

GTRIKE: Internet-based mobile application for tricycle reservation in San Jose, Occidental Mindoro

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Abstract

This study aimed to develop a useful and functional internet-based Gtrike mobile application for tricycle reservations in San Jose, Occidental Mindoro. The researchers used Flutter to create the app, employed geolocation to track the locations of both drivers and passengers, and utilized other software tools, including Dart, Android Studio, Node.js, and Firebase. The developed application for tricycle reservations included a program designed to fulfill the intended functions. To evaluate the Gtrike mobile application, the researchers constructed a questionnaire and distributed it to seven (7) drivers and eight (8) passengers. The researchers tested the application and measured performance differences by comparing Gtrike with other booking apps. Based on the results, the app's capacity to reliably notify users was indicated by its 3.00 rating for real-time driver and passenger availability updates. Its flexibility in ensuring a smooth experience was shown by its 2.73 rating regarding its ability to adapt to reduced internet speeds. Thus, the Gtrike app is commended for its effective reservation system, trustworthy real-time updates, and adaptability to diverse network conditions. Findings reveal no significant difference in effectiveness between the Gtrike application and other existing booking applications regarding speed, accuracy, and accessibility. This indicates that both applications are considered valuable. The researchers recommend that future studies further enhance the application by adding an agreement for users to consent to share their information, incorporating a call feature, implementing a live map, and introducing a push notification button to keep drivers updated without needing to open the app.

Keywords: internet-based mobile application, tricycle booking reservation (Gtrike), real-time updates; flutter; geolocation

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1. Introduction

One of the most significant aspects of our lives is transportation. Not everyone has access to services to meet their transportation needs. As stated by Dimalanta et al. (2023), jeepneys account for 40% of these trips. Public transportation is one of the most important inventions and discoveries made for people because so many people use it to get to the places they want. However, the sudden increase in people's transportation services also leads to some complications, such as traffic and road incidents. However, tricycles are the main public transportation used in San Jose. Most individuals here view this as a business; many use their tricycles to earn money for their families. The Land Transportation Office's 2022 Annual Report states that over 1.5 million tricycles are registered nationwide (Senate No. 1865, 2023). This only goes to show that tricycles are among the most accessible businesses that people may use to support themselves daily. Tricycles are more straightforward to ride because they are accessible anywhere and anytime, but what if they are not always available? Tricycle drivers significantly impact the nation's and the municipality's economic standing. They should have been treated like gold instead of waste because of their impact on the passengers' lives and the local economy. How might we improve and simplify their lives? Reduced gas waste and fatigue? For this reason, we developed an app that would assist them in finding and scheduling passengers at the precise time and place. As stated by Hoehle and Venkatesh (2015), the development of mobile applications innovates and expands the sector and can significantly impact society. As technology advances, mobile applications help our nation improve and benefit people in society. Mobile applications can be easily accessed anytime and anywhere. People can use mobile applications to contact their families, browse the internet, and take pictures, and they can be used for entertainment anytime. The mobile application also significantly impacts society, as people can use it in their daily lives and careers. People can also use it to grow their business and increase their income (Willocx et al., 2016).

According to Zydney and Warner (2015), mobile devices are growing more popular and becoming a part of our daily lives, which makes our lives more convenient. The new application can meet our needs by giving different activities such as online shopping, education, and online booking. Mobile devices and applications will keep influencing our lives and society. Other applications already serve a competitive advantage over transportation services in bringing the drivers and customers together. As a result, the number of online transportation services gradually increased, and they positively impacted society and the country's economy. Currently, we have different internet-based applications that can be used for ride-hailing. Some of them are Grab, Move It, Angkas, JoyRide, Owto, and TokTok.

The current phenomenon shows that application-based booking for rides has become an instant need for most people since it also has a great result for them as customers, as it will become easier to find a ride to go somewhere else. According to Butani (2023), ride-booking applications make it more convenient for people to make reservations through mobile applications, and they allow customers to change and cancel their reservations. These applications continue to rise due to availability, making ride-booking applications more accessible to customers. Additionally, it allows customers to monitor the driver's location in real time. It provides safety and security for the passengers as it allows them to see the identity and information of the driver.

