

Design and Implementation of Computerized Restaurant Table Booking System

Raji Abdullahi Egigogo^{1*}, Muhammad Tijjani Naniya², Abubakar Ahmad Abubakar³, Almansir Mansir⁴

¹⁻⁴Department of Software Engineering and Cyber Security, Al-Qalam University, Katsina, Nigeria

Abstract

The dining landscape has undergone a significant transformation with the advent of technological advancements, particularly in how restaurants manage customer reservations. Traditionally, reservations were handled through telephone calls or in-person visits, often resulting in long wait times, uncertainty regarding table availability, and limited communication avenues. In addressing these challenges, this paper focuses on the development and implementation of a Restaurant Table Booking System designed to streamline reservations and improve customer experiences. Utilizing an agile software development methodology allows for flexibility, customer input, and prompt delivery of value. Frontend development incorporates HTML, CSS, and Bootstrap to create a user-friendly interface, while PHP and MySQL manage backend processes and database functions. Implementation prioritizes reliability and security with the use of the Apache web server. The findings of this study affirm the Restaurant Table Booking System as a valuable and transformative tool for the restaurant industry. By effectively addressing the need for efficient table management and reservation procedures, this system reduces manual errors and enhances the overall customer experience significantly.

Keywords: Computerized; Restaurants; Table; Booking System

Received: 30 December 2023

Revised: 9 March 2024

Accepted: 15 April 2024

Introduction

In recent years, the restaurant industry has experienced substantial technological advances, sparking a rising demand for digital solutions to boost operational efficiency and enrich customer experiences. Globally, there's been consistent growth in the restaurant sector, reflecting a growing inclination towards dining out (Okumus et al., 2021) (Aditya et al., 2023). In response to these trends, restaurant owners and managers are actively seeking effective means to streamline their operations and adapt to evolving customer preferences (Sidik, 2022)(Dwipayana et al., 2022). The food and hospitality industry has witnessed significant technological strides, particularly with the adoption of restaurant table booking systems, essential for improving customer satisfaction and refining restaurant procedures (Wibowo, 2022)(Meiniarti et al., 2022). These systems empower patrons to easily reserve tables for their preferred date and time, eliminating the need for physical visits or prolonged phone calls (Akan, 2020); (Yulianto et al., 2014) (Purnama & Silaen, 2021). Traditionally, table reservations relied on customers making phone calls or visiting restaurants in person, leading to inefficiencies, extended wait times, and potential errors (Aryanto & others, 2020). Online reservation systems have significantly mitigated these issues, providing a seamless and efficient process for both customers and restaurant staff (Arora, 2021); (Yani et al., 2019); (Pudyawardana, 2023).

In today's dining landscape, as noted by (Bhatia & Manocha, 2022), customers often encounter challenges while trying to reserve tables at their preferred restaurants. These hurdles include prolonged waiting times, uncertainty about availability, and difficulty communicating with restaurant staff. Smart technologies and increased data availability, as highlighted by (Leung & Loo, 2022) empower restaurateurs to gather valuable customer information, aiding in strategic and operational decision-making, offering substantial value to both restaurants and owners.

(Furtado et al., 2020) investigate technology adoption in restaurant management, emphasizing its advantages while recognizing challenges such as initial investment costs and staff training. This aligns with the proposal to develop an online booking system, emphasizing technology's potential in enhancing restaurant operations. Similarly, (Ge et al.,

*Corresponding author.

E-mail address: rajaiegigogo@auk.edu.ng (Raji Abdullahi Egigogo)



2021) delves into customer satisfaction, loyalty, and restaurant management systems, emphasizing features like online reservations and personalized offers that positively influence customer experiences. This study parallels the proposed investigation into the relationship between customer satisfaction and a restaurant table booking system, emphasizing a seamless user experience. Additionally, (Hasanah et al., 2021) examines cloud-based restaurant systems, emphasizing scalability and cost-effectiveness, mentioning concerns about data security. This aligns with the acknowledgment of cloud technology's potential benefits in restaurant operations within the proposed creation of an online booking system, albeit with a specific focus on table reservations.

