



D'Marsian's: Web-Based Admission and Progress Tracking with Real-Time Visualization System

Hadjara A. Salem¹, Harra Lou S. Ramos², Helman Dashedle M. Dacuma³, Jonel E. Ebo⁴,
Dr. Philipcris C. Encarnacion⁵

¹Saint Columban College, Pagadian City, Philippines, hadjara.salem@sccpag.edu.ph

²Saint Columban College, Pagadian City, Philippines, harralou.amos@sccpag.edu.ph

³Saint Columban College, Pagadian City, Philippines, helmandashedle.dacuma@sccpag.edu.ph

⁴Saint Columban College, Pagadian City, Philippines, jonel.ccs@sccpag.edu.ph

⁵Saint Columban College, Pagadian City, Philippines, philipcrisen.ccs@sccpag.edu.ph

Received Date : December 25, 2025 Accepted Date : January 27, 2026 Published Date : February 07, 2026

ABSTRACT

The initial evaluation indicated that many small training facilities, such as taekwondo facilities, are still using manual systems to track student admissions, payments, and program changes. The above stated steps result in 3 main results: slow data retrieval, inaccuracy of student records, and lack of visibility into the performance of students create additional work for the office staff. The lack of a single source for data and a visual tool for managing data makes it difficult for office staff to conduct actual enrollment trend analysis, payment status tracking, and evaluate student progress. The research contains information on the D'Marsian's system, a web-based admission and progress monitoring tool, which gives users visual data in real time. This system was designed as part of a capstone project to provide a single source of digital data that meets all the operational needs of the client.

The system was developed using a systematic, methodical approach that included initial requirements gathering, data analysis, system design, implementation, and review to ensure alignment with client expectations and operational workflows. Students can register using the online system, and all student records are stored in one place. Real-time data visualization and several systems provide a record of student achievements, progress in terms of their belts and payment balances, along with the status of their enrolment, should they be accepted. Automatic email reminders are sent that provide users with advance notice of deadlines to pay and other important notices. The system sends email notifications to inform users about upcoming payment deadlines and essential announcements. Still, administrators must manually start these notifications, which gives them better control and precision when sending messages. The system assessment results show that administrative work became more efficient, data access improved, and communication between administrators and

parents became more structured. The research shows that small training institutions can use a web-based admissions and progress-tracking system as an effective operational improvement tool and a scalable model for educational and sports organizations. The study explores web-based systems for managing check-in processes and student admissions, while tracking student progress through real-time data display and the development of information systems.

Key Words: Web-based system, admission management, student progress tracking, real-time visualization, information system development.

1. INTRODUCTION

In many public and private organizations, technology has become an essential component of recent digital-era advancements [1]. The increasing adoption of digital technologies across various sectors has emphasized the need for organizations to improve efficiency, data accuracy, and accessibility through information systems [2]. Recent studies show that digital technology adoption plays a significant role in improving efficiency and performance in small and medium-sized organizations [3]. Any small-scale company always gives business orders the highest priority while considering the best strategy. [4]. Further research will link digital capability with better operational performance and data management [5]. International reports highlighted digital transformation as the most crucial target for small businesses, to update their technologies and systems and improve service delivery [6]. Although recent technological improvements have occurred, small training organizations, including Taekwondo studios, still rely on paper documents to complete student admissions, track payments, and monitor student progress. The traditional practices these institutions use to manage their operations become less effective when their student population exceeds 50, because they create delays in retrieving information, disorganized documentation, and make

it difficult to track student advancement, and create problems for administrators who try to contact parents. The existing restrictions demonstrate that small training institutions need to adopt centralized, web-based management systems tailored to their needs.

The research process began with requirements gathering and analysis, which is a crucial step in software development because it helps the development team understand what the system must do to meet user needs and supports proper planning and system design [7]. The team took the first step to identify current administrative procedures, along with the essential requirements for system admission management, student record maintenance, payment monitoring, and student achievement tracking. The team gathered information from their first assessment of existing manual procedures and combined it with input from administrative personnel to create a study that included all required information. The collected data was then analyzed to define the system's functional and non-functional requirements [8], as well as user roles and system limitations. Research shows that misunderstandings of requirements at an early stage can lead to problems later in development, making requirements analysis an essential part of building a successful system [8].