Statement of the Problem - This project aimed to develop an efficient and user-friendly online application for motor tricycle bookings. This initiative will provide commuters with an easily accessible means of reaching their destination. The following questions are intended to be answered by this study: (1) What is the level of effectiveness in using the Gtrike mobile application for tricycle booking reservations regarding type of phone, internet connectivity, security, privacy, and location of users and drivers? (2) What is the Gtrike app's performance

level in terms of speed, accuracy of information, and accessibility? (3) Is there a significant difference in the level of effectiveness between the Gtrike application and other existing applications used for booking reservations in terms of speed, accuracy, and accessibility?

Significance of the Study - The research aimed to develop an internet-based mobile application for tricycle reservations, allowing passengers to conveniently book tricycles in San Jose, Occidental Mindoro. This application helped tricycle drivers find passengers efficiently. The study's findings and results benefit companies in the transportation sector. This study is significant to the following: To tricycle drivers, this study helped tricycle drivers increase their daily earnings by providing them with an application for finding passengers efficiently. It also helped them minimize their fuel costs. This study benefited passengers by providing a more convenient way to book rides. The Gtrike provided them with easy access to get rides. This study benefited app developers by improving their understanding of transportation applications. This will also help them improve their technical skills and allow them to contribute to the transportation sector. The local government may benefit them by having an improved, organized tricycle transportation system. The Philippine National Police benefited from having the tricycle driver's information in the application. This enables them to identify which driver to locate when an incident occurs. Lastly, this study will improve future researchers' understanding of transport-related applications. This study provided reliable sources of information.

Scope and Delimitation of the Study - This study focused on developing, testing, and evaluating mobile-based applications for tricycle reservations. The study benefited the tricycle drivers, especially the commuters, who want to go to their destination quickly and hassle-free. The researchers developed the application using Flutter. They used geolocation to track the current location of the user and the driver. They evaluated the effectiveness and reliability of the application through a thorough process. The application is completed and only available on Android mobile phones with a version of six (6) or above. The application can be downloaded by directly sending the link to the users. The application has a map feature to show the available registered tricycle drivers nearby. The user can check if the tricycle is available or not, and they can see the information about the driver (name, plate number, location, and status). Field testing is conducted at San Jose, Occidental Mindoro, during the school year 2024-2025. The researchers aimed to create a valuable and helpful solution for commuters who want safe and trusted transportation to their destination more conveniently.

2. Methodology

Research Design - This study implemented an applied research design to develop and test a functional prototype for an online tricycle booking application—the system aimed to provide a reliable and accessible platform for commuters to book tricycles efficiently. The main objective is to assess the application's performance based on usability, response time, system reliability, and location accuracy. This study adopted a quantitative research approach. To ensure accurate and relevant findings, main factors such as booking efficiency, app responsiveness, GPS tracking accuracy, and user satisfaction are measured to evaluate the system's overall effectiveness in providing a seamless transportation booking experience.

Participants of the Study - The researchers actively participated in the observation of the application. They observed the effectiveness of the application in different tests. The researchers tested the accuracy and reliability of the application by randomly selecting fifteen (15) respondents. Eight (8) respondents are grade 12 students studying at Divine Word College of San Jose. The remaining seven (7) respondents are tricycle drivers around San Jose, Occidental Mindoro. The researchers used random sampling to choose the respondents. This ensures that the findings of this study are accurate and reliable, providing a better understanding of the application's effectiveness in different situations.

