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Building Resilience Digital Community Ecosystem by Applications Information System and Brand Experience

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***Abstract*—In the face of rapid technological advancements and socio-economic disruptions, digital community ecosystems must develop resilience to ensure sustainability and adaptability. This study investigates how digital applications, information systems, and brand experience contribute to building resilience in Indonesia's land transportation sector. Using a quantitative approach, data were collected from 350 valid responses through online structured questionnaires targeting users of land transportation services, such as buses, trains, and ride-hailing platforms in Jakarta, Bandung, and Surabaya. The sampling was purposive, involving users with prior experience using digital transportation apps. The data were analyzed using Structural Equation Modeling - Partial Least Squares (SEM-PLS). The findings indicate that system quality and information quality significantly influence brand experience, which in turn affects user engagement. Furthermore, user engagement plays a crucial role in enhancing the resilience of the digital community ecosystem. The study confirms that brand experience partially mediates the effect of system and information quality on engagement. Implications of the study emphasize the importance for transportation providers to prioritize high-quality, user-centric digital services that foster emotional connection and trust, which are essential to sustaining adaptive and resilient community platforms in the face of urban transportation challenges.**

***Index Terms*—Applications information system, brand experience, community resilience, digital ecosystem, land transportation.**

I. INTRODUCTION

The rapid digital development in Indonesia's land transport sector is changing the way services are provided and experienced. Cities such as Jakarta, Bandung, and Surabaya are seeing an increase in digital solutions, coordinated information systems, and improved brand interactions focused on elevating service standards, user contentment, and operational strength. This progress involves not just technological improvements, but also creating a strong digital community ecosystem network that can adjust to obstacles and fulfill the rising needs of urban transportation.

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This study provides several novel theoretical insights into the intersection of digital systems, user experience, and resilience within the context of land transportation in emerging economies, particularly Indonesia. The digital transformation of Indonesia's urban transportation and land services is reshaping service delivery and user experiences. In major cities, there's a growing emphasis on digital applications and integrated information systems to enhance service quality and operational efficiency [1]. However, challenges persist in public acceptance and system quality, necessitating improvements in reliability and user-centered design [1], [2].

The transformation extends beyond technological advancements, encompassing changes in marketing strategies, governance, and urban planning [3], [4]. The shift towards digital services aims to create more accessible, efficient, and trustworthy systems, but requires careful consideration of diverse urban contexts and citizen engagement [4]. This digital evolution is not just about branding, but about building resilient, adaptive urban ecosystems that can meet the growing demands of urban mobility.

The integration of information systems and brand experience frameworks offers insights into digital resilience and user engagement. System quality, information quality, and service quality are highlighted by the Information Systems Success Model as factors that influence user satisfaction and system utilization [5], [6]. These variables, together with psychological factors such as involvement and pleasure, are strong predictors of user interaction with mobile apps [6]. Digital resilience, enabled by information systems, is crucial for organizations to recover from exogenous shocks and navigate disruptions [7]. Unlike prior studies that treat technology quality, brand experience, and resilience as isolated phenomena, this research integrates them into a unified model. It uniquely positions brand experience as a mediating variable that links technical attributes (system and information quality) to broader community outcomes (digital resilience). Furthermore, this study applies SEM-PLS methodology to the transportation sector, which is still underexplored in existing IS and marketing research.

A holistic approach to digital resilience design is essential, particularly for AI-based information systems facing challenges like demand shocks [8]. By combining these perspectives, researchers can explore how digital applications

contribute to brand experience and enhance the resilience of digital community ecosystems in sectors like land transportation, ultimately strengthening collective capacity to address future disruptions [7], [8]. Through the integration of these frameworks, the research seeks to investigate the role of digital tools and information systems in enhancing brand experience and, in turn, supporting the strength of the digital community ecosystem within the land transportation industry.

Indonesia's terrestrial transport system has experienced considerable digital advancement lately. Recent studies highlight Indonesia's efforts to modernize its public transportation system, particularly in Jakarta. The implementation of smart mobility solutions includes the integration of various modes like commuter lines, buses, MRT, and LRT through unified payment systems and real-time information [9], [10]. The JakLingko program exemplifies this approach, aiming to improve service delivery and user experience [11], [12].

