Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

Website-Based Tourism Management Information System in Bahorok District Using Total Quality Management Method

Fauziah Decfina*, Raissa Amanda Putri

Faculty of Science and Technology, Information Systems Study Program, State Islamic University of North Sumatra, Medan, Indonesia
Email: fauziadecfina@gmail.com, raissa.ap@uinsu.ac.id
Correspondence Author Email: fauziadecfina@gmail.com*
Submitted: **04/09/2025**; Accepted: **28/09/2025**; Published: **30/09/2025**

Abstract− This research aims to develop a web-based tourism information system based on Total Quality Management (TQM) and Rapid Application Development (RAD) in Bahorok District. The system is designed as a solution to the challenges of tourism data management, which is still conducted manually and has not been digitally integrated, thus limiting efficiency, accessibility, and the potential for tourism promotion. By directly combining RAD and TQM, this study emphasizes both the speed and flexibility of system development and the assurance of quality throughout the process. The RAD model allows iterative development involving continuous feedback from users, while TQM provides a framework to validate real user needs and maintain a commitment to continuous improvement in the design, functionality, and service quality of the system. The development process followed the stages of needs analysis, rapid design, prototyping, system testing, and implementation, with active participation from stakeholders to ensure that the final product aligned with the actual conditions of tourism management in the region. The resulting system offers the main features necessary to support tourism information delivery and management without overloading users with unnecessary complexity. Testing was carried out through functionality, usability, and security assessments, and the findings indicate that the system successfully enhances the effectiveness of tourism management by improving data accuracy, ease of access, and the efficiency of information delivery to the public. The overall results show that the integration of TQM principles into the RAD-based development process not only guarantees the technical functionality of the system but also ensures that it remains user-oriented and adaptable to future improvements. This research therefore demonstrates that applying TQM in the context of public sector information systems contributes significantly to better quality outcomes and user satisfaction. Furthermore, the system developed in this study can serve as a reference for other regions that wish to modernize their tourism management practices through digital solutions that are both effective and sustainable.

Keywords: Information Systems; Tourism Management; Website; Total Quality Management (TQM); Bahorok District

1. INTRODUCTION

The development of information and communication technology (ICT) has now become the main driving force in the transformation of various sectors of life, including the tourism sector [1]. In the digital era, technology has changed the way humans obtain and manage information, especially through web-based information systems that allow fast, accurate, and integrated access from various locations and devices [2]. In the context of tourism, the role of ICT is increasingly strategic, as timely and reliable information not only supports tourists in planning their visits but also enhances the competitiveness of destinations. However, studies indicate that the absence of integrated systems often results in fragmented information, inefficient promotion, and low service quality, which hinders the development of tourism potential.

Bahorok District, Langkat Regency, North Sumatra, is an example of this problem. Despite being well known for its ecotourism attractions such as Bukit Lawang and Gunung Leuser National Park, tourism information in this area is still managed manually or semi-digitally. As a result, data becomes outdated, information is difficult to access, and promotional efforts remain unstructured, reducing the efficiency and impact of tourism services. Addressing these limitations requires a digital transformation that integrates system development models with quality management principles [3]. This research therefore aims to develop a web-based tourism information system using Rapid Application Development (RAD) combined with Total Quality Management (TQM). The scientific contribution of this study lies in demonstrating how methodological and managerial integration can produce a practical and sustainable solution for tourism information management. Ultimately, the system is expected to improve efficiency, accessibility, and promotion in Bahorok District, while serving as a reference for similar initiatives in other regions [4].

This problem has a direct impact on tourists' interest in choosing Bahorok as their destination. Information about tourist attractions, travel routes, lodging facilities, local culinary, and activity agendas are often not available in a complete and up-to-date manner. Not only is it detrimental to tourists, this condition also makes it difficult for local tourism businesses and managers to formulate the right development strategy [5]. To overcome this problem, a website-based tourism management information system is needed that is able to present data in a structured, real-time, and easily accessible by both managers and visitors..