Data Gathering Procedure - This study used a quantitative approach to evaluate the effectiveness of online tricycle booking applications in improving local transportation services within San Jose, Occidental Mindoro. This study mainly focused on understanding the experience of tricycle drivers, potential riders, and passengers as they

interacted with the application. Data is collected through a researcher-made questionnaire and administered to fifteen (15) participants. The experts in science and research validated the researcher-made instrument, which has 21 items. Moreover, this study randomly selected seven (7) tricycle drivers from San Jose and eight (8) Grade 12 students from Divine Word College of San Jose. The questionnaire is designed with clear instructions to ensure ease of understanding and accuracy of responses. All responses are recorded securely and confidentially and analyzed using statistical methods to gain insight into the app's performance. The researcher made sure that informed consent was obtained from all participants before data collection. The total days of gathering the data, including the trial of the application interface, booking, the distribution of the questionnaires, and the collection, lasted for ten (10) days. This study aimed to provide insights and recommendations for optimizing the online tricycle booking system, enhancing user satisfaction, and local transportation services in San Jose, Occidental Mindoro.

Research Process: Stage 1 Preparation and Gathering of Materials - This study used free and open-source software for application development, including Flutter, Dart, Node.js, Firebase, and Android Studio. To evaluate its accuracy and reliability, fifteen (15) respondents were selected through random sampling—eight (8) Grade 12 students from Divine Word College of San Jose and seven (7) tricycle drivers from San Jose, Occidental Mindoro. The researchers actively observed and tested the application's effectiveness in different scenarios. AHP 300 was spent on tricycle bookings and mobile loads to support the data-gathering process, ensuring the findings were accurate and reliable. These software tools are needed to create the “Gtrike” app: Flutter, Dart, Node.js, Firebase, and Android Studio. The researchers proposed an app for tricycle drivers and commuters in San Jose, Occidental Mindoro. By developing this app, tricycle commuters can easily book a tricycle by installing the “Gtrike” application. This application also helped tricycle drivers to conveniently find passengers by just waiting for a booking on the “Gtrike” app. This software allows tricycle drivers to effectively navigate around the area, as the “Gtrike” app has GPS within the application. It saves passengers time when making reservations and helps tricycle drivers find passengers around the area.

Stage 2: Building and Development of the Project - To properly design the application, the researchers followed the following steps: first, they drafted a logo design for the application; second, they drafted a design for the user interface; third, they finalized the designs and layout for the application; and lastly, they programmed the user interface and the function of the application. This process lasted seven (7) days.

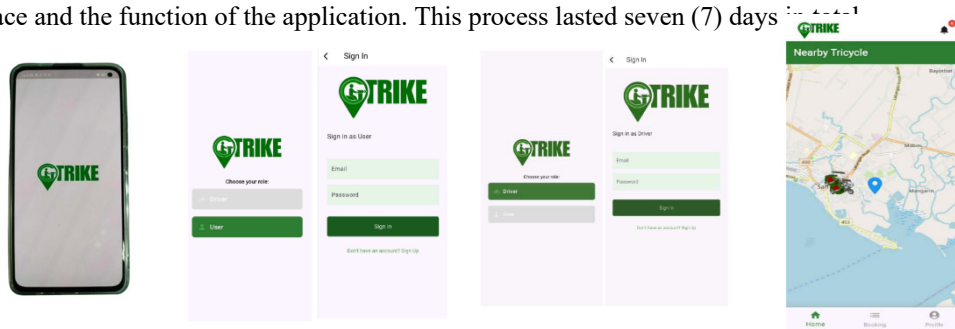


Figure 1. Gtrike Application

Stage 3: Experimental Stage, Observation, and Data Recording - For the experimental stage, the researchers showed the Gtrike application to the tricycle drivers and passengers and determined whether the app was user-friendly and practical. The researchers gathered the data through questionnaires. The researchers observed whether the “Gtrike” application was fully functional at this stage. The researchers' data gathering lasted ten (10) days, and all the processes are already included. The respondents were given a questionnaire to see their insights about the “Gtrike” application. The researchers recorded and used the data to see whether the “Gtrike” worked as intended and if the users benefited from using the application. The study collected feedback from users who have tested the internet-based mobile application for tricycle reservations in San Jose, Occidental Mindoro. The validated questionnaire evaluates the application's performance in real-world usage. The questionnaire aims to assess the app's usability, booking efficiency, reliability, user satisfaction, and overall performance. Respondents

were asked to rate their level of satisfaction on a scale and provide qualitative comments on their experience using the app through closed-ended and open-ended questions. The collected feedback helped assess how effectively the app facilitates tricycle reservations and identified areas for improvement based on user experiences.