With a notable decrease in traffic congestion in Jakarta, from 61% in 2017 to 34% in 2021, these initiatives have produced encouraging outcomes [9]. The modernization of transportation systems contributes greatly to convenience but requires addressing negative impacts through eco-efficient practices [13]. These efforts are designed to improve user ease, decrease traffic, and encourage eco-friendly urban travel.

However, combining digital technologies also presents difficulties. Security threats in cyberspace have emerged as a significant issue, as the transportation industry faces numerous cyberattacks that could disrupt services and jeopardize user information. To address these issues, innovative approaches like blockchain, artificial intelligence, and machine learning are being adopted to enhance ITS security [14]. The COVID-19 pandemic emphasized the necessity of robust transportation networks that can adjust to unforeseen shifts in demand and operational limitations [15]. Digital twin technology, combined with blockchain, offers potential solutions for creating more efficient, secure, and sustainable transportation systems [16]. Overall, the transportation sector must focus on enhancing resilience, security, and adaptability to meet current and future demands [17]. Additionally, the importance of having resilient transportation networks capable of responding to unforeseen changes in demand and operational constraints was highlighted by the COVID-19 epidemic.

This integrative approach contributes to theory by expanding the application of the Information Systems Success Model to transportation services, recontextualizing brand experience theory as a bridge between digital performance and collective behavioral resilience, and demonstrating empirically that user engagement, rooted in brand experience, significantly fosters community resilience, providing a pathway for sustainable digital community ecosystems.

II. Related Work

Previous studies primarily examined digital transformation, user experience, or organizational resilience in isolation. However, none have explicitly integrated system quality, information quality, brand experience, and digital ecosystem resilience within a single empirical framework in the Indonesian land transportation sector. This study fills that gap by synthesizing constructs from the information systems success model, brand experience theory, and digital community ecosystem theory, and empirically testing their interconnections using SEM-PLS. This integrated approach offers a novel contribution by uncovering the mediating role of brand experience in enhancing user engagement and resilience, which was previously underexplored. In the land transportation sector, ease of use significantly influences user loyalty for app-based services, while factors like service responsiveness and guarantees affect user attitudes [18]. The use of digital technology, sound financial management, and strong customer connections helped trucking firms become more resilient during the COVID-19 epidemic [19].

Social media marketing has a beneficial impact on brand trust, affect, and value consciousness in online transportation, all of which have an impact on brand loyalty [20]. Likewise, digital transformation, collaboration skills, and innovation value are key factors in the resilience of small and medium-sized businesses (SMEs) [21]. In many industries throughout Indonesia's business and transportation sector, these results demonstrate the increasing significance of digital technologies in influencing consumer experiences, brand loyalty, and organizational resilience.

Grasping the interactions among digital technologies, brand experience, and community resilience is essential for those in policy-making, transportation management, and service delivery. While it's still necessary to bridge the digital divide [22], these technologies facilitate community participation, remote resource access, and virtual communication. The insights gained from this study can inform strategies to increase user happiness, foster loyalty, and build resilient transportation networks that can withstand adversity. Digital technologies support economic recovery resilience in cities by supporting cooperative networks and enabling government-sponsored platforms, public-private partnerships, and citizen co-production [23].

The transportation network is vital for community resilience, with open-source data and routing algorithms helping evaluate access to amenities under various hazard scenarios [24]. Mobility platforms and their ecosystems have demonstrated superior adaptability and resilience compared to non-platform competitors during the pandemic [25]. Additionally, the results may enrich the wider conversation about sustainable urban travel and the influence of digital advancements in public transit.

