

# Empowering Bantayan Island Through a Centralized Digital Tourism Portal: An Evaluation Using ISO/IEC 25010 and UTAUT

Dino L. Ilustrisimo, Ph.D.  
Cebu Technological University – Main Campus  
[dino.ilustrisimo@mclawis.edu.ph](mailto:dino.ilustrisimo@mclawis.edu.ph)

Date Submitted:  
**February 15, 2026**

Date Accepted:  
**March 30, 2026**

Date Published:  
**April 05, 2026**

DOI:  
**10.5281/zenodo.19430835**

## ABSTRACT

Tourism is a vital driver of economic growth in island destinations; however, many emerging tourism areas struggle with fragmented information systems, weak digital integration, and limited coordination among stakeholders. This study developed and evaluated a Centralized Digital Tourism Portal for Bantayan Island, Philippines, to consolidate tourism-related information, services, and governance across its three municipalities. A mixed-methods approach was adopted, combining system development with quantitative evaluation based on ISO/IEC 25010 software quality standards and the Unified Theory of Acceptance and Use of Technology (UTAUT). Results indicate high system quality, with usability ( $M = 4.58$ ), security ( $M = 4.52$ ), compatibility ( $M = 4.53$ ),

and reliability ( $M = 4.33$ ) rated at excellent levels, while functional suitability ( $M = 3.85$ ) and performance efficiency ( $M = 4.07$ ) were rated very good. User acceptability was also strong, with performance expectancy ( $M = 4.60$ ) and effort expectancy ( $M = 4.38$ ) reflecting high perceived usefulness and ease of use. However, facilitating conditions ( $M = 4.11$ ) and social influence ( $M = 4.07$ ) revealed variability linked to disparities in infrastructure, technical support, and institutional promotion. Despite the system's strong technical performance and user acceptance, key barriers—including unstable internet connectivity, financial constraints, and limited digital infrastructure—remain critical challenges to large-scale implementation. Overall, the study demonstrates the potential of centralized digital tourism platforms to enhance destination management, improve stakeholder coordination, and support sustainable tourism development.

**Keywords:** *Technology Management, Digital Tourism Portal, Sustainable Tourism, ISO/IEC 25010, UTAUT, Tourism Information System, Bantayan Island, Digital Transformation*

## INTRODUCTION

Tourism is the activity of people traveling to and staying in places outside their usual environment for leisure, business, or other purposes for a limited period of time. It remains as a significant driver of economic growth, particularly in island destinations where natural attractions and cultural heritage serve as primary assets. Bantayan Island, located in Cebu, Philippines, is known for its pristine white beaches, preserved culture, and beautiful scenes of artifacts and traditions. Significant numbers of local and foreign tourists visit the island for leisure, family, and friends' bonding time. Despite its increasing popularity as a tourist destination, its tourism ecosystem remains constrained by decentralized data management,

inconsistent information dissemination, and limited digital integration among Local Government Units (LGUs), tourism enterprises, and community stakeholders. One common problem these visitors encounter during their visits is the unavailability of a good and effective booking platform for their accommodations. Facebook pages and websites provided by hotels and guesthouses were questioned based on their reliability; thus, scams are being avoided. This results in inefficiencies in visitor management, limited visibility for local businesses, and weak coordination among stakeholders.

The increasing reliance on digital technologies in tourism highlights the need for a centralized platform that integrates tourism information, supports real-time communication, and enables data-driven decision-making (Gretzel et al., 2015; Sigala, 2018). In response, this study developed a Centralized Digital Tourism Portal designed to unify tourism-related services and data across Bantayan Island. To ensure system effectiveness and adoption, the portal was evaluated using ISO/IEC 25010 software quality standards and the Unified Theory of Acceptance and Use of Technology (UTAUT). These frameworks provide a comprehensive assessment of system performance and user acceptance, particularly in multi-stakeholder environments. This study contributes to the literature by developing and empirically validating a multi-stakeholder centralized digital tourism platform tailored for small island destinations. Unlike existing studies that focus solely on system design or user perception, this research provides a combined technical–behavioral evaluation framework applicable to decentralized tourism environments.