Statistical Treatment of the Data - The researchers recorded the data gathered, and it was consolidated and analyzed by the following statistical treatment: mean scores were used by the researchers to determine the level of effectiveness in using the Gtrike mobile application for tricycle booking reservation in terms of speed, the accuracy of the information, and accessibility and the level of performance of the Gtrike app in terms of the type of phone, internet connectivity, security and privacy, and location of users and drivers. Moreover, the t-test was used to test the significant difference in the level of effectiveness between the Gtrike application and other existing applications used for booking reservations in terms of speed, accuracy, and accessibility.

3. Results and Discussions

Table 1

Mean Level of Effectiveness in using the Gtrike Mobile Application for Tricycle Booking Reservation in terms of Types of Phones and Internet Connectivity

Indicators (Types of Phones)	Frequency Rank				Overall	
	4	3	2	1	Weighted Mean	Descriptive Equivalent (DE)
The Gtrike app runs smoothly on my device without lagging or crashing.	8	6	1	0	3.47	High Level
The app's performance varies depending on my phone model and specifications.	3	10	2	0	3.07	Moderate Level
My phone's battery life is affected when using the Gtrike app for an extended time.	0	6	8	2	2.40	Low Level
Composite Mean					2.98	Moderate Level
(Internet Connectivity)						
I can successfully use the G-trike app for booking, even with a slow internet connection.	0	10	5	0	2.67	Moderate Level
The Gtrike app provides real-time driver /passenger availability updates without delays.	3	9	3	0	3.00	Moderate Level
The app automatically adjusts to slower internet speeds to ensure smooth usage.	1	9	5	0	2.73	Moderate Level
Composite Mean					2.80	Moderate Level

Legend: 3.25-4.00 High Level; 2.50-3.25 Moderate Level; 1.75-2.50 Low Level; 1.00-1.74 Very Low Level

Table 1 presents the mean level of effectiveness in using the Gtrike mobile application for tricycle booking reservations in terms of types of phones and internet connectivity. Based on the respondents' assessments, a weighted mean of 3.747 indicates that the G-trike app runs smoothly on their phones. It showed that the Gtrike application is working correctly on the different phones of the users. It falls in the "high level" category and has the highest mean among the three other datasets. 3.07 agreed that the phone performance depends on the type of phone they used, and 2.40, which is the lowest, says that their phone's battery was not affected while G-trike was

running; this showed that the G-trike app does not have any problems when it comes to the battery since it does not affect it a lot. This resulted in the overall weighted mean of 2.98, falling under the “Moderate Level” category. These results are supported by the findings of Gyorödi et al. (2017), who stated that the performance tests and scores can be employed to predict slow or sluggish areas of an application on every device for developers to write applications that will run and perform similarly on both operating systems. This study shows that the Gtrike app worked differently depending on the type of phone being used. The performance could be good or not. Because of this, most researchers are challenged to improve their app if the product's performance shows negative results. However, in the researchers' case, most of the phones used by the driver and passenger showed good performance with their product, Gtrike. Furthermore, the Gtrike app's internet connectivity performance has an overall weighted mean of 2.80, which falls in the “Moderate Level” category, indicating that users found the app effective in maintaining smooth operations even with varying internet speeds. A score of 2.67 indicated that users could effectively make bookings even when their connection was slow. Its 3.00 rating for real-time driver and passenger availability updates demonstrated the app's capacity to notify users reliably. The app's flexibility in guaranteeing a flawless experience was demonstrated by its 2.73 rating for its ability to adapt to reduced internet speeds. Based on these findings, the Gtrike app is praised for its effective reservation system, dependable real-time updates, and flexibility in handling various network situations. The finding resonated with the study of Ferreira et al. (2016), which found that internet connectivity significantly impacts the functionality of applications; without a good connection, apps cannot update, navigation services are unavailable, and instant messages may not be sent. Understanding connectivity patterns helped overcome these constraints by optimizing smartphone usage and enhancing the user experience with internet-enabled apps.

