

Evaluating the System Quality and Implementation Acceptability of Itourgab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija

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Abstract: Tourism information systems play an important role in improving destination visibility, accessibility of tourism information, and visitor engagement, particularly in rural communities with emerging tourism potential. However, many rural destinations still rely on fragmented online sources and limited digital platforms, which restrict tourists' ability to access reliable and centralized travel information. This study evaluates the system quality and implementation acceptability of iTourGab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija, developed to centralize tourism information, provide geolocation-based navigation, and enhance the digital visibility of local tourism destinations.

A quantitative descriptive-evaluative research design was employed involving IT experts and end-users composed of tourists, tourism officers, and local business partners. The system was evaluated using the ISO/IEC 25010 Software Product Quality Model, while implementation acceptability was assessed through structured Likert-scale instruments. The collected data were analyzed using weighted mean.

The results indicate that iTourGab demonstrated high compliance with software quality standards and was highly acceptable to users, particularly in terms of tourism information accessibility, navigation services, data accuracy, and user engagement. The findings confirm that the system is technically robust and suitable for deployment as a digital smart travel guide supporting tourism promotion in Gabaldon, Nueva Ecija.

Keywords: Smart Tourism System, Progressive Web Application, Search Engine Optimization, Tourism Information System, ISO/IEC 25010, System Quality Evaluation, Implementation Acceptability, Digital Tourism Platform, Rural Tourism Technology, Tourism Digitalization.

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I. INTRODUCTION

Tourism plays a significant role in promoting sustainable development, particularly in rural communities endowed with natural and cultural resources (Wearing & Neil, 2009). In the Philippines, ecotourism has emerged as an effective approach for environmental conservation while simultaneously generating economic opportunities for local communities. In Nueva Ecija, ecotourism destinations such as forests,

waterfalls, and protected landscapes, including Minalungao National Park and the community-managed areas of Gabaldon, have increasingly attracted visitors and contributed to local development (Suarez et al., 2019). Tourism activities in the municipality of Gabaldon have shown consistent growth, with tourism records indicating more than 210,000 visitors from January to September. Despite this increasing tourist influx, visitors frequently rely on fragmented sources of information such as word-of-mouth recommendations, scattered social

media content, and incomplete online resources, which limit access to reliable tourism information and services (Bacalso-Medalla, 2023).

Existing studies emphasize that the availability of centralized and reliable digital information significantly influences tourism development and visitor satisfaction. Digital tourism platforms that integrate interactive maps, travel directories, and planning tools enable tourists to access destination information efficiently and support informed travel decision-making (Dudensing & Pulver, 2020; Woyo, 2021). Furthermore, smart tourism technologies incorporating location-based services, real-time updates, and digital engagement tools have been shown to enhance visitor experience and strengthen destination competitiveness (Kalinic, Marinkovic, & Pantano, 2020). However, many rural destinations remain underrepresented in digital tourism platforms, highlighting the need for localized digital solutions capable of improving destination visibility and facilitating access to tourism information.

In response to these challenges, this study proposes the development of iTourGab. The system is designed as a centralized digital tourism platform that integrates tourism directories, interactive mapping, navigation assistance, and booking support. Developed as a Progressive Web Application, iTourGab can be accessed through web browsers across multiple devices without requiring installation. The integration of advanced search engine optimization techniques enhances the online visibility of Gabaldon's tourism resources, while user-generated features such as ratings and reviews promote user engagement and informed decision-making (Filiari et al., 2015; Zeng & Gerritsen, 2014). Accordingly, this study evaluates the system quality and implementation acceptability of iTourGab to determine its effectiveness as a digital tourism platform capable of supporting tourism promotion and digital service delivery in the Municipality of Gabaldon, Nueva Ecija.

II. REVIEW OF RELATED LITERATURE

To establish the theoretical and conceptual foundation of this study, relevant literature and prior studies on digital tourism technologies were examined. This review focuses on research related to smart tourism systems, geolocation-based travel applications, Progressive Web Applications (PWAs), search engine optimization in tourism platforms, user engagement in digital tourism environments, and the evaluation of system quality and user acceptability. These studies provide important insights into the technological and operational factors that influence the effectiveness, usability, and adoption of modern tourism information systems.

➤ *Smart Tourism Systems and Digital Travel Platforms*

Smart tourism technologies have transformed how tourists access destination information and interact with travel services. These systems integrate digital platforms, communication technologies, and data-driven services to enhance visitor

experiences and improve destination competitiveness. Gretzel, Sigala, Xiang, and Koo (2015) explain that smart tourism systems enable destinations to deliver personalized and context-aware services that support tourist decision-making. Similarly, Buhalis and Amaranggana (2015) emphasize that digital tourism platforms facilitate information exchange between tourists, service providers, and destination managers, allowing centralized access to tourism information and improving travel planning efficiency.