### **Statement of the Problem**

This study aims to develop and evaluate a centralized digital tourism portal tailored to the unique needs of Bantayan Island. The development of the system will be tailored according to the answers of the following questions:

1. What is the demographic profile of the respondents according to their stakeholder group?

1.1 Tourists:

- 1.1.2 Age;
- 1.1.3 Sex;
- 1.1.4 Country/Region of Origin;
- 1.1.5 Purpose of Visit;
- 1.1.6 Preferred Accommodation
- 1.1.7 Length of Stay;
- 1.1.8 Frequency of Travel to Bantayan Island

1.2 Local Residents:

- 1.2.1 Age;
- 1.2.2 Sex;
- 1.2.3 Educational Attainment;
- 1.2.4 Livelihood Source
- 1.2.5 Involvement in Tourism-Related Activities.

1.3 Tourism Business Owners/Managers:

- 1.3.1 Type of Tourism Enterprise;
- 1.3.2 Years in Operation;
- 1.3.3 Number of Employees;
- 1.3.4 Digital Tools Currently Used;
- 1.3.5 Level of Involvement in Tourism Activities.

1.4 LGU Tourism Officers and Staff:

- 1.4.1 Position/Designation;
- 1.4.2 Years of Service;
- 1.4.3 Level of Involvement in Tourism Data Management;

- 1.4.4 ICT/Digital Skills Background.
2. What are the current tourism approaches and practices in Bantayan Island in terms of:
    - 2.1 Tourism information dissemination;
    - 2.2 Tourist assistance and customer service;
    - 2.3 Use of digital tools, platforms, or online systems;
    - 2.4 Tourism data collection, reporting, and management?
  3. What are the technical requirements in developing the centralized digital tourism portal in terms of:
    - 3.1 design and features;
    - 3.2 data management and integration requirements;
    - 3.3 software development and maintenance cost?
  4. As rated by the respondent groups, what is the extent of compliance of the developed model with ISO 25010 Software Quality Assurance Standards when it comes to:
    - 4.1 functional suitability;
    - 4.2 usability;
    - 4.3 security;
    - 4.4 compatibility;
    - 4.5 maintainability;
    - 4.6 portability;
    - 4.7 performance efficiency and
    - 4.8 reliability?
  5. As perceived by the respondent groups, what is the level of acceptability of the centralized digital tourism portal based on UTAUT constructs:
    - 5.1 performance expectancy;
    - 5.2 effort expectancy;
    - 5.3 social influence; and
    - 5.4 facilitating conditions?
  6. What barriers and challenges may affect the development, implementation, and sustainability of the centralized digital tourism portal?
  7. Based on the findings, what centralized digital tourism portal can be adapted?

## METHODS

### Research Design

The study employed a descriptive–developmental research design. The descriptive component was used to examine existing tourism practices, digital readiness, and stakeholder perceptions, while the developmental component focused on the design, development, and evaluation of the Centralized Digital Tourism Portal. Ethical standards were strictly observed in compliance with the Data Privacy Act of 2012. Informed consent was obtained from all participants, anonymity was maintained, and institutional approval was secured before data collection.

### Research Locale

The study was conducted on Bantayan Island, Cebu, Philippines, covering the municipalities of Bantayan, Madridejos, and Santa Fe. The island is a major tourism destination characterized by growing visitor arrivals, diverse tourism enterprises, and decentralized digital tourism practices. The setting was deemed suitable due to its reliance on tourism, fragmented information systems, and increasing demand for integrated digital solutions.