Following the analysis phase, the system design stage was conducted to define the overall architecture, data flow, and core system modules. This stage included creating diagrams and models, such as a block diagram, to illustrate the interactions among parents, administrators, system components, and the centralized database. The design developed a central web-based system that enables online student registration, student profile management, payment tracking, and real-time monitoring of enrollment and progress data, in accordance with SRS specifications.[9]

Administrative operations at D'Marsian's Taekwondo Studio were handled through manual record-keeping, which required staff members to maintain student enrollment records and payment information, and to monitor student development and academic achievements. Parents who asked for information about their children's progress, outstanding payments, and training results faced long wait times because administrators had to search for and confirm records [10] manually. In addition to their existing duties, staff members had to perform three additional tasks: updating belt rankings, monitoring attendance, and recording achievements. The manual work required for these tasks increased the risk of errors, leading to data inconsistencies typical of paper-based systems. [11]. These recurring administrative challenges demonstrated the need for a more efficient and organized system, as digital information systems have been shown to improve administrative efficiency and record accuracy in educational and organizational settings. In response, this study presents D'Marsian's Web-Based Admission and Progress

Tracking with Real-Time Visualization System, a centralized web-based platform designed to support online student registration, student profile management, payment tracking, and real-time visualization of enrollment and progress data [12],[13]. The system also provides administrator-initiated system-assisted notifications, as well as a public-facing landing page that displays studio information, student achievements, rankings, and events. The system plan aims to achieve three goals through its digital transformation of administrative workflows and the creation of a centralized record system, which will enable better administrative efficiency, improved data access, and more efficient communication between school staff and parents, according to the Software Requirements Specification, which defines project objectives and boundaries [14].

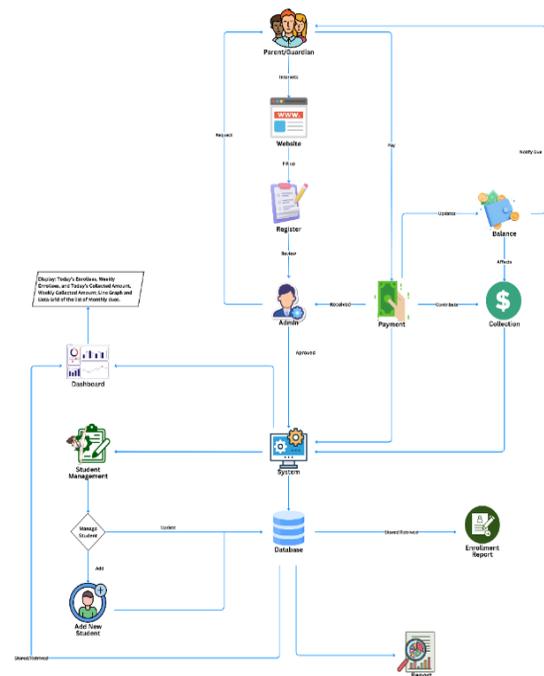


Figure. 1: Product Perspective

Figure 1 shows the product perspective of D'Marsian's Web-Based Admission and Progress Tracking System with Real-Time Visualization System shows how parents or guardians, administrators, system components, and the centralized database interact with each other. The system functions as a web-based platform that enables parents or guardians to access the website to view information and submit student registrations. At the same time, administrators use the administrative interface to receive, review, and manage these registrations.

The system connects its essential modules for student management, payment processing, dashboard visualization, and reporting, as shown in the diagram. The system processes and stores registration and payment data submitted by parents in a centralized database to maintain data consistency and

reliability. The administrative dashboard displays real-time updates of student balances and collection records after payment transactions occur. The dashboard displays enrollment statistics, payment collections, and student progress in visual summaries, which help administrators track system operations and make informed decisions.

Overall, the product perspective presents a centralized, integrated solution that replaces manual administrative procedures with an efficient digital workflow. The platform improves data access through its unified system, which combines student enrollment records with financial data and training progress details, while enabling administrators to communicate more effectively with parents and assisting in running the Taekwondo gym.

