
**UNIVERSITY OF THE PHILIPPINES**
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**MASTER OF INFORMATION SYSTEMS**

**OLIVER LESTER L. BERRIS**

# THE DEVELOPMENT OF A WEB-BASED MEMBERSHIP TRACKING INFORMATION SYSTEM FOR A KARATE MARTIAL ARTS SCHOOL IN THE PHILIPPINES

Thesis Adviser:
**Blancaflor Arada**
**Faculty of Information and Communication Studies**

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**Acceptance Page:**

This paper prepared by **OLIVER LESTER L. BERRIS** with the title: "**The Development of a Web-based Membership Tracking Information System for a Karate Martial Arts School in the Philippines**" is hereby accepted by the Faculty of Information and Communication Studies, U.P. Open University, in partial fulfillment of the requirements for the Master of Information Systems.

_____ August 12, 2025

**BLANCAFLOR P. ARADA**
Adviser (Date)

_____ August 12, 2025

**BLANCAFLOR P. ARADA**
Program Chair (Date)

_____

DIEGO SILANG S. MARANAN
Dean
Faculty of Information and Communication Studies

_____

Date

## Biological Sketch

Oliver is an experienced professional in the field of software engineering, mobile application development, and information systems spanning over 15 years. He holds a Bachelor of Science in Computer Science with a specialization in Software Engineering from De La Salle Canlubang, and has also earned graduate-level units in the Master of Science in Information Technology at De La Salle University – Manila.

Oliver currently serves as an Associate Manager in the Software Product and Platform Engineering division of Accenture, Inc., where he leads initiatives in mobile application development and developer relations in various projects and clients. Oliver is also a part-time professional lecturer at De La Salle University – Manila, teaching courses in C programming, object-oriented programming in Java, and mobile application development using Android, both in Java and Kotlin.

Oliver is fond of playing computer video games, experiencing culture with lifestyle immersion, and is a foodie who thinks that really good food promotes world peace and makes the world a better place.

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## ABSTRACT

A karate martial arts school that has many branches in the Philippines faced challenges in managing its growing membership base and keeping track of important information, which resulted in inefficiencies, errors, and decreased member satisfaction. To address these issues, a karate martial arts school in the Philippines needed an effective membership tracking information system to automate membership management, improve communication, streamline data management, and enhance member engagement.

The methodology used to prove the successful implementation of the proposed information system was to utilize the Technology Acceptance Model (TAM), Socio-Technical Systems Theory (STS), and the Information Processing Theory (IPT). The Web-Based Membership Tracking Information System (WBMTIS) was developed to provide better accessibility, present up-to-date information on karate practitioners, and create a customized platform tailored to a karate martial arts school aimed at utilizing open-source technologies. Throughout the development process of WBMTIS, frameworks such as Scrum and ADDIE, were used with modifications to these frameworks in order to aid in the successful implementation and acceptance of the system based on information system theories included in the research. The research helped in identifying the unique needs of the karate martial arts school and tailor-fitted the system according to the stakeholders wants and needs.

The overall result of implementing the WBMTIS affirmed the system's functional effectiveness and high level of user acceptance due to a yielded mean score of 91.25 based on the usability testing conducted using the System Usability Scale (SUS), therefore classifying the WBMTIS under the usability category of "Excellent".

The information system theories used in the study were grounded in TAM, STS, and IPT, which assisted in the system's design, human-computer interaction, and adoption strategy. These frameworks supported the evaluation of the system's ease of use, social and organizational integration, and cognitive efficiency in information processing. The study concludes that the system successfully met its objectives and offers a practical model for digital transformation within martial arts organizations. Recommendations for future enhancement include the integration of an online payment gateway, push notifications, calendar synchronization, an internal messaging module such as chat, an advanced analytics dashboard, and an e-learning component to extend instructional reach and system functionality.

# Chapter I

# THE PROBLEM DOMAIN

## Statement of the Problem

A karate martial arts school that has many branches in the Philippines faced challenges in managing its growing membership base and keeping track of important information, which resulted in inefficiencies, errors, and decreased member satisfaction. In one karate style, particularly with Kyokushin, the organization have a total of approximately 12 million members with over 1,200 official dojos around 124 different countries, the number of members mentioned also include those coming from unofficial dojos (“Kyokushinkaikan,” n.d.). To address these issues, a karate martial arts school needed an effective membership tracking information system to automate membership management, improve communication, streamline data management, and enhance member engagement.

Therefore, the researcher aimed to study the benefits of developing a membership tracking information system for the karate martial arts school and how it improved the organization's performance in managing its members and promoting karate as a sport and martial art. In order to obtain all the essential knowledge, data, and information, the study sought to answer the following questions;

a) How did implementing a membership tracking information system affect the efficiency of membership management in a karate martial arts school?
b) What was the impact of the membership tracking information system on a karate martial arts school's communication with its members and dissemination of information?
c) How did the membership tracking information system affect a karate martial arts school's ability to market toward specific membership groups?
d) What was the effect of implementing a membership tracking information system on member satisfaction and engagement in a karate martial arts school?
e) How did the membership tracking information system support a karate martial arts school in organizing and conducting karate events and tournaments, particularly amidst COVID-19 restrictions?

## Background and Objectives of the Project

Karate is a martial art that originated in Okinawa, Japan, in the 14th century. It was developed from the indigenous Ryukyuan martial arts and influenced by empty-handed Chinese kung fu during intense cultural exchanges in the middle centuries of the millennium. The original name of karate was *唐手*, which means “Tang dynasty hand” or “Chinese hand” in Okinawans. In bringing the art to mainland Japan, 20th-century Okinawan practitioners adopted two Japanese characters, “*kara*” (empty) and “*te*” (hand), to represent the art (Lim, 2021). Karate was imported into Japan in the 1920s, and several schools and systems developed, each favoring somewhat different techniques and training methods (Britannica, 2022). Today, karate is loved as a martial art, combat sport, and sport with worldwide popularity. It is characterized as a striking art that uses kicking, emphasizing concentrating as much of the body’s power as possible at the point and instant of impact (Britannica, 2022). In the Philippines, karate is one of the most practiced sports among young and old alike (“Kyokushin Philippines,” n.d.). Modern karate is a combat sport characterized mainly by a striking art, but traditional Okinawan karate embraced grappling techniques called *toitee* or *torite* and throwing techniques. Karate includes the art of weapons, such as *bo-jutsu*, *sai-jutsu*, and *nunchaku-jutsu* (“Karate of Japan — Encyclopedia of Japan,” n.d.). According to Bie (2021), in mid-December 2020, young Filipino karate enthusiasts participated in the second friendship tournament organized by the United Karate-do Federation (UKE) to showcase their martial arts skills and capabilities. The event aimed to motivate more students to attend their karate classes to stay fit and healthy physically, mentally, and emotionally amidst the COVID-19 situation.



Membership Tracking System, commonly referred to as loyalty tracking system, is crucial for the efficient and effective management of member-based organizations as this kind of system enhanced overall member experience, promoted strategic decision making, streamlined operations, and aided in the growth and sustainability of the organization. For a karate organization that has a total of approximately 12 million members worldwide, managing and validating the karate journey of all members within the organization is necessary as to ensure data integrity is in place and to make the communication between members worldwide more seamless and accessible.

Membership Tracking System used to implement PVC plastic cards with bar codes and magnetic stripes which are proprietarily linked to the membership software. These systems are adaptable to various applications, from church memberships to retail loyalty programs, in cases where a pre-existing solution is unavailable or unsuitable for a particular application (Carey, 2017; IdentiSys, n.d.). Since the Membership Tracking Information System is software designed to manage and track membership information for organizations or businesses that rely on memberships to thrive (Kindful, 2021) (Rafferty, 2019) (Sakovich, 2023) (Kuah, 2022), it helped streamline how organizations connect with their members, gather and disseminate information, and market toward specific membership groups (Kindful, 2021). Automating membership management helped organizations keep membership data and information up to date, which was difficult as the organization grows and changes (Valloso, 2020). Implementing a membership tracking information system improved the performance of a karate martial arts school by empowering staff, board, and volunteers to support members, quickly field phone calls from members, and ensure members' needs are met (Kuah, 2022).

The need to conduct this study lied in the potential benefits that implementing a membership tracking information system can provide to a karate martial arts school. By automating membership management, a karate martial arts school improved its performance and streamlined how it connects with its members, gathers and disseminates information, and markets toward specific membership groups. This resulted in better communication, more efficient data management, and improved member satisfaction. Furthermore, as karate continues to gain popularity worldwide, motivating and engaging young karate enthusiasts through events and tournaments was essential to keep them physically, mentally, and emotionally healthy amidst COVID-19. Therefore, studying the benefits of a membership tracking information system for a karate martial arts school helped the organization better serve its members and promote karate as a sport and as a martial art.

The objectives of the study were to improve the student management with progress tracking in place through automation and streamlining of data, offer meaningful insights for better decision making, and provide an enhanced

communication and engagement between its members and the communities within the organization in order to foster trust.

## Significance and Scope of the Project

The significance of the present study to a karate martial arts school was to automate its membership management, improve communication, streamline data management, and enhance member engagement by developing a Membership Tracking Information System. It also had broader implications, highlighted the benefits of implementing a Membership-Tracking Information System for organizations and businesses that rely on memberships to thrive. Membership tracking systems helped organizations keep membership data and information up-to-date, which was difficult as the organization grows and changes. Automating membership management helped organizations keep track of membership information, resulting in better communication, more efficient data management, and improved member satisfaction. The study also highlighted the significance of karate as a martial art, combat sport, and a sport with worldwide popularity. As karate continues to gain popularity worldwide, motivating and engaging young karate enthusiasts through events and tournaments was essential to keep them physically, mentally, and emotionally healthy amidst COVID-19. Therefore, studying the benefits of a membership tracking information system for a karate martial arts school helped the organization better serve its members and promote karate as a sport and martial art. The following stakeholders benefitted on the implementation of a web-based membership tracking information system for a karate martial arts school, namely: Karate Teacher, Karate Student, and System Administrator.



The Karate Teacher was able to keep track of all their karate students along with their martial arts journey through the intuitive and straight-forward use of available features in the system. The Karate Teacher had created events with ease as they can easily manage and see the engagement in real-time from registration up to attendance. A reports module can also be accessed by the Karate Teacher to review the overall result and experience of an event. In terms of determining readiness of a Karate Student to go to the next rank or participate in an upcoming tournament or seminar, these details were readily available and can be accessed through a summary report of the Karate Student which was displayed in a timeline sequenced manner.

The Karate Student, or a guardian in case the karate student is still a minor, had an enhanced learning experience as progress is accessible anytime along with timely feedback in order to know what areas in their karate journey are for improvement, received notifications for better support, and had convenience of registering to events.

The System Administrator was able to take advantage of having a centralized data management, achieved operational efficiency through automated processes and creation of reports, and provide appropriate access control to intended users within the karate martial arts school as part of security and compliance.

The scope of the study was to evaluate and improve the membership tracking through the development of web-based information system tailored for a karate martial arts school based on theories and frameworks in system development with the inclusion of the stakeholder's participation in order to determine of acceptance of the web-based information system through the System Usability Scale (SUS) Survey.

The limitations of the study were the following: the scalability of the system to handle growing number of members beyond the availed cloud service subscription, device compatibility, and dojo traditions.

## Documentation of Existence and Seriousness of the Problem

A karate martial arts school did not have a centralized database that can effectively track and manage its members, which included their personal information, membership status, and competition records. This led to inaccurate and incomplete data that caused delays and errors in organizing events and verifying participant eligibility.

Without a reliable information system, a karate martial arts school had to rely on manual coordination among its various chapters, coaches, and officials to gather and share information about members and events. This was time-consuming, prone to errors, and difficult to coordinate during pandemic-related disruptions.

During COVID-19 restrictions, a karate martial arts school had to comply with various health protocols and government regulations that required accurate and up-to-date information about its members and events. A lack of reliable information

system made it challenging for the karate martial arts school to comply with these requirements and ensure the safety and well-being of its members and participants.

Without a robust information system, members of the karate martial arts school felt left out and unsupported in their karate journey, especially when they were unable to participate in events due to inaccurate or incomplete membership data. This led to dissatisfaction, disengagement, and even attrition among members.

Taken together, these indicators suggested the existence of a problem related to membership tracking information system support for the karate martial arts in organizing and conducting karate events and tournaments, especially amidst COVID-19 restrictions. Addressing these problems required an information system to be developed and implemented, which offered centralized and reliable membership data, along with facilitating communication and coordination among various stakeholders.

## Scope and Limitation of the Study

The Web-based Membership Tracking Information System is designed to support the administrative, instructional, and operational activities of a karate martial arts school for three primary user roles: karate students or guardians, karate teachers or instructors, and system administrators.

All users can register for an account, log in, reset passwords, and, in the case of administrators, approve or deny user access requests. Only the system administrators can manage user accounts and assign roles, as their focus is primarily focused on system-level functions.

Karate teachers and system administrators can access modules to manage student and teacher records. Karate Teachers are responsible for updating student progress and documenting karate journeys, while both karate teachers and system administrators can view and maintain teacher records. Karate teachers can also keep track of all records of students and other instructors under their supervision.

Karate students and karate teachers have access to the "My Profile" feature, where they can view their personal information and system-generated QR codes for

convenient identification. The event management module is handled by the karate teachers, who can create and manage events within the system. Both karate students and karate teachers can register for upcoming events, print their digital tickets, and scan QR codes for attendance tracking during the actual event.

The system supports mobile access for karate students and karate teachers, allowing key features to be accessed through a mobile application. Offline support is also implemented using a local database with the inclusion of the repository design pattern, which will ensure system functionality in the absence of internet connectivity.

Both karate teachers and system administrators can generate reports related to student performance, attendance, and participation. In addition, both roles can access the system logs and verify data integrity through blockchain verification mechanisms.

While the developed system provides core functionalities necessary for membership tracking, several advanced features remain outside the current scope and represent limitations of the present implementation. Notably, the integration of a secure online payment gateway has not yet been realized. As a result, the processing of membership fees, event registrations, and other financial transactions continues to be handled manually, limiting the system's ability to ensure seamless and accountable financial management. Additionally, the system does not currently support push notifications, which restricts its capacity for real-time communication and immediate dissemination of updates such as event schedules and important announcements.

Another limitation is the absence of calendar synchronization capabilities. Users must manually track events and training sessions within the system, which may hinder efficient time management and planning. Furthermore, the system lacks a comprehensive analytics dashboard, which would otherwise enable instructors and administrators to visualize data related to member progress, attendance, and overall program performance. Communication within the system is also limited, as it does not include an internal messaging or chat feature that could facilitate centralized, traceable, and collaborative interactions among users.

Lastly, the instructional component of the system is constrained by the lack of an integrated e-learning module. The current system does not offer video tutorials, interactive quizzes, or online course materials, thereby limiting its capacity to support hybrid or remote learning environments. These limitations identify areas for future development to enhance the system's utility, scalability, and effectiveness in addressing the evolving needs of users.

# Chapter II

# REVIEW OF EXISTING ALTERNATIVES

## Membership Tracking Information System

Membership tracking information systems were widely used to manage memberships and track member behavior. There have been numerous studies and literature that have explored the various aspects of managing and maintaining a membership tracking information system. Such membership tracking information systems allowed these organizations to maintain and track member information, send out announcements through available communication channels, and organize events. Schneider & Niederjohn (2015) mentioned the implementation of a membership management information system was an important aspect of having successful membership management techniques.

Several studies have examined the role of membership tracking information systems in improving customer service and retention through customer loyalty. Graviardhi et al. (2021) pointed out that these systems have enhanced the customer's overall experience by providing swift and efficient services to their members, which include payment processing, report generation, and scheduling. Another study conducted by AMIXA LLC (2021) found that these systems helped improve customer retention by providing members with relevant information about products and services through customer communications, which increased member involvement.