## Respondents of the Study

Table 1. *Distribution of Respondents*

Respondents Types	Number	Percentage
Tourists	81	36%
Local Residents	98	43%
Business Owners	31	14%
LGU Tourism Personnel	17	7%
Total	227	100%

Table 1 represents the number of respondents who participated in the conducted survey, where eighty-one (81) tourists from the towns of Bantayan, Madridejos, and Santa Fe took part in the poll on their own. These people were asked questions at ports, beaches, hotels, restaurants, and places where tourists do things. Tourists were included as respondents because they are the main people who use tourist information and are very important for judging how easy it is to use, how useful it is, and how relevant it is to a centralized digital tourism portal.

In addition, there were ninety-eight (98) locales or residents from the three municipalities who also took part in the study. They were chosen because tourism affects locals directly, and they reflect the community's point of view on digital adoption, tourism readiness, and sustainable tourism development.

For the tourism business sectors, thirty-one (31) participated in the survey, and they were either owners or managers of hotels, restaurants, tour companies, transportation services, and souvenir shops on the island. Business owners were purposefully included since they play a key role in providing tourism services, interacting with customers, and promoting online. Their assessment aids in ascertaining the significance, commercial applicability, and prospective economic advantages of the suggested unified digital tourism platform.

Seventeen (17) tourism workers from the LGUs of Bantayan, Madridejos, and Santa Fe also took part in the study. They were picked because they worked directly in tourism operations, data management, policy implementation, and helping visitors. People who work in LGU tourism give expert opinions on the planned digital tourism portal's system integration, data needs, policy alignment, and preparedness for use.

There were 227 people who answered the survey, including tourists, locals, company owners, and LGU tourism staff. This number makes sure that the study's conclusions are more reliable by including a wider range of people from the island's tourism ecosystem.

## Scoring Procedure

The rating scale used to assess the respondents' evaluation of the Centralized Digital Tourism Portal's compliance with the ISO 25010 Software Quality Assurance Standards. The scale ranges from 1.00 to 5.00, with each interval corresponding to a specific level of agreement. A rating of 4.21–5.00 indicates Excellent, reflecting a high level of satisfaction or strong affirmation of the statement. Scores within 3.41–4.20 fall under Very Good, signifying general agreement with the statement. A midpoint range of 2.61–3.40 represents a Satisfactory response, suggesting that the respondent neither agrees nor disagrees. Lower ranges indicate dissatisfaction, with 1.81–2.60 classified as Fair and 1.00–1.80 categorized as Poor. This rating scale provides a structured basis for interpreting user perceptions regarding the portal's quality attributes, ensuring consistent and meaningful analysis of stakeholder feedback.

Likewise, the rating scale that was used to measure the respondents' level of acceptability toward the proposed system is based on a scale that ranges from 1.00 to 5.00, with each interval representing a specific degree of agreement. A score between 4.21 and 5.00 corresponds to Strongly Agree, signifying a very high level of positive acceptance toward the statement being evaluated. The range 3.41 to 4.20 indicates Agree, reflecting general approval though with less intensity. Responses within 2.61 to 3.40 fall under Neutral, suggesting that respondents hold no definitive inclination toward agreement or

disagreement. Lower scores denote varying degrees of dissent: 1.81 to 2.60 signifies Disagree, while the lowest range of 1.00 to 1.80 represents Strongly Disagree, indicating strong negative sentiment. This scale provides a systematic framework for capturing user perceptions regarding the acceptability of the Centralized Digital Tourism Portal.