Table 2 presents the results of the first part of the questionnaire, which gathered data on the effectiveness of the security and privacy measures of the Gtrike app and the location of users and drivers. Based on the results, the application is rated to influence the security and privacy features on the performance and speed of the app, with the highest positive response anchor being "High Level." It is also rated as satisfactory in protecting personal information and delays in booking a ride through the Gtrike app on a high response anchor: "Moderate Level."

Table 2 presents the results of the first part of the questionnaire, which gathered data on the effectiveness of the security and privacy measures of the Gtrike app and the location of users and drivers. Based on the results, the application is rated to influence the security and privacy features on the performance and speed of the app, with the highest positive response anchor being "High Level." It is also rated as satisfactory in protecting personal information and delays in booking a ride through the Gtrike app on a high response anchor: "Moderate Level." The mean for the question delays, 2.60, is the lowest of the three, while the mean for the question performance and speed, 3.27, is the highest. The mean for the satisfaction question, 2.87, is between these two means. The overall mean is calculated to be 2.91, which falls within the range of the question for "Moderate Level". Thus, the Gtrike app's performance is moderate in terms of security and privacy. These results resonated with the insights from Wu et al. (2020), who underscored the perception of the users about having security and privacy in mobile applications and its importance. In their study, they highlighted the importance of having a security and privacy system. The users would feel safe and secure and be able to use the application without any worry that their personal information would be leaked.

Furthermore, based on the results, the location of users and drivers in the application is rated to accurately identify the pickup and drop-off points on the highest positive response anchor: "High Level" It is also rated to take longer to connect with a nearby driver/passenger and that the location did not affect the performance of the application on the high positive response anchor: "Moderate Level". The mean for the question location, 2.67, is the lowest of the three, while the mean for the question accuracy, 3.33, is the highest. The mean for the question connectivity, 2.87, is between these two means. The overall mean is calculated to be 2.96, which falls within the range of the question for "Moderate Level". Thus, the IGtrike app's performance level is Moderate in terms of the location of users and drivers. These results resonated with the insights of Verma et al. (2024), who underscored the importance of the location. Their study highlighted the importance of location in providing

real-time services. It enabled the accurate locations of both parties for the app to function correctly. In addition, it enhanced the app's service efficiency by making passengers feel safe and allowing them to monitor the driver's location.

Table 2

Mean Level of Effectiveness in using the Gtrike Mobile Application for Tricycle Booking Reservation in terms of Security and Privacy, and Location of Users and Drivers

Indicators (Security and Privacy)	Frequency Rank				Overall	
	4	3	2	1	Weighted Mean	Descriptive Equivalent (DE)
I am satisfied with the security measures implemented in the Gtrike app to protect my personal information.	3	9	1	2	2.87	Moderate Level
The security and privacy features of the Gtrike app affect its overall performance and speed.	2	13	1	0	3.27	High Level
The security measures ever caused delays or difficulties in booking a ride through the Gtrike app.	1	7	7	0	2.60	Moderate Level
Composite Mean					2.91	Moderate Level

Indicators (Location of Users and Drivers)

The Gtrike app has a tracking feature accurately identifies my pickup and drop-off points.	6	8	1	0	3.33	High Level
Due to GPS-related concerns, I have experienced that the app takes longer than expected to find or connect with a nearby driver/passenger.	3	7	5	0	2.87	Moderate Level
The current location of the driver/passenger has no effect in the performance of the G-trike app.	1	9	4	1	2.67	Moderate Level
Composite Mean					2.96	Moderate Level

Legend: 3.25-4.00 High Level; 2.50-3.25 Moderate Level; 1.75-2.50 Low Level; 1.00-1.74 Very Low Level

Table 3

Mean Level of Performance of Gtrike Mobile Application for Tricycle Booking Reservation in terms of Speed, Accuracy of Information, and Accessibility

Indicators (Speed)	Frequency Rank				Overall	
	4	3	2	1	Weighted Mean	Descriptive Equivalent (DE)
The Gtrike app processes my wants in using the app for booking or looking for a passenger app quickly.	3	10	1	1	3.00	Moderate Level