Additionally, these membership tracking information systems played a critical role in the financial success of organizations, as these systems allowed businesses to automate billing processes and manage memberships in order to save time and cost.

## Most Popular Membership Tracking Information Systems in the World

Membership tracking information systems were essential tools for organizations as the database of members was managed efficiently and the retrieval of information gave the organizations the convenience to access member information anytime.

Implementing a membership tracking information system significantly improved organizational efficiency and member engagement, resulting in higher member retention rates, increased member engagement, and greater financial stability.

One of the most popular membership tracking information systems in the world is Wild Apricot. Wild Apricot was a cloud-based membership management system that provided organizations with tools to manage their members, events, and payments. Additional features that made the information system stand out were based on membership registration and renewal, event creation and management, digital marketing marketing through email, and financial tracking.

Another popular membership tracking information system was MemberClicks. MemberClicks was a comprehensive membership management system that offered a range of tools involving website building, event creation, online payments, and member communication. MemberClicks also provided organizations with a user-friendly interface, which made management of their membership information easy.

CiviCRM was another popular membership tracking information system due the development of an open-source solution that provided organizations with a range of tools for managing their members, event registration, and financial activities. CiviCRM offered a range of features available for use in the form of contact management, email campaigns, and tracking finances.

There are additional membership management information systems that can be utilized on demand and used on the go: GymMaster, PerfectMind, MindBody, ClubWorx. The GymMaster solution provided a cloud-based gym and martial arts management solution that capitalizes on membership management, class scheduling, and payment processing. PerfectMind was another martial arts management software that offered modules on membership management, attendance checking, and marketing tools. MindBody offered features for organizations to conveniently manage members, schedule classes, and automate marketing activities. ClubWorx provided membership-based features along with creation of reports geared for tracking members and their engagement through a cloud-based platform.

MyStudio was designed to provide martial arts studios and fitness businesses with a comprehensive solution for managing their operations, enhancing member experiences, and driving business growth through digital marketing strategies.

Dojo Expert provided a martial arts management system that keeps track of its members along with their attendance and rank in their affiliated martial arts.

Other popular membership tracking information systems include Zen Planner, which was specifically designed for gyms and fitness centers, and Neon CRM, which offered a range of tools for non-profit organizations.

| Existing Alternatives | Cloud-based and Event Campaigns | Member Management | User Friendly and Customizable | Reports and Track Progress | Open Source Technology | QR Code as Identity Verification | Integrating Blockchain as Security |
|---|---|---|---|---|---|---|---|
| Wild Apricot | O | O | O | X | X | X | X |
| MembersClick | O | O | O | X | X | X | X |
| CiviCRM | O | O | X | O | O | X | X |
| ZenPlanner | O | O | X | O | X | X | X |
| GymMaster | O | O | X | O | X | X | X |
| PerfectMind | O | O | X | O | X | X | X |
| MindBody | O | O | X | O | X | X | X |
| ClubWork | O | O | X | O | X | X | X |
| MyStudio | O | O | X | O | X | X | X |
| Dojo Expert | O | O | O | O | X | X | X |

*Table 2-1. Core Functionalities of Existing Alternatives*

Table 2-1 provides the core functionalities that have been implemented by each existing alternative to having a membership tracking system for prospective customers who would want to utilize the product and services offered to their martial arts school. Based from the same table, the common features that were available in existing alternatives were cloud-based and event campaigns, member management, reports and tracking progress. Some unique features of the existing alternatives were being user-friendly, customizable, and capitalized on open source technology. In spite of utilizing technology to manage memberships and booking of events, the existing alternatives did not capitalize on emerging technology to innovate processes, which could have QR Code as Identity Verification for digital identification and integrating Blockchain as Security for authenticity of the records on their martial arts journey.

## Importance of Tracking Sports Org Members

One study published in the International Journal of Sports Science and Engineering suggested that tracking member performance provided valuable information for coaches and managers. The study found that by analyzing performance data collected through tracking technologies such as GPS, coaches and managers have identified areas where individual players or the team as a whole need improvement.

In addition to improving performance, tracking also helped coaches and managers communicate more effectively with their players. A study published in the Journal of Sports Science and Medicine found that using tracking technologies to monitor training sessions and game-time scenarios helped coaches develop more specific and effective feedback for their players.

Another study published in the Journal of Strength and Conditioning Research found that tracking also helped coaches and managers identify potential injury risks. By tracking player movements and physical exertion levels, coaches and managers have identified when players are at risk of injury and took preventative measures accordingly.

Aside from performance improvement, injury prevention, and effective communication, another benefit of tracking sports organization members was the ability to optimize resources. A study published in the Journal of Sports Sciences found that tracking technologies helped coaches and managers allocate resources more effectively by identifying areas of overlap or inefficiency in training practices.

**Membership Tracking Information System for a Karate Martial Arts School**

The membership tracking information system was able to provide unique features that are not supported with the availability of existing alternatives such as utilization of QR code as an alternative that served as a digital identification, uploading of documents as proof on the karate participant's karate journey, sharing of specific information with compliance with data privacy laws and controls from the users, prove the validity plus authenticity of the details of each karate participant through utilization of blockchain technology, and provide tailor-fit reports from data analytics that assisted those in management positions in providing decisions that were beneficial to the organization or karate martial arts school especially on joining important events such as tournaments and international seminars. The membership tracking information system incorporated some unique features in the Decision Support System and Competency-based Human Resource Information System to provide meaningful insights to aid in decision making and have accurate data with the karate journey progress of each karate participant, respectively.

## Chapter III

## APPROACH TO BE TAKEN IN THE SUBJECT

### Theoretical Framework

*Technology Acceptance Model*

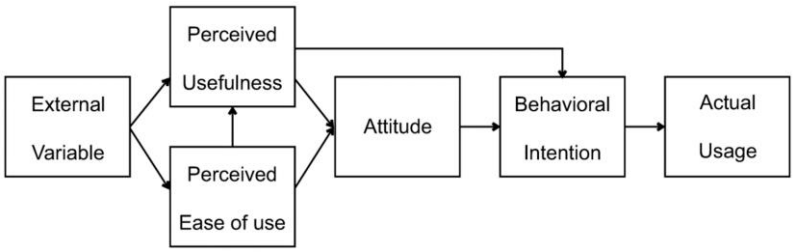


*Image 3-1 – Diagram on the Technology Acceptance Model*

The Technology Acceptance Model (TAM) is a theoretical framework in information systems that delineates the factors that influence users' adoption and use of technology. Fred Davis first proposed the TAM in 1986 and highlighted two primary factors that affect an individual's intention to use new technology, which involve perceived ease of use and perceived usefulness. The perceived ease of use intent refers to the extent to which a user believes using the technology was effortless. The perceived usefulness pertained to how much a user believes the technology helped enhance their job performance. TAM has a broad application across diverse technologies and contexts, such as web portals and digital technology in education. TAM has been expanded to encompass additional factors that impact technology acceptance, in the form of social influence, cognitive instrumental processes, and trust. TAM posited that perceived ease of use and perceived usefulness predict the adoption of information technology. However, intentions do not always translate into behavior, and multiple factors influence the strength of the relationship between preferences and behavior. TAM was a valuable tool for evaluating technology adoption within an organization. Through conducting surveys to assess the perceived usefulness and perceived ease of use, TAM helped in creating more functional and user-friendly systems. TAM has been employed in developing web portals, particularly in the B2B sector (Davis et al., 1989; Davis et al., 1989).

*Socio-Technical Systems Theory (STS)*

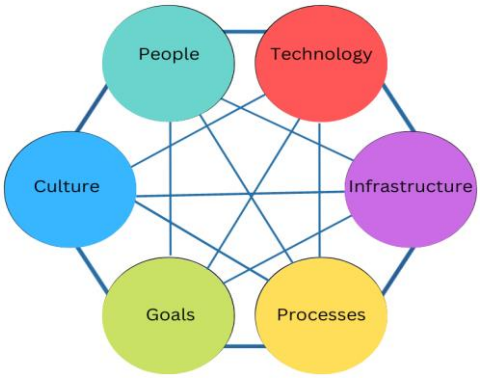


*Image 3-2 – Diagram on Socio-Technical Systems Theory*

The Socio-Technical Systems theory (STS) involved the interrelatedness of various social and technical aspects of an organization. STS was founded on two principles, which revolve around the interaction of social and technical factors to create the conditions for successful or unsuccessful organizational performance, and the optimal design of a system requires the joint optimization of both social and technical factors. STS was a distinct field of inquiry that applied an understanding of social structures, roles, and rights to inform the design of systems that involve communities of people and technology (Janse, 2022). The STS approach effectively blended both the technical and social systems of an organization despite configurations that may arise in such systems where one solution may not work well or effectively with another. The STS theory established that change in an organization was mainly focused on one area, which tends to fail. STS suggested that there were interdependencies present in an organization, and the optimal design of a system required the joint optimization of social and technical factors. A socio-technical system was the term usually given to any instantiation of socio and technical elements engaged in goal-directed behavior. Examples of STSs included emails, blogs, and social media sites such as Facebook and Twitter. The importance of STS lied in its holistic, interconnected contribution of technology and the human systems that operated and interacted with it. Understanding how a socio-technical system worked to take more than just looking at the information systems, human resources, or technology alone. Planning, communication, and ongoing improvement helped address socio-technical system challenges (Janse, 2022; Fox, 1995).

*Information Processing Theory (IPT)*

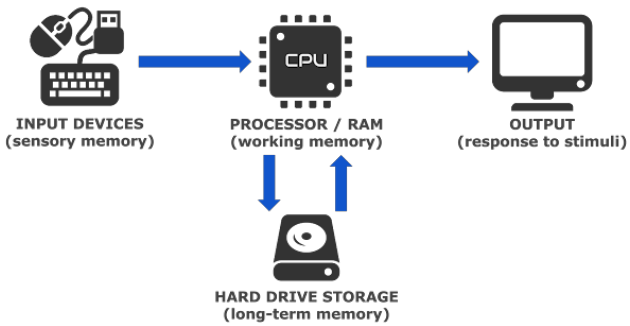


*Image 3-3 – Diagram for Information Processing Theory*

Information processing theory was an approach to studying cognitive development that evolved out of the American experimental tradition in psychology. This theory took into account the mental development of a child's mind in terms of maturational changes. The theory used a computer model to describe human learning, where information was processed, stored, and retrieved. The process involved attending, encoding, storing, and retrieving information. George Armitage Miller was one of the founders in the field of psychology and made significant contributions to the development of the information processing theory. George Armitage Miller researched the capacity of the working memory and discovered that people only held up to 7 plus or minus 2 items. George Armitage Miller also coined "chunking" when explaining how to maximize our short-term memory (Miller, 1956). Two theorists, Richard C. Atkinson and Richard Shiffrin, proposed a multi-stage theory of memory, breaking it down into sensory, short-term, and long-term memory (Atkinson & Shiffrin, 1977), which eventually was associated with the Cognitive Information Processing Theory. The development of the information processing framework was continued through the years and has been applied to various fields, including education and artificial intelligence.The The information processing theory was more geared toward the fundamental limitations on processing and communication of information and less oriented toward the complex operation of particular devices. The theory became useful in understanding how humans process and store information, and had practical applications in education and technology (Vinney, 2020).

## Rationale for the Framework

In developing a membership tracking information system for a karate martial arts school, TAM was employed to identify factors that have an impact on the system's adoption by its members. Accurate and up-to-date information on members' attendance and karate training progress was provided to increase the perceived usefulness of the system. The system's user-friendly and ease of navigation have improved in terms of the perceived ease of use.

The STS theory helped ensure that the system was designed to meet the organizational needs and take into account its members. The system was properly designed to meet the karate organization's specific needs and integrated into the organization's existing workflows.

The IPT theory helped in ensuring the system was designed to provide the correct and appropriate information to the right people at the right time. The system provided instructors with real-time information about members' attendance and progress in order to make informed decisions about training and coaching.

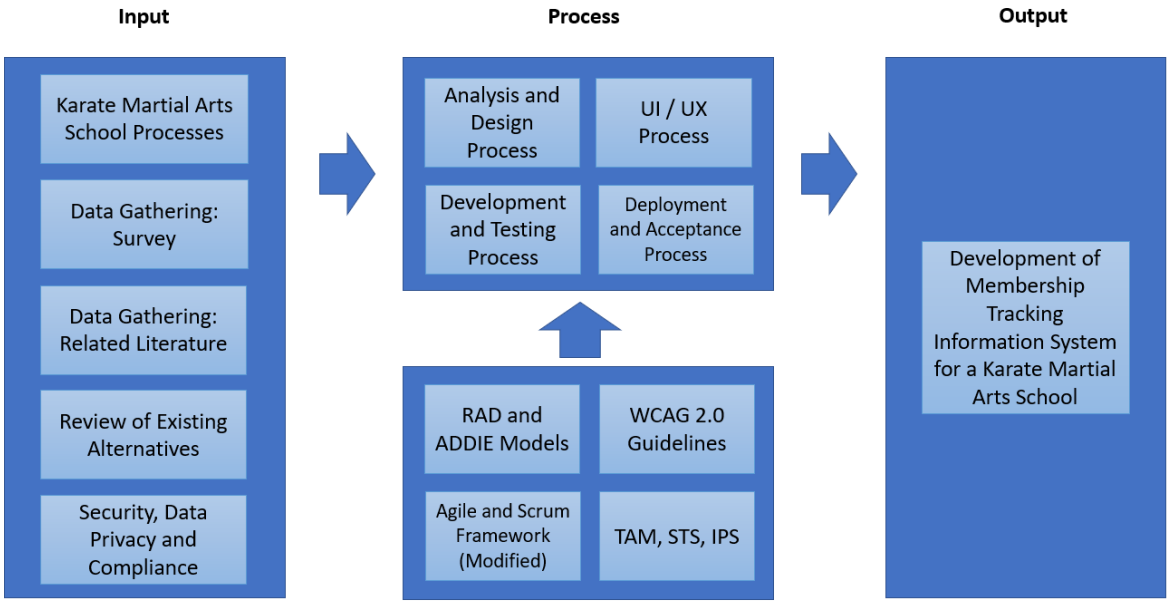


*Figure 3-1. Theoretical Framework for the IS Project*

Figure 3-1 shares how the information system theories were incorporated in the processing part of the theoretical framework which resulted in the development of the membership tracking information system for a karate martial arts school.

The theoretical framework guiding the development of the Web-Based Membership Tracking Information System integrates three main components: Input Layer, Processing Layer, and Output Layer. The Input Layer includes stakeholder requirements, membership data, user feedback, and the organization's cultural and operational context. At the core, the Processing Layer integrates the TAM, highlighting perceived usefulness, ease of use, and user behavior; the STS, emphasizing the interaction between people, processes, technology, and environment; and the IPT mapped of how input data is captured, processed, stored, and transformed into meaningful outputs. Finally, the Output Layer reflects the tangible benefits of the system: enhanced member engagement, streamlined operations, and improved decision-making through accurate, accessible analytics.

