



## Design of Web-Based Applications in Agrotourism Information Systems Using the SWOT Analysis Method

Ipang Sasono<sup>1</sup>, Riyanto<sup>2</sup>, Suroso<sup>3</sup>, Mustar Aman<sup>4,\*</sup>, Joni Iskandar<sup>5</sup>

<sup>1,2,3,4,5</sup>Information System Departement, Insan Pembangunan University of Indonesia

Email : <sup>1</sup>isasono@yahoo.com, <sup>2</sup>rizal\_ariyanto@ymail.com, <sup>3</sup>suroso.ip@gmail.com,

<sup>4</sup>mustarstmik@gmail.com, <sup>5</sup>joniiskandar.chaniago@gmail.com.

### Abstract

The Tangerang Regency Agrotourism represents a community-oriented recreational park designed for tourism. However, the existing information system for Tangerang Regency Agrotourism is non-web-based and lacks integration with modern information technology, leading to suboptimal processing of Agrotourism-related data. This research aims to assess the current system and develop a web-based agro-tourism information system for Tangerang Regency. The primary goal is to fulfill user requirements and aid governmental efforts in presenting park and tourist attraction information through a SWOT analysis-driven approach. The predicament faced by Tangerang Regency Agrotourism revolves around its reliance on non-integrated Microsoft Office applications for data processing, resulting in a lack of computerization. Employing qualitative research methodology, this study employs object-oriented system design techniques alongside the Unified Modeling Language. Consequently, the outcome of this research is the successful creation of a web based Agrotourism information system application tailored for Tangerang Regency's unique needs.

**Keywords:** Information, System, Object-Oriented, SWOT, Web-Based, Agrotourism

## 1. INTRODUCTION

Tangerang Regency Agrotourism serves as a communal tourist park and recreation locale. Up until now, Agrotourism's information system has not been web-based or technologically integrated, resulting in suboptimal management of various facets, including tourist attraction promotion, ticket sales, and park facilities. Consequently, the potential for comprehensive recreational area development has been hindered. This limitation stems from the reliance on conventional data processing methods, specifically Microsoft Office applications, which prevent the realization of a fully computerized system. To address these issues, the study seeks to elucidate the current system's functioning, construct a web-based information system tailored for Tangerang Regency Agrotourism, and cater to user needs while aiding the government in presenting park-related information through SWOT analysis.



This challenge persists due to the inadequate replacement of the Microsoft Office system, both internally and externally, within the Agrotourism framework. The researchers employed a descriptive approach for this investigation, employing techniques such as observation, interviews, and literature review for data collection. The system design process adopted an object-oriented approach, utilizing the Unified Modeling Language. The outcome of this research materialized as a web based Agrotourism information system application, capable of considerably reducing traditional promotional expenses by obviating the necessity for external tourism exhibitions. The application satiates the requirements of both visitors and potential tourists, providing comprehensive data on Tangerang Regency's tourism offerings, including detailed insights into the recreational parks and their geographical locations.

The research by Ary, M., & Sanjaya, R., titled "Strategy Planning and Development of Study Programs Using SWOT Analysis," employs a questionnaire-based data collection method, focusing on tertiary education program enhancement [1]. Another study, conducted by Wedhasmara, A., presents an application prototype for strategic management strategy formulation within business organizations, integrating SWOT analysis and the quantitative strategic planning matrix [2]. Amirov, A. M.'s research, titled "Regional Agrotourism Competence Assessment: Theoretical Approaches," delves into the development of tourism within various countries, utilizing a population sampling approach [3].

In a related context, AW, A., Sulistyowati, N., & MM, Sk.'s work titled "Strategic Planning Analysis of Information System Technology" employs SWOT analysis to address information technology utilization within planning [4]. Gerami, F.'s study titled "Planning for Sustainable Tourism Development Using SWOT Analysis – Case Study: Pasargad Region–Fars" adopts SWOT analysis to outline sustainable tourism development strategies [5]. Furthermore, Sasono, I. et al.'s article, titled "Design of Web-Based Applications in Agrotourism Information Systems Using the SWOT Analysis Method," utilizes a descriptive approach coupled with SWOT analysis to create a web-based Argowisata information system, resulting in digitally supported software concepts.