Moreover (Said et al., 2021) explores mobile applications in restaurant management, highlighting their impact on efficiency and customer engagement while recognizing challenges related to user adoption. This aligns with the proposal's recognition of mobile applications' benefits in restaurant management, with a narrowed focus on table reservation improvements. Similarly, (Roy et al., 2022) reviews data analytics in restaurant management, emphasizing its role in decision-making and optimization while recognizing challenges in small-scale restaurants. Likewise, the proposal acknowledges the significance of data analytics but specifically focuses on table reservations.

Further (Lee et al., 2021) investigates AI integration in restaurant systems, emphasizing its potential in streamlining processes and human-AI collaboration for successful implementation. This aligns with the acknowledgment of AI's potential benefits in restaurant management while focusing on enhancing table reservation processes. Additionally, (Filimonau & Naumova, 2020) explores blockchain technology's potential in enhancing transparency and security in restaurant operations while recognizing scalability and data privacy challenges. Similarly, the proposal recognizes blockchain technology's benefits while focusing on improving table reservation processes.

Moreover (Li et al., 2023) examines robotics and automation's impact on restaurant processes, emphasizing their potential in reducing labor costs while highlighting the need for effective integration with human elements. This aligns with the recognition of technology's potential benefits while focusing on specific enhancements in table reservation processes. (Marsyahariani et al., 2018) investigates IoT applications in restaurant management, recognizing real-time monitoring benefits while emphasizing secure communication and data privacy. This aligns with the recognition of IoT's potential in restaurant operations while focusing on table reservation improvements.

Moreover (Marsyahariani et al., 2018) proposes an advanced reservation system integrating eCRM, emphasizing personalized interactions and customer satisfaction within the proposal's focus on technology's role in enhancing customer experiences. Furthermore, (Subrahmanyam & others, 2021) examines Online Table Reservation Systems, emphasizing operational streamlining and user experiences while recognizing data privacy challenges. This parallels the acknowledgment of technology's benefits and challenges in enhancing restaurant operations within the proposal's focus on table reservation improvements. Moreover, (Sakib, 2023)) highlights accurate revenue forecasting's significance in restaurants, emphasizing data-driven decision-making within the proposal's acknowledgment of technology's role in informed decision-making and enhancing operations. Furthermore, (Lohith et al., 2023) proposes a novel assessment method using textual analysis, emphasizing diverse viewpoints and subjective analysis within the proposal's focus on using technology to improve restaurant operations. Lastly, (Zaman, 2023), proposes technological solutions aiding users in making informed menu choices, emphasizing personalized algorithms and user needs within the proposal's recognition of technology's potential to enhance dining experiences.

The ongoing trend of digitalization in various industries, coupled with consumers' increased expectations for convenience, has further driven the creation and implementation of the Computerized Restaurant Table Booking System. It represents an innovative solution addressing the evolving needs of diners and restaurant management, aiming to heighten customer satisfaction, streamline operations, and meet the demands of the digital era.

Method

A software or system process model outlines the sequential activities within a software development project and their relative order (Wynn & Clarkson, 2018) (Iskandar et al., 2023). In the realm of software development, various approaches are employed, each following a distinct life cycle to ensure the success of the development process (Mohammed et al., 2017) (Al-Saqqa et al., 2020). For this study, the Agile software development model was adopted. The adoption of this model was driven by its renowned flexibility and customer-centric approach, making it a favored

choice for numerous contemporary software development projects (Chapman et al., 2018). The representation model is in Figure 1 below:

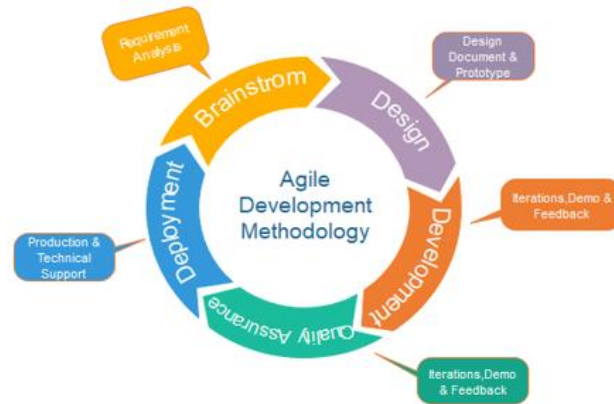


Figure 1. Agile Software Development Model

Requirements engineering encompasses defining, documenting, and maintaining requirements within the engineering design process (Sadiq & Jain, 2012) (Laplante & Kassab, 2022) (Buade & Miller, 2024). In this study this process was diligently undertaken to understand customer desires, analyze needs, assess feasibility, negotiate viable solutions, articulate clear specifications, validate these specifications, and professionally manage the evolving requirements as they transition into a fully functional system (Kossiakoff et al., 2020) (Cross, 2021).