2. METHODOLOGY

The study, conducted to develop an online application and progress-tracking system for a Taekwondo gym, used system development research processes and a structured approach to ensure the resulting system addressed the administrative problems identified during the initial assessment. These problems included manual processes for student enrollment, student payment tracking, and student progress monitoring. The approach used a systematic, iterative process to ensure that the system requirements, design elements, and operational needs of D'Marsian's Taekwondo Studio were properly documented in the Software Requirements Specification. [15].

The research process began with requirements gathering and analysis, which is a crucial step in software development because it helps the development team understand what the system must do to meet user needs and supports proper planning and system design. The team researched current administrative procedures to determine essential system requirements for three areas: admission management, student records, and payment tracking and progress visualization. The team gathered information through two methods: studying existing manual work methods and interviewing administrative staff. The collected data was analyzed to define the system's functional and non-functional requirements, user roles, and system limitations. Research shows that misunderstandings of requirements at an early stage can lead to problems later in development, underscoring the importance of requirements analysis in building a successful system.

The system design stage, after the analysis phase, established all system components through its work on architectural design, data movement studies, and essential system modules. This stage used various diagrammatic and modeling techniques to create block diagrams that depicted how parents, administrators, system components, and the centralized database system interacted with one another. The design used a centralized web-based system that enables

online student registration and student profile management, payment tracking, and real-time enrollment and progress data visualization according to the SRS requirements.

During the implementation phase, developers created the system in accordance with the approved design specifications and project requirements. The system used appropriate web technologies for implementation, and its features enabled administrators and parents to access different functions via role-based access control. The development team created core features that included registration processing and payment record management, dashboard visualization and report generation, and system-assisted notification features that administrators could control. The system integrated these core features with the centralized database to maintain consistent and reliable data across all functions.

Finally, the review and validation phase was conducted to verify that the system met the defined requirements and operated as intended. Functional testing was performed to ensure that major system features worked correctly, including registration submission, payment tracking updates, dashboard data visualization, and reporting functions [16]. Client feedback was used to confirm that the system aligned with operational expectations. The methodology ensured that the developed system effectively addressed the identified administrative challenges while adhering to the scope, constraints, and objectives outlined in the SRS [17].

2.1 Research Design

We used an Agile method to develop this system because of its flexibility and collaborative, iterative characteristics that matched our research needs. Agile development involves systems going through many phases during development and continuing to be refined with ongoing user input through incremental improvement. The development of the Web-Based Admissions and Progress Tracking with Real-Time Visualization System required this approach, as it enabled us to work closely with our clients to ensure the system met the Taekwondo studio's operational requirements.

In addition, the system's development adhered to recommended software engineering practices for requirements analysis, system design, implementation, testing, and documentation. These practices ensured that the developed system maintained quality, reliability, and maintainability throughout the development process. The Agile methodology also supported better collaboration among team members and facilitated timely adjustments to system features when necessary. The Agile process model adopted in this study followed a cyclical progression through several phases, as illustrated in Figure 2.

2.2 Software Development Phases

D'Marsian's developed their Web-Based Admission and Progress Tracking with Real-Time Visualization System using a structured approach in accordance with the Agile software development methodology. The rationale for adopting an

Agile method was to facilitate iterative development and allow flexibility in ongoing system development as requirements evolve based on customer feedback. The Agile development process was organized into multiple phases to provide systematic planning (the first phase of each development activity), accurate implementation, and validation, all of which contribute to the successful development of the system (SRS).

2.2.1 Requirements Specification

During the Requirements Specification phase, the focus was placed on identifying, analyzing, and documenting all functional and non-functional requirements for the new system. This phase also entailed initial assessments of D'Marsian's current administrative processes, which are performed manually, including student admission, fee payment tracking, and progress tracking. The Consultants conducted several consultations with the client to understand the client's operational workflows, user roles, and expectations regarding the system. All of the above phases helped ensure that the system requirements accurately reflect the client's actual requirements.