The Agrotourism establishment within Tangerang Regency stands as a pivotal tourist attraction, drawing a significant number of visitors. Of note, the marine attractions, particularly the beach and educational park, have retained their popularity since 2017. Notably, the influx of both domestic and foreign tourists reached approximately 200,378 individuals by 2022. Consequently, endeavors to enhance Tangerang Regency's tourism, especially Agrotourism, are imperative. To facilitate this, the government must formulate an effective development strategy founded on SWOT analysis, enabling a comprehensive understanding of opportunities, strengths, weaknesses, and threats pertaining to these attractions.

## 2. METHODS

The type of research used is descriptive qualitative, namely a systematic and subjective approach in explaining everything that exists in the field and is oriented towards efforts to understand the phenomenon as a whole. In this case the author uses SWOT analysis as a first step to find out the right development strategy for agro-tourism in Tangerang Regency. SWOT analysis is a method of developing conditions and evaluating a problem, project or business concept based on internal and external factors, namely strengths, weaknesses, opportunities and threats. This method is most often used in business evaluation methods to find strategies that will be carried out. SWOT analysis only describes the situation that occurs, not just solves the problem. SWOT analysis is carried out with the intention of identifying the level of readiness of each function of the overall functions carried out to achieve the goals that have been set. This researcher has several stages as shown in Figure 1 [6]:

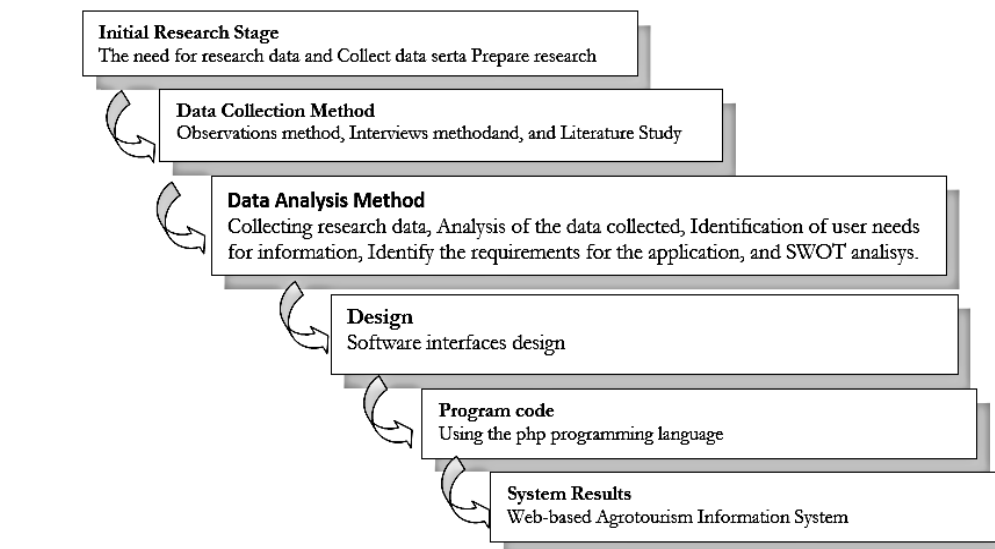


Figure 1. Research steps in system design

## 3. RESULTS AND DISCUSSION

In analyzing the system, researchers used SWOT analysis to build a web-based tourist information system [7]. SWOT analysis is carried out with the intention of identifying the level of readiness of each function of the overall functions carried out to achieve the goals that have been set, as well as for systems designed using an object-oriented system approach that can focus on the current system functionality. Furthermore, the results of the analysis will be visualized and documented with the Unified Modeling Language.