Previous study integrates three core theoretical frameworks—the Information Systems (IS) Success Model [6], brand experience theory [30], and digital community ecosystem [24] into a unified conceptual model. IS Success Model offers the foundational lens for evaluating the technical quality of digital transportation applications through constructs such as system quality and information quality, which are theorized to influence user perceptions and satisfaction. Brand experience functions as the mediating psychological mechanism, translating system-level interactions into emotional and cognitive responses (e.g., trust, enjoyment, immersion), which are essential for sustainable user engagement. Digital community ecosystem serves as the

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outcome construct, capturing the system's ability to adapt and sustain functionality amidst disruptions, contingent upon collective user engagement and platform stability.

Operationally, these concepts are measured as follows:

1) *System quality and information qua*lity
   Reflective constructs assessed through user perceptions of functionality, reliability, and data accuracy [6].
2) *Brand experience*
   Captures users' emotional and cognitive responses to the platform using validated scales [30].
3) *User engagement*
   Measured via behavioral intention, frequency of use, and advocacy [5].
4) Digital community ecosystem
   Defined through user-reported perceptions of adaptability, participation, and platform stability during disruption [24].

This integration creates a causal chain, Technical Quality (IS Success)→Experiential Evaluation (Brand Experience)→ Behavioral Response (User Engagement) → Collective Outcome (Digital Ecosystem Resilience). Such a model contributes to theory by linking information systems performance, brand psychology, and community resilience in one unified structure—a novel contribution to both IS and transportation literature.

By employing a quantitative methodology using Partial Least Squares Structural Equation Modeling (SEM-PLS), this study investigates the interplay between digital system performance, user experience, and ecosystem resilience in the context of Indonesia's land transportation sector. The objectives of this research are:

1) To evaluate the extent to which system quality and information quality of digital transportation applications influence users' brand experience, thereby revealing how technical performance translates into emotional and cognitive user perceptions.
1) To examine the impact of brand experience on user engagement, highlighting the mediating role of brand experience in fostering continued interaction, trust, and loyalty within digital platforms.
2) To determine the effect of user engagement on the development of a resilient digital community ecosystem, assessing how user participation and behavioral commitment contribute to the platform's adaptability and sustainability in a dynamic transport environment.

III. RESEARCH METHOD

A. Research Design

This research utilizes a quantitative approach to explore how digital applications, information systems, brand experience, and the resilience of digital community ecosystems are interconnected within Indonesia's land transportation industry. Indonesia's transportation industry has been the subject of recent research on digital transformation and user experience. The significance of cultural systems was highlighted by research on smart city platform ecosystems in significant Indonesian cities, which also identified political leadership and smart urban services as crucial mediating factors [26]. In Jakarta, a study on app-based land transportation found that ease of use significantly influenced user loyalty, while factors like service responsiveness did not affect attitudes towards usage [18].

Another study demonstrated that digital transformation, collaboration capability, and innovation value positively impact the resilience of small and medium enterprises in Bandung [21]. In East Java, a comparison of two public transportation applications using the User Experience Questionnaire method showed positive user impressions for both apps, with the Transjatim application outperforming the Gobis Suroboyo Bus application across all evaluated scales [27]. A cross-sectional survey method was implemented, gathering information from users of different land transport services, such as buses, trains, and ride-hailing services, in key urban areas like Jakarta, Bandung, and Surabaya.

B. Theoretical Framework

The Information Systems Success Model emphasizes the significance of system quality, information quality, and service quality in achieving user satisfaction and efficient system use, both of which are essential for the success of a company. The combination of information systems and brand experience in digital ecosystems is the subject of this collection of articles. The Information Systems Success Model highlights system quality, information quality, and service quality as key factors influencing user pleasure and system use [5], [6]. Digital community ecosystem resilience, which focuses on the capacity to recover from external shocks [7], is becoming a crucial topic in the study of information systems.

In the context of Digital Business Ecosystems (DBEs), resilience is assessed through the analysis of ecosystem goals and roles, as demonstrated in cases such as winter road maintenance and COVID-19 testing [28]. Brand experience centers on the personal, internal reactions that consumers have in response to brand-related triggers, covering aspects such as sensory, emotional, cognitive, and behavioral experiences.