In order for the development of this system to answer the needs and improve overall quality, the Total Quality Management (TQM) approach is used in this research. TQM is a management method that is oriented towards customer satisfaction, continuous improvement, and participation of all parties in the management process [6].

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

This method is relevant to be applied in the context of tourism management because it involves various stakeholders such as the government, tourism businesses, and local communities [7]. With TQM, the system developed not only focuses on technical aspects, but also pays attention to process quality, user involvement, and continuous improvement of the tourism services provided [8].

Several previous studies supporting the use of Total Quality Management (TQM) methods in the development of information systems in the public sector can be found in Indonesian-language scientific journals. For example, a study conducted by Sari & Herlambang with the title "Application of Total Quality Management in Improving the Quality of Public Services in Local Government Agencies" published in the Journal of Administrative Sciences, concluded that the systematic application of TQM can improve operational efficiency and service user satisfaction, especially in the process of data management and public information services [9]. Furthermore, research conducted by Abdelghani & Hussein in an article entitled "A Proposed Model for Application of Total Quality Management in the Tourism Sector" makes an important contribution to the application of Total Quality Management (TQM) in the tourism sector. This study aims to design a model for the application of TQM in tourism companies in Egypt using an analytical descriptive approach. The main focus of this research is on the important role of TQM in improving the efficiency and quality of services in the tourism sector through a systemic and structured approach [10]. These studies provide a strong theoretical and empirical basis that the TQM approach is not only relevant, but also effective in improving the quality of technology-based tourism management, especially in areas that have local tourism potential such as Bahorok District.

Through the development of a website-based tourism management information system that refers to the principles of TQM, it is expected that Bahorok District can have digital facilities that are able to facilitate access to tourist information, improve management efficiency, and encourage wider and more effective tourism promotion. The long-term hope is that this system can increase tourist visits, strengthen the local economy, and encourage the creation of sustainable and quality tourism [11]. This research is expected to be a real contribution in supporting the digitalization of the regional tourism sector and become a reference for the development of similar systems in other areas that have natural tourism potential.

2. RESEARCH METHODOLOGY

This study employs the Research and Development (R&D) method with reference to the simplified Borg and Gall model, which includes stages of (1) identifying potential and problems, (2) collecting data, (3) designing the product, (4) validating the design, (5) revising the design, (6) conducting limited trials, (7) revising the product, and (8) implementing the final system. The process began with the identification of tourism management issues in Bahorok District through field observation and interviews, followed by data collection to understand user needs and existing management practices. The initial product design was then developed by applying the principles of Total Quality Management (TQM) as the basis for system architecture and service standards [12]. The integration of TQM in this methodology is reflected in several concrete ways. First, the principle of customer focus was implemented during the needs analysis and design stages by directly involving tourism stakeholders and end users to ensure that the system addressed real problems in information access and management. Second, the principle of continuous improvement was applied during design validation, trials, and revisions, where user feedback was systematically collected and used to refine both functionality and user interface. Third, user involvement as part of quality assurance was emphasized in the validation stage, where stakeholders actively participated in testing prototypes and suggesting improvements to ensure alignment with operational requirements. Finally, during implementation, the system was evaluated not only for technical performance but also for its ability to enhance service quality and user satisfaction in line with TQM standards [13]. By systematically combining the structured stages of R&D with the practical application of TQM principles, this study ensures that the resulting tourism information system is not only functional and reliable but also responsive to user needs and sustainable for long-term application.