## Technologies Used

AWS Cloud was used to deploy the web service instance and utilize the capabilities of making the information system reliable, accessible anytime, and secure. Another benefit for going for AWS Cloud was to easily scale according to the user demand and be able to pay for the services consumed by the web instance created. The back end utilized PHP and MySQL using the Laravel Framework and Git for quick development of the intended information system. The database had security measure in place by ensuring the configuration will only allow connections to allowed users with the SSH keys registered in the server, configuring allowed ports, whitelisting host, disabling remote logins, setting up a local file access barrier and file permissions, and capture every transaction being done in the database. The Laravel Framework was used to take advantage of being a responsive website by being able to determine the current display of the device through a few configuration settings and make the adjustment of the website components automatically to have the appropriate view of the website. Flutter was also included in the development to have a dedicated mobile application that can be downloaded through the user's device platform such as

Android and iOS. In designing the look and feel of the web application, the guidelines in WCAG 2.0 were the reference in ensuring that both the UI and the User Experience was considered during development. Having utilized these technologies, majority being open-source, these provided the karate martial arts school with a system that was tailor-fit to the organizational needs and customization on adding new features or services in the future was done through remote access development by having best development practices including security measures in place. Monitoring of the development progress was done through Trello Software. The QR Code was implemented as an alternative to the physical identification card which provided convenience, interoperability, additional security to the private information of each member, and a secure mechanism to ensure that the generated QR Code is verifiable with a digital badge that is capable of showing their current level in their karate journey. In all aspects in managing data along with sensitive details and personal identifiable information, the proposed information system for the karate martial arts school adhered to the Data Privacy Act of 2012, known as RA 10173, and was in place to seek the consent from each user before any processing of data.

# Chapter IV

# PROJECT PLAN

## Concept

The creation of the Web-based Membership Tracking Information System implemented a combination of the Rapid Application Development model of the Software Development Lifecycle with the ADDIE model, a framework with an acronym that stands for Analyze, Design, Develop, Implement, and Evaluate, which was associated with Instructional Systems Design. Parts of the Scrum Framework were taken all throughout the phases to provide checkpoints with the stakeholders on the progress and to help determine when the features reached an acceptable state. The inclusion of the Scrum Framework with Trello Software aided in transparency, determined the successful implementation through inspection, and made acceptance of the system through the combination of the theories shared in the theoretical framework. The Scrum Framework was usually done in teams consisting of at least 2 or 3 members, but this approach can be adapted even for a single member involved in development by utilization of the Kanban approach to take on tasks that were readily available from the product backlog within the bandwidth or current capacity of work based on the agility to deliver incremental value.

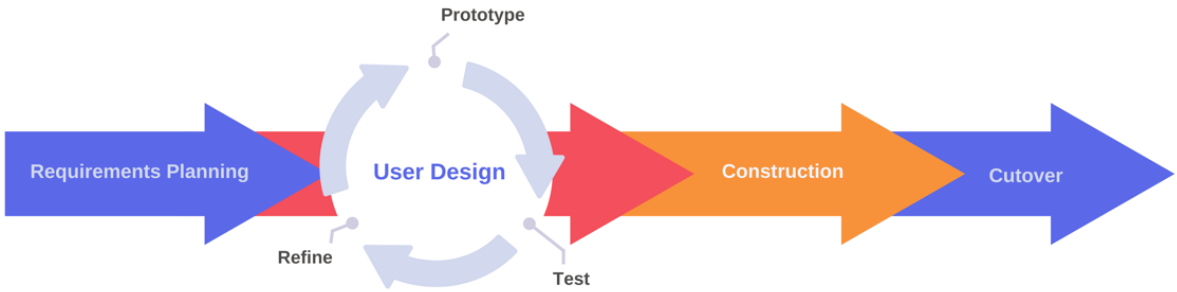


*Image 4-1 – Diagram on Rapid Application Development*

As illustrated in Image 4-1, the RAD model emphasizes quick iterations and minimal upfront planning, prioritizing speed and user feedback throughout development. The diagram shows a cyclic process comprising four core phases: Requirements Planning, User Design, Construction, and Cutover. The Requirements

Planning phase involves identifying key features and objectives in collaboration with stakeholders. In the User Design phase, developers and users work closely to build system models, wireframes, and prototypes. The Construction phase covers coding, testing, and feature development, performed rapidly based on feedback from previous prototypes. Finally, the Cutover phase entails final implementation, user training, and full deployment of the information system.

This model aligns well with projects that demand fast delivery and evolving requirements—ideal for the karate school context where iterative stakeholder input was critical.

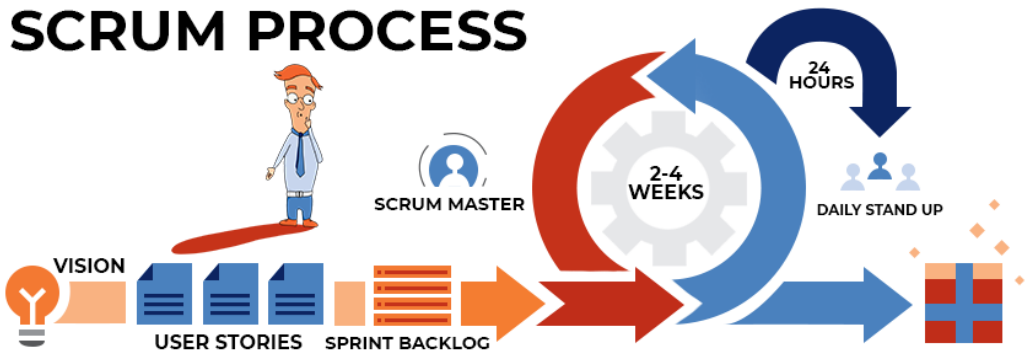


*Image 4-2 – Diagram of the Scrum Framework*

Image 4-2 depicts the Scrum Framework, a lightweight agile methodology structured around short development cycles called Sprints (typically two weeks). The diagram presents the flow from Product Backlog to Sprint Planning, leading into Sprint Execution, and concludes with Sprint Review and Sprint Retrospective.

The Product Backlog is a prioritized list of features and enhancements (called *user stories*) to be implemented. During Sprint Planning, the team selects stories for the upcoming sprint, forming the Sprint Backlog. The Sprint is a time-boxed development cycle where selected features are implemented. After the sprint, a Sprint Review is conducted with stakeholders to demonstrate completed work along with a Sprint Retrospective, where improvements for future sprints are identified.

The diagram captures Scrum's emphasis on transparency, inspection, and adaptation, supporting continuous delivery and improvement, especially suitable for the evolving needs of the dojo system.

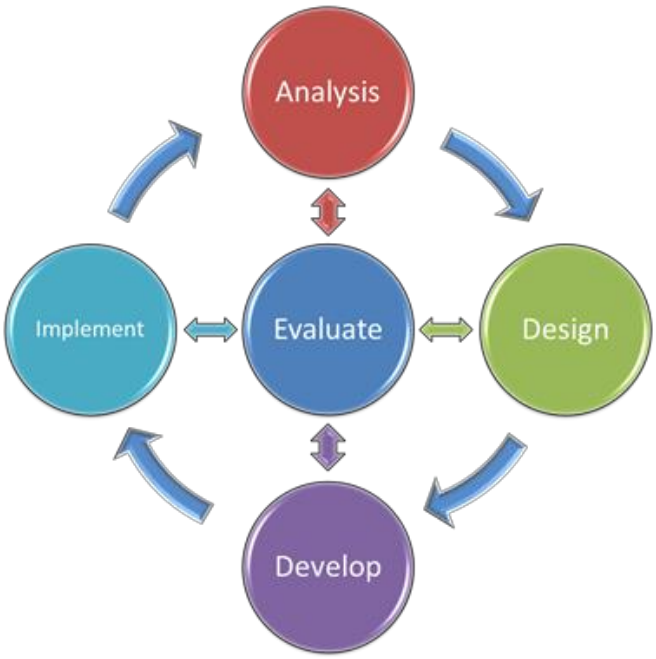


*Image 4-3 – Diagram of the ADDIE model*

As shown in Image 4-3, the ADDIE model consists of five distinct yet interconnected phases: Analyze, Design, Develop, Implement, and Evaluate. The ADDIE model is a systematic framework traditionally used in instructional design, but adapted here for iterative system development.

The Analyze phase involves identifying user needs, dojo workflows, and pain points in the existing membership process. The Design phase refers to the creation of blueprints, mockups, and user stories based on the analysis. The Develop phase is the actual coding and construction of the features, tied closely with sprints. The Implement phase includes testing, deployment to staging or production environments, and user onboarding. And the Evaluate phase is both formative (during development) and summative (post-deployment), often supported by tools like SUS surveys or stakeholder interviews.

The model was integrated within each sprint cycle to ensure continuous alignment with user expectations, reinforcing both technical quality and usability.

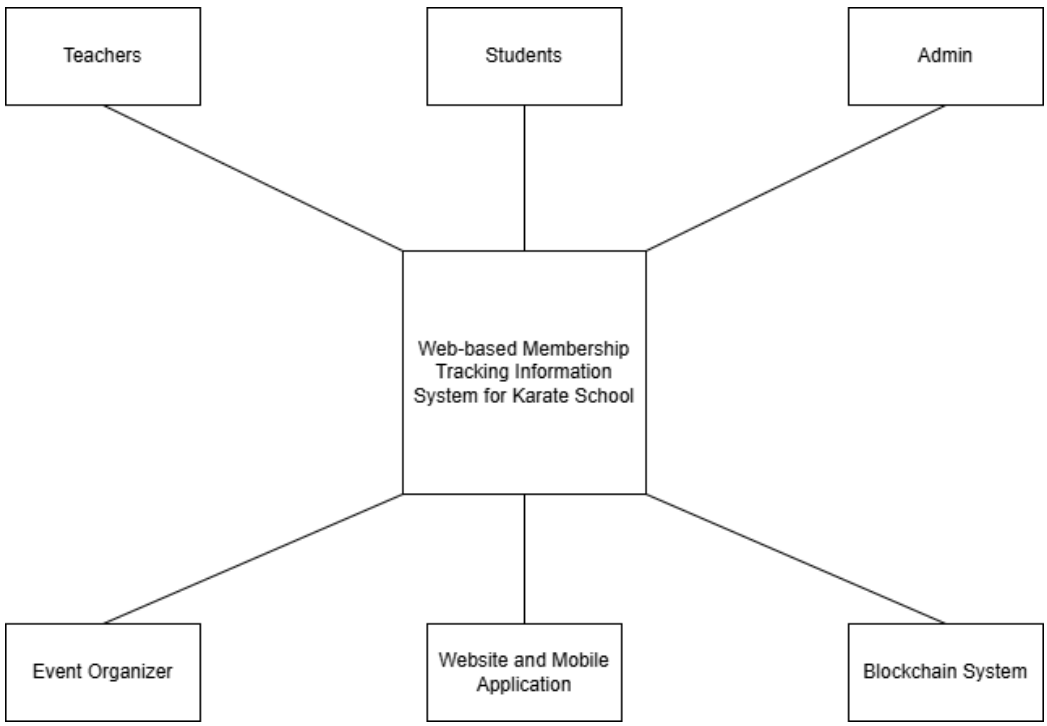


*Image 4-4 – Context Diagram of WBMTIS*

Figure 4-4 shows the context diagram of the Web-based Membership Tracking Information System, displaying a high-level view of how various external entities interact with the system. At the center of the diagram is the actual information system, which serves as the main platform for managing student and teacher records, events, reports, and logs. The system supports both web and mobile access and includes offline capabilities and blockchain-based verification for enhanced integrity.

Surrounding the system are six key external entities. Students interact with the system to sign up, log in, view and update their profiles, register for events, and scan QR code tickets. The system returns personalized data such as profiles, event details, and training records. Teachers manage student progress by updating karate journey data and accessing related reports and records. Admins oversee user management, including approving accounts and assigning roles. The admins also generate reports, manage logs, and handle high-level administrative tasks.

Event Organizers are venue owners who can conduct events and are handled separately by the Admins. The Web and Mobile Application interacts with the system by providing access to certain features like profile viewing and QR scanning, which are later synced using the repository design pattern and a local database. Lastly, the Blockchain System implemented within the system communicates with the core platform to verify logs and ensure that key data, such as student achievements and records are tamper-proof.

The context diagram is essential for understanding the boundaries of the system and how it interfaces with users and technologies. The context diagram provides stakeholders with a clear visual and functional summary of the system's scope, helping guide further development, design, and deployment strategies.

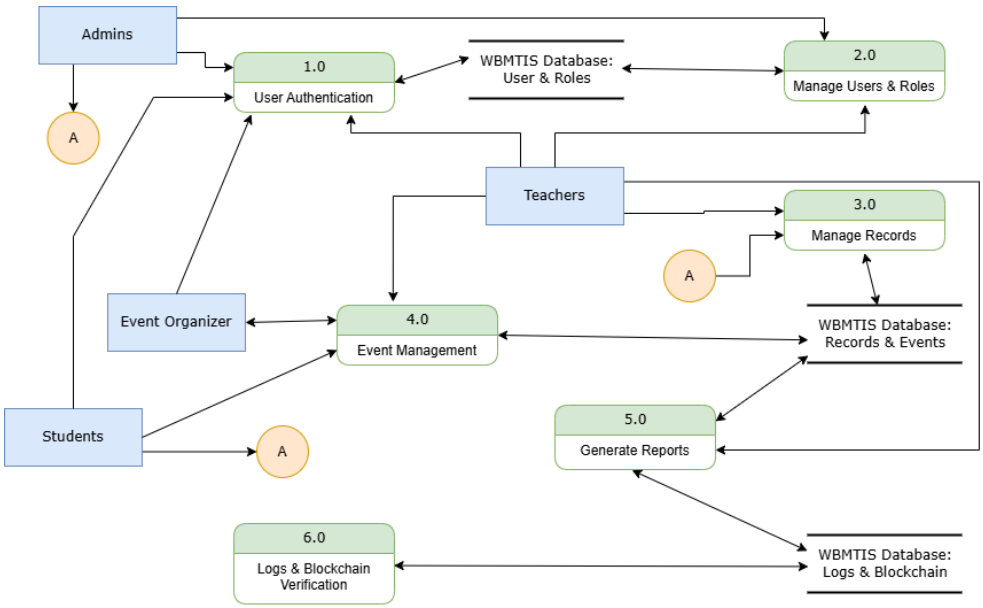


*Image 4-5 – Data Flow Diagram of WBMTIS*

Figure 4-5 presents the Data Flow Diagram (DFD) of the Web-based Membership Tracking Information System, illustrating the exchange of information between users and system processes. The DFD diagram gives a visual representation of how data is processed within the system through six main processes that involve user authentication, user roles, student and teacher records, event organization, reporting, and log verification.

The User Authentication process manages all procedures related to login, sign-up, and password reset or recovery requests for students, teachers, and admins. Upon successful authentication, users are granted access corresponding to their respective functionalities. The Manage Users and Roles process is primarily utilized by admins and teachers, who are responsible and get to oversee the approval of user registration and assigning appropriate roles. The Manage Records process allows admins and teachers to update and maintain various records, such as user profiles and karate journey milestones. This process also integrates with the mobile app, which provides offline data capabilities and synchronization features once online.

The Event Management process caters to student registration for events, creation and management of events by organizers, and the generation and issuance of QR code-based tickets. The Generate Reports process aggregates data to provide insights related to student progress, attendance, and historical event history. Finally, the Log and Blockchain Verification process interfaces with the blockchain infrastructure system to authenticate and secure essential logs and records, thereby ensuring their authenticity and integrity.

These processes operate with key external entities involving students, teachers, admins, event organizers, and the blockchain system. Each entity engages with relevant processes through well-defined data flows. The accompanying DFD offers the stakeholders a visualization of the movement of information, providing a clear understanding of how each user group interacts with the system effectively manages, safeguards, and verifies critical data assets.

