Exploring community satisfaction in building an innovative android-based mobile survey application for people travelling to Mentawai Island

Nazarwin*, Juliandri Hasnur and Edi Kurniawan

Department of Sea Transportation, Politeknik Pelayaran Sumatera Barat, **Indonesia**

*Corresponding Author: edi.bojes@gmail.com

✎ **Cite this**   https://doi.org/10.24036/jptk.v7i1.35823

Abstract: This research aims to develop and evaluate an android-based mobile survey application to measure passenger satisfaction with transportation service standards to Mentawai Island. The application that has been developed will help in the evaluation process so that the improvement of sea transportation services can be improved. This study used the 4D development model and involved 30 passengers of the Mentawai Fest Ship as research subjects. The research instruments used were a validation questionnaire and a practicality test. A survey of public satisfaction with transportation services to Mentawai Island using an Android-based application will be developed, implemented, and evaluated. The results show that the application effectively meets the community's needs, shows high validity, and provides a convenient feedback mechanism for users. Overall, these findings contribute to efforts aimed at improving the quality of transportation services and the overall passenger experience.

Keywords: Survey; Service; Tourist; Guide online

1.   Introduction

Sea transportation is the vital backbone to effectively explore the beauty of the Mentawai islands (Marwan & Anwar, 2020). On the way from one place to another, such as to the capital of West Sumatra Province, Padang (Ihsan et al., 2021), locals still depend on sea transportation. People carry out various activities, and transportation is an irreplaceable supporting tool to meet these needs. Efficient transportation can meet its capacity, be integrated easily between modes of transportation, and operate with regularity, smoothness, speed, accuracy, safety, comfort, and economic efficiency (Poliak et al., 2021; Tian et al., 2020). With effective and efficient transportation, the burden on the community as users of transportation services can be reduced. In contrast, the quality of service remains high.

Mentawai Island is one of Indonesia's most popular tourist destinations (Pakan, 2022). However, transportation conditions to the island can present some challenges, such as delays, lack of information, or other aspects that can affect passenger comfort and satisfaction. Understanding public satisfaction with transportation services is crucial, so it is essential to improve this, starting from the aspects of infrastructure and service development until a high level of satisfaction creates a positive experience for tourists and potentially increases visits to Mentawai Island.

Passenger service standards are the main guideline in determining the quality of service that should be provided by transportation providers (Sharma & Pandit, 2021; Vicente et al., 2020). Evaluation of this standard's fulfillment level can provide valuable insights for service improvement and

development (Zurell et al., 2020). Meanwhile, until now, collecting public satisfaction data still uses a conventional model, which is relatively ineffective and efficient. Therefore, using Android-based mobile survey application technology is considered a solution that can facilitate the data collection process more quickly and accurately. The development of technology, especially mobile applications, opens up new opportunities for collecting community feedback (Ribeiro-Navarrete et al., 2021). The Android-based mobile survey application can also provide easy access for the community to participate in the survey flexibly.

The state of the art of this research is the development of an Android-based mobile survey application designed to measure community satisfaction with passenger service standards on transportation to Mentawai Island. This application represents a technological advancement in collecting community feedback, offering a practical and efficient means for users to participate in surveys flexibly and for service providers to gather data quickly and accurately. This application is expected to be an effective tool to capture data and provide concrete solutions for service improvement. With this background, the research is expected to make a real contribution to improving the quality of transportation services to Mentawai Island based on direct feedback from the community. The research questions to achieve the objectives of this study are:

RQ1. What are the results of developing an Android-based mobile survey application on public satisfaction with passenger services to the Mentawai island?

RQ2. What are the results of the validity and practicality of mobile survey applications based on Android?

2. Methods

Research Type

The research method used is Research and Development (R&D) with the 4D development model (Four-D), which is an approach that is often used in media or product development, processes, or innovations in various fields (Thiagarajan et al., 1974). This 4D model consists of four stages: defining, designing, developing, and disseminating (Handrayani et al., 2023; Sansi et al., 2023).