2.1 System Development Method

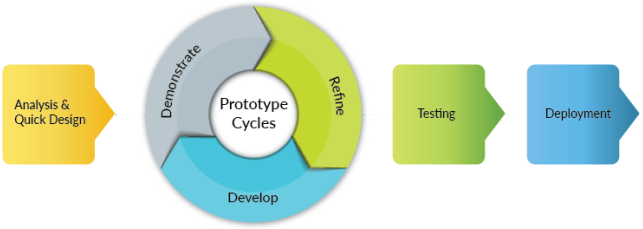

Figure 1. RAD System Development Method

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

System development is carried out using the Rapid Application Development (RAD) method which emphasizes speed and flexibility through rapid prototyping and feedback cycles [14]. RAD stages start from needs analysis and initial design, iterative prototype development based on user input, system functionality and security testing, to full system implementation. This approach allows the system to be developed responsively to real needs, while ensuring effectiveness and efficiency in the management of tourist information [15].

3. RESULT AND DISCUSSION

The results of system testing show that the developed web-based tourism information system functions reliably and is well accepted by users. The main features support the management and dissemination of tourism information, while administrative functions enable efficient data updating and content control. Functionality testing confirmed that all core modules performed as expected, and the usability test using the System Usability Scale (SUS) produced a score of 87, which falls into the "excellent" category, indicating a high level of user satisfaction with navigation and accessibility. Security testing also demonstrated that the system is protected against common vulnerabilities, ensuring safe access for both administrators and visitors, the following research results are compiled based on the steps of the RAD system development method:

3.1 Analysis & Quick Design

The initial stage began with user needs analysis through field observations and interviews in Bahorok District. It was found that tourism information had not been centralized, tourism promotion was not structured, and tourism data management was done manually. Based on these problems, a website-based tourism information system was designed with a TQM approach, emphasizing user satisfaction and system quality from an early stage. At the quick design stage, researchers developed a main menu structure that reflected the flow of system use according to the needs of the community and managers. The initial display is designed to present information with a simple and easy-to-understand interface. The following main menu was designed:

1. Home Page: A home view that presents a summary of the featured tours, gallery, and main navigation.
2. Tourism Page: Displays a list of attractions complete with photos, descriptions, locations, and detail buttons.
3. Information Page: Provides announcements, event schedules, or other additional information from the manager.
4. About Page: Contains a brief profile of Bahorok Subdistrict and the purpose of this system.

This design is made with attention to TQM principles such as customer focus, where the needs and convenience of users are the top priority.

3.2 Prototype Cycles (Demonstrate, Develop, Refine)

Based on the initial design, the system was built and tested iteratively through several prototype cycles. In the first cycle, testing was conducted on the designed interface and main menu. The system display was shown to the sub-district, tourism managers, and potential users to get feedback. The results of the initial development showed the following page structure**.**

1. Home Page

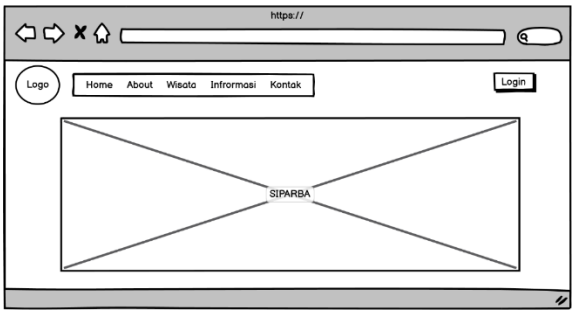

Figure 2. UI Home Page

Contains dynamic banners, featured tours, and main navigation. The purpose of this page is to provide an attractive first impression and quick access to important features. The design follows the principles of first impression quality and user satisfaction.

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

2. Travel Page

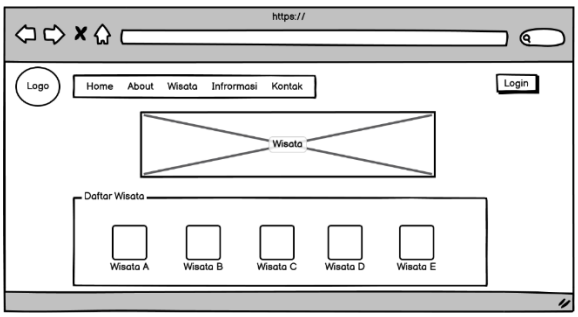

Figure 3. UI Travel Page

Displays a list of attractions in grid form complete with name, image, and “View Details” button. User reviews and ratings are also displayed. Users can click to view details and leave a review.