Functional requirements identified during this phase included online student registration, student profile management, payment and balance tracking, real-time visualization of enrollment and progress data, report generation, and system-assisted notifications initiated by administrators. Non-functional requirements such as usability, security, data accuracy, system performance, and role-based access control were also defined. All identified requirements were documented in the Software Requirements Specification (SRS) to serve as a reference for system design, development, and validation throughout the software development lifecycle.

3. RESULTS

D'Marsian's used an Agile process model for both the design and implementation of its Web-Based Admission and Progress Tracking with Real-Time Visualization System. Each of the four phases in this process helped develop successful system features to meet the administrative needs identified in the original assessment. The results of each phase are discussed below.

3.1 Review

Success will depend on identifying clear and complete requirements. The efforts began with setting out the needs and capabilities required to support and manage the functions; namely, all of the processes (functional and non-functional) that currently exist at D. M. T. S. will be taken into account, and how administrative processes (e.g., students being admitted, tracking payments made, and monitoring student progress) will take place. Information was gathered through a combination of initial assessments and consultation with the developer (client) to understand the current 'workflow' of existing processes and help identify the exact 'needs' that will be encompassed in the system's functionality. The results of

this phase ensured that features such as Online Student Registration, Student Profile Management, Payment Tracking, Real-Time Visualization, and Reporting could support the day-to-day operational needs of the school, so that, as the project moved forward, the creation of detailed Requirement Sign-Off Documentation (Req. Docs) would be created for each function for future phases of development.

3.2 Planning

The planning stage was crucial for coordinating the activities involved in developing the system and for defining the project's approach. By reviewing the requirements, we had a clear structure for our project, including system objectives, project scope, and development tasks. We also identified key modules for the system (registration, student administration, payment tracking, dashboard visualization, and report generation). This stage was used to reserve resources, establish timelines, and define the responsibilities of each member on the development team and the client. Frequent meetings between the development team and the client allowed both parties to maintain a consistent understanding of what the system could accomplish and its limitations.

3.3 Design

During the design phase, the overall system architecture and data flow were defined. This included designing the interaction between parents or guardians, administrators, system modules, and the centralized database. To show how student registration, payment updates, and report generation work, diagrams (e.g., block diagrams) were developed. User interface designs were created to make it easy to use and straightforward for both parents and administrators. The design focused on a centralized, web-based architecture that would enable real-time visualizations to help administrators monitor and make decisions efficiently

3.3.1 Technical Specification

The D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System comprises several key components that support centralized admission management, payment tracking, and student progress monitoring. The system is implemented as a web-based platform that allows users to access its functionalities through a standard web browser. Parents or guardians interact with the system through the website to register students and view relevant information. At the same time, administrators serve as the primary users responsible for managing registrations, student records, payments, progress data, and system reports. The system can be accessed using devices such as desktop computers, laptops, tablets, or smartphones, provided that a stable internet connection is available. Administrators manage the system by reviewing submitted registrations, tracking payments and balances, updating student information, monitoring progress and achievements, and generating reports. The centralized database ensures that all student data, including enrollment, fees, and progress, is securely stored and

consistently maintained. The system uses a client–server architecture in which the web interface communicates with the backend system for data processing and storage. HTML

- CSS
- PHP
- MySQL
- JavaScript
- Bootstrap

3.3.2 Use Case Diagram

A use case diagram illustrates the system's functional requirements and user interactions from the end users' perspective. Its primary aim is to provide a straightforward, high-level summary of how users interact with the system.

