Evaluating the Transportation Sector of Siargao Island: Basis for a Proposed Online Payment System with QR Code Technology

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Abstract: *The rapid growth of tourism in Siargao Island continues to outpace its transportation sector resulting to inefficiencies and security concerns stemming from cash transactions. Tourists face challenges such as fare inconsistencies, limited payment options, and safety concerns due to the reliance on cash transactions, making the current system cumbersome and risky for all parties involved. This study aims to evaluate the current transportation sector and propose "e-Bayad" application, a QR code-based online payment system, to enhance convenience, efficiency, and security for tourists and service providers. A mixed-methods approach was employed, combining quantitative data from surveys and qualitative insights from interviews to understand the transportation challenges and user preferences. The respondents have a high level of agreement in terms of the lack of transparency in fare collection procedures (WM = 4.21), overcharging of fare by transportation providers (WM = 4.17), and inconsistency in fare charges among different transportation modes (WM = 4.14).The study also identified significant points, including fare-related issues, payment difficulties, and security concerns, leading to the proposal of the "e-Bayad" system, an online payment system. This system offers QR code payments that streamlines transactions and improves transparency to address these challenges. The development and implementation of "e-Bayad" has the potential to transform the transportation payments in Siargao. It can significantly improve the overall transportation experience for both tourists and locals and contributing to the sustainable growth of the island's tourism industry.*

Keywords: e-Bayad, Siargao Island, transportation, QR code, online payment.

I. INTRODUCTION

Siargao Island, renowned for its pristine beaches and world-class surfing destinations, has witnessed a significant surge in tourism in recent years. This influx of visitors, while boosting the local economy, has also exposed the limitations of the island's transportation system. Tourists and locals alike grapple with inefficiencies, limited payment options, and difficulties in navigating the island's transportation network.

Presently, the absence of convenient and modern payment methods for transportation services on Siargao Island poses a major challenge. Cash transactions remain the predominant mode of payment, often leading to delays and inconveniences for both tourists and service providers. This lack of digital payment options not only hinders the seamless flow of transactions but also leaves tourists vulnerable to potential security risks associated with carrying large amounts of cash.

The research was conducted in Siargao Island, Surigao del Norte, Philippines. The island's unique geographic location and burgeoning tourism industry make it an ideal setting for investigating and addressing the transportation challenges faced by both residents and visitors. The study aims to fill the existing gap by developing a system software equipped with algorithms and processes specifically designed to enhance Siargao's transportation landscape.

By introducing a modern and efficient payment system, the study seeks to streamline transactions, improve the overall tourist experience, and contribute to the sustainable growth of Siargao's tourism industry. The proposed system

software will not only address the current limitations but also lay the groundwork for a more integrated and user-friendly transportation network on the island.

II. OBJECTIVE OF THE STUDY

This exploration aims to achieve the following objectives:

- To identify the challenges faced by the tourists in the current transportation system of Siargao Island.
- To evaluate the current transportation payment ecosystem in Siargao Island
- To propose "e-Bayad" application, an online payment system with QR code mechanism.
- To formulate recommendations for the improvement of transportation payment system in Siargao Island.

III. RELATED LITERATURE

3.1 Effective Public Transportation System

An effective public transport system is seen as a fundamental requirement for modern society. It does not only meet basic mobility requirements, but also increasingly ensuring that time, resources, and assets are used efficiently to minimize negative impacts on the environment. With a system for online ticket generation and sales,users can easily book tickets to online cultural or sporting events, pay online, then print their e-tickets on the home printer and head straight to the event venue [1]. No need to wait in line or be stressed about getting tickets right before the event. Everyone needs to queue to buy tickets. With technology advancing so rapidly, this must change too. The new technology should be upgraded and adopted soon with online technology and payment gateways that will come through the market and become a huge success. In recent years there have been more advances in technology (Tommy Kuncara et al, 2021).

The traditional mode of transportation processes, particularly land-base, has now been transformed into online using smart application software. This provides several advantages, including flexibility, convenience, speed, and security. It also influences payment methods for these app-based transportation services. The transportation service providers, including one of them, continue to promote the use of this cashless method through promotion or a loyalty point program for service users [3].