C. Sampling and Data Collection

The population of interest consists of individuals utilizing digital transportation services in Indonesia. A deliberate sampling method was used to choose participants who have utilized digital apps for transportation purposes [29]. Information was gathered through an online survey shared on social media and platforms related to transportation services. In total, 400 replies were collected, with 350 identified as valid following the data verification process [29].

D. Measurement Instruments

The questionnaire was created using established scales from earlier research, modified to fit the environment of Indonesia's land transportation industry. Fig. 1 illustrates the conceptual framework of the study, showing the hypothesized

relationships between system quality, information quality, brand experience, user engagement, and digital community ecosystem resilience. The constructs measured include:

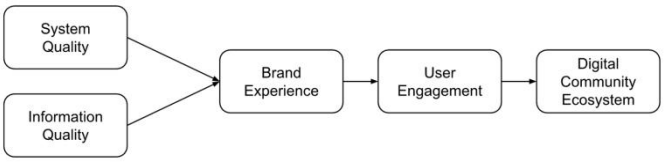

Fig 1. Research model.

- System Quality: Assessed using items related to reliability, ease of use, and functionality [6].
- Information Quality: Measured through accuracy, timeliness, and relevance of information provided by the application [6].
- Brand Experience: Evaluated using sensory, affective, intellectual, and behavioral dimensions [30].
- User Engagement: Assessed through frequency of use, duration, and depth of interaction with the application [5].
- Digital Community Ecosystem: Measured by the digital community's capacity for adaptation, recovery, and expansion in the face of adversity [24].

Each item was given a score on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 presents the measurement constructs and example indicators used in the survey instrument, which include system quality, information quality, brand experience, user engagement, and digital community ecosystem.

Table 1.
Instrument Indicators

Construct	Number of Items	Example Indicators
System Quality	4	"The app operates reliably," "The app is easy to use"
Information Quality	3	"The information is accurate," "The information is timely"
Brand Experience	5	"The app is engaging," "I enjoy using the app"
User Engagement	3	"I frequently use the app," "I recommend the app to others"
Digital Community Ecosystem	4	"The platform adapts well during disruptions," "Users support one another"

E. Data Analysis

The data was analyzed using the Partial Least Squares (PLS) method for Structural Equation Modeling (SEM). Partial Least Squares Structural Equation Modeling (PLS-SEM) is a covariance-based SEM alternative that works well for complicated models, prediction-oriented studies, and non-normal data distributions [33]. It is especially helpful for exploratory research and models with several constructs and indicators [29]. Bibliometric research [31] demonstrates the increasing popularity of SEM-PLS in a variety of study areas.

While offering advantages like simultaneous examination of measurement and structural models with fewer assumptions, PLS-SEM requires careful consideration of its appropriateness for specific research contexts [32]. Researchers should justify their use of PLS-SEM and follow up-to-date guidelines for application and interpretation [33]. Despite some calls for its abandonment, PLS-SEM remains a powerful tool when used responsibly, offering both confirmatory and predictive capabilities in structural equation modeling [32], [29]. For this analysis, SmartPLS version 4.1.1.2 was used. The SEM-PLS method is appropriate for exploratory studies and intricate models featuring various constructs and indicators.

F. Measurement Model Assessment

In structural equation modeling, the evaluation of measurement models entails using a variety of criteria to evaluate validity and reliability. Factor loadings are used to determine indicator reliability, with a value of 0.70 or higher being deemed acceptable [29]. Composite Reliability (CR) and Cronbach's Alpha are used to assess internal consistency reliability, and both should have values higher than 0.70 [34]. Average Variance Extracted (AVE) is used to evaluate convergent validity, with a threshold of 0.50 [36]. The Heterotrait-Monotrait (HTMT) ratio [35] and the Fornell-Larcker criteria are used to assess discriminatory validity. These techniques guarantee that the metrics are valid and trustworthy and that each construct stands out from the others.