Payment and confirmation of bookings are completed within a reasonable time.	7	6	2	0	3.33	High Level
I experience fewer delays when using Gtrike than other apps.	0	9	6	0	2.60	Moderate Level
Composite Mean					2.98	Moderate Level

Indicators (Accuracy of Information)

The app accurately details available drivers/passengers and estimated arrival times.	2	10	3	0	2.93	High Level
The fare indication in the app is reliable and matches the actual fare charged.	6	9	0	0	3.40	Moderate Level
Gtrike provides more reliable information on driver/passenger availability than other apps.	3	8	4	0	2.93	Moderate Level
Composite Mean					3.09	Moderate Level

Indicators (Accessibility)

The Gtrike app is easy to navigate and use for first-time users.	3	9	1	2	2.87	Moderate Level
The app's interface is designed for convenience, even for users with minimal technical knowledge.	2	13	1	0	3.27	High Level
Gtrike is more user-friendly than other booking applications.	1	7	7	0	2.60	Moderate Level
Composite Mean					2.91	Moderate Level

Legend: 3.25-4.00 High Level; 2.50-3.25 Moderate Level; 1.75-2.50 Low Level; 1.00-1.74 Very Low Level

Table 3 presents the data gathered for the level of performance of Gtrike for tricycle booking reservations in terms of speed, accuracy of information, and accessibility. Based on the evaluation of this study's respondents, the Gtrike performance in terms of speed falls on the overall anchor: "Moderate Level." It is also indicated that the payment and confirmation speed of 3.33 is the highest of the three. While the mean for the indicator who has experienced fewer delays, 2.60, is the lowest, the overall mean is calculated to be 2.89, which falls into the "Moderate Level" category. Therefore, it is concluded that in terms of speed, the Gtrike app worked efficiently. This showed that the speed and performance of mobile applications are critical to user satisfaction and the application's overall success. In connection to that, David (2021) stated that network performance was one of the main factors that affected the speed and responsiveness of an application. It is found that network variability—such as slow or unstable connections—can severely affect the performance of mobile apps, leading to delays or interruptions in service. Moreover, the findings for the level of performance of Gtrike for tricycle booking reservations in terms of accuracy of information indicated that the application provides accurate information regarding fare estimation, driver and passenger availability, and estimated arrival times, all of which fall under the descriptive category of "Moderate Level." Among the indicators, fare estimation received the highest mean score of 3.40, while driver/passenger availability and estimated arrival times recorded the lowest

mean score of 2.93. The overall mean of 3.09 confirms that the application's accuracy remains within the "moderate level" range. These results highlight the importance of accurate information in mobile applications, as users rely on real-time availability and pricing details to make informed decisions. Concerning that, Kılıçer (2022) emphasizes that one of the significant challenges in internet usage is ensuring information accuracy. The study suggests that misinformation significantly affects the reliability of online information, particularly on digital platforms where users base their decisions on the data they encounter.

Moreover, the Gtrike application is rated more convenient, user-friendly, and easy to navigate, especially for users with minimal technical knowledge. The weighted mean for the indicator convenient is 3.33, considered "high level" out of the two, and the weighted mean for the indicator easy to navigate and user-friendly is 3.27, which is the lowest. The computed average score is 3.29, falling into the "High Level" group. Therefore, users' "high level" indicates that the Gtrike performs well in terms of accessibility. This showed that accessibility is an important part of mobile applications, ensuring that every factor is easy to navigate. In connection to that, mobile devices have many different applications, and accessibility is one of the important factors for users to efficiently utilize the programs (Perinello & Gaggi, 2024).