3.2 Electronic Wallet

Using e-Wallet for payment made the mobility of using public transportation much faster. It allows user to order the ticket from the phone and get the QR-Code to be scanned. The E-Wallet has another feature that can attract people to use it , enjoy the cashback and redeem a prize or promotion. In the future, this mobile application will be embedded with e-commerce system where all the e commerce system can connect to this payment system and there is possible to get some income from e-commerce advertising in the mobile application [4].

3.3 Cashless Payment Technology

The application, made by Novatisyari and Widiastuti, support cashless method of payment. There were many benefits for both sellers and buyers. By using the cashless method, it saves energy and supports the practicality of buying and selling transactions. Although there are still security problems and weak relationships between payment methods and value spent, technological development cannot be felt by large business, even with small business people to support their business operations. It is just that the seller and the buyer must be wiser in using GO-PAY application which is a freeware. The cashless payment method in technology-based online applications can be a breakthrough that can meet the transaction needs in this modern human life [5].

To collect transport fare efficiently, cashless payments on public transportation were additionally adopted and progressively prevalent and offered new opportunities for a public transport company to collect those fares. The research made Bwigenge , S. et al. evaluates passenger's acceptance of cashless payment system. In this research, Technology acceptance and Technology readiness index models have been merged because these models are relevant to evaluate passengers' acceptance of a cashless payment system adopted by a certain transportation company [6].

Similarly, the study of Khamasi, J. [7]explains the implementation of a cashless passenger payment system, using two broad methods, mobile money payment and RFID payment for Kiira Motors' Kayoola EVS that is ideal for short

distance travel and help improve passenger's experience on the bus. The Mobile Money Payment is implemented within a mobile application, through the mobile application, a passenger is provided with an interface whereby they can pay for their bus fare after booking for a bus and a ticket is automatically provided to them as a Quick Response (QR) code which is scanned on the QR reader installed on the bus to validate payment [7].

Many respondents agreed that the outbreak of the Covid-19 indeed brings a positive impact on the cashless payment method to break the chain of infection of this virus and stay hygiene. However, financial institutions should take the solutions to assist the customers with difficulties in using a new method of a payment transaction since it will help increase customer satisfaction and bring a good image for the organization. People still think that the online payment system has many financial risks that may occur during the transaction process [8].

3.4 Contactless Payment Technology

The study results made by Cayasa, R.J.L. et.al. [9] showed that there isan area of improvement with the effort of creating a contactless payment as shown on the service blueprint. With this approach, the application of the multi-carrier payment system in the new normal will significantly decrease the risk of the commuting public being infected by the covid-19 virus. As the researchers conducted surveys, it provides us a clear view that some people were willing to take the said app. With this type of payment system, passengers have peace of mind when it comes to safety. The used of a contactless payment system via the mobile platform to book or have a ride will give more convenience to the commuting public especially in metro manila PUVs. The fast, ease, and reliability of transactions between the operator of PUVs and passengers will be flawless and worry-free this is also to be protected by each party on the uprising of the virus. This is also the next step to be the new normal on our local PUV system as we uncover new ways in the contactless payment system [9].

3.5 Digital Ticketing

The results obtained from the study of Bożena Frączek and Anna Urbanek[10] confirm the statistically significant roles in digital ticketing and payments in passenger transport of both mobile devices with access to the internet, as well as the level of financial inclusion regarding banking financial offers via electronic channels. On the other hand, the results show the lack of a statistically significant impact of income, educational attainment, or level of financial literacy on this variable.

The project was valuable to general society who were looking with the present issues. The proposed framework of Reddy, C. U. [11] empowers the general population to have the ticket for movement in metropolitan and for the most part open transport. In addition, the printed material was decreased and loosing of the card was eventually wiped out. It guaranteed reduction of tedious and cash issues. Further, the subtle elements of the ticket of each traveler are put away in the database alongside conductor points of interest which are followed by the administrator.