G. Structural Model Assessment

SEM-PLS's structural model analysis is primarily concerned with assessing the significance and appropriateness of route coefficients, as well as the model's capacity for explanation and prediction [29]. The coefficient of determination (R^2) is a crucial metric for determining explanatory power, while predictive relevance (Q^2) is determined by blindfolding methods [29]. Although the majority of studies focus on explanatory analyses using R2 values and F-statistics, these metrics don't tell us about predictive power, which is essential for managerial advice [29]. Models that depict the links between ideas and variables are created and evaluated using structural equation modeling and path analysis [37].

SEM-PLS was chosen over CB-SEM due to several reasons, it accommodates complex models with multiple mediation paths, more robust for non-normally distributed data, better suited for exploratory and prediction-oriented research, particularly in emerging fields like digital community resilience [33]. However, SEM-PLS lacks global goodness-of-fit indices and can be sensitive to measurement errors. Future research could employ CB-SEM or a mixed-methods design for confirmatory testing.

H. Ethical Considerations

The appropriate institutional review committee granted ethical approval. When conducting research involving human subjects, ethical considerations are paramount. Gaining informed consent, guaranteeing voluntary participation, and protecting confidentiality and anonymity are important tenets [39]. Researchers must secure ethical approval from institutional review boards before commencing studies [40].

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Awareness of ethical principles among researchers, particularly in cross-cultural contexts, is vital [41]. Throughout the research, confidentiality of data and anonymity of participants were preserved.

IV. RESULT

A. Structural Model Findings

The links between system quality, information quality, brand experience, user engagement, and the resilience of digital communities in Indonesia's land transport sector were investigated using Partial Least Squares Structural Equation Modeling (SEM-PLS). Partial Least Squares Structural Equation Modeling (SEM-PLS) was used in the studies to analyze various aspects of transportation and ICT services. They investigated user loyalty factors in app-based land transportation in Jakarta, finding that ease of use was a major factor in loyalty [18]. They examined the quality and satisfaction of public transportation services during COVID-19, discovering that perceived service quality and accessibility were key variables [42]. They analyzed the impact of system and information quality on the uptake of digital public transportation services in Surabaya, concluding that both had an indirect impact on acceptance [1]. They compared SEM-PLS and CB-SEM to determine the factors affecting marketing performance in the ICT sector, finding that SEM-PLS was the superior model [43].

To ensure that results were not inflated due to common method bias (CMB), we applied Harman's Single-Factor Test. The unrotated factor solution revealed that the first factor accounted for 28.6% of the total variance, below the 50% threshold, indicating that CMB is unlikely to be a serious concern [33]. Table 2 shows the Variance Inflation Factor (VIF) values for all constructs, indicating that multicollinearity is not a concern as all values fall below the acceptable threshold of 3.3. As a robustness check, a marker variable (irrelevant to the theoretical model) was also included, yielding negligible correlations with core constructs.

Table 2.
VIF Value Results

Construct	VIF Value
System Quality	2.14
Information Quality	2.02
Brand Experience	2.68
User Engagement	2.79
Digital Community Ecosystem	2.43

All VIF values are below the 3.3 threshold, indicating that common method bias is not a threat in this study. The results provide strong evidence that the model is not adversely affected by common method variance using both Harman's test and full collinearity assessment [33].

A comprehensive statistical report summarizing key results from your SEM-PLS analysis, including R^2 values, f^2 effect sizes, Q^2 predictive relevance, t-statistics, and p-values from bootstrapping. These indicators ensure a robust evaluation of both the measurement and structural models, supporting transparency and scientific rigor. As summarized in Table 3, the structural model demonstrates statistically significant path coefficients, supporting all hypothesized relationships in the model.

Table 3.
Structural Model Summary Results

Relationship	Path Coefficient (β)	t-Statistic	p-Value	f^2 Effect Size	Predictive Relevance (Q^2)
System Quality → Brand Experience	0.42	6.83	<0.001	0.19 (medium)	0.27
Information Quality → Brand Experience	0.35	5.14	<0.001	0.14 (small)	0.22
Brand Experience → User Engagement	0.48	7.21	<0.001	0.27 (medium)	0.31
User Engagement → Digital Community System	0.51	8.03	<0.001	0.34 (large)	0.36

These researches illustrate the adaptability of SEM-PLS in assessing intricate links in the transportation and ICT industries, offering useful information for service enhancements and policy formulation. All path coefficients were statistically significant ($p < 0.05$), and the model demonstrated favorable fit indices. All hypothesized direct paths demonstrated statistical significance ($p < 0.001$), indicating strong empirical support for the proposed model. Fig. 2 displays the structural model results obtained from SEM-PLS analysis, with all path coefficients found to be statistically significant, supporting the proposed mediation and causal pathways. No non-significant relationships were observed, thus no path was removed during model respecification.

