improve travel comfort. Harmony and Gayah (2017) developed an RTI evaluation approach from the demand and supply sides of information, emphasizing the importance of tailor ing RTI system design to user characteristics, including those in rural or suburban areas. Meanwhile, Gebresselassie and Sanchez (2018) highlighted the role of smart mobility applications in supporting socially sustainable transportation, including the inclusion of people with disabilities in digital transportation systems. These five studies support the urgency of analyzing local consumer preferences, such as in the Cicalengka area, so that digital services like the KAI Access application can be designed inclusively, adaptively, and oriented to the evolving needs of users.

Tang and Thakuriah (2012) found that the implementation of an RTI system in Chicago's bus transportation system successfully increased ridership by fostering trust and transparency in the service. Zhang et al. (2017) in their study in Stockholm showed that real-time crowding information helped passengers make travel decisions more conveniently and efficiently. Meanwhile, Tirachini and Cats (2020) emphasized that the COVID-19 pandemic has accelerated digital transformation in the transportation sector and shifted user preferences toward safer, faster, and app-based services. These findings generally indicate that consumer preferences for digital transportation services continue to evolve along with changes in technology and social contexts. Therefore, it is crucial for transportation service companies like PT KAI to adapt the design of digital applications, such as KAI Access, to respond to the local needs of commuters in Cicalengka in an adaptive, participatory, and inclusive manner. These studies support the urgency of analyzing consumer preferences locally, such as in the Cicalengka area, so that digital services like the KAI Access application can be designed in an inclusive, adaptive, and oriented towards evolving user needs.

This research objectives to identify and analyze the evolution of consumer preferences in using digital transportation service applications, specifically KAI Access, in the Cicalengka area as part of the Greater Bandung commuter area. In addition, this study also aims to evaluate the extent to which the design of the KAI Access digital service has responded to these changing preferences, including aspects of ease of use, clarity of information, available features, and system comfort and reliability. The results of the study are expected to provide recommendations for the development of digital service designs

that are more relevant, easily accessible, and in accordance with the needs of local consumers, in order to increase adoption, user satisfaction, and the sustainability of digital-based transportation services. The method used is a descriptive qualitative approach with data collection techniques through in-depth interviews with internal parties (KAI Access managers or developers) and external parties (application users in Cicalengka). Informants were selected purposively by considering their direct involvement in the service.

2. Method

This study uses a descriptive qualitative method that aims to describe in depth the evolution of consumer preferences for digital transportation services through the KAI Access application in the KAI Cicalengka area. This approach was chosen because it can explore user experiences, perceptions, and needs holistically in a real-world context. we apply a SWOT analysis, which focuses on IFAS (Internal Strategic Factors Analysis Summary) which includes strengths and weaknesses, as well as EFAS (External Strategic Factors Analysis Summary) which involves opportunities and threats. This research was conducted in the KAI Cicalengka operational area during 2025.

3. Results

An IFAS is used in strategic management to identify **internal strengths and weaknesses** of an organization (or industry), then weigh and rate them to understand their overall strategic position. In the table 3.1 showed about IFAS matrix especially for SWOT analysis (Strengths and weakness) as follows:

Table 1. IFAS Matrix(Internal Strategic Factor Analysis Summary) of Strength and Weakness

Internal Factors	Weight	Ratings	Weight x Ratings
Strengths			
1. The application is easy to use by most users	0.20	4	0.80
2. Practical, no need to queue at the counter	0.15	4	0.60
3. The e-boarding pass and commuter line features make traveling easier.	0.10	3	0.30
4. Applications according to the preferences of the younger generation	0.10	3	0.30
Sub-Total	0.55		2.00
Weaknesses			
1. Not all users are tech-savvy (elderly/lay)	0.15	2	0.30
2. Local train tickets are running out fast	0.10	2	0.20
3. App updates are too frequent and confusing	0.10	2	0.20
4. There is no direct QRIS payment integration yet (e.g. ShopeePay)	0.10	2	0.20
Sub-Total	0.45		0,90
Total	**1.00**		**2.90**

From Table 1 above can be seen that The IFAS (Internal Strategic Factor Analysis Summary) Matrix shows that the KAI Access application's main strengths are ease of use, a simple interface, and practicality in booking tickets and using features such as e-boarding passes and the Commuter Line. This aligns with today's consumer preferences for digital, fast, and efficient services. Furthermore, the majority of users, who are students, feel comfortable with the features offered. However, this application also has several weaknesses, such as updates that are too frequent and confusing for some users, limited understanding of digital technology among lay users, and limited availability of local train tickets, which often run out during peak hours. Another weakness identified from interviews is the lack of integration of the direct payment system via QRIS with popular e-wallets such as ShopeePay, which is a user expectation. Based on the calculation results, the total IFAS score is 2.90, indicating that the internal strengths of the KAI Access application are quite dominant and can be used as capital in developing better services.