Software design involves conceptualizing and specifying a software system's architecture, structure, behavior, and functionality to meet defined requirements and objectives (Wasson, 2015) (Foster & Towle Jr, 2021) (Menshenin et al., 2023). Positioned within the software development life cycle (SDLC), it crucially bridges the gap between system requirements and practical implementation (Laksana et al., 2022) (Wijaya & Susanto, 2021). This phase encompasses facets such as physical design, logical design, among others. Below is the depiction of various designs for this study.

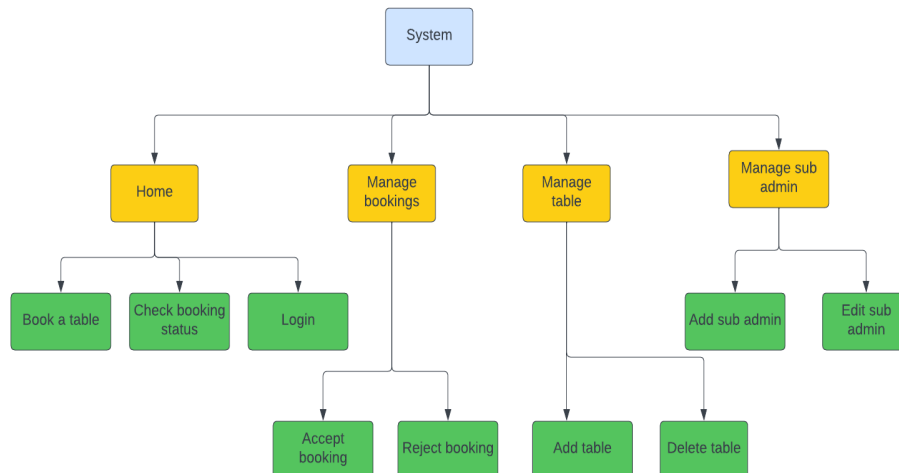


Figure 2. Structural Design of the System

In Figure 2, the structural design of the system is the structure that exists in the system that will be built, where in this system there is a menu that can be used to carry out actions in it because there is a login menu to enter the system using a username and password, a book a table menu to view the table. available, check booking status menu to see the status of tables that have been booked. Next, in the manage bookings menu there is an accept booking and reject booking menu. Then the manage table menu has an add table and delete table menu. Finally, there is the manage sub admin menu, which includes the add sub admin and edit sub admin menus.

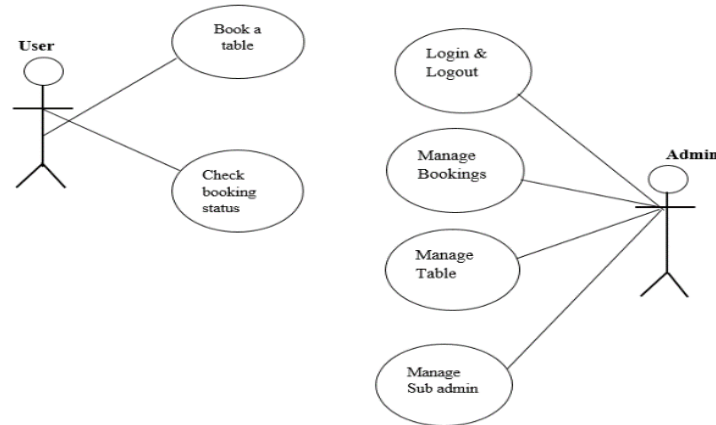


Figure 3. Use Case Diagram of the System

In Figure 3, use case diagram of the system, there are two actors who can use this system, namely user and admin (Iqbal et al., 2020). Users can view book a table and check booking status while admins can login and log out, manage bookings, manage tables and manage sub admins.