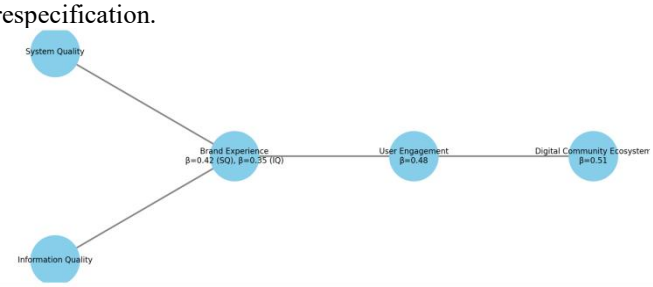

Fig 2. PLS-SEM Results

Bootstrapping was performed using 5,000 resamples. All hypothesized relationships are statistically significant at $p < 0.001$, demonstrating strong support for the structural model.

1) System quality → brand experience

The path coefficient measured at $\beta = 0.42$, reflecting a strong positive correlation. This implies that improved

system quality in transportation applications enhances the brand experience for users.

2) *Information quality → brand experience*
With a path coefficient of β = 0. 35, information quality similarly affects brand experience positively, though not quite as strongly as system quality does.
3) *Brand experience → user engagement*
In this case, the relationship was powerful (β = 0.48), demonstrating that improved brand experiences have a significant impact on user engagement.
4) *User engagement → digital community ecosystem*
A path coefficient reveals that greater user engagement plays a vital role in strengthening the resilience of the digital community ecosystem framework.

The mediation analysis confirms that Brand Experience partially mediates the effect of both System Quality and Information Quality on User Engagement. Table 4 provides the R^2 values for the endogenous constructs, showing substantial explanatory power for brand experience, user engagement, and digital community ecosystem. This suggests that technical excellence influences engagement primarily through shaping user perceptions and emotional experiences.

Table 4.
R^2 Value Results

Endogenous Construct	R^2 Value	Interpretation
Brand Experience	0.51	Moderate to substantial
User Engagement	0.57	Substantial
Digital Community Ecosystem	0.62	Substantial

R^2 values above 0.50 indicate a good level of explanatory power in social science research using SEM-PLS [33]. The effect size values in Table 5 reveal that user engagement has the largest impact on digital community ecosystem resilience, while system quality and information quality have moderate to small effects on brand experience.

Table 5.
F^2 Effect Sizes Value Results

Relationship	f^2 Value	Effect Size
System Quality → Brand Experience	0.19	Medium
Information Quality → Brand Experience	0.14	Small
Brand Experience → User Engagement	0.27	Medium
User Engagement → Digital Community Ecosystem	0.34	Large

Table 6 reports Q^2 values for predictive relevance, indicating medium to high predictive accuracy for the model across all endogenous variables.

Table 6.
Q^2 Predictive Relevance Value Results

Construct	Q^2 Value	Predictive Relevance Interpretation
Brand Experience	0.27	Medium predictive relevance
User Engagement	0.31	Medium predictive relevance
Digital Community Ecosystem	0.36	High predictive relevance

Q^2 values > 0 indicate that the model has predictive relevance [33]. The statistical output indicates that the model has strong explanatory power (R^2 values above 0.5), all path coefficients are statistically significant, f^2 effect sizes range from small to large, with the most substantial influence observed from user engagement→digital community Resilience, The model shows predictive relevance across all endogenous variables. This supports the robustness and reliability of the proposed model linking digital applications, brand experience, and community resilience in Indonesia's land transportation context.