Research Subjects and Locations

Research subjects focus on Mentawai Fest Ship passengers as users of sea transportation services to and from Mentawai Island, as many as 30 people. The research was successfully conducted at Muara Padang Harbor in December 2023. In the context of this study, researchers explored aspects such as comfort, safety, accessibility, information, or additional services desired by passengers. In addition, involving related parties such as port authorities, ship management (Syahril et al., 2023), and perhaps the local government can provide a broader view of the problems and possible solutions (Nabawi et al., 2021, 2022).

Research Instruments

This study used a validation questionnaire to collect data on the developed media, following the approach of (Nieveen, 1999). This research questionnaire was validated by experts from 2 material experts and three media experts with ten years of teaching and research experience at the West Sumatra Sailing Polytechnic. Each question item was assessed with a focus on language structure. The accuracy aspect ensures that the valid measurement can function precisely and with high precision (Matthews et al., 2022). The application successfully passed validation, involving two

experts, prototype revision, and evaluation. The practicality test assessed the application's usability based on responses from 30 community respondents to the standard of ship passenger services to the island of Mentawai through random sampling.
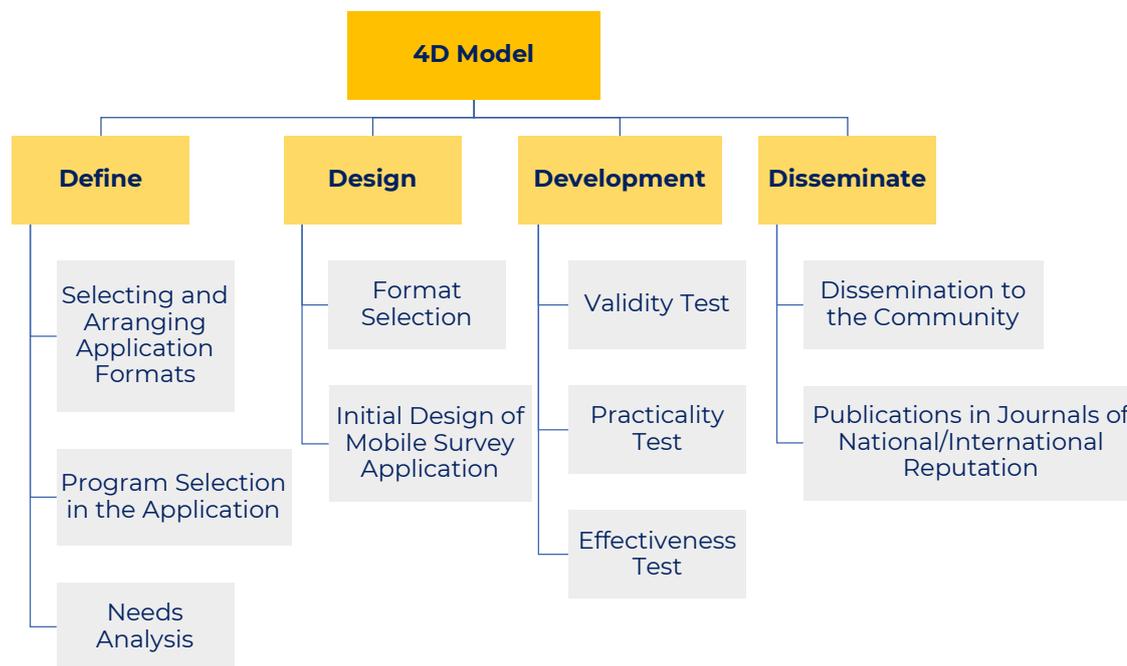

Figure 1. 4D development model

Data Analysis Technique

Data for application development was collected through questionnaires using Google Forms. The process involved needs analysis, selection of media formats and application prototypes, preparation of validity and practicality questionnaires, and testing by material and media experts. On the one hand, the application is considered valid if it has undergone a revision and evaluation process based on validator feedback. In addition, this study also involved community respondents to the standard of ship passenger services to the island of Mentawai, which functioned as research subjects in the ease of use of the satisfaction survey application in the practicality test (Jumaroh et al., 2023). The technique used is a simple random sampling model, and Microsoft Excel software functions for analyzing and processing the data of this study. Descriptive data analysis techniques describe the validity, practicality, and effectiveness of using the Survey application. The data interpretation used is Statistics (Aiken, 1985), which is formulated as follows: $V = \sum s / [\, n\,(c-1)\,]$.