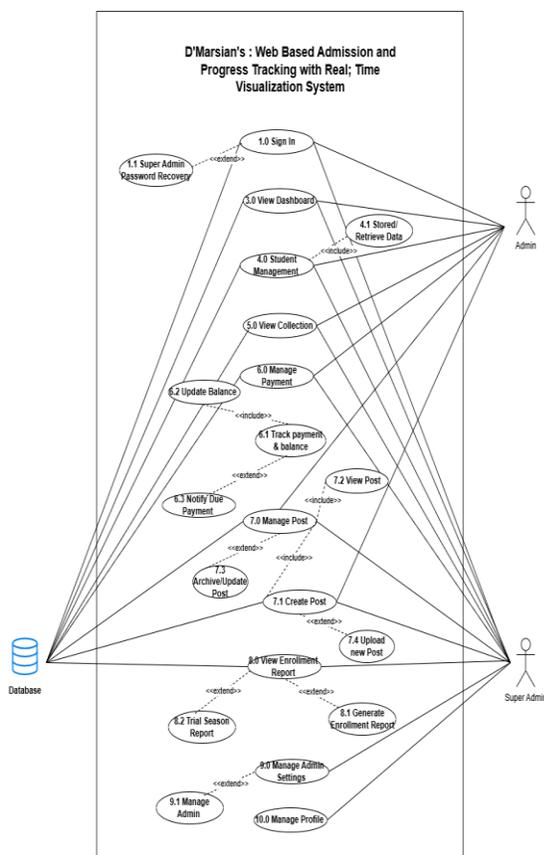


Figure 2: Admin Use Case Diagram

Figure 2 illustrates the Admin Use Case Diagram for D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System, showing the functions administrators perform to manage system operations. Admin users can log in to the system, review and approve student registrations, manage student profiles, track payments and balances, update student progress and achievements, manage posts and announcements, view dashboard visualizations, and

generate reports. These use cases highlight the administrator's role in maintaining accurate records, monitoring enrollment and payment status, and ensuring smooth system operation. In contrast, Figure 4 presents the Parent Use Case Diagram, which focuses on the system's public-facing functions. Parents can view informational pages such as the home, about, offer, schedule, archive, and contact pages, and they can submit student registration forms through the website. Together, the two figures clearly separate roles, with administrators handling system management and decision-making. At the same time, parents interact with the system mainly for information access and student registration.

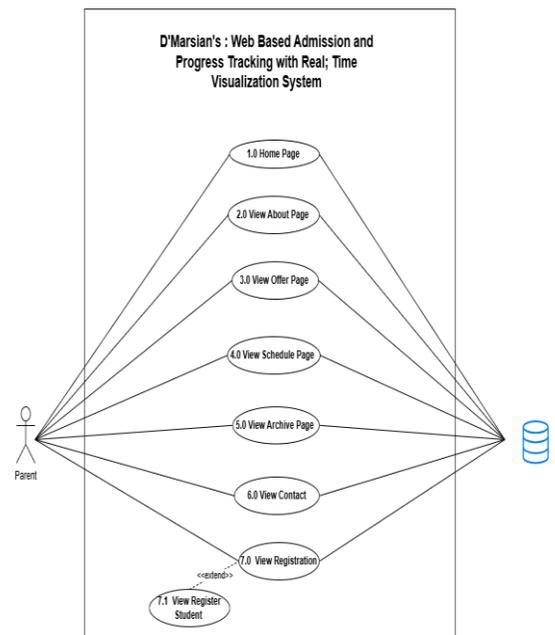


Figure 3: Parent Use Case Diagram

Figure 3 illustrate the Parent Use Case Diagram shows how parents interact with D'Marsian's Web-Based Admission and Progress Tracking System through the public website. Parents can view information pages and submit student registration forms, which are stored in the system database for administrator review.

3.3.3 Interface Design

The interface design of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System was created to be simple, straightforward, and easy to use for both administrators and parents. The system uses a web-based interface that allows users to navigate pages and features without difficulty. Clear menus, labeled buttons, and organized layouts were applied to reduce user confusion and support smooth interaction with the system.



Figure 4: Data Visualization

Figure 4 illustrates the data visualization feature of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System as displayed on the administrator dashboard. The dashboard presents enrollment and student progress data using visual charts that summarize information in an easy-to-understand format.

These visual charts allow administrators to quickly monitor enrollment status and student progress without manually reviewing records. By visually displaying real-time data, the system supports faster understanding, better monitoring, and more efficient administrative decision-making..

The registration form is titled 'JOIN THE TEAM' and includes the subtext 'Begin your journey to discipline & strength.' It contains several input fields: 'STUDENT'S FULL NAME', 'PARENT'S FULL NAME', 'ADDRESS', 'SCHOOL', 'PHONE NUMBER', 'EMAIL ADDRESS', 'PARENT'S PHONE NUMBER', 'PARENT'S EMAIL', 'Select Class', 'Select Belt Rank', and 'Enroll or Trial Session'. A prominent green 'CONFIRM REGISTRATION' button is at the bottom. A small notice at the bottom states: '*Notice: After submitting the form, please wait for a confirmation email from D'Marsiana Taekwondo Gym to verify.'