➤ *Geolocation and Navigation Technologies in Tourism Systems*

Location-based technologies play a crucial role in modern tourism applications by enabling tourists to explore destinations and access nearby attractions through real-time navigation services. Xiang and Gretzel (2010) highlight that geolocation technologies significantly improve the accessibility of destination information and enhance travel experiences. Web-based geolocation systems provide lightweight and accessible alternatives to complex geographic information systems, making them suitable for tourism platforms in rural destinations (Lopez & Kumar, 2023; Chen et al., 2024).

➤ *Progressive Web Applications in Tourism Platforms*

Progressive Web Applications have emerged as effective technologies for developing accessible and responsive digital tourism platforms. PWAs combine the functionality of mobile applications with the accessibility of web-based systems, allowing users to access services through browsers without installation requirements. Studies indicate that PWAs provide faster loading speeds, cross-device compatibility, and improved user experience, particularly in areas with limited internet connectivity (Osakwe et al., 2021; Saluja & Thomas, 2023). These advantages make PWAs suitable for tourism platforms designed to support travelers using multiple devices.

➤ *Search Engine Optimization in Tourism Visibility*

Search Engine Optimization plays a significant role in improving the discoverability of tourism platforms in online search results. Since travel planning often begins through online searches, tourism websites that implement effective SEO strategies can significantly increase destination visibility and visitor engagement. Sharma and Sharma (2022) report that SEO practices such as keyword optimization, structured metadata, and mobile-friendly design improve website rankings and attract higher organic traffic. Similarly, Dwyer and Silic (2024) emphasize that improved digital visibility strengthens destination marketing and increases tourism competitiveness.

➤ *User Engagement and Digital Tourism Platforms*

User engagement is an essential component of digital tourism platforms because interactive features encourage participation and improve travel decision-making. Research shows that user-generated content, including ratings and reviews, significantly influences tourists' trust and travel choices. Filiari, Alguezaui, and McLeay (2015) highlight that online reviews increase traveler confidence when selecting

tourism services. Sparks and Browning (2011) further note that travelers frequently rely on peer-generated feedback when evaluating tourism experiences.

➤ *Software Quality Evaluation Using ISO/IEC 25010*

Ensuring software quality is critical in the development and implementation of digital tourism systems. The ISO/IEC 25010 model provides a standardized framework for evaluating software quality through characteristics such as functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability (ISO/IEC, 2011). Studies indicate that systems evaluated using this framework demonstrate improved reliability and user satisfaction, making it a widely used model for software quality assessment (Kumar et al., 2023).

➤ *System Acceptability and Technology Adoption*

System acceptability determines whether users are willing to adopt and continuously utilize a developed platform. Research indicates that usability, perceived usefulness, and system satisfaction significantly influence technology adoption and continued usage (Venkatesh, Thong, & Xu, 2018). In tourism platforms, systems that provide accessible information, intuitive navigation, and reliable functionality are more likely to be accepted and utilized by tourists and stakeholders (Benckendorff, Xiang, & Sheldon, 2019).

III. METHODOLOGY

This study employed a quantitative descriptive–evaluative research design to examine the system quality and implementation acceptability of iTourGab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija. The evaluation aimed to determine the system’s technical performance, reliability, and usability, as well as its readiness for practical implementation as a digital tourism platform. Data were gathered using structured evaluation instruments administered to IT experts and end-users, enabling the assessment of both the system’s technical robustness and its level of user acceptance.

➤ *Research Design*

The study adopted a multi-perspective evaluation approach to examine the system quality and implementation acceptability of iTourGab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija. The evaluation incorporated both expert-based assessment of software quality and end-user evaluation of system acceptability, ensuring that the developed platform was examined from both technical and user-oriented perspectives.

The system’s technical quality was assessed using the ISO/IEC 25010 Software Product Quality Model, which provides a structured framework for evaluating key software characteristics. In addition, the system’s implementation acceptability was measured through structured user feedback

instruments administered to end-users. A standardized evaluation scale was applied to determine respondents’ perceptions of the system’s quality attributes and level of acceptability. The interpretation of results reflects the degree to which iTourGab satisfies established software quality standards and demonstrates readiness for practical implementation as a digital tourism platform for the Municipality of Gabaldon, Nueva Ecija.

➤ *Data Collection Procedure*

Data for this study were collected using structured evaluation questionnaires administered to two groups of respondents: IT experts and end-users. The instruments were designed to assess the system quality and implementation acceptability of iTourGab as a digital tourism platform for Gabaldon, Nueva Ecija.