### 3.1. System Analysis

Based on the results of observations and interviews, information is obtained about the strengths, weaknesses, opportunities, and threats possessed by the Tangerang Regency tourist attraction, namely [8]:

1. Strengths, the strengths/advantages of the current system:
  - a. Marketing personnel can interact directly with prospective visitors.
  - b. A closer emotional connection is established between potential visitors and marketing personnel because the ticket offer interactions are carried out directly.
2. Weaknesses, weaknesses/deficiencies of the running system:
  - a. It takes a lot of money to print brochures, banners, and billboards for the promotion of agro-tourism to attract interested visitors
  - b. Reach to potential visitors is limited to certain areas.
3. Opportunities, and future opportunities from the developed system:
  - a. The process of marketing or selling entrance tickets for Tangerang Regency Agrotourism can use information technology so that the reach of potential visitors is much wider.
  - b. Visitors will find it more helpful if the company applies information technology.
  - c. The community will be more familiar with Tangerang Regency Agrotourism.
4. Threats (threats) threats from outsiders against the running system:
  - a. Marketing competition or ticket sales for the lower middle class is getting tougher, so companies need to innovate supported by information technology.
  - b. Many large developers who build and market Agrotourism for the lower middle class, market their products using information technology. Agrotourism in Tangerang Regency, like it or not, must keep up with the times if you want to remain competitive.

From the SWOT system analysis running above, the company built a web-based agro-tourism information system application in Tangerang Regency according to the SWOT analysis by looking at the tourism geography matrix by producing four alternative strategies, namely creating strategies by exploiting strengths to get opportunities, creating strategies to reduce weaknesses to take advantage of opportunities, create strategies that use strengths to overcome threats and create strategies that minimize weaknesses and avoid threats [8,9].

1. Strengths Strategy. There are several development strategies in optimizing strengths to take advantage of opportunities for tourism objects in Tangerang Regency, namely: In promoting tourist attractions to prospective visitors, it is enough to use information technology, namely by building a web-based agro-tourism information system, so that it can reduce direct interaction between marketing personnel and visitors, and make it easier for candidates visitors in

buying tickets because the ticket buying process is already online where the output is in the form of e-tickets [10].

2. Weaknesses Strategy. There are several strategies for minimizing weaknesses with take advantage of the opportunities for Tangerang Regency tourist objects, namely: Tangerang Regency agro-tourism objects no longer incur substantial costs for the process of printing brochures, banners, and installing billboards for Agro-tourism promotion to attract interested visitors because potential visitors and the wider community can already know directly and in detail about Tangerang Regency agro-tourism objects online, so that the Tangerang Regency agro-tourism object web site can be accessed throughout Indonesia and even abroad [11, 12].
3. Opportunity. Opportunities for the future from the developed system: Development and development of environmentally friendly tourist objects by exercising strict control over the implementation of elements of tourism actors that are not in accordance with the attitudes and actions of tourism actors which can threaten damage to tourist objects. The process of marketing or selling entrance tickets to Tangerang Regency Agrotourism can utilize information technology so that the reach of potential visitors or tourism is much wider and potential visitors will find it more helpful by applying information technology, so as to increase tourist visits both locally and nationally. The absorption of labor is even higher [13, 14].
4. Threats. Threats from outsiders to the running system: There are many tourist objects that are more interesting than the tourist attractions in Tangerang Regency. With the application of a web-based Agrotourism information system application, tourists will know more about tourist attractions in Tangerang Regency, and it will be easier for potential visitors to buy tickets without waiting in line to get tickets, and potential visitors have been spared from the many fake tickets. Agro-tourism in Tangerang Regency must also supervise every visitor and develop interesting games and maintain existing facilities [15, 16].