3.6 Synthesis

The studies discussed above confirmed that online booking and payment can reduce processing time and avoid delays. It highlights the transformative potential of cashless payment method in reforming transportation services, promoting convenience, efficiency, financial inclusion, and technology innovation. Users can easily book tickets to online cultural or sporting events, pay for them online, then print their e-tickets on the home printer and head straight to the event venue with the use of online technologies. There is no need for anyone to queue to buy ticket and become stressed before the event[1]. The printed materials will be replaced by digital copies and eliminate tedious cash-related issues. All information will be stored in safe and secured database and readily available anytime and anywhere[11]. However, people still think that the online payment system has many financial risks that may occur during the transaction process [8]. Addressing associated challenges and ensuring equitable access remains imperative for realizing the full benefits of this paradigm shift in transformative payment ecosystems.

IV. METHODOLOGY

Research Approach and Design

This study employs a mixed-method approach following a sequential explanatory research design with the quantitative phase and qualitative phase. The quantitative stage involves the administration of an online structured questionnaire via Google Forms to collect numerical data. The qualitative phase incorporates the use of open-ended questions in the questionnaire and interview guide. This technique provides a deeper insight into the experiences, challenges, and perceptions of respondents, allowing for a more comprehensive understanding of the transportation sector and payment preferences on Siargao Island. The study also assesses the viability of implementing an online payment system with Quick Response Code (QR) mechanism.

Research Instruments

The research instruments primarily consist of an online survey questionnaire, administered via Google Forms, and semi-structured interview. The online survey is designed to collect comprehensive data about the demographic profile of the respondent, experiences with current transportation services, preferences in the online payment system for transportation services, and potential improvements in the transportation services of Siargao Island. The semi-structured interview served as a qualitative tool for conducting in-depth discussion with a selected group of participants, and key stakeholders, aiming to delve deeper into their experiences, perspectives, and recommendations concerning maritime travel services in Siargao Island. It is designed to encourage participants to elaborate on their responses and provide detailed insights.

Participants of the Study

The study involves three main groups of participants: tourists, local residents, and local transportation service providers or business owners. The tourists visiting the island shared their insights into their experiences with the current transportation system, including their preferences, challenges faced, and suggestions for improvement. The local residents offered perspectives on the transportation needs and issues within the community. Finally, the local transportation service providers such as tricycle drivers and taxi operators also contributed valuable information on existing payment methods, operational challenges, and their readiness to embrace new technologies like an online payment system. These diverse participant groups were ensured with a comprehensive understanding of the transportation landscape on Siargao Island and facilitate the development of effective solutions tailored to the needs of both tourists and locals.

Sampling Method

The study employed convenience sampling method in selecting the participants of the study. This method involved selecting participants based on their accessibility and willingness to participate, given the practical constraints of reaching these stakeholders. The study aims to gather diverse perspectives from both tourists and local stakeholders, providing a comprehensive understanding of the transportation landscape on Siargao Island and the feasibility of implementing an online payment system.

Data Gathering Procedure

The data gathering procedure has collected both primary and secondary data. The primary data were collected through surveys, interviews, and observations. The online survey was conducted among tourists and transportation service providers using structured questionnaires administered via Google Forms. The interviews was conducted with key stakeholders to gather in-depth insights into their perspectives on the transportation system and payment methods. The observations was carried out to assess the current transportation system and observe any challenges faced by users. The secondary data were gathered from existing literature, reports, and official documents related to transportation, tourism, and payment systems in Siargao Island. This data provided additional context and background information for the study, helping to complement and validate the primary data collected through surveys and interviews.

Data Analysis

The quantitative data gathered from the respondents were analyzed using descriptive statistical treatment including frequency distribution, weighted mean score, standard deviation, and ranking. The results generated provided

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significant findings that addressed the objectives of the study. Table 1.0 presents the guide to determine the acceptability level of the proposed "e-Bayad" online payment system with Quick Response (QR) code mechanism from the different users involved in the transportation landscape of Siargao Island.

Table 1.0 Interpretation of Range of the Weighted Mean

Range of the Weighted Mean	Interpretation
4.51 – 5.00	Strongly Agree (for questions asked)
3.51 – 4.50	Agree (for questions asked)
2.51 – 3.50	Moderately Agree (for questions asked)
1.51 – 2.50	Disagree (for questions asked)
1.50 and below	Strongly Disagree (for questions asked)

V. RESULT AND DISCUSSION

This chapter presents the results and findings from the analysis of the data collected in the study. It encompasses the demographic profile of the respondents, the assessment of the challenges faced by the tourists, the discussion of the proposed "e-bayad" application, and the recommendations for the improvement of the current transportation system of Siargao Island.