***System Design and Architecture***

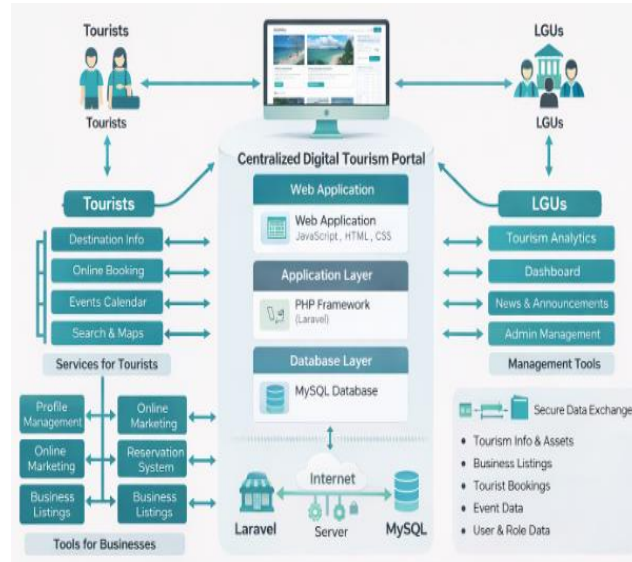


Figure 1. *Centralized Digital Tourism Portal System Architecture*

The Centralized Digital Tourism Portal was designed as a web-based, multi-stakeholder platform that integrates tourism services, data, and communication across Bantayan Island’s three municipalities. The system follows a three-tier architecture consisting of the presentation layer, application layer, and data layer, ensuring scalability, security, and efficient data processing.

The platform is composed of four primary modules: The Tourist Module, Business Management Module, Resident Module, and LGU Administrative Module. Each module is designed to support specific user roles while maintaining centralized data integration.

The Tourist Module provides access to destination information, travel guides, and search functionalities. The Business Module enables tourism enterprises to manage profiles, publish services, and interact with customers. The Resident Module facilitates community participation through job opportunities and local updates. The LGU Module supports governance through analytics dashboards, tourism reporting, and business monitoring tools.

These functionalities directly address the identified gaps in tourism information dissemination and digital integration, particularly the fragmented communication systems and limited digital visibility of local enterprises. The centralized architecture ensures real-time data synchronization across stakeholders, improving coordination and decision-making.

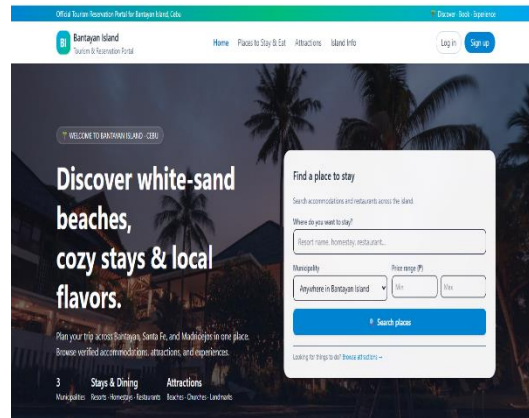


Figure 2. Home Page of the Centralized Digital Tourism Portal

The Landing Page or Home Page of the Centralized Digital Tourism Portal serves as the primary entry point for all users, providing an inviting and intuitive interface that highlights the platform’s major features. It presents a clean layout with a prominent navigation menu, quick-access buttons, and visually engaging banners that showcase key destinations and tourism activities across the island municipalities. Designed to accommodate tourists, local residents, business owners, and LGU personnel, the home page offers seamless access to essential services such as destination exploration, business registration, tourism updates, and real-time announcements.

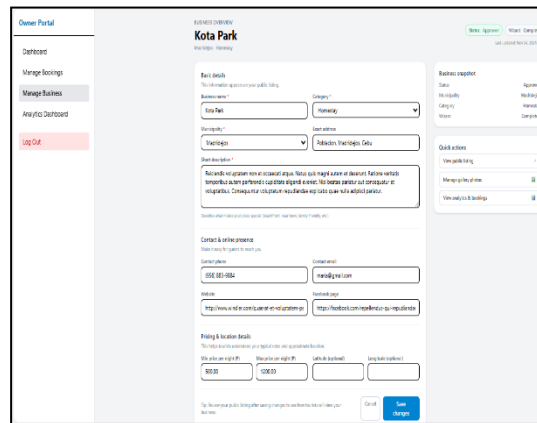


Figure 3. Set up Business Profile Page

Upon first login, business owners are guided through a Setup Wizard to complete their business profile. The wizard consists of: (1) Basic Details where owners must provide Business name, Category (e.g., resort, hotel, homestay), Municipality, Business description, (2) Contact Details, where owners must provide Physical address, Phone number, Business email, Website (optional), Facebook page.