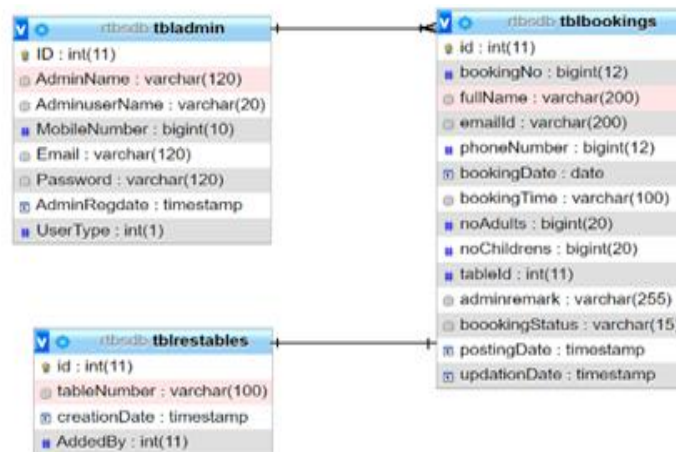


Figure 4. Entity Relationship Diagram of the System

In figure 4. The entity relationship diagram of the system is a database that contains the data needed in this system which is interrelated in the system being built.

Results and Discussion

Results

The system was developed using distinct software development tools, categorized into Front-End, Back-End, and Web Server components. Front-End development relied on HTML, CSS, and Bootstrap for shaping the user interface (Yunita, 2023) (Somi, 2023). Meanwhile, PHP and MYSQL served as the Back-End development tools, managing the system's essential functions (Nurcahyani et al., 2024) (Rochkind, 2013). The Apache web server, valued for its security, reliability, and availability, was selected as the Web Server (Vokorokos et al., 2015). Complementing these were additional tools such as Git, GitHub, and Visual Studio Code utilized throughout the development process. The system is tested using the unit testing, in which the system developed is tested in order to evaluate the system's compliance with the specified user requirements (Piantadosi et al., 2019). In this view, the requirements of this system are categorized into two units/modules. These are the admin requirements, student requirements and user requirements.

Table 1. Admin Requirements Testing

Test ID	Function	Description	Expected Results	Actual Results	Status
1	Login	Admin try to login into the system	Admin logs into the system	Admin was logged into the system	Successful
2	Logout	Admin try to log out in the system	Admin logs out of the system	Admin was logged out of the system	Successful
3	Manage bookings	Admin tries to manage bookings in the system	Booking managed in the system	Bookings were managed in the system	Successful
4	Manage tables	Admin tries to manage the table in the system	Tables managed in the system	Tables were managed in the system	Successful
5	Manage Sub admin	Admin try to manage the Sub admin in the system	Sub admin managed in the system	Sub admins were managed in the system	Successful

Table 1 admin requirements testing is a collection of test results for the system being tested, where each row represents a test scenario with details about the function being tested, the steps taken in testing, and the expected and actual results. First, the "Test ID" column provides a unique identification for each test scenario, while the "Function" column describes the action or feature of the system being tested. A complete description of the actions performed in each test scenario is contained in the "Description" column, which provides an overview of what the system is expected to do in that situation. The "Expected Results" column estimates the results that should occur if the system functions run correctly, while the "Actual Results" column records the actual results of executing that test scenario. Finally, the "Status" column provides information about whether the test scenario was successful or not. Thus, this table presents a clear picture of the system test results and its functionality.

Table 2. User Requirement Testing

Test ID	Function	Description	Expected Results	Actual Results	Status
1	Book a table	User tries to book a table in the system	User book a table in the system	Table was booked in the system	Successful
2	Check booking status	User tries to check booking status in the system	User checks booking status in the system	Booking status was checked in the system	Successful

Table 2 user requirements testing in the table explains the steps taken in each testing scenario. In the first scenario, the user tries to book a table in the system, which should result in a successful table booking. Meanwhile, in the second scenario, the user tries to check the order status in the system, which is expected to result in a successful retrieval of the order status. Thus, the table describes the actions performed by users in system testing and what should happen as a result.