In addition to the strategy of building a web-based information system application, agro-tourism companies in Tangerang Regency also have a strategy for developing agro-tourism objects in Tangerang Regency by adding facilities according to the SWOT analysis by looking at the tourism geography information matrix, namely

#### 1 Strengths and Opportunities Strategies

There are several development strategies in optimizing strengths to take advantage of tourism object opportunities, namely:

- a. Building and repairing tourism infrastructure and maintenance.  
If tourists who visit feel that their needs while in the tourist attraction area are sufficient, of course it will become a special memory for visitors and the desire to return to the tourist attraction. Therefore it is necessary to build infrastructure suggestions to support activities such as restaurants or

cafes, souvenir shops, tourist services, and lodging for visitors. Not only that, maintenance of existing infrastructure must continue to be carried out to maintain the beauty of infrastructure.

b. Develop tourist attractions

Tourist attractions that can be built on agro-tourism are water attractions, such as boat rentals and children's playgrounds.

c. Build and organize tourism accessibility

Accessibility is the most important infrastructure in supporting the development of regional tourism, because with good road access it will give tourists a sense of comfort to go through it without worrying about accidents.

2. Weaknesses and Opportunities Strategies

There are several strategies in minimizing weaknesses by taking advantage of opportunities in agro-tourism objects, namely:

a. Increase promotion and improve better development programs to attract visitors so they are ready to face competition between objects.

b. Coordinate with the private sector to invest capital so that it can help continue the development of infrastructure, accommodation, and accompanying attractions.

c. Conduct empowerment, counseling in order to foster and increase public awareness and tourism managers about the importance of tourism awareness.

3. Strengths and Treats Strategies

There are several strategies for using force to overcome threats in agro-tourism objects, namely:

a. Optimizing the natural potential and uniqueness of tourist objects by maintaining and maintaining tourist objects on an ongoing basis to face competition in tourist objects.

b. Development and development of environmentally friendly tourist objects by exercising strict control over the implementation of elements of tourism actors that are not in accordance with the attitudes and actions of tourism actors which can threaten damage to tourist objects.

c. Organize companion tourism objects so that the atmosphere at tourist objects is more varied and able to attract and retain tourists to linger in agro-tourism locations.

4. Weaknesses and Treats Strategy

There are several strategies in minimizing weaknesses and avoiding threats in agro-tourism objects, namely:

a. Improving the quality of professional workforce in the management and maintenance of tourist objects on an ongoing basis so as to reduce environmental damage due to arbitrary development.

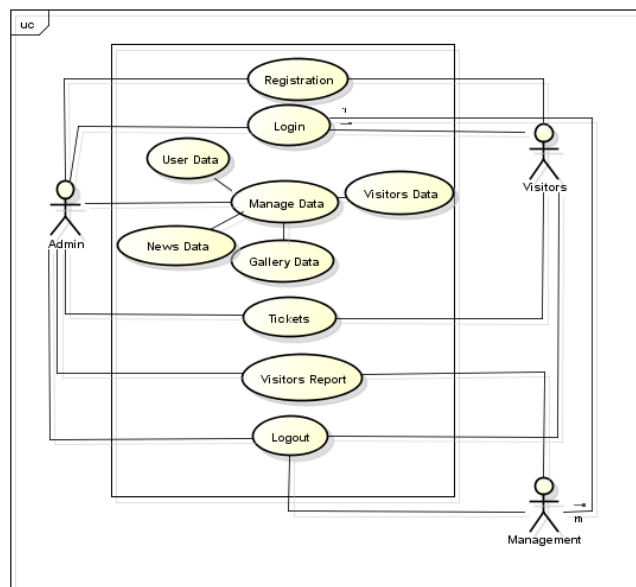
b. Supervise and maintain existing facilities at tourist sites.