Figure 5: Registration

Figure 5 illustrates the online registration form of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System. The form allows parents or guardians to enter student and parent details, including personal information, contact details, selected class, and belt rank, in a clear, organized layout.

After the form is submitted, the registration information is stored in the system database for administrator review and approval. This registration interface replaces manual paper-based enrollment and helps ensure accurate data entry, faster

School	Parent's Name	Parent's Phone	Parent's Email	Belt Rank	Discount	Schedule	Class	Status	Actions
ZSSAT	Mariam Salem	09657754113	arazensalem@gmail.com	White	¥1000.00	MWF-AM		Inactive	<input type="checkbox"/> <input type="checkbox"/>
SCC	Elsie Dacuma	09975640228	elsie@gmail.com	White	¥300.00	MWF-PM		Active	<input type="checkbox"/> <input type="checkbox"/>
ZSSAT	Esriyaya Salem Lae	09657754113	arazensalem@gmail.com	White	¥0.00	MWF-PM		Active	<input type="checkbox"/> <input type="checkbox"/>
ZSSAT	Corazon Lopez	09675678989	arazensalem@gmail.com	Green	¥1000.00	Kyurugi		Active	<input type="checkbox"/> <input type="checkbox"/>
SCC	Esriyaya Salem Lae	09657754113	arazensalem@gmail.com	White	¥500.00	Poomsae		Active	<input type="checkbox"/> <input type="checkbox"/>
SCC	Elsie M Dacuma	09975640228	mugiw200@gmail.com	White	¥500.00	MWF-AM		Active	<input type="checkbox"/> <input type="checkbox"/>
SCC	Harra Lou	09975640228	mugiw200@gmail.com	White	¥0.00	Kyurugi		Active	<input type="checkbox"/> <input type="checkbox"/>

Figure 6: Progress Tracking

Figure 6 illustrates the progress tracking feature of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System. The table displays student records including parent details, belt rank, selected class, status, and available actions for updating or managing student progress.

This progress tracking interface allows administrators to easily monitor student enrollment status and belt advancement in an organized and centralized view. By presenting progress data in a structured table format, the system helps reduce manual tracking and supports accurate and efficient management of student records.

4. DEVELOPMENT

The development of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System focused on turning the approved design and requirements into a working web-based system. Key features such as online student registration, student record management, payment tracking, progress monitoring, data visualization, and report generation were implemented and connected to a centralized database.

During this phase, system functions were developed step by step to ensure accuracy and proper system behavior. Testing and adjustments were performed alongside development to ensure that the system features worked correctly and met the requirements defined in the Software Requirements Specification (SRS) and relevant prior work.

5. MAINTENANCE

After deployment, the maintenance phase consists of ensuring D'Marsian's Web-Based Admission and Progress Tracking with a Real-Time Visualization System is functioning correctly. This involves fixing errors, adding system features as necessary, and retaining accurate and secure student records, payment information, and progress data.

Regular monitoring and minor updates help maintain system performance and usability. Maintenance also allows the

system to adapt to future changes such as new classes, updated belt rankings, or additional reporting needs, ensuring long-term reliability and continued support for administrative operations.

6. CONCLUSION

This study successfully developed D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System to address the challenges of manual student admission, payment tracking, and progress monitoring in a Taekwondo training institution. The system provides online registration, centralized record management, payment tracking, progress monitoring, and data visualization, which improved administrative efficiency and data organization.

ACKNOWLEDGEMENT

The researchers would like to express their sincere appreciation to **Mr. Marcelo Pescadera Maglinao Jr.**, the client of this project, for his guidance, support, and valuable input throughout the development of D'Marsian's Web-Based Admission and Progress Tracking with Real-Time Visualization System. His cooperation and feedback greatly contributed to the successful completion of this study.