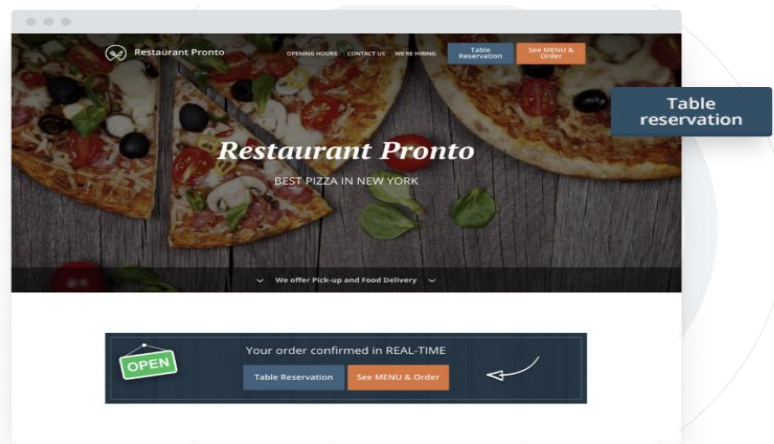


Figure 5. Restaurant System Home Page

Figure 5 restaurant system home page is the appearance of the system page when it is first opened. On this page there are several menus that can be used by users and admins to order and manage restaurant table reservations.

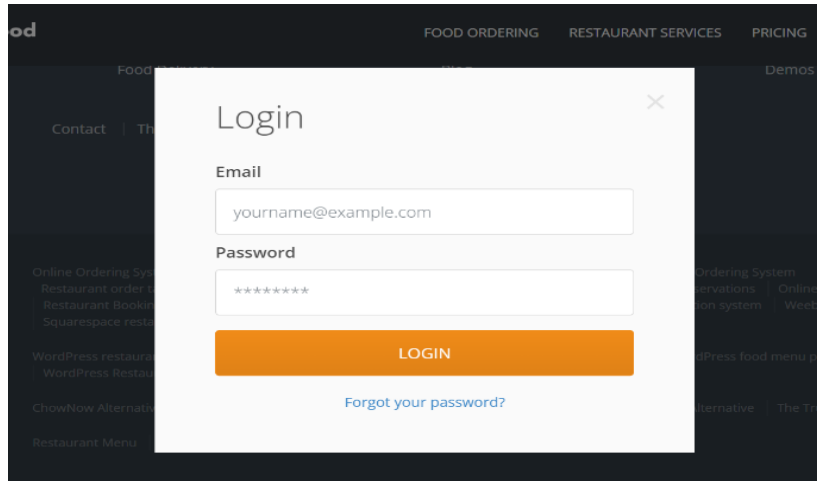


Figure 6. Restaurant System Login Page

Figure 6 restaurant system login page displays the login page for the restaurant system. In the middle of the page, there is an input area for entering the username and password. Below that, there is a 'Login' button that can be clicked to enter the system. The clean and intuitive page design makes it easy for users to access the system and perform various actions related to restaurant management.

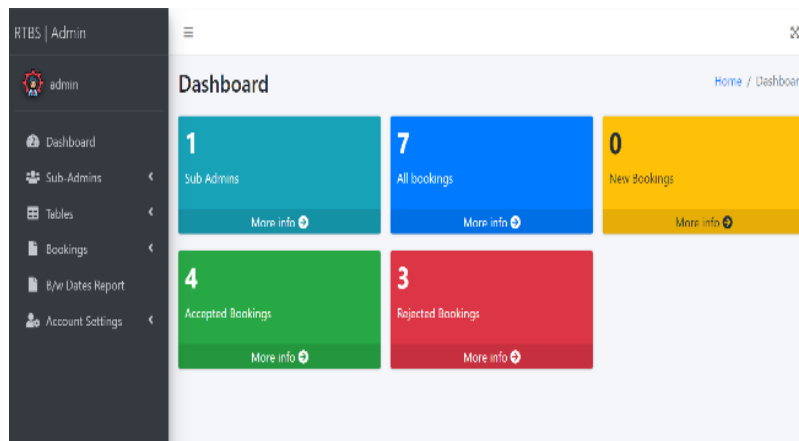


Figure 7. System Dashboard Page

Figure 7 The system dashboard page is the admin dashboard page for restaurant management. On this page, there is a sub admin menu, tables, bookings, data reports, and account settings which can be accessed by the admin.

Discussion

The restaurant table booking system has been efficiently developed, integrating diverse technologies such as HTML, CSS, Bootstrap, PHP, and MySQL. Its primary function revolves around providing users with easy access to available tables, enabling hassle-free reservations, and efficient booking management. Throughout its development, rigorous testing and evaluation ensured the system's flawless functionality. A substantial part of this evaluation involved collecting and meticulously analyzing user feedback. This feedback has been pivotal in refining the system's user interface, elevating the overall user experience, and ensuring alignment with the intended objectives.