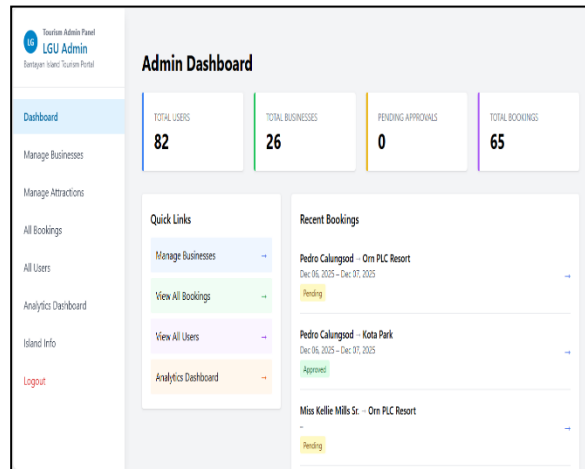


Figure 4. LGU Administrator's Dashboard

The Admin Dashboard is the central control panel for all tourism officers. It displays Total approved businesses, Total bookings, New pending business registrations, Recent booking activities, Popular attractions (if analytics enabled). Quick Access Shortcuts Displays Manage Businesses, Manage Attractions, Manage Announcements, Manage Users, View Tourism Analytics. The dashboard also adapts visually to the selected municipality's branding and logo.

## RESULTS AND DISCUSSION

Table 2. Current Tourism Practices and System Gaps

Indicator	Mean	Interpretation
Information accessibility	2.56	Disagree
Consistency of updates	2.60	Disagree
Customer service adequacy	2.49	Disagree
Digital tool usage	2.44	Disagree
System accessibility	2.31	Disagree
Promotion effectiveness	2.37	Disagree
Overall Mean	2.55	Weak System Performance

The overall mean of 2.55 (Disagree) indicates that Bantayan Island's tourism system is fragmented and underperforming. Stakeholders experience difficulty accessing reliable information, inconsistent updates, and inefficient service delivery.

The low score for digital tool usage (2.44) confirms that digitalization efforts remain limited and uncoordinated. These findings support previous research emphasizing that fragmented tourism systems reduce destination competitiveness and hinder stakeholder collaboration (Gretzel et al., 2015).

Table 3. *Tourism Data Management Practices*

Indicator	Mean	Interpretation
Data accuracy	2.85	Neutral
Reporting consistency	2.89	Neutral
Data organization	3.03	Neutral
Use for decision-making	3.55	Agree
Overall Mean	3.08	Moderate Readiness

Tourism data management practices exhibit a moderate level of readiness ( $M = 3.08$ ). While LGUs utilize available data for decision-making ( $M = 3.55$ ), inconsistencies in data collection, reporting, and storage indicate the absence of standardized systems.

This reflects a common challenge in developing tourism destinations, where data exists but is not integrated, limiting its usefulness for planning and forecasting (OECD, 2023). The lack of a unified database further supports the need for a centralized system capable of automating data flows and improving governance efficiency.

Table 4. *ISO/IEC 25010 Evaluation*

Dimension	Mean	Interpretation
Functional Suitability	3.85	Very Good
Reliability	4.33	Excellent
Performance Efficiency	4.07	Very Good
Usability	4.58	Excellent
Security	4.52	Excellent
Compatibility	4.53	Excellent
Maintainability	4.53	Excellent
Portability	4.57	Excellent

The system demonstrated high compliance with ISO/IEC 25010 standards, with most dimensions rated “Excellent.” Notably: Usability (4.58) confirms the effectiveness of user-centered design; Security (4.52) ensures compliance with data protection requirements; Reliability (4.33) reflects stable system performance.

The slightly lower rating for functional suitability (3.85) suggests minor variability in user experience, likely influenced by differences in digital literacy and device capabilities.