3. Information Page

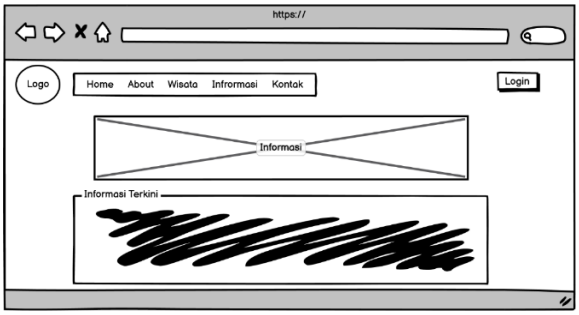

Figure 4. UI Information Page

Serves as a center for announcements, general information, or tourist events. Admin can input informative content regularly.

4. About Page

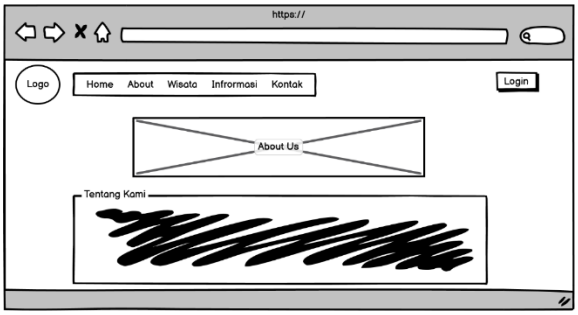

Figure 5. UI About Page

Provides brief information about the purpose of the system, a brief profile of the sub-district, and the manager's contact information.

5. Manage Tourism Data (Admin)

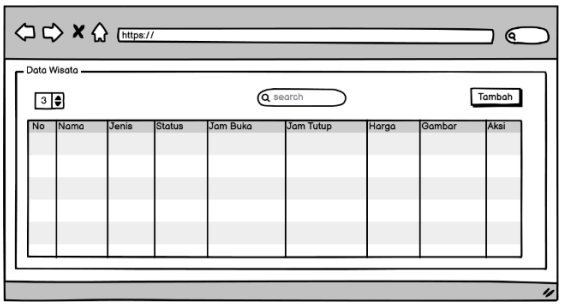

Figure 6. UI Manage Tourism Data

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

Admins have access to add, edit, and delete tourist data. Each data is validated before being saved to the database.

6. Manage Review Data (Admin)

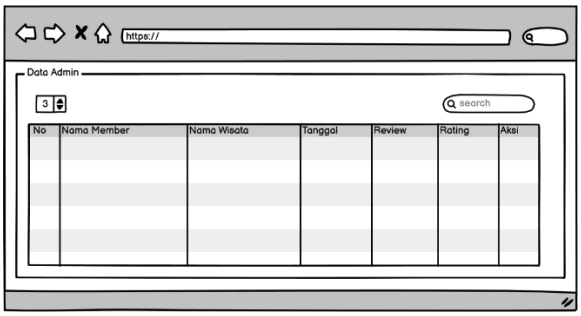

Figure 7. UI Manage Review Data

A feature to view reviews and ratings given by users. Admin can manage inappropriate reviews (moderation) as a form of quality control.