Conclusions and Suggestions

Conclusions

The results of this study firmly establish the restaurant table booking system as a highly valuable and transformative addition to the restaurant industry. By effectively addressing the critical need for efficient table management and reservation processes, this system significantly minimizes manual errors while notably elevating the overall customer experience. The amalgamation of user feedback and thorough testing unequivocally confirms the system's exceptional functionality and user-friendliness, rendering it an invaluable tool for both restaurant staff and patrons.

Suggestions

Here are some suggestions for further research related to the Design and Implementation of a Computer-Based Restaurant Table Reservation System:

1. Future research could focus on developing additional features to improve system functionality, such as the use of intelligent algorithms to predict reservation rates and wait times.
2. Further research can evaluate the system's performance in handling high-order volumes. This includes load testing, response time analysis, and identification of bottlenecks in the system.
3. Expanding the ordering system to include mobile applications compatible with multiple platforms. This will give users more flexibility to place mobile orders.

References

- Aditya, I., Prihatini, P. M., & Sarja, N. K. P. G. (2023). Sistem Reservasi Meja dan Makanan Pada D'Wika Restoran Berbasis Web. *Politeknik Negeri Bal*.
- Akan, P. (2020). The restaurant industry in the new era: What is ahead for businesses and research? *Industrial and Managerial Solutions for Tourism Enterprises*, 94–109. <https://doi.org/10.4018/978-1-7998-3030-6.ch007>
- Al-Saqqa, S., Sawalha, S., & AbdelNabi, H. (2020). Agile software development: Methodologies and trends. *International Journal of Interactive Mobile Technologies*, 14(11).
- Arora, A. (2021). Table Reservation and Meal Ordering System Using QR Code. *International Journal for Research in Applied Science and Engineering Technology*, 9(VII), 1387–1390. <https://doi.org/10.22214/ijraset.2021.36492>
- Aryanto, V. D. W., & others. (2020). Marketing Digital: Solusi Bisnis Masa Kini dan Masa Depan. *PT Kanisius*.
- Bhatia, M., & Manocha, A. (2022). Cognitive Framework of Food Quality Assessment in IoT-Inspired Smart Restaurants. *IEEE Internet of Things Journal*, 9(9), 6350–6358. <https://doi.org/10.1109/JIOT.2020.3001447>
- Buede, D. M., & Miller, W. D. (2024). The engineering design of systems: models and methods. *John Wiley & Sons*.
- Chapman, W. L., Bahill, A. T., & Wymore, A. W. (2018). Engineering modeling and design. *CRC Press*. <https://doi.org/https://doi.org/10.1201/9780203757314>
- Cross, N. (2021). Engineering design methods: strategies for product design. *John Wiley & Sons*.
- Dwipayana, K. W., Winetra, I., & Pradnyana, I. (2022). Sistem Reservasi Pada Restoran Temusapa Berbasis Website. *Politeknik Negeri Bali*.
- Filimonau, V., & Naumova, E. (2020). The blockchain technology and the scope of its application in hospitality operations. *International Journal of Hospitality Management*, 87. <https://doi.org/10.1016/j.ijhm.2019.102383>
- Foster, E., & Towle Jr, B. (2021). Software engineering: a methodical approach. *Auerbach Publications*. <https://doi.org/https://doi.org/10.1201/9780367746025>
- Furtado, N. G., Furtado, J. V., Filho, L. C. V., & da Silva, R. C. (2020). The influence of technology payment adoption in satisfaction: A study with restaurant consumers. *International Journal of Business Excellence*, 21(2), 209–230. <https://doi.org/10.1504/IJBEX.2020.107580>
- Ge, Y., Yuan, Q., Wang, Y., & Park, K. (2021). The structural relationship among perceived service quality, perceived value, and customer satisfaction-focused on starbucks reserve coffee shops in Shanghai, China. *Sustainability (Switzerland)*, 13(15). <https://doi.org/10.3390/su13158633>
- Hasanah, F. N., Renaldi, F., & Umbara, F. R. (2021). Implementing Cloud Computing Technology on Restaurant's Expenses Monitoring System. *IOP Conference Series: Materials Science and Engineering*, 1115(1), 012039. <https://doi.org/10.1088/1757-899x/1115/1/012039>