IT experts evaluated the system using the ISO/IEC 25010 Software Product Quality Model, which includes key quality attributes such as functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. Meanwhile, end-users evaluated the system in terms of functional suitability, performance efficiency, and usability, as well as implementation acceptability factors, including accessibility of tourism information, geolocation and navigation services, data availability and accuracy, and user engagement and participation. The collected responses provided quantitative data used to determine the overall system quality and level of implementation acceptability of iTourGab, supporting the assessment of its readiness for practical deployment as a smart travel guide platform for the Municipality of Gabaldon, Nueva Ecija.

➤ *Participants*

The participants of this study consisted of two groups: IT experts and end-users who evaluated the system quality and implementation acceptability of iTourGab.

The end-users included 50 respondents, composed of 40 tourists, 5 tourism officers, and 5 local business partners from the Municipality of Gabaldon, Nueva Ecija. Tourists were selected using stratified sampling to ensure representation of both local and domestic visitors. These participants evaluated the system based on functional suitability, performance efficiency, usability, and implementation acceptability.

The second group consisted of 10 IT experts with professional experience in software and web development, who assessed the system using the ISO/IEC 25010 Software Product Quality Model. Their evaluation focused on key quality attributes including functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.

➤ *System Evaluation Rating Scale*

A structured rating scale was used to evaluate the system quality and implementation acceptability of iTourGab. The

scale measured the extent to which the system complies with the ISO/IEC 25010 software quality standards and its readiness for practical deployment as a digital tourism platform.

Table 1 presents the Unified System Evaluation Rating Scale used to interpret the mean scores obtained from the evaluation.

Table 1. Unified System Evaluation Rating Scale

Mean Range	ISO/IEC 25010 Quality Interpretation	System Readiness Interpretation	Implementation Acceptability
3.25 – 4.00	Highly Functional / Highly Efficient / Highly Compatible / Highly Usable / Highly Reliable / Highly Secured / Highly Maintainable / Highly Portable	Highly Recommended for Use	Highly Acceptable
2.50 – 3.24	Functional / Efficient / Compatible / Usable / Reliable / Secured / Maintainable / Portable	Recommended for Use	Acceptable
1.75 – 2.49	Needs Improvement	Needs Improvement Before Use	Needs Improvement
1.00 – 1.74	Poor	Not Recommended for Use	Poor

Before completing the evaluation, respondents were given time to interact with the system and explore its key features, including browsing tourism destinations, viewing site information, and using geolocation and navigation services. The evaluation instrument used a 4-point Likert scale to measure perceptions of system quality attributes and implementation acceptability.

software quality characteristics, while end-users evaluated its functional suitability, performance efficiency, usability, and system acceptability, including accessibility of tourism information, geolocation and navigation services, data availability and accuracy, and user engagement. The computed results were used to determine the overall quality and readiness of the system for deployment.

The completed questionnaires were collected and analyzed using weighted mean computation to determine the overall level of system quality, readiness for use, and implementation acceptability of iTourGab.

IV. RESULTS AND DISCUSSION

➤ Data Analysis

Data collected from IT experts and end-users were analyzed using the weighted mean to evaluate the system quality and implementation acceptability of iTourGab. IT experts assessed the system based on selected ISO/IEC 25010

This section presents the findings of the system evaluation of iTourGab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija, focusing on the software quality attributes based on the ISO/IEC 25010 Software Product Quality Model and the level of implementation acceptability as assessed by IT experts and end-users.

Table 2. Summary of the IT Experts' Evaluation of iTourGab

Software Quality Attribute	Mean Score	Verbal Description
Functional Suitability	3.60	Highly Functional
Performance Efficiency	3.77	Highly Efficient
Compatibility	3.45	Highly Compatible
Usability	3.73	Highly Usable
Reliability	3.68	Highly Reliable
Security	3.76	Highly Secured
Maintainability	3.63	Highly Maintainable
Portability	3.80	Highly Portable
Grand Mean	3.68	Excellent Quality

As shown in the table, Portability obtained the highest mean score of 3.80, interpreted as Highly Portable, indicating that iTourGab can operate effectively across various devices, browsers, and operating environments. This flexibility is essential for web-based tourism systems where travelers

frequently access information using smartphones, tablets, and computers (Pressman & Maxim, 2020).

Performance Efficiency (3.77) and Security (3.76) also received high ratings, suggesting that the system provides responsive performance while ensuring protection of user data

and system resources. Efficient and secure platforms are critical for digital tourism services that rely on real-time information and online interactions (Sigala, 2018; Whitman & Mattord, 2021). Meanwhile, Compatibility obtained the lowest mean score of 3.45, though still interpreted as Highly Compatible,

indicating effective integration with existing technologies (Sommerville, 2016). Overall, the grand mean of 3.68 (Excellent Quality) demonstrates that iTourGab meets established software quality standards and is technically suitable for deployment as a digital tourism platform.