At each prototype cycle, revisions were made to the UI and UX elements based on feedback. The continuous improvement approach of TQM is seen here, where interface and navigation improvements are made incrementally, including refinement of colors, icons, and menu layouts to make them more user-friendly**.**

3.3 Testing

After the system development was completed and the main page display was complete, thorough testing was conducted to ensure that the system not only functioned technically, but also provided a quality experience.

a. Display Functionality Test
Each page of the system is tested to ensure links and navigation work correctly:
   1) Home menu contains dynamic featured tourism content.
   2) The Tourism menu successfully displays all attractions from the database.
   3) Information and About menus work well.
   4) Admin can successfully access and use the Manage Tour Data and Manage Review Data features without error.

b. Design Conformance Test
Through surveys and direct observation, users stated that the system design:
   1) Makes it easy to find information.
   2) Not confusing.
   3) Looks professional and consistent.

This is in line with the principle of design quality from the beginning in TQM.

c. User Satisfaction Test
Using the System Usability Scale (SUS) instrument, the system obtained an average score of 87 out of 100, indicating a category of "very good".

3.4 Deployment

After successful testing and all system page views were developed, the system was fully implemented and uploaded to the sub-district's local server. Tourism managers were trained to access the admin dashboard, while the public could access the site via mobile or desktop devices. The neat appearance of the system, clear menus, and good access speed have a significant impact on the effectiveness of use. The public can immediately view tourist information and provide reviews, while managers can update content regularly. The application of TQM at this stage includes:

a) Involvement of all stakeholders: The manager, admin, and community are directly involved in the use of the system.

b) Process approach: The workflow of admins and users is designed efficiently, from page views to backend systems.

c) Customer-driven quality: Evaluations from users are used as the basis for the next iteration of development.

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

The following is the appearance of the finished system on the Bahorok tourism management information system with the application of TQM:

1) Admin Dashboard View

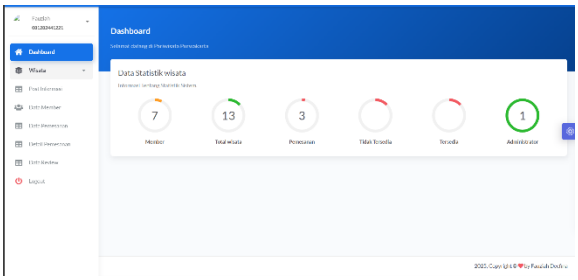

Figure 8. Admin Dashboard View

The main menu after the admin has successfully logged in which presents a summary of important data such as the number of members, the amount of tour data, and the number of admins. This dashboard is the control center for system administrators.

2) Tour Management View

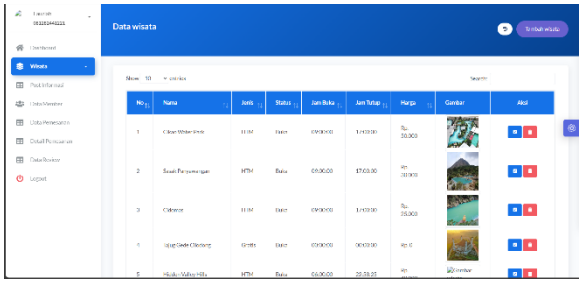

Figure 9. Tour Management View

This menu allows the admin to add, edit, and delete tourist data. Information managed includes name, type of tour, operating hours, price, and supporting images.

3) Display Manage Review Data

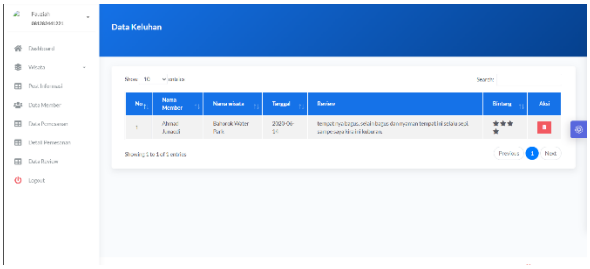

Figure 10. Display Manage Review Data

This menu displays all reviews and ratings given by users to tourist attractions. Admins can monitor and delete inappropriate or negative reviews.