- Iqbal, S., Al-Azzoni, I., Allen, G., & Khan, H. U. (2020). Extending UML use case diagrams to represent non-interactive functional requirements. *E-Informatica Software Engineering Journal*, 14(1), 97–115. <https://doi.org/https://doi.org/10.37190/e-Inf200104>
- Iskandar, A., Fitriani, R., Ida, N., Sitompul, P. H. S., & others. (2023). *Dasar Metode Penelitian*. Yayasan Cendekiawan Inovasi Digital Indonesia.
- Kossiakoff, A., Biemer, S. M., Seymour, S. J., & Flanigan, D. A. (2020). Systems engineering principles and practice. *John Wiley & Sons*. <https://doi.org/https://doi.org/10.1002/9781119516699>
- Laksana, I., Kariati, N. M., & Saputra, U. W. E. (2022). Perancangan Desain Media Reservasi Berbasis Website di Ocean Terrace Restaurant. *Politeknik Negeri Bali*.
- Laplante, P. A., & Kassab, M. (2022). Requirements engineering for software and systems. *Auerbach Publications*. <https://doi.org/https://doi.org/10.1201/9781003129509>
- Lee, M., Kwon, W., & Back, K. J. (2021). Artificial intelligence for hospitality big data analytics: developing a prediction model of restaurant review helpfulness for customer decision-making. *International Journal of Contemporary Hospitality Management*, 33(6), 2117–2136. <https://doi.org/10.1108/IJCHM-06-2020-0587>
- Leung, R., & Loo, P. T. (2022). Co-creating interactive dining experiences via interconnected and interoperable smart technology. *Asian Journal of Technology Innovation*, 30(1), 45–67. <https://doi.org/10.1080/19761597.2020.1822748>
- Li, Y., Zhang, Z., Pedersen, S., Liu, X., & Zhang, Z. (2023). The influence of relative popularity on negative fake reviews: A case study on restaurant reviews. *Journal of Business Research*, 162. <https://doi.org/10.1016/j.jbusres.2023.113895>
- Lohith, C., Chandramouli, H., Balasingam, U., & Arun Kumar, S. (2023). Aspect Oriented Sentiment Analysis on Customer Reviews on Restaurant Using the LDA and BERT Method. *SN Computer Science*, 4(4). <https://doi.org/10.1007/s42979-022-01634-8>
- Marsyahariani, N., Daud, N., Amin, M., & Aziz, A. (2018a). Restaurant reservation system using Electronic customer relationship management. *E-Ajuimct.Uitm.Edu.My*, 2289–6589.
- Marsyahariani, N., Daud, N., Amin, M., & Aziz, A. (2018b). Restaurant reservation system using Electronic customer relationship management. *E-Ajuimct.Uitm.Edu.My*, 2289–6589.
- Meiniarti, M., Gunawan, R., Suherman, Y., & Setiawan, A. (2022). Perancangan Sistem Reservasi Meja dan Makanan Pada Rumah Makan Berbasis Web (Studi Kasus Di Rumah Makan Ayam Bakar Celup Mang Rojak). *Infotek: Jurnal Informatika Dan Teknologi*, 5(2), 287–297. <https://doi.org/https://doi.org/10.29408/jit.v5i2.5848>
- Menshenin, Y., Mordecai, Y., Crawley, E. F., & Cameron, B. G. (2023). Model-based system architecting and decision-making. In *Handbook of Model-Based Systems Engineering* (pp. 289–330). Springer. https://doi.org/https://doi.org/10.1007/978-3-030-93582-5_17
- Mohammed, N. M., Niazi, M., Alshayeb, M., & Mahmood, S. (2017). Exploring software security approaches in software development lifecycle: A systematic mapping study. *Computer Standards & Interfaces*, 50, 107–115. <https://doi.org/https://doi.org/10.1016/j.csi.2016.10.001>
- Nurcahyani, A. S. R., Gunawan, D., & Lai, C.-H. (2024). Development of a learning management system. *AIP Conference Proceedings*, 2926(1). <https://doi.org/https://doi.org/10.1063/5.0184762>
- Okumus, B., Ozturk, A. B., & Bilgihan, A. (2021). Generation Y's dining out behavior. *International Hospitality Review*, 35(1), 41–56. <https://doi.org/10.1108/ihr-07-2020-0023>
- Piantadosi, V., Scalabrino, S., & Oliveto, R. (2019). Fixing of security vulnerabilities in open source projects: A case study of apache http server and apache tomcat. *IEEE Conference on Software Testing, Validation and Verification (ICST)*, 68–78. <https://doi.org/https://doi.org/10.1109/ICST.2019.00017>
- Pudyawardana, W. (2023). Perancangan Sistem Informasi Pemesanan Makanan Dan Minuman Berbasis Web Pada Restoran Lamongan Cahaya. *ALMUISY: Journal of Al Muslim Information System*, 2(1), 2023.
- Purnama, F., & Silaen, S. (2021). Sistem Informasi Pemesanan Online Pada Situasi Kafe and Resto. *FORTECH (Journal of Information Technology)*, 5(1), 1–6.
- Rochkind, M. (2013). Expert PHP and MySQL: application design and development. *Apress*. <https://doi.org/https://doi.org/10.1007/978-1-4302-6008-0>
- Roy, D., Spiliotopoulou, E., & de Vries, J. (2022). Restaurant analytics: Emerging practice and research opportunities. *Production and Operations Management*, 31(10), 3687–3709. <https://doi.org/10.1111/poms.13809>