The next step in developing the mobile survey application involves a process of revision and evaluation based on validator feedback. The practicality test aims to collect responses about the ease of use from people traveling on the Mentawai Fest ship who have used the mobile survey application the researchers have successfully developed.

3. Results

This development produces an application for a community satisfaction survey of passenger service standards on transportation to Mentawai Island based on Android. The product specifications of this development include the following. First, select and arrange the format of the application, with consideration of the suitability and ability of the community. Second, selecting and organizing

program content, set based on the order of viewing material, level of difficulty, and survey prerequisites. Lastly, this survey application, developed to represent the community's satisfaction with the standard of passenger service on transportation to Mentawai Island based on Android, provides convenience for users in delivering their feedback.
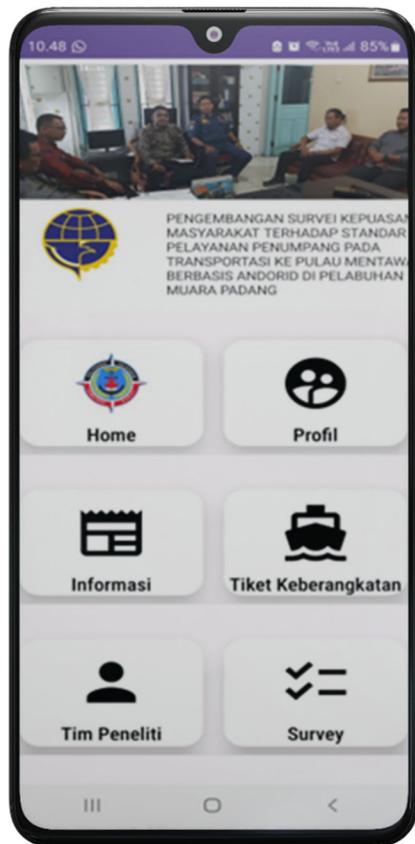
Community Survey Application Against Passenger Service Standards on Transportation to Mentawai Island Based on Android is prepared every to find out how passenger satisfaction with the standard of service provided to the community.

Instructions for use of the app

Passenger Service Information on Transportation to Mentawai Island

Information about the app developer

Figure 2. Results Development of Android-based mobile survey application

Needs Analysis

Requirements analysis is a systematic process for identifying, collecting, and analyzing information related to the goals and needs of a project or system. The goal is to comprehensively understand what stakeholders want or need and convert it into requirements that can be implemented. The results of the initial survey of public satisfaction with passenger service standards on transportation to the island of Mentawai were conducted using Google Forms.

Of the 170 respondents who filled out the questionnaire through Google Form, it can be concluded that 5.9% consider the transportation service to Mentawai Island to be very bad, 43.5% thought it to be wrong, 21.2% stated that it was moderate, 24.9% said that it was good, and 3.5% said that it was very good. The average public perception of the Transportation Service Standard to Mentawai Island was 64%, categorized as poor. Based on this data, it can be concluded that the average score of the initial public satisfaction survey with the Passenger Service Standards on Transportation to Mentawai Island is 64%, which is categorized as poor. Therefore, the community considers that transportation services to Mentawai Island are still unsatisfactory. Enhancing service quality mandates proactive enhancements driven by applications that solicit feedback regarding public satisfaction levels with the rendered services.

Table 1. The results of the needs analysis of the initial public satisfaction survey

Score Range	Category	f	%
0 – 45	Very poor	10	5,9
46 – 65	Poor	74	43,5
66 – 75	Medium	36	21,2
76 – 90	Good	44	25,9
91 – 100	Very good	6	3,5
Overall		**170**	**100**

Application Validity Test

The validity analysis of the development product involves evaluating the product that has been developed. Five experts filled in the validity of the Community Satisfaction Survey material, while five application experts filled in the validity of the application quality. The validator's assessment in this section is to provide judgment on the content of the Survey instrument. The validation results can be seen in Table 2.