Demographic Profile of the Respondents

Table 2.0: Profile of the Respondents in Terms of Gender

Gender	Frequency	Percentage %
Male	39	42.4%
Female	53	57.6%
Total	92	100%

Table 2.0 presents the distribution of the respondents by gender. It can be noted that many of the respondents are female, which comprises 55 or 57.3% as compared to 41 or 42.7% male participants. This implies that majority of the respondents who participated are females.

Table 3.0: Profile of the Respondents in Terms of Age

Age	Frequency	Percentage %
Under 18	8	8.7%
18-25	54	58.7%
26-35	27	29.3%
36-45	3	3.3%
46-55	0	0.0%
Over 55	0	0.0%
Total	**92**	**100%**

Table 3.0 shows the profile of respondents according to their age. Most of the respondents are aged between 18-25 years old, which comprises 54 or 58.7%, 27 or 29.3% aged 26-35, 8 or 8.7% aged is under 18, 3 or 3.3 aged 36-35 and there are no respondents that aged between 46 and above. These implies that majority of the respondents are young adults aged between 18 to 25 years old.

Table 4.0 Profile of the Respondents in Terms of Classification

Classification	Frequency	Percentage %

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Tourist	35	38%
Local Resident	56	60.9%
Business Owner/Operator	1	1.1%
Total	**96**	**100%**

Table 4.0 presents the profile of respondents according to classification. The majority of participants are local residents (60.9%), followed by tourists (38%), and only a small percentage are business owners/operators (1.1%).

Table 5.0 Profile of the Respondents in Terms of Transportation Utilization

Classification	Frequency	Percentage %
Always	33	35.9
Sometimes	39	42.4
Often	19	20.7
Never	1	11.1%
Total	**92**	**100**

Table 5.0 presents the respondents use transportation on the island sometimes (42.4%) or always (35.9%), with a smaller percentage often (20.7%), and very few respondents never use transportation (1.1%).

The Challenges Faced by the Tourists in the Current Transportation System of Siargao Island

Table 6.0 shows the challenges encountered by the tourist in the current transportation system of Siargao Island. The respondents have a high level of agreement in terms of the lack of transparency in fare collection procedures (WM = 4.21), overcharging of fare by transportation providers (WM = 4.17), and inconsistency in fare charges among different transportation modes (WM = 4.14). This is followed by lack of clear instructions or information on fare collection regarding fare charges and breakdowns (WM= 4.09), limited availability of small denominations for fare payment (WM = 4.04), and limited availability of alternative payment methods (WM = 4.02). Tourists also reported concerns about the difficulty in understanding fare rates and payment methods (WM = 3.97) and their experience in delays and inefficiencies in manual cash transactions during peak tourist seasons (WM = 3.95). The survey also found that tourists find payment transactions to be time-consuming (WM = 3.82) that they have difficulty accessing or using local currency for fare payment (WM = 3.78). These findings suggest that the current transportation system in Siargao Island is not user-friendly for tourists, and that there is a need for improvements in fare transparency, payment methods, and efficiency.

Table 6.0 The Challenges Faced by the Tourists in the Current Transportation System of Siargao Island in Terms of Fare Collection

No.	Description	WM	Description
1	I am currently experiencing difficulty in understanding fare rates and payment methods.	3.97	Agree
2	I am currently noticing inconsistency in fare charges among different transportation modes.	4.14	Agree
3	I am currently experiencing limited availability of small denominations for fare payment.	4.04	Agree
4	I am currently concerned about the lack of transparency in fare collection procedures.	4.21	Agree
5	I am currently noticing overcharging by transportation providers.	4.17	Agree
6	I am currently facing a lack of clear instructions or information on fare collection regarding fare charges and breakdowns.	4.09	Agree
7	I am currently having difficulty accessing or using local currency for fare payment.	3.78	Agree