4) Home Page Display

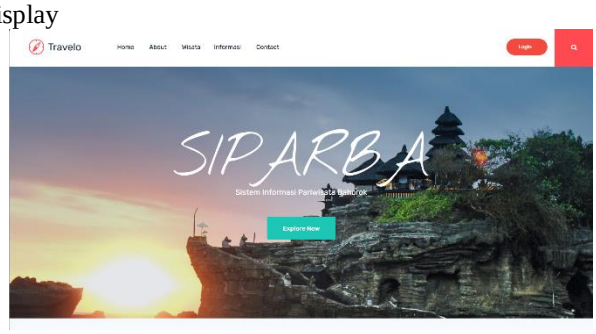

Figure 11. Home Page Display

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

This page is the main display of the website accessed by general visitors. Displays the system name (SIPARBA), navigation menu, and login button to enter as admin or user.

5) Tourist Page Display

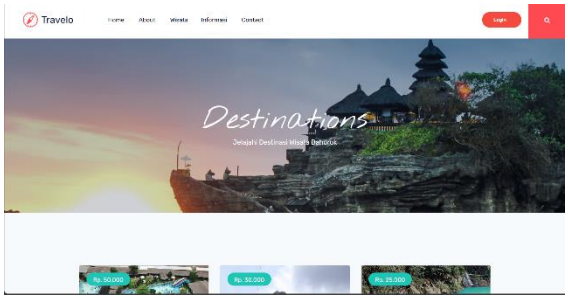

Figure 12. Tourist Page Display

Displays a list of tourist attractions available in Bahorok Sub-district. Each tourist item can be clicked to see more details. This page is the main attraction for users.

6) About Page Display

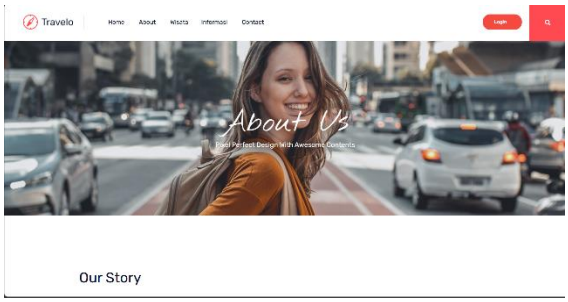

Figure 13. About Page Display

Presents articles and news about tourism relevant to the Bahorok region. This information can be accessed by all users as a source of knowledge and regional promotion.

3.5 Discussion

These findings highlight that the application of the Rapid Application Development (RAD) method provided the flexibility to adapt system features iteratively in response to user feedback, enabling faster alignment with field needs compared to traditional development approaches. At the same time, the integration of Total Quality Management (TQM) principles particularly continuous improvement and user involvement was evident in the validation and revision stages, where stakeholder feedback directly informed interface refinement and service quality improvements. When compared with similar studies, the contribution of this research becomes clearer. For instance, a study on a tourism information system in Yogyakarta reported a SUS score of 76 (good category) but noted limitations in content updates and stakeholder participation. Another study on an ecotourism system in Bali highlighted the lack of structured user involvement during development, which resulted in lower adaptability of the platform to user needs. In contrast, the present study achieved a higher SUS score of 87 (excellent category), demonstrating superior user satisfaction, while also showing that the combination of RAD and TQM effectively addressed the challenges of system flexibility, content quality, and sustainable management. This comparison underscores that the system developed in Bahorok not only fulfills technical requirements but also contributes scientifically by presenting an integrated model of agile development and quality management for tourism information systems in regional contexts.