Table 5. *User Acceptability of the System (UTAUT)*

Construct	Mean	Interpretation
Performance Expectancy	4.60	Strongly Agree
Effort Expectancy	4.38	Strongly Agree
Social Influence	4.07	Agree
Facilitating Conditions	4.11	Agree

User acceptability results indicate strong adoption potential. Performance Expectancy (4.60) shows that users perceive the system as highly beneficial; Effort Expectancy (4.38) confirms ease of use; Social Influence (4.07) suggests growing peer acceptance; Facilitating Conditions (4.11) highlight moderate support availability.

These findings, stated in Table 5, align with UTAUT theory, where perceived usefulness and ease of use are primary drivers of technology adoption (Venkatesh et al., 2003). Variability in facilitating conditions in this case suggests that infrastructure and support systems remain uneven across municipalities.

Table 6. *Barriers to Implementation and Sustainability*

Indicator	Mean	Interpretation
Internet connectivity issues	4.26	Strongly Agree
Maintenance cost concerns	4.27	Strongly Agree
Financial limitations (businesses)	4.25	Strongly Agree
Resistance to digital systems	4.30	Strongly Agree
Lack of digital literacy	4.19	Agree
Weak infrastructure	4.20	Agree
Inter-LGU coordination issues	4.09	Agree
Lack of clear guidelines	4.22	Strongly Agree
Overall Mean	4.17	Major Barriers Identified

Table 6 signifies that despite strong system performance and acceptance, significant barriers remain. The greatest concerns include: internet instability, financial constraints, and resistance to digital adoption. These challenges reflect broader socio-technical limitations commonly observed in developing tourism destinations (UNWTO, 2019). The lack of standardized policies and inter-LGU coordination further emphasizes the need for governance frameworks to support digital transformation.

### Synthesis of Findings

The results present a clear narrative progression:

- Tourism system is fragmented and inefficient;
- Data management is moderately functional but unintegrated;
- Developed system is technically robust (ISO 25010);
- Users strongly accept the system (UTAUT);
- However, structural barriers remain.

This synthesis confirms that while the proposed centralized digital tourism portal is technically viable and socially acceptable, its long-term success depends on addressing infrastructure, policy, and capacity-building challenges.

### CONCLUSION

Empirical findings revealed that while tourism demand is high in Bantayan Island—driven primarily by leisure travel, repeat visitation, and extended stays—the supporting tourism infrastructure remains largely decentralized, resulting in inefficiencies in information dissemination, customer service, and data management. The developed Centralized Digital Tourism Portal effectively addressed these gaps, as evidenced by its strong compliance with ISO/IEC 25010 software quality standards as well as with UTAUT constructs. These results confirm that the system is technically robust, user-centered, and capable of supporting real-world tourism operations. In light of these findings, the study concludes that the implementation of a Centralized Digital Tourism Portal for Bantayan Island has the potential to significantly enhance tourism management. When supported by appropriate policies, sustained funding, continuous training, and institutional collaboration, the portal can serve as a foundational digital infrastructure for advancing sustainable, inclusive, and competitive tourism development in Bantayan Island and has the potential to become the pilot project for neighboring tourism islands.

### Acknowledgment

I am beyond thankful for the wisdom and knowledge cast by the Almighty Father. In addition, I am thankful to the effort and time tendered by the respondents, as I would not be able to achieve relevant findings without them. The same appreciation is given to the three (3) municipal mayors of Bantayan Island, the BSIT Department Faculty, and Staff, MCC Colleagues, students, and my parents, siblings, and family. Lastly, my profound gratitude to the Ngoratch ML Team (Bernie, Richard, Lloyd, Rjay) for staying up late evenings and early mornings, who were there cheering me up to continue this research study until it reaches the much-awaited part - the publication.

### References

- Aditya, T., & Pradhan, R. (2020). *ICT adoption challenges in developing tourism destinations*. *Journal of Tourism Technology*, 11(3), 245–263.
- Ali, F. (2022). Digital readiness and adoption of tourism technologies among local communities. *International Journal of Tourism Research*, 24(2), 178–192.
- Alcantara, M., & Dacuma, M. (2021). Digital competency of local government personnel in the Philippines. *Philippine Journal of Public Administration*, 65(1), 56–72.
- Al-Ssulami, H., Jalil, M., & Khan, A. (2022). LsHASHq: A faster string-matching algorithm using longer q-gram shifting. *Journal of Information Science*, 48(4), 515–530.