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8	I am currently dealing with limited availability of alternative payment methods.	4.02	Agree
9	I am currently finding payment transactions to be time-consuming.	3.82	Agree
10	I am currently experiencing delays and inefficiencies in manual cash transactions during peak tourist seasons.	3.95	Agree
	Average Weighted Mean Score	**4.02**	**Agree**

The challenges faced by the tourists in the current transportation system of Siargao Island in terms of Security Issues are shown in Table 7.0. The tourists' security concerns related to fare payment on public transportation, with ratings ranging from 1 to 5, where 1 indicates strong disagreement and 5 indicates strong agreement, were analyzed. The findings revealed several key worries among tourists such as their safety when using cash for fare payment, especially at night with a weighted mean of 4.08, followed by their worry about fraud or scams related to fare collection methods and robbery or pickpocketing while paying fares, both with an average rating of 3.96. The lack of trust in transportation providers regarding fare handling was another issue, with an average rating of 3.87. Tourists expressed concern about theft or loss of money during fare payment transactions, with an average rating of 3.86. These findings suggest that tourists are apprehensive about the security of their belongings when using public transportation, possibly due to factors such as crowded conditions, poorly lit stations, or a lack of security personnel. Such concerns may deter tourists from utilizing public transportation, potentially impacting the tourism industry negatively.

Table 7.0 The Challenges Faced by the Tourists in the Current Transportation System of Siargao Island in Terms of Security Issues

No.	Description	WM	Description
1	I am currently concerned about theft or loss of money during fare payment transactions.	3.86	Agree
2	I am currently aware of instances of fraud or scams related to fare collection methods.	3.96	Agree
3	I am currently concerned about safety when using cash for fare payment, especially at night.	4.08	Agree
4	I am currently lacking trust in transportation providers regarding fare handling.	3.87	Agree
5	I am currently aware of instances where tourists have been targeted for robbery or pickpocketing while paying fares.	3.96	Agree
	Average Weighted Mean Score	**3.94**	**Agree**

Evaluation of Current Transportation Payment System in Siargao Island

Table 8.0 Evaluation of the Current Transportation Payment System

No.	Description	WM	Description
1	The current payment options available for transportation services are convenient and accessible.	4.05	Agree
2	The existing transportation payment system is transparent and reliable.	3.89	Agree
3	There current transportation payment system is efficient.	3.86	Agree
	Average Weighted Mean Score	**3.93**	**Agree**

The respondents find the current payment options convenient and accessible (4.05 - Agree). They also find the existing system to be transparent and reliable(3.89) and efficient (3.43). The respondents seem to find the current transportation payment system to be acceptable but needs improvement. While it is easy to use and functions reliably, there could be ways to make it more efficient.

Features and Functionalities of the Proposed E-Bayad Application, An Online Payment System with QR Code Mechanism

Table 9.0 Level of Importance of the User-Friendly Interface

Question	Level of Importance	Frequency	Percentage
How important do you think it is for the application to have a user-friendly interface for both users and transportation service providers?	Extremely Important	34	37%
	Very Important	44	47.8%
	Moderately Important	8	8.7%
	Somewhat Important	3	3.3%
	Not Important	3	3.3%

Table 9.0 shows the importance of a user-friendly interface for both users and transportation service providers on a transportation app. The data shows a high level of importance, 47.80% (very important) and 37.00 % (extremely important), for the user-friendly interface of the e-Bayad Application.

Table 10 Features and Functionalities of the Proposed E-bayad Application, An Online Payment System with QR Code Mechanism

Features	Frequency	Percentage %	Rank
Online payment and reservation feature	71	77.2%	1
Digital receipts and invoices	62	67.4%	3
Automated communication with users	60	65.2%	4
Integration with multiple payment gateways	42	45.7%	8
User reviews and ratings system	51	55.7%	6.5
Integration with GPS navigation services	51	55.7%	6.5
Real-time transaction tracking	69	75%	2
Multi-language support	52	56.5%	5
Other: [Please specify]	16	17.4%	**9**

The table 10.0 shows the frequency and percentage of users who use different features of online payment and reservation systems. The feature used most frequently by users is Online payment and reservation (71 users or 77.2%). This suggests that this is the core functionality that users expect from such systems. Tied for the second least used features are Integration with GPS navigation services and User reviews and ratings system (each used by 51 users or 55.7% of users). These features may be helpful for some users, but they are not essential for the core function of online payment and reservation systems. The least used feature is Integration with multiple payment gateways (used by only 42 users or 45.7% of users). This could be because users are comfortable using the payment gateway that is already integrated into the system.