Table 2. Material expert validation analysis results

No	Assessment Indicator	Aiken's V Score	Interpretation
1.	Survey content feasibility	0,86	Valid
2.	Survey Language Feasibility	0,88	Valid
3.	Feasibility of graphical aspects	0,90	Valid
	Overall	**0,88**	**Valid**

with an average score of 0.88. Therefore, this material can be used to evaluate public satisfaction with Passenger Service Standards on Android-based transportation to Mentawai Island.
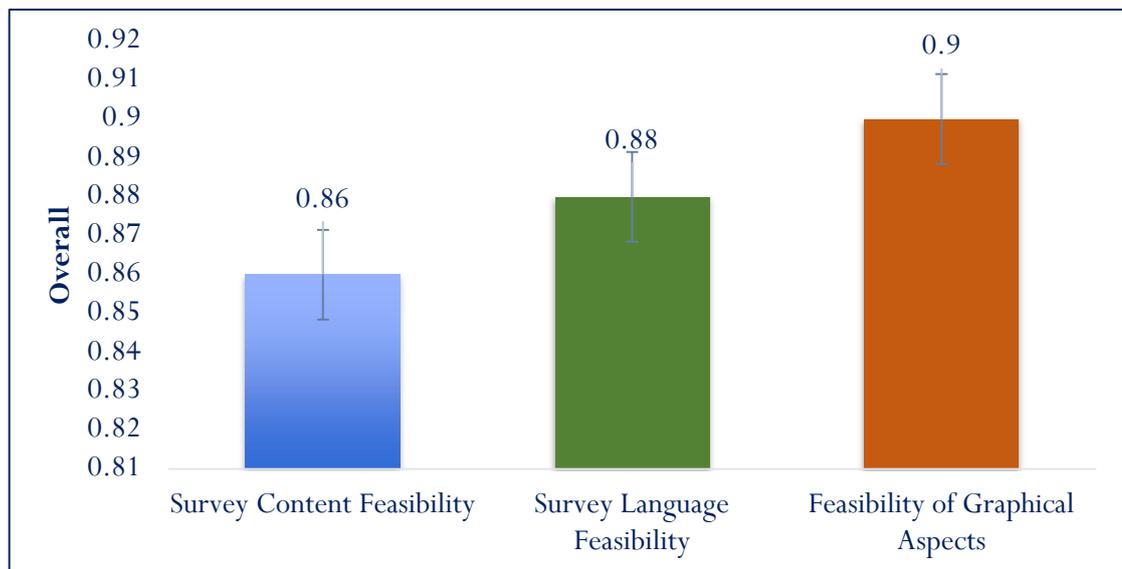

Figure 3. Graph of material expert validation results

The validator's assessment in this section is to provide judgment on the application. The validation results can be seen in Table 3.

Table 3. Media expert validation analysis results

No.	Assessment Indicator	Aiken's V Score	Interpretation
1.	Application Display	0,85	Valid
2.	Application Benefits	0,87	Valid
3.	In-App Interaction	0,93	Valid
4.	Application Contents	0,89	Valid
	Overall	**0,88**	**Valid**

Through the validity evaluation of the public satisfaction survey application on passenger service standards on transportation to the island of Mentawai based on Android, positive results were found, with an average score reaching 0.88. therefore, based on Android, this application can be relied upon to assess public satisfaction with passenger service standards on transportation to the island of Mentawai.
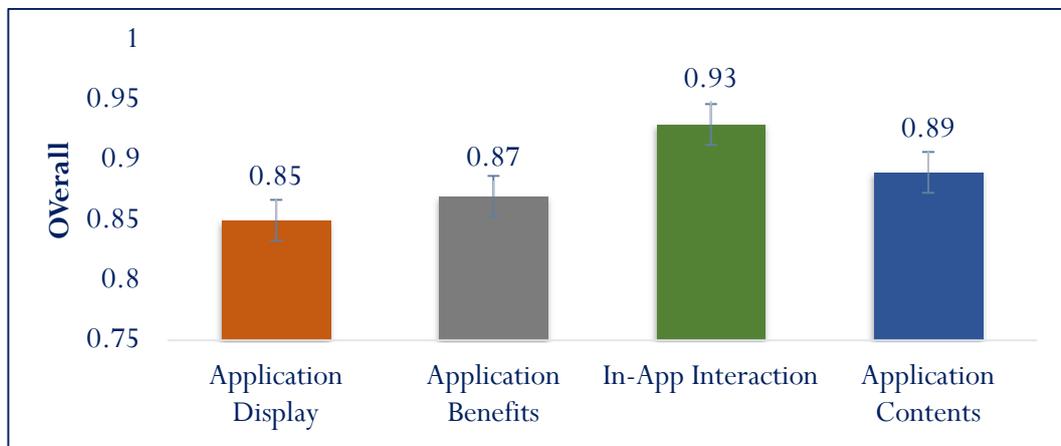