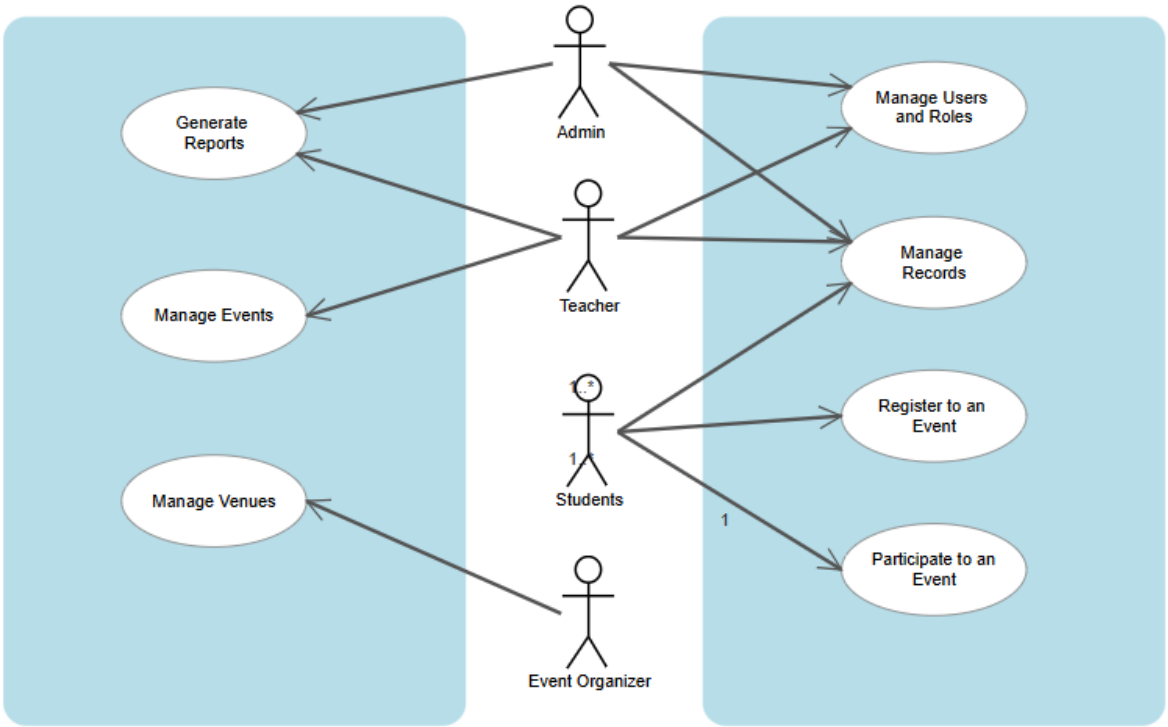


*Image 4-6 – Use Case Diagram of WBMTIS*

Image 4-6 presents the use case diagram that delineates the key actors and core functionalities of the Web-Based Membership Tracking Information System for a karate martial arts school. The system has four primary user roles: Admin, Teacher, Student, and Event Organizer, each interacting with specific system functions relevant to their responsibilities. The Admin user role oversees high-level administration tasks, including user and role management, reports generation, and logging of records. The Teacher user role has access to functionalities like maintaining student records and producing reports, thereby supporting both instructional activities and performance monitoring. The Student user role interacts with the system by registering for events and participating in them, reflecting their engagement and progress in training activities. The Event Organizer user role is responsible for coordinating event logistics, ensuring that the operational readiness of upcoming scheduled events is handled efficiently. The Use Case diagram shown visually maps the relationships between users and system functionalities using clear, directional associations, thereby emphasizing the modular, role-based structure of the platform. This structure not only

ensures security through access control but also streamlines user experience by tailoring access to each role's specific functions.

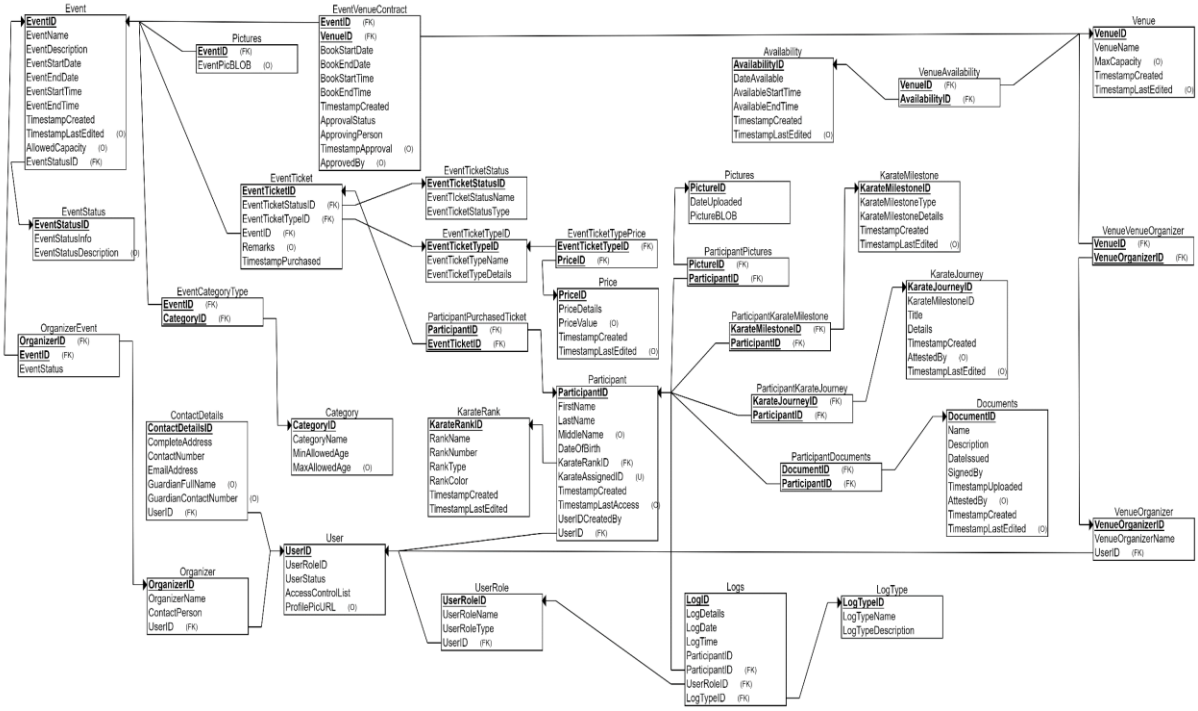


*Image 4-6. Entity-Relation Diagram of WBMTIS*

Image 4-6 presents the entity-relationship diagram (ERD), which outlines the underlying database structure of the Web-Based Membership Tracking Information System. The ERD presented features a collection of various interconnected tables that support event management, user roles, venue logistics, karate journey tracking, and system logging. Central to the table schema is the User table, which connects to the UserRole table for access control and profile management. Users are linked to the Participant table, which captures detailed member data such as rank, belt level, and progress in achieving milestone, with inclusion of documents, pictures, and QR codes for identification. The KarateJourney and KarateMilestone tables track student belt progression and training achievements. Events are managed through the Event, EventTicket, EventVenueContract, and EventCategoryType tables, which allow for ticketing, categorization, and venue assignment. Ticketing is further detailed with EventTicketType, EventTicketStatus, and associated Price tables in orderto define pricing structures. Venues and their availability are managed through the Venue,

Availability, and VenueAvailability tables. Event coordination and user engagement are facilitated by the OrganizerEvent and EventJoinRequest tables, while contact information is stored separately in the ContactDetails table. System activities are logged via the Logs and LogType tables, ensuring traceability and audit readiness. Overall, the schema is designed with a modular and relational approach, enabling scalable and organized data management aligned with the needs of a membership-based karate organization.

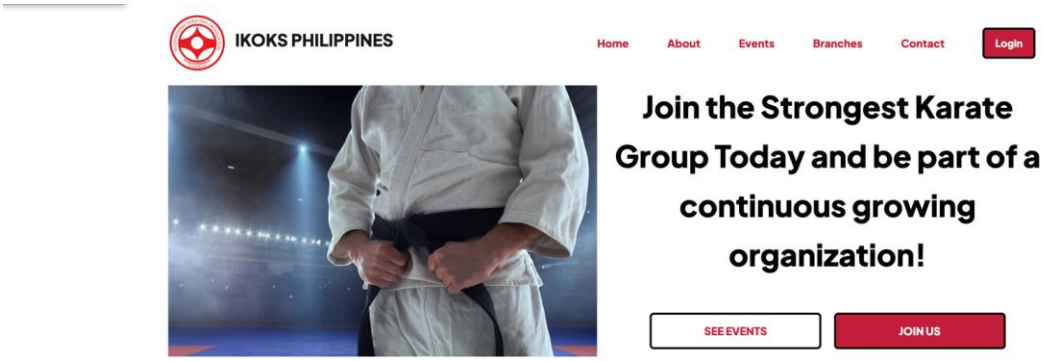


*Image 4.7 – Home Page of WBMTIS*

*Image* 4-7 shows the public landing page of the Web-Based Membership Tracking Information System. It provides key navigation options such as Home, About, Events, Branches, and Contact, along with a prominent Login button. A central call-to-action invites users to join the organization or view upcoming events, suggesting a focus on recruitment and community engagement.

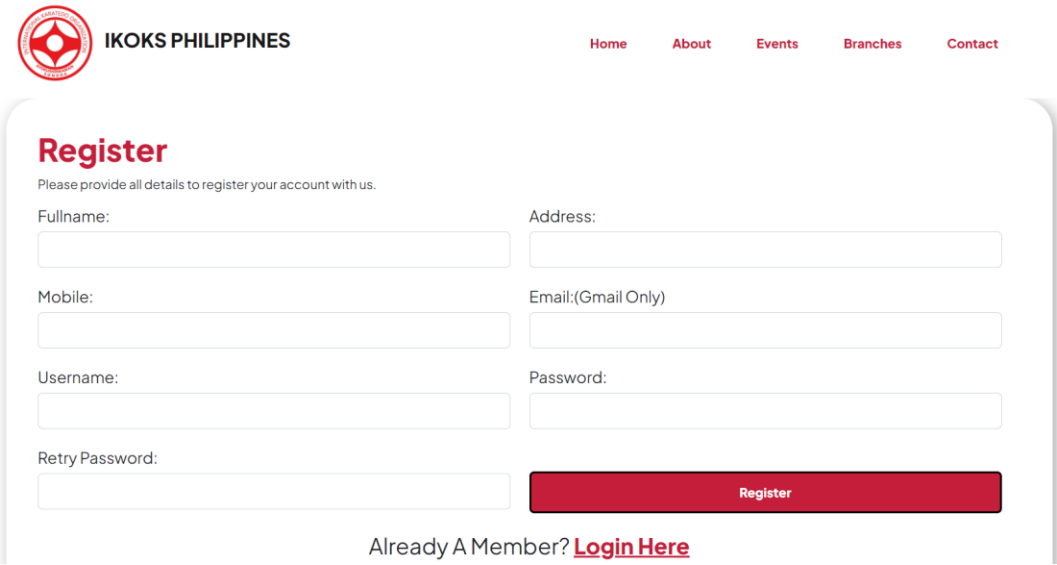


*Image 4.8 – Registration Page of WBMTIS*

*Image* 4.8 shows the screen that facilitates new member registration. Users are required to input essential personal and account details such as full name, address, mobile number, email (restricted to Gmail), username, and password. A password confirmation field ensures secure input. The Register button submits the form, while a redirect link is provided for users who are already members to log in.

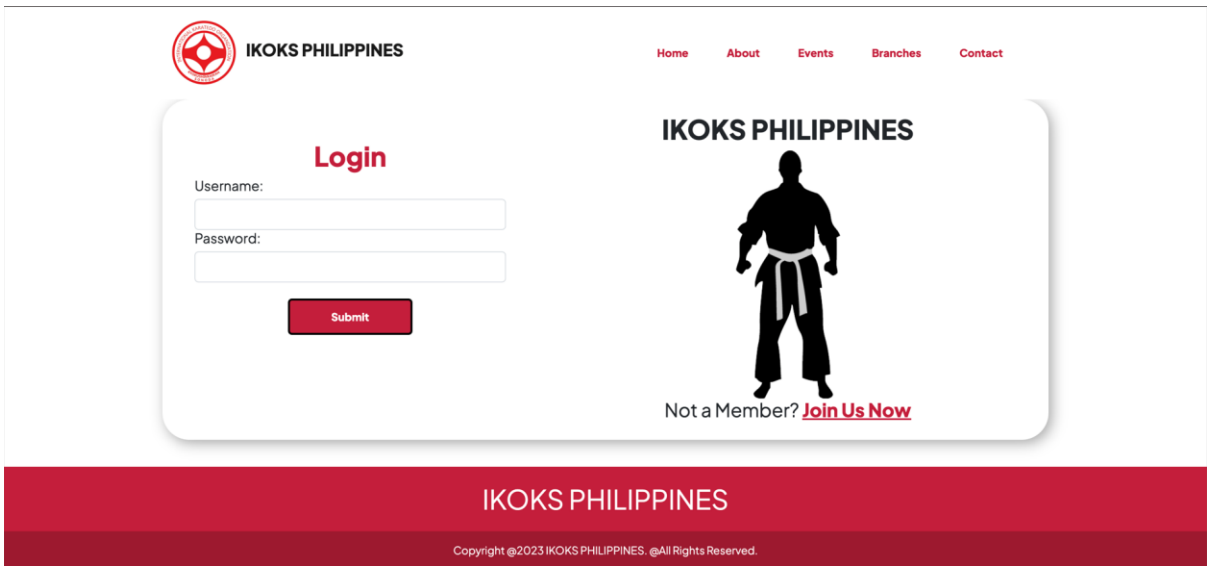


*Image 4.9 – Log in Page of WBMTIS*

*Image* 4-9 shows the page that provides a secure authentication interface for returning users. It includes fields for username and password, a submit button, and a prompt directing non-members to the registration page. The layout reinforces brand presence and gives users a clean, straight-forward way to access their personalized dashboard and features based on their roles.

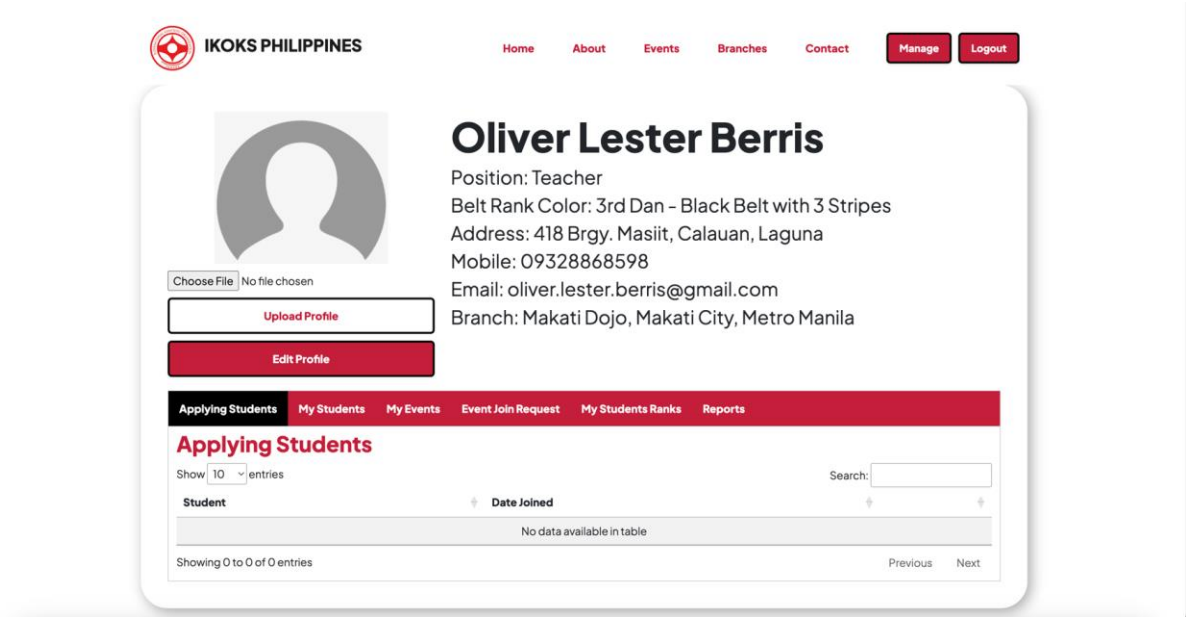


*Image 4.10 – Home Dashboard of Teacher Role in WBMTIS*

*Image* 4.10 shows the screen that displays the teacher's profile information, including name, position, belt rank, address, contact details, email, and assigned dojo branch. The screen allows the teacher to upload or edit their profile picture and personal details. The navigation tabs such as *Applying Students*, *My Students*, *My Events*, *Event Join Request*, *My Students Ranks*, and *Reports* indicate role-based access to key system functions.