System Development Process of the Proposed E-Bayad Application, An Online Payment System with QR Code Mechanism

The Rapid Application Development (RAD) methodology, depicted in the figure 1, will be used in the development of the e-Bayad system, which aims to revolutionize transportation with cashless payment methods on Siargao Island. This approach emphasizes quick development and iteration of prototypes over extensive upfront planning. The RAD process consists of four key stages: Analysis and Quick Design, Prototype Cycles (including Build, Demonstrate, and Refine), Testing, and Implementation.

During the Analysis and Quick Design phase, system requirements will be identified through workshops and discussions with stakeholders, utilizing tools like Google Docs, and Microsoft Word. In the Prototype Cycles phase, prototypes will be developed and refined based on user feedback. This iterative process involves building functional prototypes, demonstrating them to users, collecting feedback, and refining the design accordingly. Technologies used will include HTML, CSS, Bootstrap, and jQuery for front-end development, and PHP and MySQL for back-end development. The Testing phase will involve rigorous testing of the prototypes using frameworks like Jest and Mocha to ensure quality and functionality. Finally, in the Implementation phase, the system will be transitioned from development to production, deploying it using Docker, Jenkins, and AWS, and ensuring it is fully operational with monitoring tools like New Relic and Nagios, and providing user training through documentation and training sessions.

This RAD methodology enables a user-centered, efficient, and adaptive development process, ensuring that the e-Bayad application meets the needs of its users and can be quickly adapted based on real-world feedback. By leveraging these technologies and iterative feedback, the e-Bayad system will provide an effective and efficient cashless payment solution for transportation on Siargao Island.
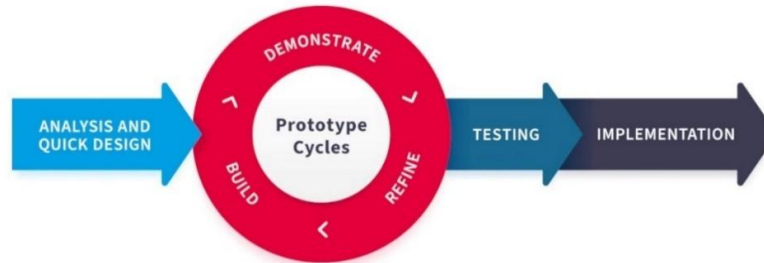

Figure 1. System Development Process of the Proposed E-Bayad Application, An Online Payment System with QR Code Mechanism

The diagram below illustrates the web application's architecture, logically defining how various components interact. Users interact with the user interface, built with HTML and CSS, through their web browser. This sends requests to the web server, which processes them using server-side code written in PHP and jQuery. The server might interact with a MySQL database to retrieve or store data. Finally, the server sends a response back to the user's browser, updating the user interface.
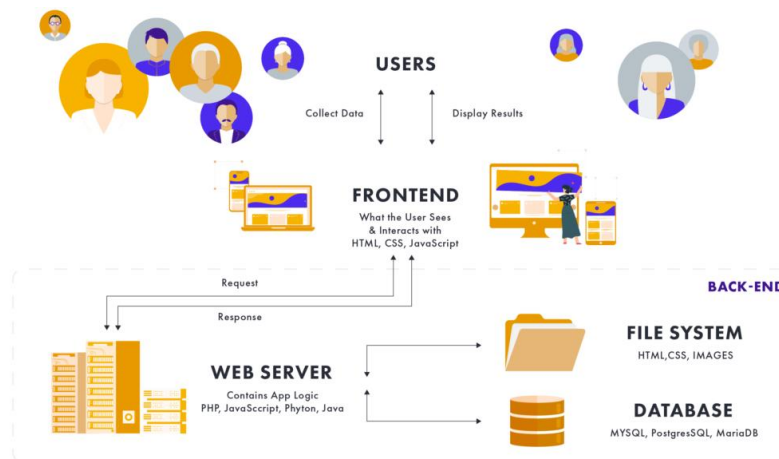