### 3.2. Object Oriented System Analysis

The current system design is carried out using object-oriented analysis for systems that are designed so that they can focus on the functionality of the system that is currently running. Furthermore, the results of the analysis will be visualized and documented with the Unified Modeling Language (UML) through Use Case Diagrams and class diagrams with the consideration that these diagrams are considered to represent the overall running system so that they can be understood by users [17]. The following diagram is used:

#### 1. Use Case Diagrams

This diagram describes user actions in application design. System design uses three users, namely admin, visitor, manager. Visitors register first, all users need access rights, visitor, news, gallery, and ticket data. In addition, visitors can view news and galleries, while the admin can print the report. Managers can view visitor data reports [18]. like Figure 2 below:

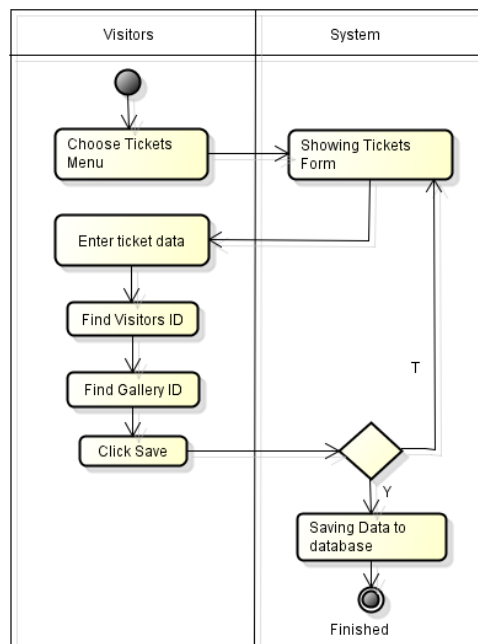


**Figure 2.** Use Case Diagrams

#### 2. Activity Diagrams

Activity Diagram is a process for storing data in the database. The diagram used is the activity registration diagram, the process flow for visitors to fill in registration data. Visitors then enter data on the registration form and click the save button. Then the system saves the registration data. If the visitor fills in incomplete data, the system will return to the registration page. For ticket

activities, namely, visitors open the ticket menu, then the system displays the ticket data form, then visitors fill in the data to order tickets, after completing data input, the system will save ticket purchase data, then visitors can see the e-ticket detail display, then visitors make payments, after making a payment, visitors get an e-ticket print out [19]. Like the ticket activity diagram in Figure 3.



**Figure 3.** Ticket activity diagrams

### 3. Sequence Diagrams

Sequence Diagram Registration is the flow of registration data storage into the database. The steps involved in registration are new visitors, namely the process of inputting and storing data. Sequence diagram User process login to access the application. If user data is already stored in the database, the application can verify it as access rights. The visitor activity diagram is the flow of visitor data storage in the database. Sequence diagrams are used to add visitor data to the database. The ticket activity diagram is a process where visitors buy tickets to enter the tourist park, before getting tickets, visitors first register, then visitors log into the application after logging in the visitor opens the ticket menu to fill in data, such as entering visitor data, select the date of entry to tourist attractions after the data is filled in, the visitor clicks submit to make a payment, then the system saves the ticket purchase data in the database, after that the visitor makes a payment, the e-ticket will appear on the visitor interface or the visitor can download the e-ticket [20]. The following is the ticket activity diagram as shown in Figure 4.