- Sadiq, M., & Jain, S. K. (2012). An insight into requirements engineering processes. *Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering*, 108 LNICST, 313–318. https://doi.org/10.1007/978-3-642-35615-5_48
- Said, Z., Housni, A. L., & College, M. E. (2021). Reserve your table : A mobile application for reservations in a restaurant Methodology : Literature review. *Journal of Student Research*, 1–7.
- Sakib, S. M. N. (2023). Restaurant sales prediction using machine learning. *Handbook of Research on AI and Machine Learning Applications in Customer Support and Analytics*, 202–226. <https://doi.org/10.4018/978-1-6684-7105-0.ch011>
- Sidik, A. (2022). Sistem Pemesanan Makanan dan Minuman Berbasis Web (Studi Kasus Restoran Bumbu Desa Lampung). *Jurnal Teknologi Pintar*, 2(5). <https://doi.org/https://doi.org/10.17977/um068v2i42022p155-163>
- Somi, M. (2023). User Interface Development of a Modern Web Application. *Politecnico Di Torino*.
- Subrahmanyam, K., & others. (2021). Online Table Reservation With Pre-Ordering. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(4), 1316–1321. <https://doi.org/https://doi.org/10.17762/turcomat.v12i4.1197>
- Vokorokos, L., Baláz, A., & Ádám, N. (2015). Secure web server system resources utilization. *Acta Polytechnica Hungarica*, 12(2), 5–19. <https://doi.org/https://doi.org/10.12700/APH.12.2.2015.2.1>
- Wasson, C. S. (2015). System engineering analysis, design, and development: Concepts, principles, and practices. *John Wiley & Sons*.
- Wibowo, A. (2022). Transformasi Ekonomi Digital. *Penerbit Yayasan Prima Agus Teknik*, 1–179.
- Wijaya, W. W. W., & Susanto, E. (2021). New normal: Pengembangan Sistem informasi penjualan menggunakan metode SDLC (system development life cycle). *Jurnal Sustainable: Jurnal Hasil Penelitian Dan Industri Terapan*, 10(1), 1–9. <https://doi.org/https://doi.org/10.31629/sustainable.v10i1.3190>
- Wynn, D. C., & Clarkson, P. J. (2018). Process models in design and development. *Research in Engineering Design*, 29, 161–202. <https://doi.org/https://doi.org/10.1007/s00163-017-0262-7>
- Yani, A. I., Asmunin, S., & Kom, M. (2019). Rancang Bangun Sitem Informasi Manajemen Pelayanan Restoran Berbasis Web Menggunakan Framework Laravel. *Jurnal Manajemen Informatika*, 9(2). <https://doi.org/https://doi.org/10.35889/jutisi.v9i2.522>
- Yulianto, B., Dewi, L. C., & Wijaya, O. (2014). Peran Website Restoran Terhadap Daya Tarik Konsumen Online. *ComTech: Computer, Mathematics and Engineering Applications*, 5(2), 1096–1109. <https://doi.org/https://doi.org/10.21512/comtech.v5i2.2376>
- Yunita, A. (2023). Challenges in front-end JavaScript development for web applications Developers’ perspective. *JournalYunita*.
- Zaman, K. T. (2023). Enhancing Restaurant Dining Experience: Design and Evaluation of A Mobile App For Personalized Menu Item Selection In Restaurants A Paper. *North Dakota State University*.