Figure 2. Web application's architecture

Recommendations for the Improvement of Transportation Payment System in Siargao Island

Table 11 Level of Importance of the Collaboration of Transportation Service Providers and Local Authorities and Tourism Organizations for Responsible and Sustainable Tourism Practices

Question	Level of Importance	Frequency	Percentage
How important is it for transportation service providers in Siargao Island to collaborate with local authorities and tourism organizations to promote responsible and sustainable tourism practices?	Extremely Important	36	39.1%
	Very Important	48	52.2%
	Moderately Important	5	5.4%
	Somewhat Important	3	3.3%
	Not Important	0	0%

Table 11 shows high level of importance of collaboration between transportation service providers, local authorities and tourism organizations to promote responsible and sustainable tourism practices. This collaboration is essential for ensuring a positive visitor experience, protecting the island's environment, and supporting the local economy.

The Key Factors for Successful Adoption and Implementation of Transportation Service Providers in Siargao Island

The qualitative data through the feedback from respondents underscores the importance of a user-friendly, secure, and transparent "e-Bayad" system tailored to the unique needs of Siargao Island. Privacy concerns necessitate robust security measures, while a mobile-compatible and accessible interface is crucial for user adoption. Transparency in fare rates and consistent service delivery will foster trust, and the system's reliability and security will encourage widespread use. Adapting the app to local preferences, collaborating with stakeholders, and ensuring affordability and accessibility are vital for successful implementation. Additionally, feedback mechanisms and incorporating features like digital receipts, automated communication, GPS integration, and multi-language support will enhance the user experience and contribute to the overall improvement of transportation services on the island.

Strategies for Promoting the e-Bayad Application to Potential Users and Adoption within the Siargao community

The feedback reveals a strong interest in "e-Bayad" and emphasizes the need for clear communication and collaboration to ensure its successful adoption in Siargao. Respondents suggest utilizing various communication channels, including social media, community events, and partnerships with local businesses and influencers, to raise awareness and educate potential users about the app's benefits. They also recommend involving local government and tourism authorities in promoting and implementing the system. Additionally, feedback highlights the importance of ensuring reliable internet connectivity, user-friendly interfaces, and the inclusion of features like QR code payments for seamless transactions. Continuous improvement based on user feedback and the provision of incentives are also seen as crucial for sustained adoption.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Tourists face various challenges and security concerns in the current transportation system of Siargao Island, including fare transparency issues, overcharging, and safety risks during transactions. These findings suggest that improvements are necessary to make the transportation system more user-friendly, transparent, and secure. Addressing these challenges will not only enhance the overall experience for tourists but also contribute to the sustainability of the tourism industry on the island. Additionally, the evaluation of the current transportation payment system highlights the importance of transparency and efficiency in payment processes. Furthermore, the significance of user-friendly interfaces and essential features in transportation apps indicates the need for technological advancements to meet tourists' expectations. Collaborative efforts between transportation service providers, local authorities, and tourism organizations are crucial to address these challenges and promote responsible and sustainable tourism practices. By prioritizing these improvements, Siargao Island can ensure a positive and memorable experience for tourists while preserving its natural beauty and supporting the local economy.

6.2 Recommendation

Based on the research findings, it is recommended to address the identified challenges and enhance the overall transportation experience for tourists visiting Siargao Island. Improvements should focus on several key areas. Firstly, efforts should be made to improve fare transparency and provide clear instructions for fare collection to alleviate tourists' confusion. Additionally, enhancing security measures, such as implementing secure payment methods, can address tourists' safety concerns during transactions. It is also crucial to focus on improving the efficiency of the current transportation payment system to provide a smoother user experience. Furthermore, developing transportation apps with user-friendly interfaces and essential features, such as online payment and reservation functionalities, can meet tourists' expectations. Finally, encouraging collaboration between transportation service providers, local authorities, and tourism organizations to promote responsible and sustainable tourism practices is essential for ensuring a positive visitor experience, protecting the island's environment, and supporting the local economy. These recommendations aim

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to create a more user-friendly, transparent, and secure transportation system on Siargao Island, ultimately enhancing the tourism experience for visitors.

VII. ACKNOWLEDGMENT

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