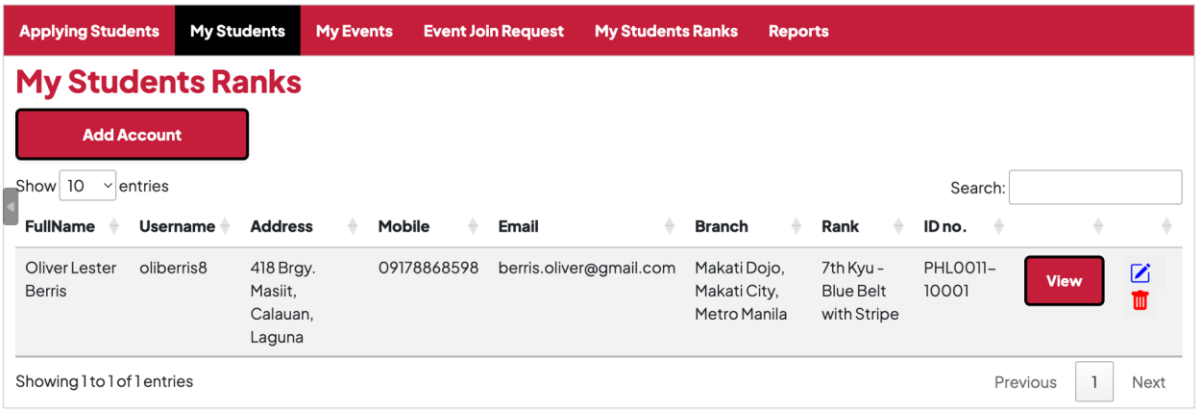


*Image 4.11 – Student Records Page of Teacher Role in WBMTIS*

*Image* 4.11 shows the screen that shows a tabular list of the teacher's assigned students. The screen includes essential student details such as full name, username, address, contact information, email, dojo branch, current belt rank, and system-generated ID number. Teachers can view or delete student records, and manage their rank status, helping to track student progress effectively.

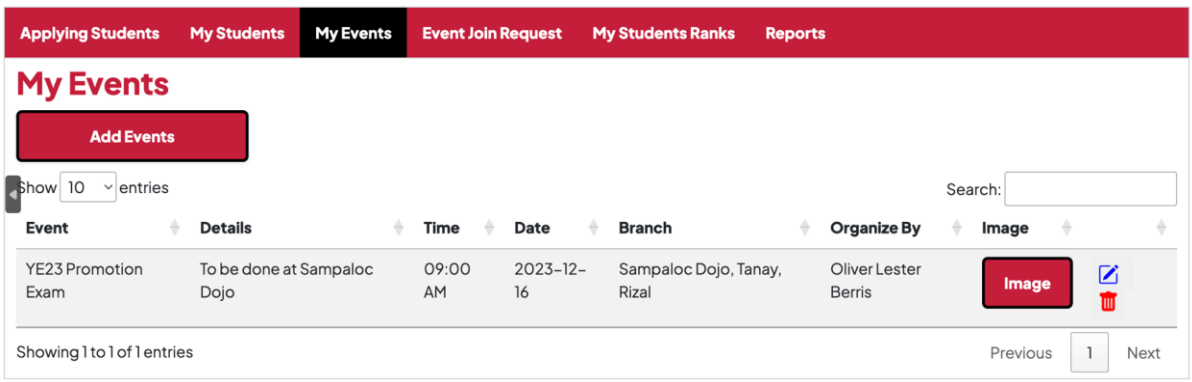


*Image 4.12 – Display Events Page of Teacher Role in WBMTIS*

*Image* 4.12 shows the screen of organized events set by the teacher. The table shows the event title, venue, time, date, branch location, and organizer name. Teachers can add new events, edit existing ones, or upload images related to the event. This interface is essential for event coordination and oversight.

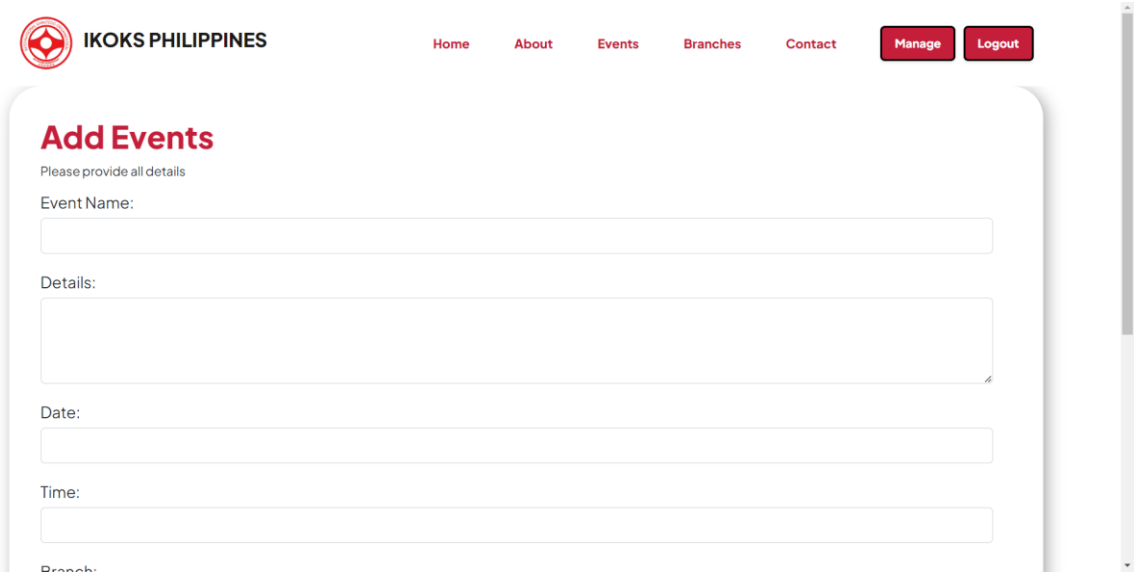


*Image 4.13 – Adding Event Page of Teacher Role in WBMTIS*

*Image* 4.13 shows the screen that allow teachers to create new events by inputting details such as event name, details, date, time, and branch. The screen provides a simple form interface that streamlines event creation and ensures that upcoming training sessions, examinations, or seminars are properly recorded and visible to participants.

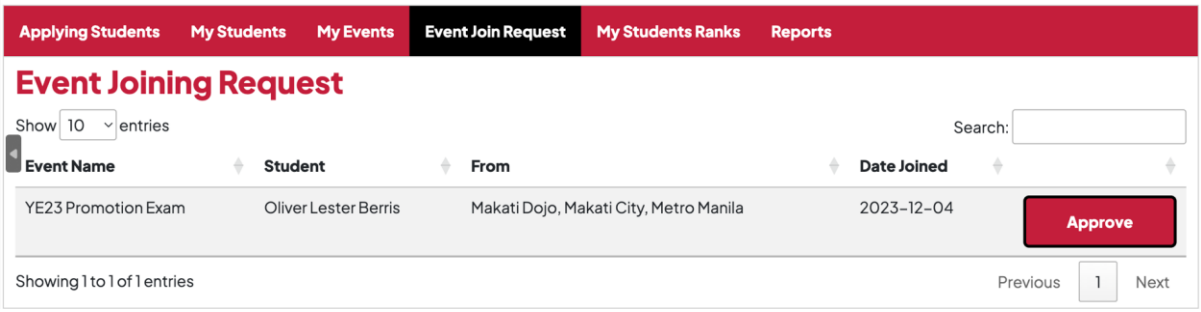


*Image 4.14 – Event Joining Request Page of Teacher Role in WBMTIS*

*Image* 4.14 shows the page that displays student requests to join upcoming events. Teachers can view which students have applied, from which dojo, and the date of the request. The "Approve" button enables the teacher to confirm or accept participation, controlling eligibility and participation flow in organized activities.

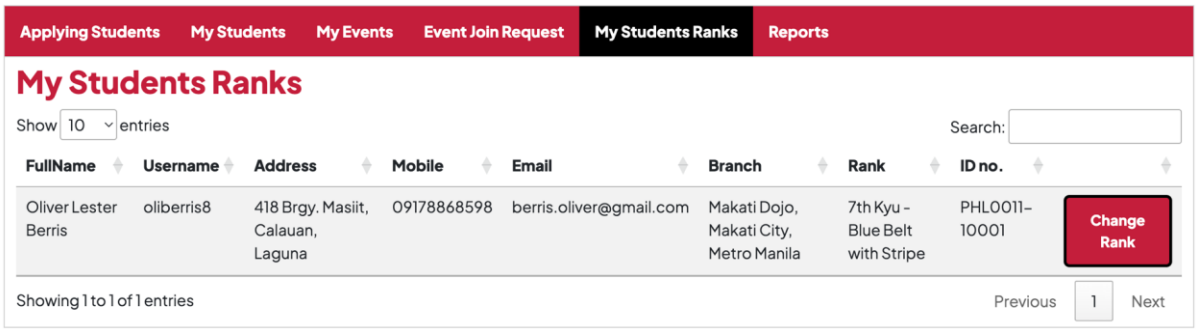


*Image 4.15 – Student Ranks Page of Teacher Role in WBMTIS*

*Image* 4.15 shows the page that allows teachers to manage and update a student's belt rank and progression status. The feature supports detailed recordkeeping for grading and promotion tracking. Teachers can click "Change Rank" to input new belt levels, aligning student records with their latest achievements.

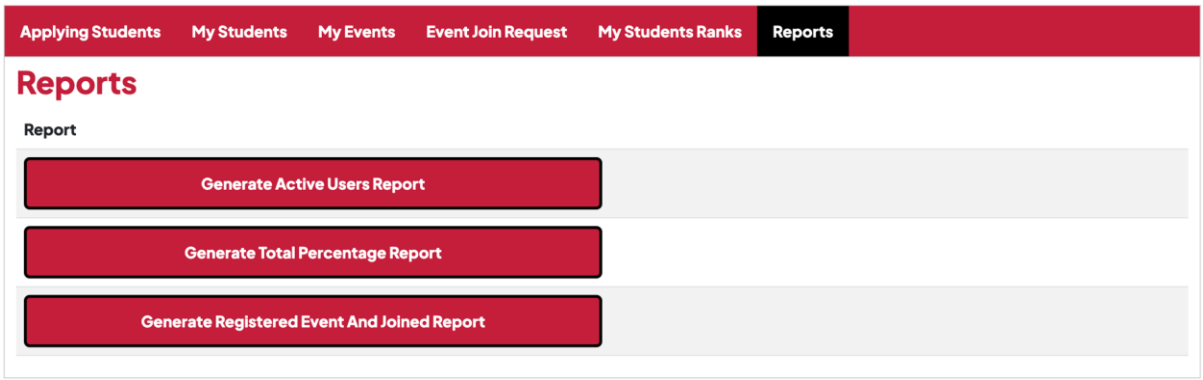


*Image 4.16 – Reports Page of Teacher Role in WBMTIS*

*Image* 4.16 shows the page that enables teachers to generate system reports. The available reports that can be generated include: *Active Users Report*, *Total Percentage Report*, and *Registered Event and Joined Report*. The automated reports provide summarized insights useful for performance evaluation, participation tracking, and administrative documentation.

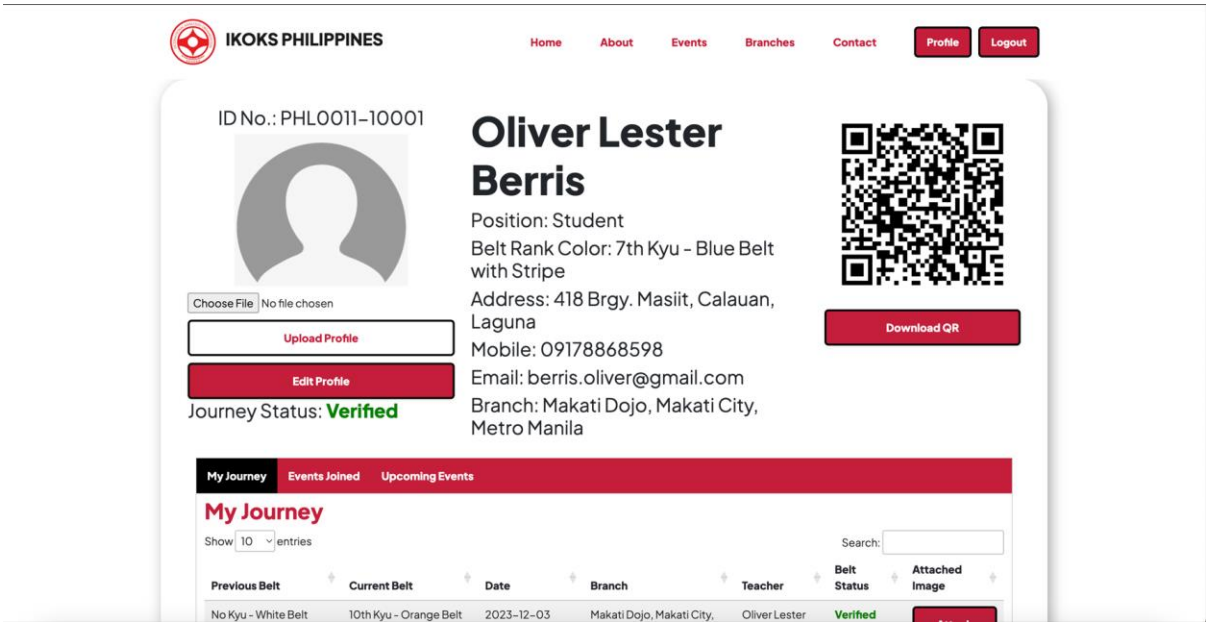


*Image 4.17 – Home Dashboard Page of Student Role in WBMTIS*

*Image* 4.17 shows the screen that displays the student's personal profile, including an assigned ID number, name, rank or belt level, address, contact information, and assigned branch. Students can upload or update their profile photo and edit their personal information. A QR code is automatically generated for each user, which can be downloaded for verification during events. The "Journey Status" indicates whether the student's progress record has been verified. The lower section displays the karate journey timeline, showing belt progress history, current rank, verification status, assigned teacher, and dojo branch.

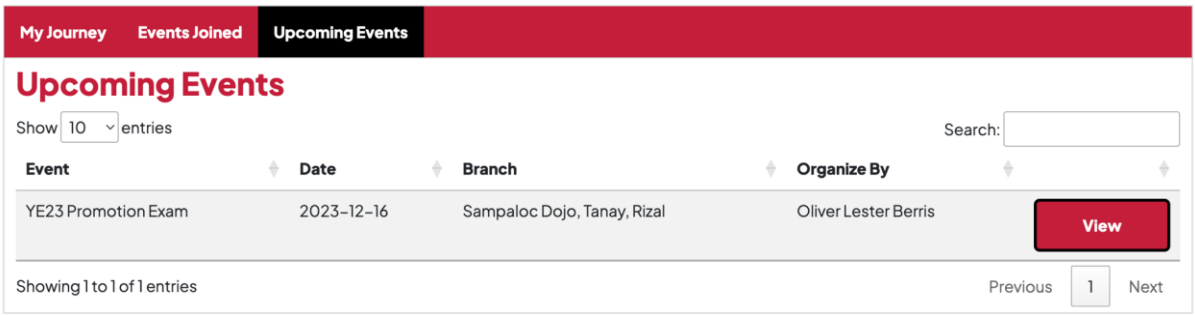


*Image 4.18 – Upcoming Events Page of Student Role in WBMTIS*

*Image* 4.18 shows the screen that lists all events the student is eligible to attend. The page includes details such as event name, date, branch, and organizer. The student can view specific event details and prepare accordingly. This section ensures

students stay informed of relevant activities and upcoming engagements at their respective dojos or other participating branches.