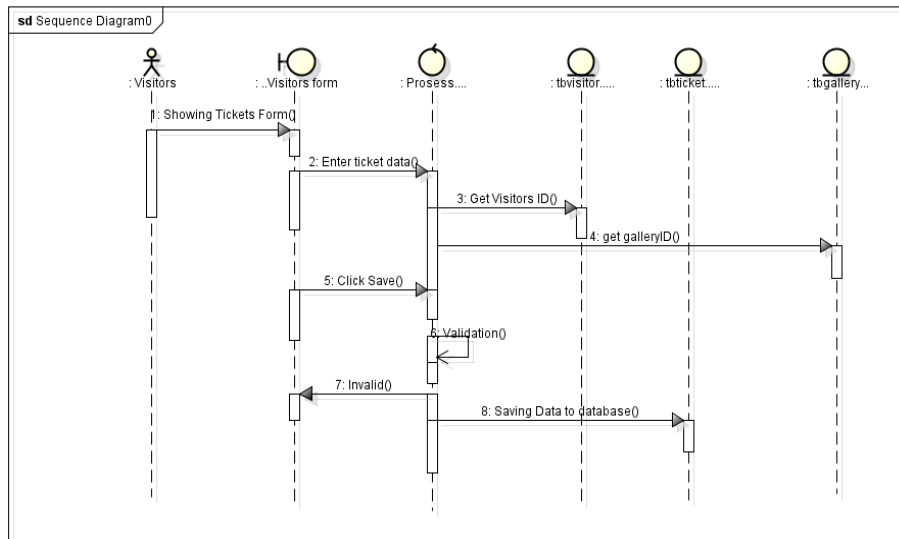


Figure 4. Ticket sequence diagrams

#### 4. Class Diagrams

The class Diagram describes the structure of the system in terms of defining the classes that will be made to build the system. Classes have what are called attributes and methods or operations. Class diagrams describe the types of objects in system and the various kinds of static relations contained in it between tables. The following is a ticket class diagram as shown in Figure 5 below:

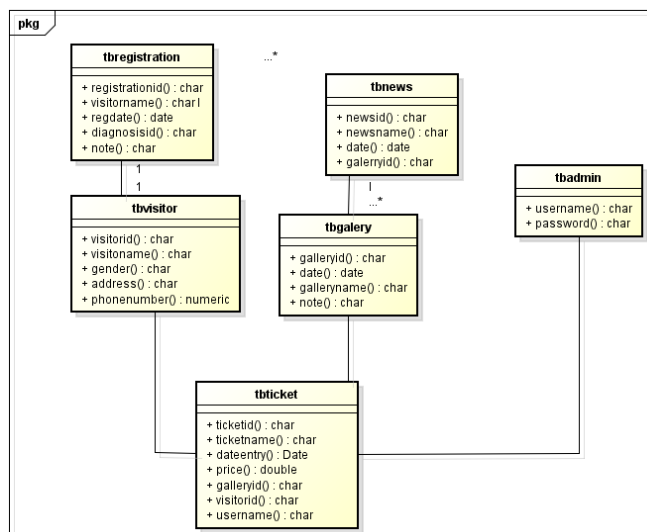


Figure 5. Class diagram

### 3.3 Implementation System

Application design is an important aspect of the Agrotourism information system, functioning as an interface for users to enter the application. The menus contained in the application being built are the Main Menu Page, Registration form, login page, visitor form, gallery form, user form, news form, ticket form, and Report interface. The design of the ticket form is used to input ticket data. This data will be stored in a database so that information systems can access ticket purchase data. While the report displays data on visitors who have purchased tickets. This feature is very useful for tracking and managing the whole ticket-buying process [17-20]. The interface design of agro-tourism information systems can operate efficiently and effectively. Some of the interfaces of the system built are shown in Figures 6, 7, and 8.



Figure 6 Main Page

Figure 7. Ticket Form



Figure 8. E-Ticket

## 4. CONCLUSION

Based on the findings of the Tangerang Regency Agrotourism information system research, the researchers draw the following conclusions: The current state of the Tangerang Regency Agrotourism information system remains conventional, evident in ticket sales, promotional efforts, and the processing of tourist-related data. Consequently, the scope of marketing for tourism attractions is restricted, ticket purchases are limited to physical counters, promotions rely on traditional methods like exhibitions, banners, and brochures, while the processing of tourist data employs Excel rather than dedicated software systems. This has resulted in the absence of centralized databases for storing tourist

information, thus raising concerns about data security and integration across existing systems.