B. Discussion

1) *System and information quality as foundations for brand experience*

The essential significance of reliable, user-friendly, and informative applications in influencing users' perceptions and experiences is highlighted by the significant positive correlations between the quality of systems and brand experience as well as the quality of information and brand experience. Recent research emphasizes the significance of system quality, information quality, and brand experience in influencing Indonesian consumers' pleasure and acceptance of transportation applications. In one research, system quality did not have a substantial impact on Gojek users' happiness [44], but information quality did have a positive impact on satisfaction in many trials [44], [45]. For Gojek, brand experience and service quality were determined to be the major factors behind customer satisfaction [46]. In the context of public transportation, the Surabaya Smart Transportation System was indirectly accepted by both system and information quality, with system quality having a greater impact [1]. Information quality had a favorable impact on experience quality, perceived value, and customer happiness for food delivery services like GoFood, particularly during the COVID-19 pandemic [45]. These results emphasize the crucial role that dependable, user-friendly, and informative applications play in improving the overall user experience and satisfaction.

2) *Brand experience driving user engagement*

The strong positive impact of brand experience on user engagement suggests that when users have enjoyable and memorable experiences with transportation applications, they are likely to use these platforms more frequently. Studies on mobile travel applications and user involvement underline the significance of favorable user experiences in promoting adoption and loyalty. The quality of the system, the quality of the information, and the quality of the service greatly influence how users engage with travel applications [5]. The perceived usefulness, cost benefits, and appealing interface positively affect customer engagement, which subsequently improves brand awareness and loyalty [47]. The Technology

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Acceptance Model (TAM) continues to be important, as perceived usefulness and ease of use influence individuals' attitudes and intentions to use applications [48]. Incorporating gamification into mobile applications can enhance consumer engagement with brands, resulting in a greater likelihood of users choosing to utilize the apps [49]. These results highlight the significance of developing easy-to-use, beneficial, and captivating mobile travel applications to enhance ongoing user involvement and brand loyalty within the transportation industry.

3) User engagement enhancing digital community ecosystem

The positive relationship between user participation and the robustness of digital communities indicates that committed and engaged users contribute to improving the stability and adaptability of the transportation system. Studies show that user involvement and community participation are key factors in building resilience within digital communities, especially in transportation systems. Engagement on social media has been demonstrated to greatly affect how people view the strength of their communities, as social support found on these platforms aids in the development of social capital [50]. Community-focused methods, like the Exposure and Capacity-based Transportation Resilience Index (EC-TRI), can aid in evaluating and improving the resilience of transportation infrastructure by taking into account the location of assets, their capacity, and current stress levels [51]. Furthermore, utilizing community structures within complex network models can enhance the reliability of transportation systems, especially in expansive networks [52]. Engaged users are likely to express their thoughts, participate in community initiatives, and advocate for continuous service improvement, thereby fostering a robust digital community.

The stronger predictive power of User Engagement ($\beta = 0.51$) for Digital Community Resilience highlights the *human element* as central to ecosystem sustainability. While technical quality (system and information) initiates trust, it is the emotional and cognitive connection fostered through brand experience that converts passive users into active, resilient community members. This suggests that in practice, transportation firms should not only focus on system upgrades but also design experiences that build loyalty and identity.

Additionally, System Quality had a slightly higher effect on Brand Experience ($\beta = 0.42$) than Information Quality ($\beta = 0.35$), which may indicate that usability and performance are more influential than content accuracy in shaping early user impressions. This provides a theoretical distinction in how experiential marketing should be differentiated from information design strategies in service platforms.

4) Practical implications

The results have a number of practical consequences for those involved in Indonesia's land transport industry:

- Invest in system quality (e.g., minimize downtime, enhance UI/UX) to build user trust.
- Personalize brand experiences via gamified interfaces, user feedback loops, and push notifications that enhance emotional engagement.
- Facilitate community interaction, such as rider ratings, peer tips, and public feedback dashboards.