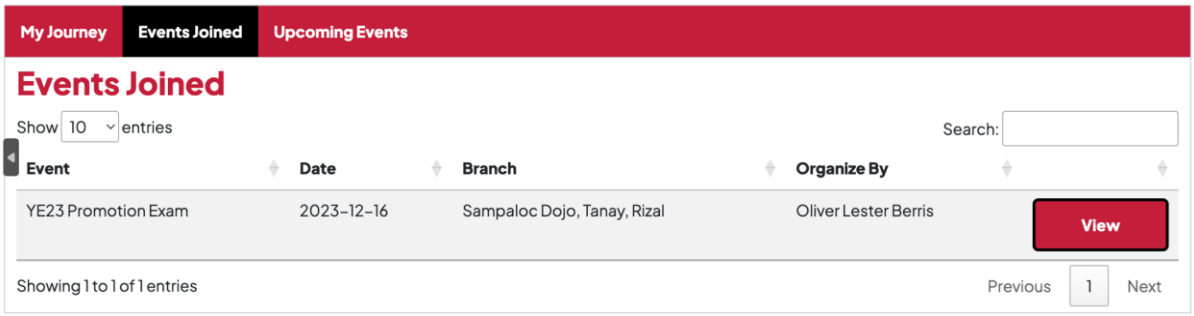


*Image 4.19 – Events Joined Page of Student Role in WBMTIS*

*Image* 4.19 shows the screen that shows a list of events the student has successfully registered for or participated in. The page offers students a clear historical log of their participation in events created by the teachers. The “View” button allows access to event-specific information or downloadable content such as tickets.

## Methods

The methods used in creating the information system was to gather the requirements and understand the current processes of the organization which were automated by leveraging available open-source technologies and provided an added competitive advantage in their operations. Analysis and Design came next to come up how the information system provided the functionalities and features from the gathered requirements through Unified Mark-up Language (UML) diagrams and documentations. When the diagrams and documentations, such as the class diagrams, activity diagrams and detailed design documents, were made available will the system development and system testing phase proceed since the tasks were under a product backlog and will be for development in sprints. The set-up made while the information system was being developed was to have Git installed in the server under the dev branch so the updates in code were monitored closely and managed well especially for back-up on codes. Data handling had a defined structure in the form of an ERD which was implemented in the database of the system.

The development of the Web-Based Membership Tracking Information System followed a hybrid methodology combining RAD, the Scrum Framework, and the ADDIE Model to ensure a flexible yet structured approach. RAD allowed for quick iterations and prototyping, ensuring that stakeholder requirements were addressed rapidly with minimal upfront planning. This was essential in responding to evolving client feedback. Scrum was incorporated through bi-weekly sprints, backlog grooming, sprint planning, sprint reviews, and retrospectives, enabling transparency, inspection, and continuous adaptation throughout the development cycle. Tasks were managed using Trello, functioning as a Kanban board to track sprint progress. Meanwhile, the ADDIE model was integrated within each sprint cycle, where each user story or module passed through the five ADDIE phases. This layered approach ensured that development remained user-centered, iterative, and aligned with both instructional and operational goals, resulting in a system that was technically sound, pedagogically relevant, and highly acceptable to users.

## Plan for User Testing and Project Assessment

The project went on for a total of 8 months, with the inclusion of user testing and project assessment. User testing was done using a user story template and a set of test cases along with the development of the information system as both the Scrum Framework and ADDIE model were utilized to provide timely feedback in a two weeks sprint to the stakeholders and implement the changes immediately before proceeding with the next features developed in the information system. The overall project assessment pushed through once both system development and system testing phase were complete. Within the remaining two weeks period, the stakeholder or client was able to determine if the developed information system was acceptable and will push through with the deployment of the information system in production for the organization to proceed with their own membership tracking system.

A user story template was used to provide a clear and structured way to define system requirements from the perspective of the end-user. The format, *"As a [type of user], I want to [perform some task] so that I can [achieve some goal]",* allowed each feature in the Web-based Membership Tracking Information System to be written in an understandable and actionable format. The user story template helped in capturing stakeholder needs clearly, organizing the development backlog during Sprints, and aligning features with business and user goals to deliver real value and priority levels.

The test case template served as a standardized tool for validating whether each developed feature of the system performed as intended. The test case template included key fields such as test steps, expected results, actual outcomes, pass/fail status, and remarks, enabling a systematic approach to quality assurance. The test case template played a critical role during the "Implement" and "Evaluate" phases of the ADDIE model by ensuring that each feature underwent thorough validation. The test case template also supported the documentation of quality assurance activities during User Acceptance Testing (UAT) during the Sprint and Sprint Reviews, while maintaining traceability by linking each test case directly to its corresponding user story. Each test case followed a structured layout, beginning with a test scenario or description similar to the user story template, followed by detailed steps and input data, a comparison of expected and actual results, and an outcome indicating whether the

test passed or failed. Each user story provided the basis for creation of test case, ensuring development was test-driven and validated from the user's perspective.

In overall validation that the developed Information System is functional, the SUS was employed as the primary user testing tool to assess the functionality, usability, and acceptance of the Web-Based Membership Tracking Information System. The SUS is a reliable, validated 10-item questionnaire that measures a system's perceived usability using a Likert scale from Strongly Disagree to Strongly Agree. The SUS provided a usability score between 0 and 100, with higher scores indicating better usability.

The Web-based Membership Tracking Information System have garnered an average SUS score of 91.25 from 20 users comprising karate teachers and students, which falls under the "Excellent" usability category. This score confirms that the system is not only functionally effective but also user-friendly, reliable, and acceptable.

This result directly supports and validates the three theories used in the Web-based Membership Tracking Information System development. For TAM, SUS questions addressed Perceived Ease of Use and Perceived Usefulness. The user stories ensured Attitude and Behavioral Intention were positive by embedding user-centered features. For STS, the Scrum events and user story approach ensured joint optimization between social and technical components. Feedback during Sprint Reviews addressed the fit between people, processes, and the system. High SUS scores confirmed that the system integrated smoothly into users' social and operational contexts. And for IPT, user stories involving dashboards, automated reports, and QR code validation directly relate to how information is input, processed, stored, and retrieved. The SUS result showed users found this set-up process efficient and cognitively manageable.

Additional testing methods included Sprint Reviews for evaluating completed user stories, UAT to simulate real-world use before deployment, iterative evaluation through the ADDIE model for continuous feedback, and Trello as a Kanban tool to track development tasks and progress.

# Chapter V

# RESULTS AND DISCUSSIONS

## Summary of Survey Results

To assess the overall usability and user acceptance of the Web-Based Membership Tracking Information System, the System Usability Scale (SUS) questionnaire was administered to a group of 20 end-users, consisting of both karate teachers and student participants. The SUS, a widely recognized instrument to evaluate perceived usability, comprises ten standardized statements rated on a 5-point Likert scale. The analysis yielded a mean SUS score of 91.25, which falls within the “Excellent” usability category. This result indicates a high level of user satisfaction, intuitiveness, and effectiveness of functionalities, confirming that the WBMTIS met stakeholder requirements and expectations. The survey also functioned as both a validation mechanism for user-centered design choices and a direct measure of usability aligned with TAM, STS, IPT.

## Detailed Breakdown and Discussion of Each SUS Question

A detailed breakdown of the results by question provides further insights into specific areas of system performance and usability. Users responded positively to the statement, *“I think that I would like to use this system frequently”*, with an average score of 4.7, which indicate a high score on perceived usefulness and behavioral intention as per TAM. The WBMTIS was not seen as unnecessarily complex as the score received 1.2, confirming the simplicity of the user interface and further supporting TAM's concept of perceived ease of use. Additionally, the statement involving *“I thought the system was easy to use”* was received with an even higher average of 4.8, which reinforces the design’s accessibility. The belief that technical assistance was unnecessary to operate the system garnered an average of 1.3, which further supports its independent usability.

Regarding system integration, specifically with the statement *“I found the various functions well integrated”*, received an average of 4.6, demonstrating that modules such as student tracking, event registration, and document uploads worked together seamlessly, which strongly aligns with IPT on emphasizing efficient input, processing, and output flows. Users also disagreed with the idea that the system was inconsistent

with an average of 1.1, indicating that design patterns and navigation structures were uniform throughout the interface. Learnability was another key strength, as the statement *"I would imagine most people would learn to use this system very quickly"*) received an average score of 4.7, affirming STS's emphasis on human-system interaction.

Other indicators, such as minimal user friction, garnering a score of 1.2, and high confidence in system usage, with a score of 4.8, made users feel in control and comfortable navigating the platform. Finally, the statement regarding the need to learn a lot before getting started has received a low score of 1.3, confirming that onboarding was simple and intuitive, thus reinforcing the IPT concept of minimal cognitive load during system use.

### Overall Interpretation

The obtained SUS score of 91.25 reflects that the WBMTIS gained an overall perception of excellent usability. The consistently high score across all individual question items indicates high usability, including in areas of ease of use, module integration, user confidence, and learnability of the system. These findings suggest that users were able to easily understand and navigate the WBMTIS with minimal effort or without requiring external support or assistance. Moreover, the uniformly strong ratings across both positively and negatively worded SUS items underscore the system's stability, reliability, and coherent user experience. The smooth and consistent interaction patterns reported by users confirm that the platform delivers an intuitive and well-integrated interface. Collectively, these results affirm the system's readiness for operational deployment and provide empirical evidence that the WBMTIS met its intended functions and user-centric design objectives.

### Additional Observations and Comments

In addition to the quantitative SUS ratings, open-ended user feedback provided valuable contextual insights that enriched the survey findings. The respondents commended the seamless nature of the event registration process, the clarity and consistency of the user interfaces, and the intuitive layout of the dashboard. These qualitative comments further substantiate the system's usability strengths and corroborate the high satisfaction reflected in the quantitative results. Some users

recommended the addition of visual indicators for student progress tracking and more dynamic reminders for event deadlines. These suggestions were noted for future improvement, but did not reflect critical usability issues. No major concerns or system errors were reported during testing, which further supports the conclusion that the system was stable and well-received by its intended users.

## Synthesis with Theoretical Frameworks

The SUS findings closely align with the theoretical frameworks adopted in this study. From the perspective of TAM, the high ease of use and perceived usefulness directly supported the increased system adoption and its continued use. The STS was reinforced by the successful integration of the system within existing dojo workflows, showing that both technical and social components were harmonized. Lastly, the IPT was validated by the users' ability to easily process and act on system data with minimal cognitive load. Together, these insights confirm that the system not only achieved technical usability but also aligned with theoretical principles essential to effective and sustainable information system design.

## Application of Frameworks, Models, and Theories

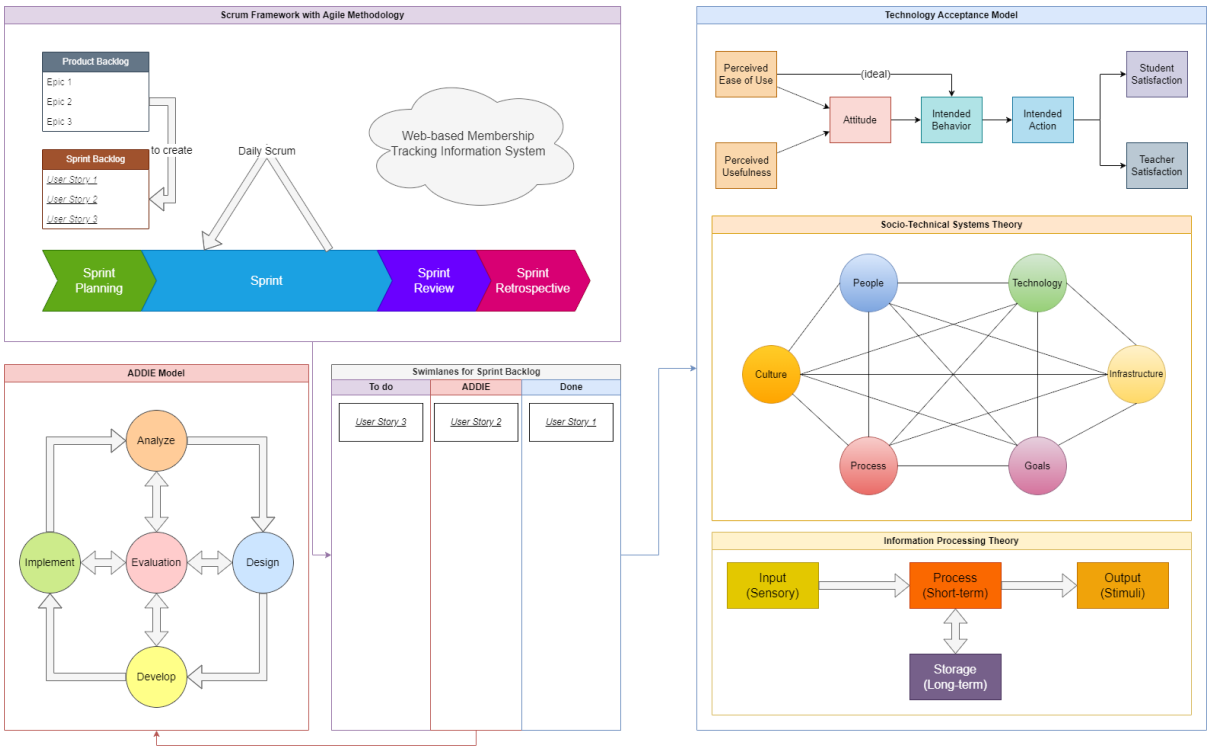

*Figure 5-1. Diagram Illustrating the Relation of all the Frameworks, Models, and Theories used in the Development of the Information System*

The diagram shown in Figure 5-1 shows how all the frameworks, models, and theories were utilized in order to successfully implement the Web-based Membership Tracking Information System. The diagram is composed of three parts: Scrum Framework with Agile Methodology, Swimlanes for Sprint Backlog and ADDIE Model, and the inter-relatedness of the following IS Theories: TAM, STS Theory and IPT.