To address these challenges, Tangerang Regency Agrotourism has embarked on a journey to enhance its tourism assets by introducing a web-based Argowisata Tangerang Regency information system. This system aims to facilitate ticket purchases, expand the outreach of tourism attractions, and accelerate and refine the processing of tourist facility data. By centralizing data within a secure database, the integrity of tourist data is ensured, while the integration of disparate systems is achieved. The development strategy for Tangerang Regency Agrotourism follows the SWOT analysis framework and considers the tourism geography information matrix. This approach yields four alternative strategies:

1. Strength Factor: the analysis focuses on organizational and project strengths, assessing the inherent qualities of the tourism venture. Tangerang Regency possesses strengths like the distinctive Koja Cliff and Monkey Forest features, an extensive area of tourist attractions, and affordable admission fees.
2. Weaknesses: intrinsic to the organization, project, or business concept, are scrutinized. Tangerang Regency's tourism objects exhibit weaknesses such as convenient yet time-consuming accessibility, issues of littering, lack of available homestay options, insufficient cleanliness in restroom facilities, and at the tourist attractions.
3. Opportunities: future-oriented opportunities external to the organization or project are explored. Tangerang Regency's tourism sector is presented with opportunities such as generating new employment opportunities for the local community, providing a platform for research, and being included in the government's list of priority development tourism objects.
4. Threats: external threats that could adversely affect the organization, project, or business concept are assessed. Tangerang Regency's tourism attractions face threats such as a potential decline in tourist numbers due to improper waste disposal and associated odors. Additionally, the emergence of alternative marine tourism attractions, emphasizing uniqueness and cleanliness, poses a competitive threat.

## REFERENCES

- [1] Ary, M., & Sanjaya, R. (2020). Strategi Perencanaan Dan pengembangan program Studi Menggunakan Analisis Swot (Studi Kasus program Studi Sistem Informasi arsa university). *Jurnal Tekno Insentif*, 14(1), 1–8. <https://doi.org/10.36787/jti.v14i1.198>
- [2] Wedhasmara, A. (2019). Prototipe Aplikasi perumusan Strategi Manajemen Strategis Pada organisasi bisnis menggunakan analisis SWOT

- dan quantitative strategic planning matrix (QSPM). *JSI: Jurnal Sistem Informasi (E-Journal)*, 11(1). <https://doi.org/10.36706/jsi.v11i1.7697>
- [3] Amirov, A. M. (2020). Regional Agrotourism Competence Assessment: Theoretical approaches. *Journal of Advanced Research in Dynamical and Control Systems*, 12(SP7), 2000–2007. <https://doi.org/10.5373/jardcs/v12sp7/20202316>
  - [4] AW, A., Sulistyowati, N., & MM, Sk. (2019). Strategic Planning Analysis of Information System Technology using SWOT method. *International Journal of Scientific and Research Publications (IJSRP)*, 9(4). <https://doi.org/10.29322/ijsrp.9.04.2019.p8862>
  - [5] Gerami, F., & Zohreh Hosseini, S. (2021). Planning for Sustainable Tourism Development using SWOT analysis – case study: Pasargad Region – fars, Iran. *Athens Journal of Tourism*, 8(1), 43–54. <https://doi.org/10.30958/ajt.8-1-3>
  - [6] Köşker, H., & Özbey, Z. (2022). Zonguldak ili endüstriyel miras turizmi potansiyelinin SWOT Analizi SWOT analysis of Zonguldak Provincial Industrial Heritage Tourism Potential. *Türk Turizm Arastirmalari Dergisi*. <https://doi.org/10.26677/tr1010.2022.1038>
  - [7] Lenis Escobar, A., Rueda López, R., García Guerrero, J. E., & Salinas Cuadrado, E. (2020). Design of strategies for the implementation and management of a complementary monetary system using the SWOT-AHP Methodology. *Sustainability*, 12(17), 6849. <https://doi.org/10.3390/su12176849>
  - [8] Phadermrod, B., Crowder, R. M., & Wills, G. B. Importance-performance analysis based SWOT analysis. *International Journal of Information Management*, 44, 194–203. <https://doi.org/10.1016/j.ijinfomgt.2016.03.009>
  - [9] Uchiyama, Y., & Kohsaka, R. (2019). Strategies of destination management organizations in urban and rural areas: Using text analysis method for SWOT descriptions at meta-level. *International Journal of Hospitality & Tourism Administration*, 24(1), 123–141. 2021. <https://doi.org/10.1080/15256480.2021.1953422>
  - [10] Jang, D., & Chun, D. (2020). A study on the development plan of the footwear industry in the Southeast Region: Using SWOT—AHP ANALYSIS METHOD. *Korean Business Education Review*, 35(4), 361–379. <https://doi.org/10.23839/kabe.2020.35.4.361>
  - [11] Krwawicz, M. (2019). The SWOT PLUS method as an extension of the SWOT method. *Nowoczesne Systemy Zarządzania*, 14(4), 111–124. <https://doi.org/10.37055/nsz/132735>
  - [12] Rochman, F. D., & Putra, B. I. *Analysis of Productivity Measurement Using Marvin E. Mundel Method and SWOT Analysis*. 2023. <https://doi.org/10.21070/ups.388>