Table 3. Summary of the End-Users' Evaluation of iTourGab

iTourGab	Overall Mean	Verbal Description
Functional Suitability	3.48	Highly Functional
Performance Efficiency	3.49	Highly Efficient
Usability	3.54	Highly Usable
Grand Mean	3.50	Excellent Quality

As reflected in the table, Usability obtained the highest mean score of 3.54, interpreted as Highly Usable, indicating that end-users found iTourGab easy to learn, navigate, and interact with. The intuitive interface and accessibility across devices enabled users to perform tourism-related tasks such as browsing destinations, accessing location information, and navigating routes efficiently. Usable digital tourism systems significantly enhance user satisfaction and encourage continued platform use (Benckendorff, Xiang, & Sheldon, 2019).

Performance Efficiency (3.49) was also rated Highly Efficient, suggesting that the system provides responsive

performance and stable operation during normal usage, which is essential for real-time tourism information access (Orehovački, Granić, & Kermek, 2013). Meanwhile, Functional Suitability (3.48) was interpreted as Highly Functional, indicating that the system effectively supports users' travel information and navigation needs (Buhalis & Amaranggana, 2015). Overall, the grand mean of 3.50 (Excellent Quality) confirms that iTourGab meets user expectations and demonstrates strong potential for real-world deployment as a digital tourism platform.

Table 4. Summary of the End-Users' Evaluation of the Acceptability of iTourGab

Acceptability	Overall Mean	Verbal Description
Accessibility of Tourism Information	3.50	Highly Acceptable
Geolocation and Navigation Services	3.51	Highly Acceptable
Data Availability and Accuracy	3.56	Highly Acceptable
User Engagement and Participation	3.60	Highly Acceptable
Grand Mean	3.54	Highly Acceptable

As shown in the table, User Engagement and Participation obtained the highest mean score of 3.60, interpreted as Highly Acceptable, indicating that iTourGab effectively encourages users to explore local destinations and interact with tourism content through feedback and reviews. Interactive tourism platforms enhance traveler engagement and participation by enabling users to share experiences and access destination information (Neuhofer, Buhalis, & Ladkin, 2015).

Data Availability and Accuracy followed with a mean score of 3.56, suggesting that users perceived the system as reliable in providing accurate and comprehensive tourism information necessary for travel planning (Fileri, Algezau, & McLeay, 2015). Meanwhile, Geolocation and Navigation Services (3.51) and Accessibility of Tourism Information (3.50) were also rated Highly Acceptable, indicating that users were able to easily locate destinations and access tourism details through the platform (Gavalas et al., 2014). Overall, the grand mean of 3.54 confirms strong user acceptability and supports the suitability of iTourGab for practical deployment as a digital smart travel guide.

V. CONCLUSIONS AND RECOMMENDATIONS

The system evaluation of iTourGab: An Advanced Search Engine Optimization Progressive Web App Smart Travel Guide for Gabaldon, Nueva Ecija yielded positive results in terms of software quality and implementation acceptability. The following conclusions and recommendations are drawn from the evaluation findings.

- The iTourGab system demonstrated strong software quality performance, obtaining a Grand Mean of 3.68 from IT experts, interpreted as Excellent Quality. This confirms that the system complies with ISO/IEC 25010 software quality standards and is technically reliable for deployment as a digital tourism platform.
- End-users positively evaluated the system, obtaining a Grand Mean of 3.50 for system quality and 3.54 for implementation acceptability, indicating that the platform effectively meets user expectations in terms of functionality, usability, and performance efficiency.
- High ratings across usability, performance efficiency, portability, and data reliability indicate that the system

effectively supports tourism-related activities such as destination exploration, navigation, and access to tourism information.

- The integration of geolocation services, interactive mapping, and SEO-enhanced tourism listings improves tourism information accessibility, strengthens digital visibility, and enhances user engagement in exploring local destinations.

To further improve the system's effectiveness and sustainability, the following are recommended:

- The Local Government Unit of Gabaldon may consider adopting iTourGab as the official digital tourism platform to support destination promotion and digital tourism management.
- The Municipal Tourism Office should ensure regular updating and verification of tourism information to maintain data accuracy and reliability.
- Continuous system maintenance, monitoring, and security updates should be implemented to sustain system performance and compliance with software quality standards.
- Orientation and promotional initiatives should be conducted to encourage tourism establishments, stakeholders, and visitors to actively utilize the platform.
- Future research may explore the integration of advanced technologies such as AI-based tourism analytics, recommendation systems, and enhanced PWA capabilities to further improve system intelligence and scalability.

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