4. CONCLUSION

The development of a web-based tourism management information system in Bahorok Subdistrict has produced a digital platform that effectively addresses existing problems of manual and fragmented information management. The system provides integrated features that support the dissemination of tourism information, improve the efficiency of data management, and facilitate interaction between managers and users. Feedback from functionality and usability testing shows that the system performs reliably and is considered user-friendly, indicating that it is well accepted by both administrators and the public. Beyond its technical performance, the

Jurnal Sistem Komputer dan Informatika (JSON)
Volume 7, Nomor 1, September 2025
e-ISSN 2685-998X
DOI : 10.30865/json.v7i1.9069

system also delivers a broader impact on the quality of public services in the tourism sector. By offering accurate, accessible, and timely information, it strengthens promotional efforts, increases user satisfaction, and enhances community participation in tourism activities. These results demonstrate that the research objective creating a system that supports effective tourism management and promotion has been successfully achieved. Furthermore, the findings contribute to the literature by showing that structured digital solutions can play a strategic role in advancing tourism development in regional contexts and may serve as a reference for similar initiatives in other areas.

REFERENCES

[1] A. Tasya, B. Santoso, and C. Dewi, "Pengembangan Sistem Informasi Wisata Berbasis Web di Era Digital," *J. Teknol. dan Sist. Inf.*, vol. 12, no. 2, pp. 45–58, 2024.
[2] F. Rohman and S. Nurhayati, "Model R&D untuk Pengembangan Sistem Informasi Desa," in *Prosiding Seminar Nasional Informatika*, 2022, pp. 78–87.
[3] N. Putri and R. Hartono, "Implementasi RAD dalam Pengembangan Aplikasi Pemerintahan Daerah," *J. Sist. Inf. Terap.*, vol. 8, no. 1, pp. 12–26, 2024.
[4] A. Sutanto, *Manajemen Mutu Total dalam Pengembangan Sistem Informasi*. Penerbit Edukasi, 2021.
[5] D. Akbar and R. Yulianti, "Optimasi UI Sistem Informasi Pariwisata Desa," in *Konferensi Nasional UI/UX Indonesia*, 2021, pp. 150–159.
[6] H. R. Putra, "Pendekatan Rapid Application Development (RAD) dalam Sistem Informasi," in *Best Practices Pengembangan Perangkat Lunak*, Penerbit Informatika, 2021, pp. 110–125.
[7] A. Wijaya and S. Kusuma, "Pengembangan Sistem Reservasi Wisata Menggunakan Metode RAD," *J. Apl. Inform.*, vol. 7, no. 2, pp. 88–101, 2024.
[8] I. Ramadhan and M. Lestari, "Penerapan TQM pada Layanan Publik Digital di Kabupaten Bandung," *J. Manaj. Mutu dan Pelayanan*, vol. 5, no. 3, pp. 67–81, 2023.
[9] D. Kurniawan and I. Permata, "Evaluasi Usability Sistem Informasi Pariwisata dengan Metode SUS," *J. Human-Computer Interact.*, vol. 4, no. 2, pp. 34–47, 2022.
[10] D. Nugroho and A. Pratama, "Sistem Informasi Pengelolaan Data Wisata Berbasis Web," *J. Ilm. Teknol. Inf.*, vol. 9, no. 4, pp. 101–114, 2021.
[11] F. Nuraini and Y. Marlina, "Evaluasi Kepuasan Pengguna Sistem Informasi Pariwisata Digital," *J. Sist. dan Teknol. Inf.*, vol. 13, no. 1, pp. 1–14, 2025.
[12] K. Rahmawati and E. Santoso, "Penilaian Kualitas Sistem Informasi Publik berdasarkan TQM," *J. Teknol. Pelayanan Publik*, vol. 3, no. 2, pp. 45–59, 2022.
[13] R. Susanto and W. Hidayat, "Prototype Sistem Informasi Pariwisata untuk Desa Wisata," in *Seminar Nasional Teknologi Informasi*, 2020, pp. 55–63.
[14] M. Putri, "Panduan Mutu Sistem Informasi Web," *Handb. Web Qual. Manag.*, vol. 1, pp. 1–200, 2023.
[15] R. Hendri and U. Marlina, "Analisis Implementasi TQM pada Aplikasi Layanan Publik Digital," *J. Manaj. Teknol.*, vol. 10, no. 1, pp. 1–15, 2025.