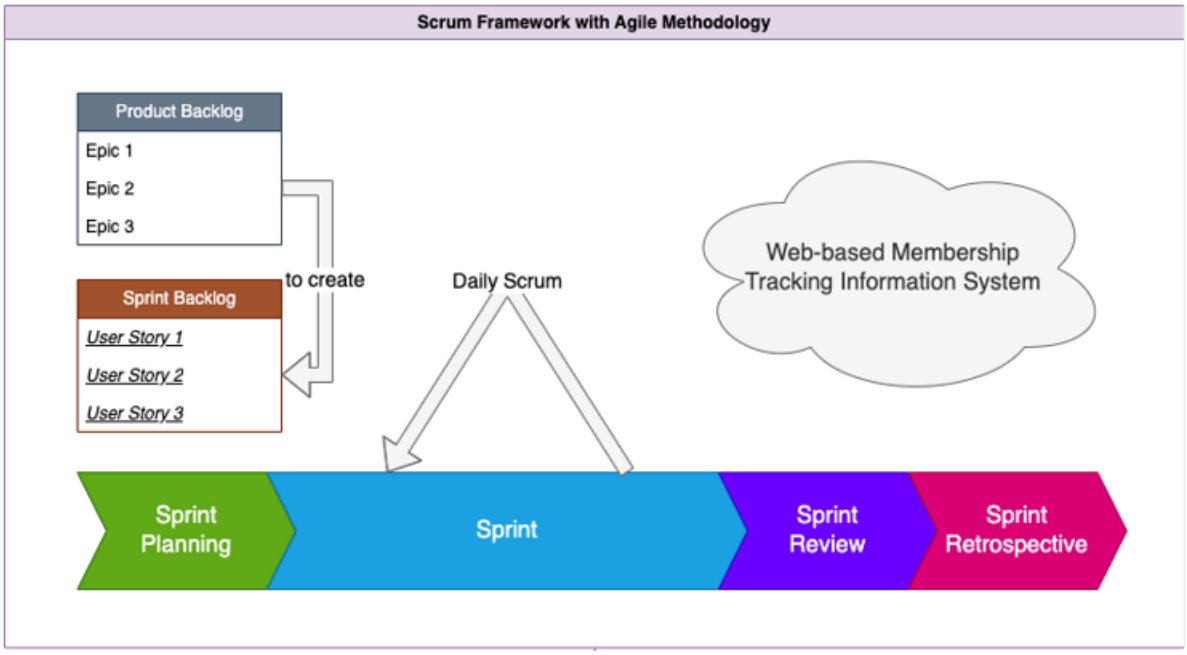


*Figure 5-2. Diagram of the Scrum Framework with Agile Methodology*

The Scrum Framework with Agile Methodology provides the events mentioned in the Scrum Framework: Sprint Planning, the actual Sprint, Daily Scrum during the Sprint duration, Sprint Review, and Sprint Retrospective (Scrum Guide, 2023). During Sprint Planning, the intended features or functionalities are placed in the Product Backlog as Epics where each Epic were broken down to create User Stories which

then are to be placed in a Sprint Backlog for the development team to prioritize which to develop first. After the development team has decided what to push through as a goal within the Sprint through the selected User Stories, the actual Sprint pushed through within the agreed timebox of 2 weeks. Once the User Stories have been developed, Sprint Review was conducted with the stakeholders or client to show the progress of the development. After the Sprint Review, the development team goes through a Sprint Retrospective to determine what went well, what can be improved, and what can be started. These events helped in promoting transparency, inspection, and adaption of the development between the client and the development team.

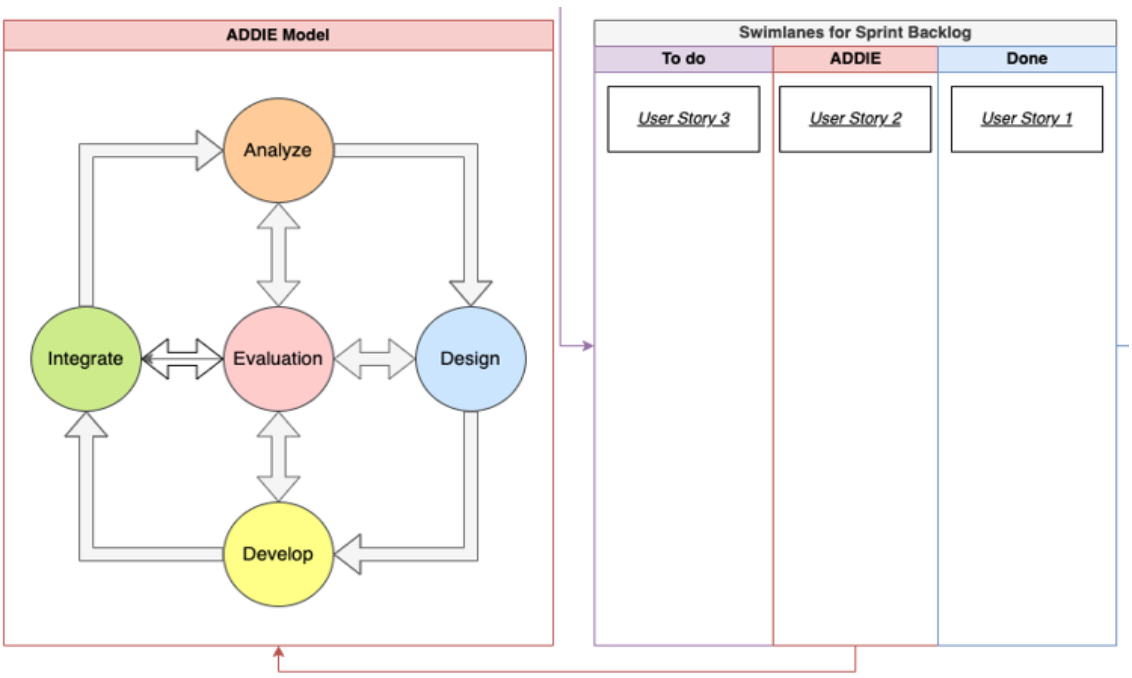


*Figure 5-3. Diagram of the Swimlanes for Sprint Backlog and ADDIE Model*

The Swimlanes for Sprint Backlog have the following statuses that each User Story will go through: To do, ADDIE, and Done. The main goal is to have all User Stories placed in the Done status. As shown in Figure 5-3, each User Story went through the ADDIE Model in the form of the following phases: In Analysis (Process

Flow), In Design (Design Thinking), In Development (Web/Mobile), In Integrate/Implement (Test and UAT), and Evaluation (Communication with Client). The usage of the ADDIE model was customized in order to capture client feedback in every phase of ADDIE for each User Story as each User Story adds an incremental value to the information system, which served as the purpose of every Sprint made. Both the Swimlanes for Sprint Backlog and the customized ADDIE Model assisted in ensuring that the system will be accepted by the client according to their organizational needs, frequent feedback through communication, user acceptance on confirming completion of User Stories or during Sprint Review, and usage preference of the stakeholder during the overall development of the information system.

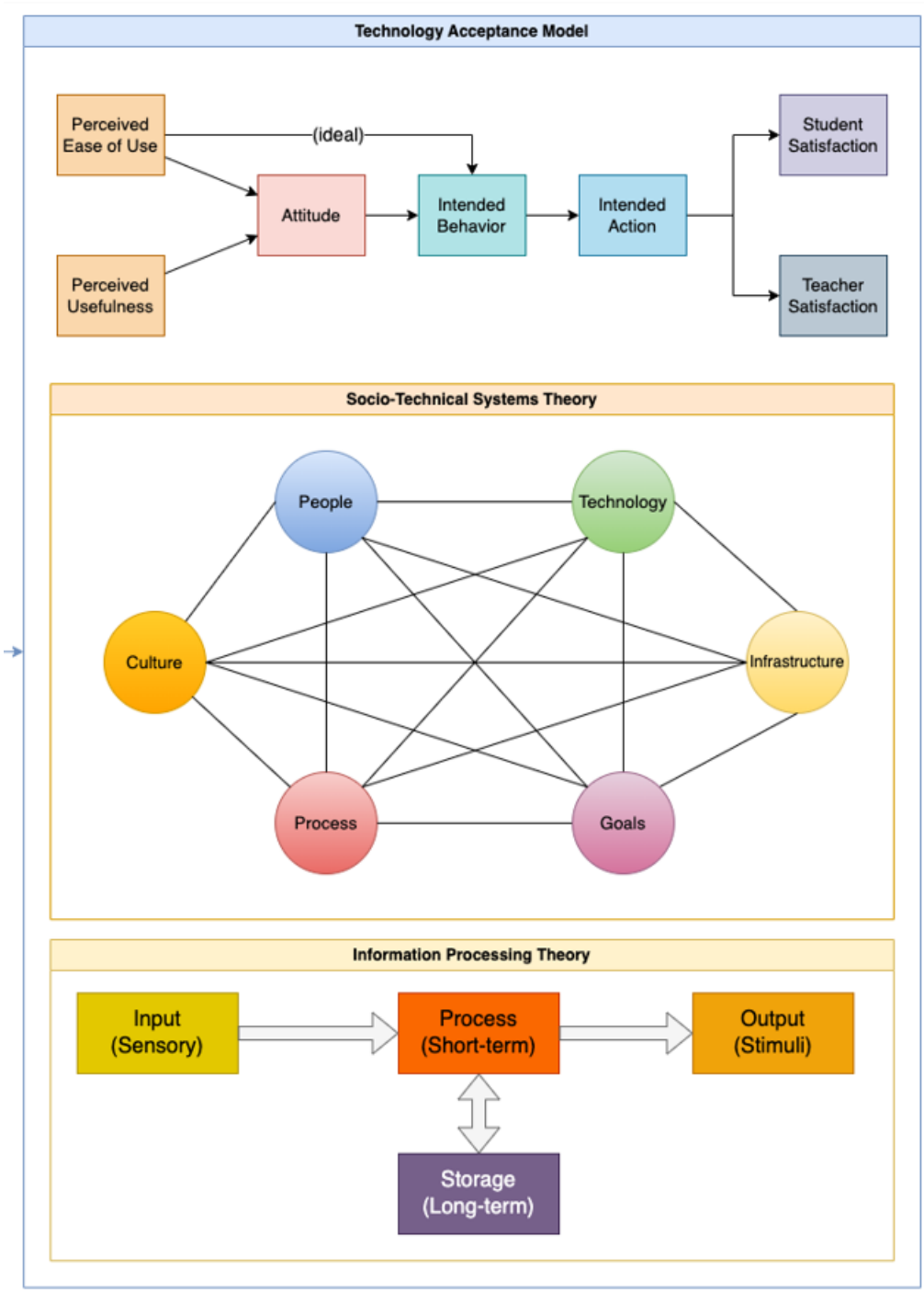


*Figure 5-4. Diagram showing how TAM, STS and IPT are inter-related in the successful implementation of the Information System*

Figure 5-4 presents how TAM, STS, and IPT were all important in the successful implementation of the information system through each User Story created.

In TAM, other factors such as Attitude and Intended Behavior were considered in order to reach the intended action that will result in the satisfaction of the users. When the intended behavior is predicted based from the ease of use or anticipated output over the perceived usefulness, the information system is more likely to be accepted by the users. As for STS Theory, the STS Theory is placed within TAM as there were external factors that does not involve technology alone and the people in the successful implementation of the information system. These external factors need to be considered along with technology and people are the following: culture, infrastructure, process, and goal. Combining these factors in the STS Theory with the additional findings in TAM had a direct relation in making the information system more adopted. And for IPT, the purpose of information system to provide relevant information based from data stored on the profile and journey of the karate user proved to be more reliable and made processed data readily availability through an on-demand or per need basis. Each User Story have phases that involve gathering input, processing data, data storage or retrieval, and providing output, which IPT has a direct correlation. Even though the IPT is more geared towards human cognitive thinking, the information system is capable to providing these details through computers where each phase can be directly related to computer parts such as keyboard for gathering input, random access memory (RAM) for processing data, hard drive for data storage or retrieval, and monitor for providing output to the users.

# Chapter VI

# CONCLUSIONS

The development study culminated in the successful development and evaluation of a Web-Based Membership Tracking Information System (WBMTIS), purpose-built for a karate martial arts school operating in the Philippine context. The WBMTIS was developed to address the organization's operational challenges, particularly in areas of member record management, monitoring of student progress, event coordination, and communication enhancement. The WBMTIS was successfully implemented and progressed within the scheduled timebox, despite some abrupt changes made throughout development of the WBMTIS in response to frequent client feedback, inclusion of specific feature requests, and evolving preference with regards to the user interfaces. These modifications were accommodated efficiently through a combined methodology, employing both the RAD model and the ADDIE framework. The RAD model facilitated interactive prototyping and adaptiveness through changing requirements, while the ADDIE framework provided a structured approach across five key phases, ensuring sustained alignment between user experiences and system capabilities.

To promote transparency and maintain close collaboration, selected elements of the Scrum Framework were incorporated throughout the project lifecycle. This included sprint planning sessions, consistent reviews with stakeholders, and the use of Trello software as a visual tool for managing the backlog and tracking the progress of each feature. Scrum introduced effective checkpoints and inspection mechanisms, enabling the determination of whether specific features had reached an acceptable level of quality. For every Sprint, which typically follows a two-week time box, enables incremental delivery of system features while remaining responsive to shifting priorities, thereby aligning with agile principles and client-centered development philosophy. Furthermore, user stories were essential in defining each system function from the end-user's perspective, and were developed in parallel with the ADDIE framework to ensure that all functional elements adhered to stakeholder expectations and acceptance criteria.

During the final evaluation phase, the System Usability Scale (SUS) was administered and yielded an average score of 91.25, which classifies the WBMTIS to be within the “Excellent” range of usability. This outcome validated the effectiveness of the user-centered development approach and provided empirical evidence that the platform was perceived as intuitive, efficient, and satisfactory by its intended users. Each SUS item reinforced key dimensions of performance, demonstrating that the system was ready for operational deployment.

These results strongly align with the theoretical foundations of information systems that were adopted in this study: TAM, STS, and, IPT. TAM played a pivotal role in assessing user adoption by highlighting the critical influence of perceived usefulness, perceived ease of use, and user attitudes in driving actual system usage. STS emphasized the necessity of integrating technological solutions with social and organizational contexts, wherein people, processes, goals, and culture collectively shaped the successful implementation of such platform. The iterative approach of the Scrum Framework effectively addressed these socio-technical considerationsby facilitating continuous stakeholder feedback through bi-weekly sprint reviews. IPT offered a cognitive foundation for analyzing how users interact and process information to engage with the features of a WBMTIS. Additionally, IPT emphasized efficient information processing, recall, and interpretation, principles which were applied in the system’s interface design and data presentation features, particularly in dashboards, logs, and report generation.

Overall, the project achieved its core objectives of improving membership tracking, enhancing communication and information flow, supporting personalized engagement, and modernizing dojo operations through technology. The integration of development frameworks and theoretical models ensured that the system was not only technically functional but also user-aligned, scalable, and capable of adapting to future needs. The Web-Based Membership Tracking Information System thus stands as a successful, theory-informed solution that advances the operational capacity and instructional support systems of the karate school.

## Chapter VII

## RECOMMENDATIONS

In light of the limitations acknowledged in the scope of the study and the findings gathered throughout the development and evaluation of the Web-Based Membership Tracking Information System, several functional enhancements are recommended to further improve system performance, usability, and relevance. These recommendations aim to address specific features that were beyond the scope of the study and are provided for further research:

1. Integration of an online payment gateway to facilitate secure and efficient processing of membership fees, event registration payments, and other monetary transactions to eliminate manual payment tracking and improve financial accountability.
2. Implementation of push notification support to enhance real-time communication and allow users to receive immediate updates regarding event schedules, deadlines, and important announcements, thereby improving responsiveness and engagement.
3. Synchronization with external calendars as users manually track events and training schedules within the system. Calendar synchronization would enable users to integrate dojo-related activities into their user's personal calendars, supporting better time management and planning.
4. Development of a comprehensive analytics dashboard to enable instructors and administrators to monitor member progress, evaluate attendance trends, and assess overall program effectiveness using visual data representations.
5. Introduction of an internal messaging or chat feature to develop another channel to centralize communications, ensure message traceability, and support real-time collaboration within the system.
6. Inclusion of an e-learning module for students featuring video tutorials, interactive quizzes, and course materials would extend the system's instructional capabilities and support hybrid or remote learning models.