Moreover, heartfelt thanks are given to **Saint Columban College** for providing the resources and academic foundation necessary to complete this research.

REFERENCES

- [1] H. Tuhuteru and R. Siwalette, "System Design and Implementation of Online Admission System at XYZ University," *Inspiration: Jurnal Teknologi Informasi dan Komunikasi*, vol. 12, no. 2, pp. 105–117, 2022. <https://tinyurl.com/2kdc6j2r>
- [2] M. Yang, M. Fu, and Z. Zhang, "The adoption of digital technologies in supply chains: Drivers, process and impact," *Technological Forecasting and Social Change*, vol. 169, p. 120795, 2021. <https://tinyurl.com/52uh8npe>
- [3] R. B. Soomro, "The adoption of digital technologies by small and medium-sized enterprises (SMEs)," *Sustainability*, vol. 16, no. 17, 2024. <https://link.springer.com/journal/13731>
- [4] A. Mishrif et al., "Technology adoption as a survival strategy for small and medium enterprises," *Innovation and Entrepreneurship*, 2023. <https://tinyurl.com/25xvcnjm>
- [5] Y. Prakasa, "Linking digital capability to small business performance," *Cogent Business & Management*, 2024. <https://www.tandfonline.com/doi/full/10.1080/23311975.2024.2342486>
- [6] OECD, *The Digital Transformation of SMEs*, OECD Publishing, 2021. <https://www.tandfonline.com/doi/full/10.1080/23311975.2024.2342486>
- [7] TechTarget, "Requirements analysis (software engineering)," *TechTarget SearchSoftwareQuality*, June 19, 2023. Available: <https://www.techtarget.com/searchsoftwarequality/definition/requirements-analysis>
- [8] A. Olsson and G. Joelsson, *Requirements Analysis for Software Development*, Bachelor's Thesis in Informatics, 2019. https://www.oecd-ilibrary.org/industry-and-service/s/the-digital-transformation-of-smes_bdb9256a-en
- [9] E. Radlbauer, T. Moser, and M. Wagner, "Designing a System Architecture for Dynamic Data Collection as a Foundation for Knowledge Modeling in Industry," *Applied Sciences*, vol. 15, no. 9, 2025.
- [10] G. C. Adiele and A. E. Bestman, "Digital Information Systems and Administrative Efficiency in Public Tertiary Institutions," *Journal of Business Development and Management Research*, vol. 10, no. 7, 2025.
- [11] K. Kurniadi, "Evaluation of Electronic Filing Systems and Their Impact on Workflow Efficiency," *Cogent Social Sciences*, vol. 11, 2025.
- [12] R. Ullah, M. Shah, and S. U. Jan, "Online Intermediate Admission Management System," *SSRN*, 2023. [Online]. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4351735
- [13] A. M. Aguda, J. A. Diaz, T. Faria, and K. J. Tunacao, "Revolutionizing Education: Enhancing Online Enrollment Systems," *Course Hero*, 2023. [Online]. Available: <https://www.coursehero.com/file/221988863/EErollment-Systemdocx/>
- [14] H.-T. Wu, "Establish a Digital Real-Time Learning System With Push Notifications," *Journal of Healthcare Engineering*, 2022. [Online]. Available: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8895321/>
- [15] G. Marcel and F. Uwizeyimana, "Development of an Online Integrated Student Management Information System: Case Study 'University of Gitwe'," *International Journal of Advanced Research in Computer Science*, vol. 10, no. 2, 2019. [Online]. Available: <https://www.ijarcs.info/index.php/Ijarcs/article/view/6479>

16. H. Shah, “Functional Testing Types Explained With Examples,” Simform, 2019. [Online]. Available:
<https://www.simform.com/blog/functional-testing-types/>
17. J. A. Banawa and M. J. T. De Jesus, “Client Satisfaction Analysis for Delivery of Services with Natural Language Processing and Decision Support System,” International Journal of Research and Innovation in Social Science, 2025. [Online]. Available:
<https://rsisinternational.org/journals/ijriss/articles/client-satisfaction-analysis-for-delivery-of-services-with-natural-language-processing-and-decision-support-system/>