Table 2. IFAS Matrix (Internal Strategic Factor Analysis Summary) for Opportunities and Threats Analysis

External Factors	Weight	Ratings	Weight x Ratings
Opportunities			
1.The trend of digitalization of society is increasing	0.20	4	0.80
2.Regulatory support for digital transportation services	0.15	3	0.45
3.The habits of young users who are mobile and like practical things	0.15	3	0.45
4.Potential collaboration with digital payment platforms	0.10	3	0.30
Sub-Total	0.60		2.00
Threats			
1. Internet network disruption in certain areas	0.15	2	0.30
2.Not all users are moving away from manual ticket purchasing	0.10	2	0.20
3.Competition with other digital transportation platforms	0.15	2	0.30
Sub-Total	0.40		0,80
Total	**1.00**		**2.80**

From the Table 2 above can be seen that the KAI Access application's main strengths are ease of use, a simple interface, and practicality in booking tickets and using features such as e-boarding passes and the Commuter Line. This aligns with today's consumer preferences for digital, fast, and efficient services. Furthermore, the majority of users, who are students, feel comfortable with the features offered. However, this application also has

several weaknesses, such as updates that are too frequent and confusing for some users, limited understanding of digital technology among lay users, and limited availability of local train tickets, which often run out during peak hours. Another weakness identified from interviews is the lack of integration of the direct payment system via QRIS with popular e-wallets such as ShopeePay, which is a user expectation. Based on the calculation results, the total IFAS score is 2.90, indicating that the internal strengths of the KAI Access application are quite dominant and can be used as capital in developing better services. Then in the Table 3 showed that the IFAS matrix for Opportunities and Threats

Table 3. Matrix EFAS (Eksternal Strategic Factor Analysis Summary) for Opportunities and Threats

Faktor Eksternal	Weight	Ratings	Weight x Ratings
Opportunities			
1.The trend of digitalization of society is increasing	0.20	4	0.80
2.Regulatory support for digital transportation services	0.15	3	0.45
3.The habits of young users who are mobile and like practical things	0.15	3	0.45
4.Potential collaboration with digital payment platforms	0.10	3	0.30
Sub-Total	0.60		2.00
Threats			
1. Internet network disruption in certain areas	0.15	2	0.30
2.Not all users are moving away from manual ticket purchasing	0.10	2	0.20
3.Competition with other digital transportation platforms	0.15	2	0.30
Sub-Total	0.40		0,80
Total	1.00	4	2.80

The External Strategic Factor Analysis Summary (EFAS) matrix is used to assess external factors influencing this digital service strategy. Several opportunities that PT KAI can capitalize on through the KAI Access application include the increasing trend of digitalization in society, government policy support for digital transformation in the transportation sector, and the tendency of young users to prefer automated and flexible services. Furthermore, there are also opportunities for collaboration with digital financial service providers to improve payment efficiency. On the other hand, there are a number of threats such as internet network disruptions that remain a problem in some areas, resistance from some users who are not yet ready to switch to digital, and competition from other digital transportation platforms offering similar services. The total EFAS score of 2.55 indicates that external opportunities are quite large, but still requires an appropriate strategy

to address these challenges.for more explanation can be seen in the table 4 about AWOT analysis bellow:

Tabel 4. SWOT Analysis.