Table 4 presents the mean ratings for various speed-related aspects, such as how quickly users can book a ride, how fast payments and confirmations are processed, and the delays experienced while using each application. The results indicated that Grab consistently received higher ratings in all three aspects. The mean scores showed that users perceived Grab to be slightly faster in processing bookings (3.27 vs. 3.00), handling payments and confirmations (3.27 vs. 3.33), and reducing delays (3.20 vs. 2.60). While the differences in mean scores suggest a slight advantage for Grab, a statistical test was conducted to determine whether this difference is significant. In terms of information accuracy, the findings show that Grab had a higher rating with an average of 3.60 compared to the Gtrike app with an average of 2.93 in terms of providing accurate details about the available drivers/passengers and estimated arrival time. However, Gtrike outperformed the Grab (3.33) app with a slightly higher rating (3.40) regarding fare indication reliability. Lastly, in providing more reliable information on driver and passenger availability, Grab exceeds the Gtrike app with an average of 3.33 compared to the Gtrike app with a rating of 2.93. These results indicated that Grab performed well in terms of the accuracy of the information, and Gtrike was rated higher than the Grab app in terms of fare indication.

Lastly, in terms of accessibility, Table 4 shows that the Gtrike application had a 3.27 mean level while the Grab application had a 3.60 mean level; both fell under "High Level" when it comes to first-time users of both applications. Therefore, the Gtrike and Grab app is easy for first-timers. Gtrike's weighted mean of 3.33 resulted in a "high level"; Grab's result was 3.13, a "moderate level" regarding the app's interface design for people with minimal technical knowledge. This means that both can be used by people who lack knowledge about the mobile phone, especially older people. Lastly, Gtrike had 3.27, which fell under "High Level," and Grab had 3.20, which resulted in "Moderate Level." When it comes to being user-friendly, the researchers conclude that Gtrike is more user-friendly because it has a simple and minimal interface compared to Grab.

Table 4

Mean Level of Effectiveness Between Gtrike Mobile Application and other existing applications used for Booking Reservation in terms of Speed, Accuracy of Information and Accessibility

Indicators (Speed)	Average (Gtrike)	Average (Grab)
The Gtrike app processes my wants in using the app to book or look for a passenger quickly.	3.00 ML	3.27 HL
Payment and confirmation of bookings are completed within a reasonable time.	3.33 ML	3.27 HL

I experience fewer delays when using Gtrike than other apps.	2.60 ML	3.20 ML
Composite Mean	2.98 HL	3.25 HL
Indicators (Accuracy of Information)	Average (Gtrike)	Average (Grab)
The app accurately details available drivers/passengers and estimated arrival times.	2.93 ML	3.60 HL
The fare indication in the app is reliable and matches the actual fare charged.	3.40 HL	3.33 HL
Gtrike provides more reliable information on driver/passenger availability than other apps.	2.93 ML	3.33 HL
Composite Mean	3.09 ML	3.42 HL
Indicators (Accessibility)	Average (Gtrike)	Average (Grab)
The Gtrike app is easy to navigate and use for first-time users.	3.27 HL	3.60 HL
The app's interface is designed for convenience, even for users with minimal technical knowledge.	3.33 HL	3.13 ML
Gtrike is more user-friendly than other booking applications.	3.27 HL	3.20 ML
Composite Mean	3.29 ML	3.31 HL

Legend: 3.25-4.00 High Level (HL); 2.50-3.25 Moderate Level (ML); 1.75-2.50 Low Level (LL); 1.00-1.74 Very Low Level (VLL)

Table 5 shows the t-test, which is paired with two samples for means for the Gtrike application and the existing application for booking reservations. The data used came from the presented items in Table 4. This indicates that the computed t-statistic (-1.4171) is lower than the critical t-values for two-tailed (4.3027) tests. The p-values (0.1406 for one-tail and 0.2921 for two-tail) are more significant than the standard significance level of 0.05. These results suggested that the difference in speed between the two applications is not statistically significant. Since the p-value is greater than 0.05, the null hypothesis (Ho) is accepted, meaning there is no significant difference in speed between Gtrike and Grab. Consequently, the alternative hypothesis (Ha), which suggests a significant difference, is rejected. These findings aligned with previous studies on network variability, such as slow or unstable connections, which can negatively impact mobile app performance and cause delays or service outages. They recommended adaptive data transmission to counteract this, enabling the application to modify its data transmission rate in response to current network conditions (David, 2021).