- [13] Sharqi, S. Construction management performance enhancement through TQM concept based on SWOT analysis. *Journal of Southwest Jiaotong University*, 54(6). 2019. <https://doi.org/10.35741/issn.0258-2724.54.6.44>
- [14] Wahyuningrum, T., Fitriana, G. F., Bahtiar, A. R., Azalea, A., & -, D. Simultaneous importance-performance analysis based on SWOT in the service domain of electronic-based Government Systems. *International Journal of Advanced Computer Science and Applications*, 13(8). 2022. <https://doi.org/10.14569/ijacsa.2022.0130837>
- [15] Zhong, X. Analysis and development suggestions of Tencent Music based on SWOT method. *BCP Business & Management*, 29, 342–345. 2022. <https://doi.org/10.54691/bcpbm.v29i.2293>
- [16] ÇAGATAY, B. Turkey's foreign trade and climate change policies: Swot Analysis Method. *Kırklareli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(2), 290–322. 2022. <https://doi.org/10.53306/klujeas.1066882>
- [17] Aman. M, Sasono. I, Nugroho. Y.A, Riyanto Dan Suroso. "Improving Sales by Object-Oriented System Approach: E-Commerce Utilization Analysis". *International Journal of Social and Management Studies*, Vol.02, No. 03, pp. 84-92. 2021. <https://doi.org/10.5555/ijosmas.v2i3.35>
- [18] Aman, M., & Suroso. Pengembangan Sistem Informasi wedding organizer Menggunakan Pendekatan Sistem Berorientasi objek Pada CV pesta. *Jurnal Janitra Informatika Dan Sistem Informasi*, 1(1), 47–60. 2021. <https://doi.org/10.25008/janitra.v1i1.119>
- [19] Aman, M.-, ., R., ., S., Sasono, I., & Nugroho, Y. A. Implementasi sistem informasi Pemasaran Rumah Dengan pendekatan Sistem Berorientasi objek pada developer property. *Jurnal ICT: Information Communication & Technology*, 20(1), 156–164. 2021. <https://doi.org/10.36054/jict-ikmi.v20i1.323>
- [20] Nugroho, Y. A., Riyanto, R., Iskandar, J., Aman, M., & Wiyono, N. Web-based patient referral system design from clinic to hospital using Object Oriented Programming System. *J. Inf. Syst. Informatics*, 5(1), 87–101. 2023. <https://doi.org/10.51519/journalisi.v5i1.425>
- [21] Riyanto, R., Aman, M., Tiara, B., Wiyono, N., & Nugroho, Y. A. Development of coronavirus disease patient registration information system with Object Oriented System Approach. *J. Inf. Syst. Informatics*, 3(4), 724–739. 2021. <https://doi.org/10.51519/journalisi.v3i4.195>