- Anelli, V. W., Di Noia, T., Ragone, A., & Zanker, M. (2022). Advances in recommender systems: Hybrid approaches and algorithmic developments. *ACM Computing Surveys*, 55(1), 1–34.
- Bautista, R., & Reyes, M. (2023). Mobile responsiveness and user satisfaction: Evidence from Philippine mobile banking applications. *Asia-Pacific Journal of Information Systems*, 33(2), 145–162.
- Bhuiyan, M., Rahman, M., & Uddin, N. (2022). Smart tourism ecosystems in island destinations: Challenges and opportunities. *Tourism Management Perspectives*, 44, 101037.
- Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2015* (pp. 377–389). Springer.
- Cruz, J., & Santos, P. (2023). Tagging systems for improving school information management. *International Journal of Educational Technology*, 18(2), 55–70.
- Croft, W. B., & Lafferty, J. (2021). Machine-learning-based improvements in information retrieval systems. *Foundations and Trends in Information Retrieval*, 15(3), 125–209.
- DATAVERSITY. (2024). *The evolution of augmented database management systems*. DATAVERSITY Publishing.
- De la Cruz, S., Mendoza, A., & Velasco, L. (2022). Enhancing mobile system responsiveness in educational platforms. *Philippine Computing Journal*, 17(1), 20–34.
- Department of Information and Communications Technology (DICT). (2020). *National ICT Ecosystem Framework*. DICT Philippines.
- Department of Tourism (DOT). (2022). *Philippine Tourism Digital Transformation Strategy*. DOT Philippines.
- Dodds, R., & Butler, R. (2019). *Overtourism: Issues, realities, and solutions*. De Gruyter.
- El Archi, Z., & Benbba, A. (2023). Digital literacy and the adoption of online platforms among local communities. *Journal of Community Informatics*, 19(1), 40–58.
- Frew, A. (2014). *ICT and tourism: Transformative impacts and emerging trends*. Channel View Publications.
- Gopalkrishna, S., Kumar, N., & Rao, V. (2021). Agile methodologies in modern software development: A comparative review. *Journal of Systems and Software Engineering*, 32(4), 112–125.
- Gössling, S., & Hall, C. M. (2021). *Tourism and sustainability: Development, globalisation and new tourism in the Third World* (4th ed.). Routledge.
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets*, 25, 179–188.
- Gretzel, U., Werthner, H., Koo, C., & Lamsfus, C. (2020). Conceptual foundations for understanding smart tourism ecosystems. *Computers in Human Behavior*, 50, 558–563.
- Heinz, E., Parycek, P., & Zumstein, D. (2023). Digital transformation in local government tourism offices. *Government Information Quarterly*, 40(2), 101760.
- International Journal of Data Mining, Modelling, and Management. (2021). Integrating SQL and NoSQL databases in data lakehouses. *IJDMMM*, 13(4), 355–370.
- International Organization for Standardization. (2011). *ISO/IEC 25010: Systems and software engineering—Systems and software quality requirements and evaluation (SQuaRE)*. ISO.
- International Organization for Standardization. (2023). *Updates to ISO/IEC 25010: Quality model and evaluation framework*. ISO.
- Kim, J., & Lee, S. (2023). Search functionalities and consumer engagement in e-commerce platforms. *Electronic Commerce Research*, 23(1), 112–130.
- Kim, S., Park, E., & Lee, J. (2025). Tourist loyalty and repeat visitation behavior in island destinations. *Journal of Travel Research*, 64(3), 455–470.
- Kumar, A., Patel, S., & Devi, L. (2022). Agile Beeswax: A contextual agile development model for mobile applications. *International Journal of Software Innovation*, 10(2), 55–72.
- Lama, P., & Pradhan, S. (2020). ICT challenges in developing island tourism destinations. *Tourism Review International*, 24(2–3), 123–138.
- Li, Y., & Jiang, J. (2023). Digital adoption among tourism stakeholders: A comparative analysis. *Tourism Economics*, 29(6), 1401–1420.
- Liu, H., Chen, T., & Wu, Y. (2021). Model-based collaborative filtering using neural networks. *IEEE Transactions on Knowledge and Data Engineering*, 33(5), 1823–1835.
- Magno, F. (2018). Local governance and tourism development in small Philippine municipalities. *Philippine Political Science Journal*, 39(1), 44–67.