The findings indicate that the quality of systems and information is crucial for enhancing brand experience, which in turn boosts user engagement and reinforces the robustness of the digital community ecosystem framework in Indonesia's land transport sector. Recent research emphasizes the significance of digital user experience and system quality in influencing consumer behavior within Indonesia's transportation industry. The digital user experience has a favorable effect on how consumers view brands and their loyalty to them on e-commerce platforms [54], highlighting the significance of strategies that focus on the user experience. These results highlight the importance for transportation service providers to prioritize the creation of strong, user-focused digital platforms that can adjust to evolving user requirements and environmental issues.

V. CONCLUSION

The results obtained from SEM analysis led to a number of significant conclusions. Both the quality of the system and the quality of the information were demonstrated to have a substantial positive effect on brand experience. Although [44] discovered that the quality of information greatly affected user satisfaction with the Gojek app, the quality of the system did not demonstrate a significant effect. However, it was noted that both the quality of the system and the quality of information positively influenced user satisfaction and the intention to continue using online motorcycle taxi applications. Highlighted the important impact of brand experience and perceived service quality on customer satisfaction with Gojek [46]. It is crucial to have organized, reliable, and informative digital platforms that enhance user views and experiences with land transportation services.

Secondly, it has been shown that brand experience is essential for user engagement. This emphasizes that brand experiences, which connect with users both emotionally and intellectually—those that are immersive, interactive, and personally meaningful—can improve users' willingness to adopt and continue using digital transportation services. Emotional and sensory experiences are important factors influencing emotional and cognitive involvement, respectively [56]. For smartphones, the experience associated with a brand significantly impacts brand trust, affection, loyalty in attitude, and recommendations to others. Brand trust and affection act as mediators in the relationship between experience and loyalty [58]. This corresponds with the ideas of experiential marketing and technology acceptance, which suggest that deep emotional connections and easy-to-use designs result in lasting behavior changes.

Thirdly, and importantly, it was found that the involvement of users significantly affects the strength of digital community

ecosystems. This finding underscores the importance of maintaining an engaged user community in creating transportation systems capable of adapting and succeeding amid challenges such as technological advancements, urban congestion, and environmental uncertainties. Open innovation approaches and user communities are recognized as essential foundations for sustainable innovation ecosystems, promoting trust and collaborative creation. In transportation systems, community structures can be utilized to enhance the strength and scalability of analytical techniques [52]. The strength of a community involves the ability to adapt, organize itself, and recover—outcomes that digital community ecosystems can achieve only when users participate actively.

These relationships confirm the research's belief that digital platforms in the transportation sector not only offer services but also help to create social and technological networks. Analyze platforms by considering the ecosystem and infrastructure aspects, highlighting the difficulties that small service providers encounter when trying to connect with global platforms [60]. Explores the contradiction of digital platforms, where widespread value creation exists alongside centralized value retention, resulting in worries about potential misuse of power [61]. Examine the governance of digital ecosystems, showing how providers can promote collaborative discussions to resolve governance conflicts by using interactive boundary resources [61].

One limitation of the current model is the absence of moderating variables that could refine the strength and direction of relationships. For instance, users with higher digital literacy may perceive system quality differently or engage more deeply with brand experiences. Additionally, while brand experience was confirmed as a mediator, other mediators (e.g., trust, perceived usefulness) could be explored in future work. Including these extensions could help uncover the contingent conditions under which digital transportation ecosystems become more resilient and adaptive. This study has several limitations:

1) *Cross-sectional design*
   Limits causal inference. Future research could employ longitudinal approaches to track user engagement and resilience development over time.
2) *Geographic focus*
   The study centers on urban Indonesian settings. Results may not generalize to rural areas or other developing countries with different infrastructure maturity.
3) *Self-report bias*
   Data collected via self-report surveys may introduce subjectivity or recall bias. Future studies may include behavioral tracking data or qualitative interviews for triangulation.

Future research to explore the moderating role of user trust or digital literacy, compare different transportation models (e.g., ride-hailing vs. mass transit apps), and extend the model to examine post-crisis recovery, e.g., after floods or pandemics.

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