Figure 4. Graph of media expert validation results

Application practicality test

The practicality of this research and development was evaluated using applications that the community had developed during the trial. A total of 30 respondents filled out the practicality instrument, and the results are presented in Table 4.

Table 4. Practicality analysis results based on user assessment

No.	Assessment Indicator	Practicality Score (%)	Interpretation
1.	Useful	88	Practical
2.	Usable	90	Very Practical
3.	Desirable	89	Practical
4.	Findable	85	Practical
5.	Accesible	50	Less Practical
6.	Credible	83	Practical
7.	Valuable	79	Practical
	Avarage	80	Practical

Table 4 above shows that this development has an average value of 80% in the practical category. Accordingly, the application of public satisfaction with passenger service standards on

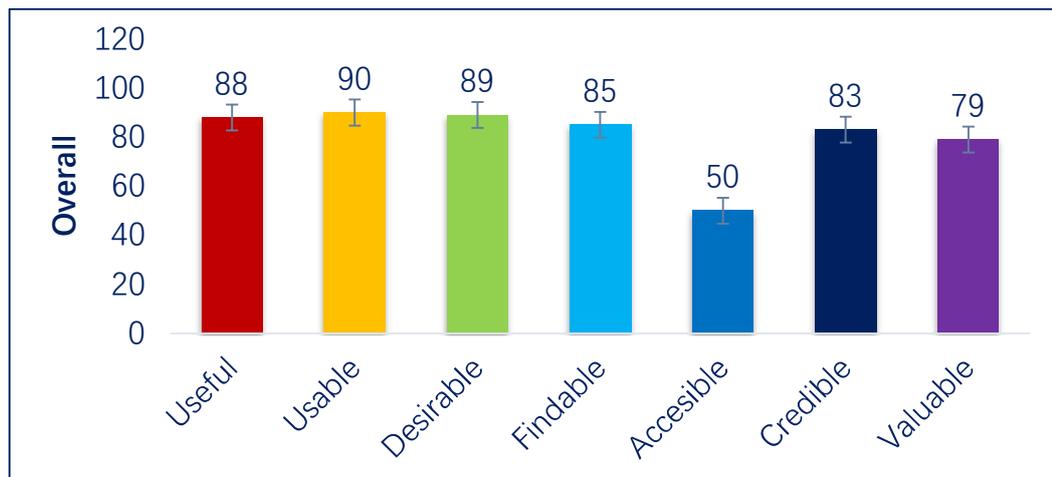transportation to the Android-based Mentawai island has proven practical to use.

Figure 5. Graph of practicality analysis results

4. Discussion

This research aims to evaluate the effectiveness of the Android-based Mobile Survey Application in measuring passenger satisfaction standards on transportation to Mentawai Island. Analysis of the results provides some critical insights in answering the objectives of this research. High utilization of the mobile survey application indicates a positive response from passengers (Javid et al., 2021; Nguyen-Phuoc et al., 2021). Ease of accessibility contributes to increased participation, enabling a more comprehensive evaluation of passenger satisfaction (Friman et al., 2020; Tahanisaz & Shokuhyar, 2020).

The survey results show varying levels of satisfaction among passengers. Analysis of these satisfaction levels about certain aspects of transportation services, such as timeliness, cleanliness, and staff friendliness, provides valuable insights into areas that need improvement. Challenges or limitations that may arise while implementing the mobile survey application add transparency to this research. Addressing issues related to survey participation, technological constraints, or potential bias ensures a comprehensive understanding of the research context (Chan, 2023).