Table 5

t-Test: Paired Two Sample for Means

	<i>Variable 1 (Gtrike App)</i>	<i>Variable 2 (Grab App)</i>
Mean (Speed)	2.976666667	3.246666667
Variance	0.133633333	0.001633333
Mean (Accuracy of Information)	3.086666667	3.42
Variance	0.073633333	0.0243
Mean (Accessibility)	3.29	3.31
Variance	0.0012	0.0643
Observations	3	3

Pearson Correlation (Speed)	0.89234012
Pearson Correlation (Accuracy of Information)	-0.5
Pearson Correlation (Accessibility)	-0.614748744
Hypothesized Mean Difference	0
df	2
t Stat	-1.417132479
P(T<=t) one-tail (Speed)	0.146082309
t Critical one-tail	2.91998558
P(T<=t) two-tail	0.292164618
t Critical two-tail	4.30265273
P(T<=t) one-tail (Accuracy of Information)	0.13153526
t Critical one-tail	2.91998558
P(T<=t) two-tail	0.26307052
t Critical two-tail	4.30265273
P(T<=t) one-tail (Accessibility)	0.45583457
t Critical one-tail	2.91998558
P(T<=t) two-tail	0.911669141
t Critical two-tail	4.30265273

Legend: p value < 0.05 significant

Moreover, the statistical treatment under the accuracy of information shows that Gtrike performed better than the Grab app regarding fare indication. Given that two-tailed (0.2631) p-values are more significant than the 0.05 threshold, the t-test results for the paired two samples demonstrated that the differences are not statistically significant. Moreover, although Grab was doing well, the aforementioned instance demonstrates that Gtrike is still competitive and has the potential to improve its accuracy and reliability to meet user expectations. As Mason (2017) stated that information accuracy is important in civilization as it ensures reliability. Moreover, in terms of accessibility, the results indicate that the computed t-statistic (-0.1254) is lower than the critical t-values for both one-tailed (2.9199) and two-tailed (4.3026) tests. Additionally, the p-values (0.2991 for two-tail) are more significant than the standard significance level of 0.05. These results suggest that the difference in accessibility between the two applications is not statistically significant. Since the p-value is greater than 0.05, the null hypothesis (H_0) is accepted, meaning there is no significant difference in accessibility between Gtrike and Grab. Consequently, the alternative hypothesis (H_a), which suggests a significant difference, is rejected. As stated by Perinello and Gaggi (2024), mobile devices have many different applications. Therefore, accessibility is important for users to utilize the programs efficiently. Ensuring accessibility would enhance the user experience. This study supported the idea that the Gtrike application is accessible to every person who uses it. Since it is easy to use and user-friendly, most users, drivers, and passengers gave positive reviews regarding the app. Compared to the other app, which is Trab, they almost had the same results. Therefore, the researchers concluded that Gtrike is also as effective as Grab in terms of accessibility.

4. Conclusions

Based on the summary of findings, the following were concluded concerning the research problems stated: The level of effectiveness in using the Gtrike mobile application for tricycle booking reservations, in terms of the type of phone, internet connectivity, security and privacy, and location of users and drivers, is "Moderate Level" upon its users. The Gtrike app's performance level in terms of speed, accuracy of information, and accessibility is "moderate level" for users as it is efficient, reliable, and user-friendly. There is no significant difference in the level of effectiveness between the Gtrike application and other existing applications used for booking reservations in terms of speed, accuracy, and accessibility.

Recommendation - With the results of the data gathered by the research, the following are the recommendations to improve the product performance for the app developer: To further ensure the privacy of the

users, passengers, and drivers, make at least an agreement that shows they agreed to share their information as well as safety measures before using the application. Future researchers may improve the identification of drivers by putting pictures of them in their bios for the safety of the passengers. If miscommunication occurs, for better understanding between the driver and passenger, a call feature will significantly help the passenger and driver for better understanding. To further know the exact location of the passenger, a live map may be used to ensure the product's performance in booking. To further know if someone booked the driver, the users may turn on the notification button instead of opening the app every time to get notifications.

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