External / Internal	Strengths: 1. The application is easy to use by most users 2. Practical, no need to queue at the counter 3. The e-boarding pass and commuter line features make traveling easier. 4. Applications according to the preferences of the younger generation	Weaknesses: 1. Not all users are tech-savvy (elderly/lay) 2. Local train tickets are running out fast 3. App updates are too frequent and confusing 4. There is no direct QRIS payment integration yet (e.g. ShopeePay)
Opportunities: 1. The trend of digitalization of society is increasing 2. Regulatory support for digital transportation services 3. The habits of young users who are mobile and like practical things 4. Potential collaboration with digital payment platforms	SO: 1. Maximize user-friendly interface and practical features to reach younger generations and new users. 2. Develop direct digital payment integration with QRIS through collaboration with e-wallet platforms. 3. Promote featured features through digital media to increase awareness and adoption 4. Develop a loyalty program or special discounts for app users	WO: 1. Provide interactive digital guides/tutorials in KAI's official applications and social media. 2. Add a notification system or waiting list when tickets run out. 3. Schedule regular updates with clear notifications and a familiar interface. 4. Immediately integrate direct QRIS payments, in line with the habits of young users in digital transactions.
Threats: 1. Internet network disruption in certain areas 2. Not all users are moving away	ST: 1. Use the advantages of e-boarding & convenience as an added value	WT: 1. Provide interactive digital guides/tutorials in KAI's official

Internal / External	Strengths:	Weaknesses:
	1. The application is easy to use by most users 2. Practical, no need to queue at the counter 3. The e-boarding pass and commuter line features make traveling easier. 4. Applications according to the preferences of the younger generation	1. Not all users are tech-savvy (elderly/lay) 2. Local train tickets are running out fast 3. App updates are too frequent and confusing 4. There is no direct QRIS payment integration yet (e.g. ShopeePay)
from manual ticket purchasing 3. Competition with other digital transportation platforms	compared to competitor applications. 2. Add limited offline mode features (eg: e-ticket and schedule storage) to overcome signal constraints 3. Involve local user communities in app feedback and development	applications and social media. 2. Provide interactive digital guides/tutorials in KAI's official applications and social media. 3. Schedule regular updates with clear notifications and a familiar interface. 4. Immediately integrate direct QRIS payments, in line with the habits of young users in digital transactions.

Table 4 showed SWOT analysis of the KAI Access application shows that this digital service has strengths in ease of use, practicality without having to queue, and superior features such as e-boarding passes and Commuter Line services that suit the preferences of young users in the Cicalengka area. However, several weaknesses remain, such as limited digital literacy among the elderly, quickly sold-out local train tickets, too frequent and confusing application updates, and the lack of direct integration of the QRIS payment system. On the other hand, significant opportunities come from the trend of digitalization in society, support from government regulations, and the habits of young consumers who prefer fast and practical services, including potential collaboration with e-wallet platforms such as ShopeePay and DANA. However, this application also faces threats such as internet network disruptions in certain areas, the continued preference for manual ticket purchases, and competition from other digital transportation applications. Therefore, this SWOT analysis serves as an important basis for PT KAI in designing a digital service

development strategy that is more adaptive, responsive, and inclusive of changing consumer preferences.