Based on the experience from this study, recommendations for future research could include exploring additional features for the mobile application, extending coverage to other transportation routes, or conducting a longitudinal study to track changes in passenger satisfaction over time. In conclusion, this discussion section presents a thorough analysis of the results of this study, providing insight into the effectiveness of the Android-based Survey Mobile Application in assessing passenger satisfaction standards on transportation to Mentawai Island. The findings contribute to ongoing efforts to improve the quality of transportation services and enhance the overall passenger experience.

5. Conclusion

Research on developing an android-based survey application produced a public satisfaction survey application for passenger service standards on transportation to Mentawai Island. This application successfully met a high level of validity with a media validation score of 0.74 and material validation of 0.87, authorized by five validators, including three media experts and two material experts. The

practicality test on the community received scores of 70.92% and 81.57%, indicating the practicality of the application after being tested. Thus, it can be concluded that this Android-based community satisfaction survey application successfully achieved its objectives, not only in its high validity but also in its practicality in use in the community. The practicality test's positive results indicate this application's potential for widespread implementation and provide significant benefits in improving public satisfaction with passenger service standards.

Author contribution

Nazarwin is a researcher and data collector of mobile survey application development; Juliandri Juliandri Hasnur is a designer and contributes to the preparation of research methods; Edi Kurniawan conducts an advanced evaluation of research methods and evaluates research methods and data analysis and discussion results, as well as provide an assessment of the Background of the Problem.

Funding statement

Acknowledgements

Competing interest

The researchers state that there was no conflict with the researched topic.

References

Aiken, L. R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement*, *45*(1), 131–142. https://doi.org/10.1177/0013164485451012

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, *20*(38), 1–25. https://doi.org/10.1186/s41239-023-00408-3

Friman, M., Lättman, K., & Olsson, L. E. (2020). Public transport quality, safety, and perceived accessibility. *Sustainability (Switzerland)*, *12*(9), 1–14. https://doi.org/10.3390/SU12093563

Handrayani, D., Rahmadani, K., Baqi, F. A., & Kassymova, G. K. (2023). Education Transformation in Era 4.0: The Effect of Learning Facilities on Student Learning Outcomes. *Journal of Computer-Based Instructional Media*, *1*(1), 34–43. https://doi.org/10.58712/jcim.v1i1.106

Ihsan, T., Arbi, Y., Irawan, A., & Sari, I. P. (2021). Fatigue Analysis to Driver of Intercity in West Sumatra Province, Indonesia (Case Study of Padang − Bukittinggi − Payakumbuh Route). *Jurnal Pendidikan Teknologi Kejuruan*, *3*(4), 227–230. https://doi.org/10.24036/jptk.v3i4.16023

Javid, M. A., Ali, N., Hussain Shah, S. A., & Abdullah, M. (2021). Travelers' Attitudes Toward Mobile Application–Based Public Transport Services in Lahore. *SAGE Open*, *11*(1), 1–15. https://doi.org/10.1177/2158244020988709

Jumaroh, J., Pernanda, D., Ulum, M., & Tin, C. T. (2023). Practicality of Smart Apps Creator-based Instructional Media on 2D Animation Subject. *Journal of Computer-Based Instructional Media*, *1*(1), 1–8. https://doi.org/10.58712/jcim.v1i1.8

Marwan, N. F., & Anwar, D. R. (2020). Landscape Design for Coastal Ecotourism of Jati Beach, North Sipora Island, Mentawai West Sumatera. *IOP Conference Series: Earth and Environmental Science*, *501*(1), 012049. https://doi.org/10.1088/1755-1315/501/1/012049

Matthews, R. A., Pineault, L., & Hong, Y. H. (2022). Normalizing the Use of Single-Item Measures: Validation of the Single-Item Compendium for Organizational Psychology. In *Journal of Business and Psychology* (Vol. 37, Issue 4). Springer US. https://doi.org/10.1007/s10869-022-09813-3

Nabawi, R. A., Syahril, & Primawati. (2021). Study Reduction of Resistance on The Flat Hull Ship of The Semi-Trimaran Model: Hull Vane Vs Stern Foil. *CFD Letters*, *13*(12), 32–44. https://doi.org/10.37934/cfdl.13.12.3244