- Miller, R., & Smith, J. (2022). Tagging as an organizational tool in educational databases. *Journal of Information Systems Education*, 33(1), 75–88.
- Muhammad, R., Ahmed, S., & Noor, F. (2021). Critical success factors in agile software development projects. *Project Management Research Journal*, 5(2), 89–102.
- Naeem, F., Hussain, S., & Khan, M. (2021). Parallel processing for near-real-time data warehousing. *Concurrency and Computation: Practice and Experience*, 33(23), e6432.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Technology-enhanced tourism experiences. *Tourism Management*, 47, 546–557.
- Nunes, R., Silva, L., & Carvalho, J. (2025). Digital inclusion in tourism communities. *Journal of Sustainable Tourism*, 33(1), 45–62.
- OECD. (2023). *Tourism in the Digital Era: Policies for Innovation and Inclusion*. OECD Publishing.
- Polus, S., & Abbas, M. (2021). Evaluating the Porter-Stemmer algorithm in modern text retrieval. *Information Processing & Management*, 58(4), 102509.
- Ramos, C., & Santos, J. (2021). Mobile responsiveness in Philippine web systems. *Philippine Information Technology Journal*, 5(1), 23–34.
- Sharma, K., Govorov, M., & Martin, T. (2024). Securing spatial files using AES encryption in enterprise GIS. *International Journal of Geoinformatics*, 20(1), 15–28.
- Sigala, M. (2018). New technologies in tourism: From big data to smart tourism ecosystems. *Journal of Service Management*, 29(2), 219–237.
- Smashing Magazine. (2022). *Agile development principles for improving web responsiveness*. Smashing Media.
- Smith, L., Johnson, P., & Brown, K. (2021). Enhancing web system responsiveness for mobile devices. *International Journal of Web Engineering*, 19(3), 44–62.
- Springer, A. (2023). Strengthening local government capacity for digital tourism. *Journal of E-Government Studies*, 12(2), 99–118.
- Tussyadiah, I. (2020). The influence of digital tourism ecosystems on destination competitiveness. *Tourism Management*, 81, 104164.
- UN Tourism. (2025). *Tourism outlook and global sustainability initiatives*. UN Tourism Publications.
- United Nations World Tourism Organization (UNWTO). (2019). *Tourism for Development*. UNWTO.
- United Nations World Tourism Organization (UNWTO). (2024). *Tourism Trends and Insights Report 2024*. UNWTO Publishing.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.
- Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology. *MIS Quarterly*, 36(1), 157–178.
- Wagner, S. (2013). *Software product quality: Theory and practice*. Springer.
- Wang, X., Li, J., & Zhao, H. (2021). Hybrid recommender system methods: A systematic review. *Expert Systems with Applications*, 168, 114298.
- Wu, Y., Xu, S., & Zhang, Q. (2023). Neural and hybrid models for advanced recommendation systems. *Knowledge-Based Systems*, 262, 110206.
- Zhang, H., & Chen, P. (2022). Improving search algorithms for large-scale online platforms. *Journal of Information Retrieval*, 25(4), 455–472.
- Zhang, Y., Wang, F., & Sun, L. (2022). Tackling data sparsity and accuracy challenges in recommender systems. *IEEE Access*, 10, 123456–123470.