4. Discussion

Previous studies provide a strong foundation for understanding changes in consumer preferences for digital services in the transportation sector, which aligns with the findings of this study. El Zarwi et al. (2017) revealed that consumer preferences are dynamic and evolve over time due to the influence of experience and technological advances, as reflected in the shift in behavior of KAI Access users in Cicalengka who prefer digital services for their practicality and efficiency. Studies by Macedo et al. (2021) and Brakewood & Watkins (2019) show that the availability of real-time information can increase user convenience and satisfaction, which is also evident in the superiority of the departure schedule feature in the KAI Access application. Adapting application design to user characteristics, as emphasized by Watkins et al. (2011) and Harmony & Gayah (2017), is also reinforced by the finding that some users in Cicalengka still experience difficulties due to application updates or limited digital literacy. The findings of Gebresselassie & Sanchez (2018) regarding the importance of inclusive application design also support the need for integration of digital payment systems such as QRIS, as proposed in this study. Furthermore, Tang & Thakuriah (2012) and Zhang et al. (2017) demonstrated that easily accessible information can improve travel comfort, reflecting the experiences of KAI Access users. Tirachini & Cats (2020) also emphasized that the COVID-19 pandemic accelerated digital transformation in the transportation sector, which also contributed to increased use of KAI Access in the Cicalengka area. Therefore, this study strengthens and complements previous findings through a locally relevant approach, and contributes to a global understanding of the importance of developing responsive, adaptive, and user-friendly digital services. Here are the figure 1 that showed the easy use or user-friendly digital services from KAI booking ticket
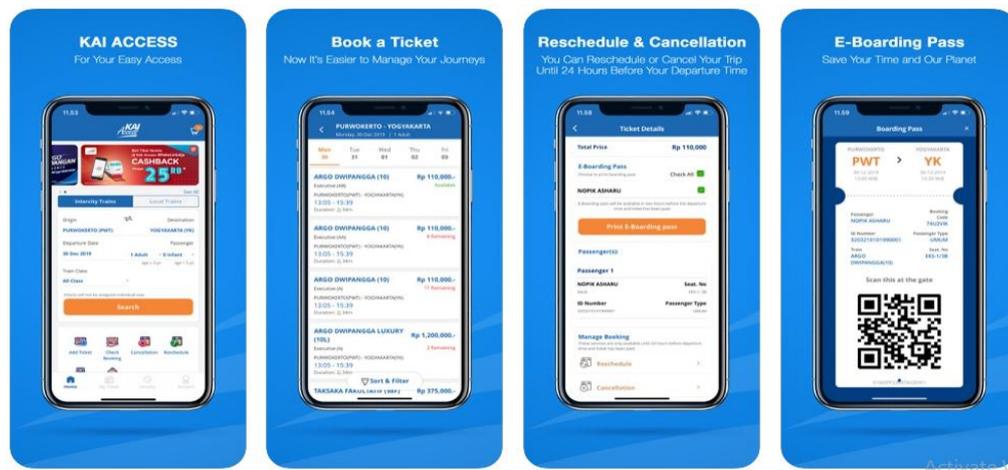

Figure 1. KAI Booking ticket, Reshedule & Cancellation and Boarding Pass.

Source: KAI Access Mobile Apps

Figure 1 above showed that how simple and easy use of booking tickets of KAI, rescheduled and Cancellation and get a E-Boarding pass only by accessing KAI access using your mobile phone or other digital devices.in the past for rescheduled or cancellation the ticket the passengers have to call the customer service or come to the ticket booth in station directly, but now it more easier only using the mobile phone and open KAI access application the passengers can do it. also for the ticket the passengers don't have to print the ticket , just show your barcode for E-boarding pass and scan it before get in to the train. The KAI access Apps is considered more easy to use and user friendly more over for young generation who literate technology in this digital era.

The strategy is implemented through problem identification, technical planning, innovative feature development, user education, and ongoing evaluation. Issues such as limited digital literacy, confusing app update frequency, limited local ticketing, and the lack of QRIS system integration form the basis for developing adaptive strategies. The development of a user-friendly interface for seniors and the addition of a simple mode feature align with digitally inclusive design recommendations for the transportation sector (Serra et al., 2022). Furthermore, the development of a waiting list feature, real-time ticket notifications, and a limited offline mode are innovative solutions to address connectivity limitations, as suggested by Zhang et al. (2023) in a study on digital accessibility of transportation in suburban areas. The strategy of integrating digital payments through QRIS or e-wallets is also supported by evidence from a recent study that the adoption of mobile payment systems improves efficiency and user satisfaction in public transportation services (Lee & Kim, 2023). User education is conducted through video tutorials, feature guide pop-ups, and social media campaigns, in line with a digital participatory approach to increasing transportation app adoption (Thakuriah et al., 2024). Evaluation is conducted iteratively based on user feedback to ensure sustainable app adoption. This strategy forms a crucial foundation for developing more adaptive, inclusive, and sustainable digital services in the public transportation sector.

5. Conclusion

This research demonstrates that consumer preference for digital transportation services has shifted toward faster, more efficient, and app-based solutions. The KAI Access app is considered to simplify ticket purchasing and schedule checking, with added value in its ease of use, simple interface, and e-boarding pass feature relevant to the younger generation. However, several limitations remain, such as low digital literacy among some users, frequent and confusing app updates, rapid selling of local train tickets, and the lack of direct payment integration via QRIS. On the other hand, opportunities for development are open through increased digitalization, government regulatory support, and collaboration with electronic payment platforms. Challenges include internet connectivity issues, continued interest in manual ticket purchasing, and competition with other digital transportation apps. Therefore, PT KAI is advised to develop a responsive, inclusive, and participatory digital service design, thus adapting to evolving user preferences and continuously strengthening customer satisfaction and loyalty.

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