Nabawi, R. A., Syahril, S., & Refdinal, R. (2022). The Study of Shape Flat Hull Ship Toward Resistance. *TEM Journal*, *11*(4), 1669–1673. https://doi.org/10.18421/TEM114-30

Nguyen-Phuoc, D. Q., Vo, N. S., Su, D. N., Nguyen, V. H., & Oviedo-Trespalacios, O. (2021). What makes passengers continue using and talking positively about ride-hailing services? The role of the booking app and post-booking service quality. *Transportation Research Part A: Policy and Practice*, *150*, 367–384. https://doi.org/10.1016/j.tra.2021.06.013

Nieveen, N. (1999). Prototyping to Reach Product Quality. In *Design Approaches and Tools in Education and Training* (pp. 125–135). Springer, Dordrecht. https://doi.org/10.1007/978-94-011-4255-7_10

Pakan, S. P. (2022). Waves for development? Local perceptions on surf tourism retribution in Mentawai Islands. *Journal of Policy Research in Tourism, Leisure and Events*, 1–14. https://doi.org/10.1080/19407963.2022.2047989

Poliak, M., Svabova, L., Konecny, V., Zhuravleva, N. A., & Culik, K. (2021). New paradigms of quantification of economic efficiency in the transport sector. *Oeconomia Copernicana*, *12*(1), 193–212. https://doi.org/10.24136/oc.2021.008

Ribeiro-Navarrete, S., Saura, J. R., & Palacios-Marqués, D. (2021). Towards a new era of mass data collection: Assessing pandemic surveillance technologies to preserve user privacy. *Technological Forecasting and Social Change*, *167*, 120681. https://doi.org/10.1016/j.techfore.2021.120681

Sansi, A. S., Rini, F., Mary, T., & Kiong, T. T. (2023). The Development of Android-based Computer and Basic Network Learning Media. *Journal of Computer-Based Instructional Media*, *1*(2), 1–13. https://doi.org/10.58712/jcim.v1i2.19

Sharma, D., & Pandit, D. (2021). Determining the level of service measures to evaluate service quality of fixed-route shared motorized para-transit services. *Transport Policy*, *100*, 176–186. https://doi.org/10.1016/j.tranpol.2020.11.002

Syahril, S., Nabawi, R. A., & Nasty, A. Z. (2023). Study on U hull modifications with concave design to improve the tourist ship stability. *Journal of Engineering Researcher and Lecturer*, *2*(2), 63–69. https://doi.org/10.58712/jerel.v2i2.96

Tahanisaz, S., & Shokuhyar, S. (2020). Evaluation of passenger satisfaction with service quality: A consecutive method applied to the airline industry. *Journal of Air Transport Management*, *83*, 101764. https://doi.org/10.1016/j.jairtraman.2020.101764

Thiagarajan, S., Semmel, D., & Semmel, M. (1974). Instructional Development for Training Teachers of Exceptional Children. In *Indiana: Indiana University Bloomington*.

Tian, N., Tang, S., Che, A., & Wu, P. (2020). Measuring regional transport sustainability using super-efficiency SBM-DEA with weighting preference. *Journal of Cleaner Production*, *242*, 118474. https://doi.org/10.1016/j.jclepro.2019.118474

Vicente, P., Sampaio, A., & Reis, E. (2020). Factors influencing passenger loyalty towards public transport services: Does public transport providers' commitment to environmental sustainability matter? *Case Studies on Transport Policy*, *8*(2), 627–638. https://doi.org/10.1016/j.cstp.2020.02.004

Zurell, D., Franklin, J., König, C., Bouchet, P. J., Dormann, C. F., Elith, J., Fandos, G., Feng, X., Guillera-Arroita, G., Guisan, A., Lahoz-Monfort, J. J., Leitão, P. J., Park, D. S., Peterson, A. T., Rapacciuolo, G., Schmatz, D. R., Schröder, B., Serra-Diaz, J. M., Thuiller, W., … Merow, C. (2020). A standard protocol for reporting species distribution models. *Ecography*, *43*(9), 1261–1277. https://doi.org/10.1111/ecog.04960