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## APPENDICES

### Deliverables and Milestones

```
@startuml

left to right direction

actor "Karate Student" as karateStudent
rectangle "Web-based Membership Tracking Information System" {
  usecase "Register Member Account" as UC1.1
  usecase "Access Member Account" as UC1.5
  usecase "View Dashboard" as UC1.6
  usecase "Change Password" as UC1.7
  usecase "View Karate Progression" as UC1.8
  usecase "Add Karate Journey" as UC1.9
  usecase "Add Documents" as UC1.10
  usecase "Update Personal Details" as UC1.11
  usecase "Update Karate Journey" as UC1.12
  usecase "Upload Document" as UC1.13
  usecase "Upload Picture" as UC1.14
  usecase "View Personal Details" as UC15
  usecase "View Karate Journey" as UC1.16
  usecase "View Documents" as UC1.17
  usecase "View Picture" as UC1.18
  usecase "Delete Karate Journey" as UC1.19
  usecase "Delete Document" as UC1.20
  usecase "Delete Picture" as UC1.21

  usecase "View Event" as UC2.3
  usecase "View Registration Status" as UC2.6
  usecase "Print Event Ticket" as UC2.9
  usecase "Scan Event Ticket" as UC2.10
  usecase "Record Event Payment" as UC2.11

  usecase "View Karate Result" as UC3.7


  usecase "Search Karate Person" as UC4.1
  usecase "View Karate Profile" as UC4.2

}
actor "Guardian" as Guardian

Guardian --> UC1.1
Guardian--> UC1.5
Guardian --> UC1.6
Guardian --> UC1.7
Guardian --> UC1.8
Guardian --> UC1.9
Guardian --> UC1.10
Guardian --> UC1.11
Guardian --> UC1.12
Guardian --> UC1.13
Guardian --> UC1.14
```

```
Guardian --> UC15
Guardian --> UC1.16
Guardian --> UC1.17
Guardian --> UC1.18
Guardian --> UC1.19
Guardian --> UC1.20
Guardian --> UC1.21
Guardian --> UC2.3
Guardian --> UC2.6
Guardian --> UC2.9
Guardian --> UC2.10
Guardian --> UC2.11
Guardian --> UC3.7
Guardian --> UC4.1
Guardian --> UC4.2

karateStudent --> UC1.1
karateStudent--> UC1.5
karateStudent --> UC1.6
karateStudent --> UC1.7
karateStudent --> UC1.8
karateStudent --> UC1.9
karateStudent --> UC1.10
karateStudent --> UC1.11
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karateStudent --> UC1.17
karateStudent --> UC1.18
karateStudent --> UC1.19
karateStudent --> UC1.20
karateStudent --> UC1.21
karateStudent --> UC2.3
karateStudent --> UC2.6
karateStudent --> UC2.9
karateStudent --> UC2.10
karateStudent --> UC2.11
karateStudent --> UC3.7
karateStudent --> UC4.1
karateStudent --> UC4.2

@enduml
```

*Figure A-1. Use Case – Karate Student (Child and Guardian)*

```
@startuml

left to right direction

actor "Karate Student" as karateStudent
rectangle "Web-based Membership Tracking Information System" {
  usecase "Register Member Account" as UC1.1
  usecase "Access Member Account" as UC1.5
  usecase "View Dashboard" as UC1.6
```

```
  usecase "Change Password" as UC1.7
  usecase "View Karate Progression" as UC1.8
  usecase "Add Karate Journey" as UC1.9
  usecase "Add Documents" as UC1.10
  usecase "Update Personal Details" as UC1.11
  usecase "Update Karate Journey" as UC1.12
  usecase "Upload Document" as UC1.13
  usecase "Upload Picture" as UC1.14
  usecase "View Personal Details" as UC15
  usecase "View Karate Journey" as UC1.16
  usecase "View Documents" as UC1.17
  usecase "View Picture" as UC1.18
  usecase "Delete Karate Journey" as UC1.19
  usecase "Delete Document" as UC1.20
  usecase "Delete Picture" as UC1.21

  usecase "View Event" as UC2.3
  usecase "View Registration Status" as UC2.6
  usecase "Print Event Ticket" as UC2.9
  usecase "Scan Event Ticket" as UC2.10
  usecase "Record Event Payment" as UC2.11

  usecase "View Karate Result" as UC3.7


  usecase "Search Karate Person" as UC4.1
  usecase "View Karate Profile" as UC4.2

}

karateStudent --> UC1.1
karateStudent--> UC1.5
karateStudent --> UC1.6
karateStudent --> UC1.7
karateStudent --> UC1.8
karateStudent --> UC1.9
karateStudent --> UC1.10
karateStudent --> UC1.11
karateStudent --> UC1.12
karateStudent --> UC1.13
karateStudent --> UC1.14
karateStudent --> UC15
karateStudent --> UC1.16
karateStudent --> UC1.17
karateStudent --> UC1.18
karateStudent --> UC1.19
karateStudent --> UC1.20
karateStudent --> UC1.21
karateStudent --> UC2.3
karateStudent --> UC2.6
karateStudent --> UC2.9
karateStudent --> UC2.10
karateStudent --> UC2.11
karateStudent --> UC3.7
karateStudent --> UC4.1
```

```
karateStudent --> UC4.2

@enduml
```

*Figure A-2. Use Case – Karate Student (Adult)*

```
@startuml

left to right direction

actor "Karate Sensei / Shihan / Kaicho" as karateTeacher
rectangle "Web-based Membership Tracking Information System" {
  usecase "Register Member Account" as UC1.1
  usecase "Assign Member Role" as UC1.2
  usecase "Approve Member Account Creation" as UC1.3
  usecase "Deny Member Account Creation" as UC1.4
  usecase "Access Member Account" as UC1.5
  usecase "View Dashboard" as UC1.6
  usecase "Change Password" as UC1.7
  usecase "View Karate Progression" as UC1.8
  usecase "Add Karate Journey" as UC1.9
  usecase "Add Documents" as UC1.10
  usecase "Update Personal Details" as UC1.11
  usecase "Update Karate Journey" as UC1.12
  usecase "Upload Document" as UC1.13
  usecase "Upload Picture" as UC1.14
  usecase "View Personal Details" as UC15
  usecase "View Karate Journey" as UC1.16
  usecase "View Documents" as UC1.17
  usecase "View Picture" as UC1.18
  usecase "Delete Karate Journey" as UC1.19
  usecase "Delete Document" as UC1.20
  usecase "Delete Picture" as UC1.21

  usecase "Create Event" as UC2.1
  usecase "Update Event" as UC2.2
  usecase "View Event" as UC2.3
  usecase "Delete Event" as UC2.4
  usecase "Register Event" as UC2.5
  usecase "View Registration Status" as UC2.6
  usecase "Approve Event Registration" as UC2.7
  usecase "Deny Event Registration" as UC2.8
  usecase "Print Event Ticket" as UC2.9
  usecase "Scan Event Ticket" as UC2.10
  usecase "Record Event Payment" as UC2.11

  usecase "Record Karate Journey" as UC3.1
  usecase "Record Karate Result" as UC3.2
  usecase "Record Document" as UC3.3
  usecase "Record Picture" as UC3.4
  usecase "Update Karate Progression" as UC3.5
  usecase "Update Karate Result" as UC3.6
  usecase "View Karate Result" as UC3.7
  usecase "Affix Attestation" as UC3.8

  usecase "Search Karate Person" as UC4.1
```

```
  usecase "View Karate Profile" as UC4.2
  usecase "View Student Progress Report" as UC4.3
  usecase "View Event Registration Report" as UC4.4
  usecase "Create Event Summary Report" as UC4.5
  usecase "Create Event Payment Report" as UC4.6
  usecase "Create Events Summary Report" as UC4.7
  usecase "Create Student Evaluation" as UC4.8
  usecase "Create Sensei Evaluation" as UC4.9
  usecase "Create Shihan Evaluation" as UC4.10


}

karateTeacher --> UC1.1
karateTeacher --> UC1.2
karateTeacher --> UC1.3
karateTeacher --> UC1.4
karateTeacher --> UC1.5
karateTeacher --> UC1.6
karateTeacher --> UC1.7
karateTeacher --> UC1.8
karateTeacher --> UC1.9
karateTeacher --> UC1.10
karateTeacher --> UC1.11
karateTeacher --> UC1.12
karateTeacher --> UC1.13
karateTeacher --> UC1.14
karateTeacher --> UC15
karateTeacher --> UC1.16
karateTeacher --> UC1.17
karateTeacher --> UC1.18
karateTeacher --> UC1.19
karateTeacher --> UC1.20
karateTeacher --> UC1.21

karateTeacher --> UC2.1
karateTeacher --> UC2.2
karateTeacher --> UC2.3
karateTeacher --> UC2.4
karateTeacher --> UC2.5
karateTeacher --> UC2.6
karateTeacher --> UC2.7
karateTeacher --> UC2.8
karateTeacher --> UC2.9
karateTeacher --> UC2.10
karateTeacher --> UC2.11

karateTeacher --> UC3.1
karateTeacher --> UC3.2
karateTeacher --> UC3.3
karateTeacher --> UC3.4
karateTeacher --> UC3.5
karateTeacher --> UC3.6
karateTeacher --> UC3.7
karateTeacher --> UC3.8
```

```
karateTeacher --> UC4.1
karateTeacher --> UC4.2
karateTeacher --> UC4.3
karateTeacher --> UC4.4
karateTeacher --> UC4.5
karateTeacher --> UC4.6
karateTeacher --> UC4.7
karateTeacher --> UC4.8
karateTeacher --> UC4.9
karateTeacher --> UC4.10

@enduml
```

*Figure A-3. Use Case – Karate Teacher (Sensei, Shihan, Kaicho)*

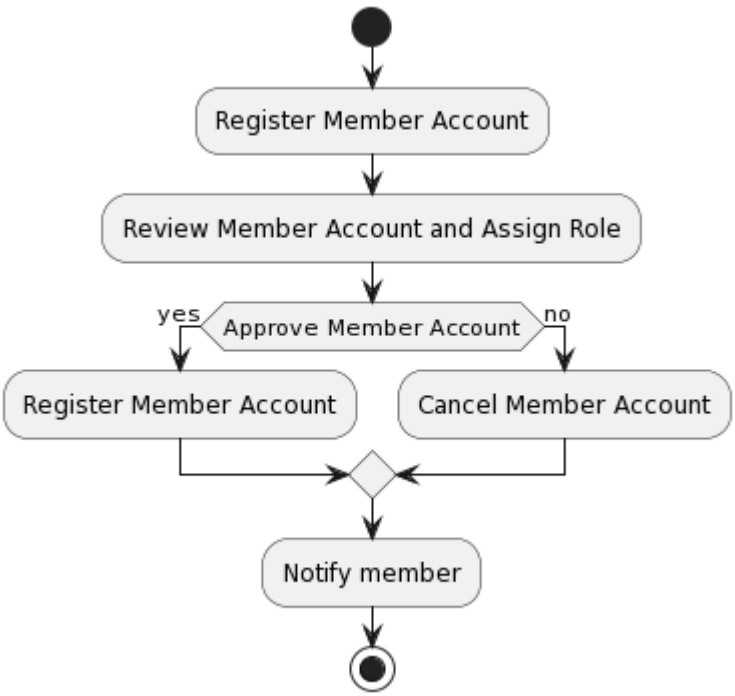



*Figure A-4. Activity Diagram for Registering Account*

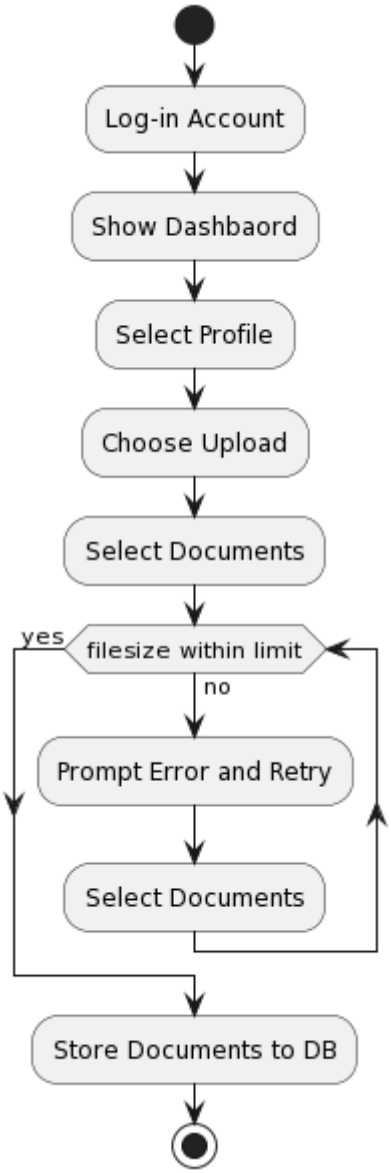



*Figure A-5. Activity Diagram for Uploading Documents*

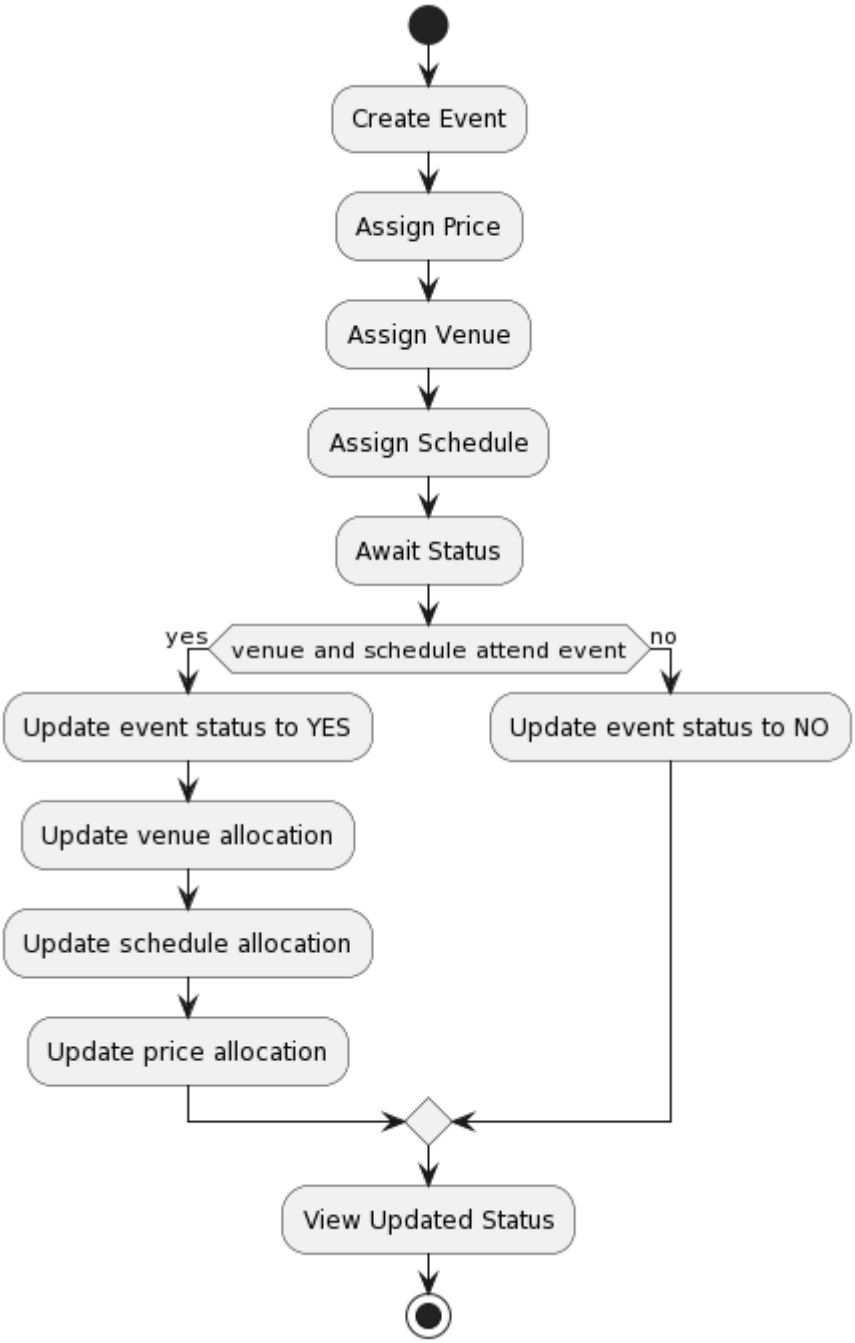



*Figure A-6. Activity Diagram for Creating an Event*

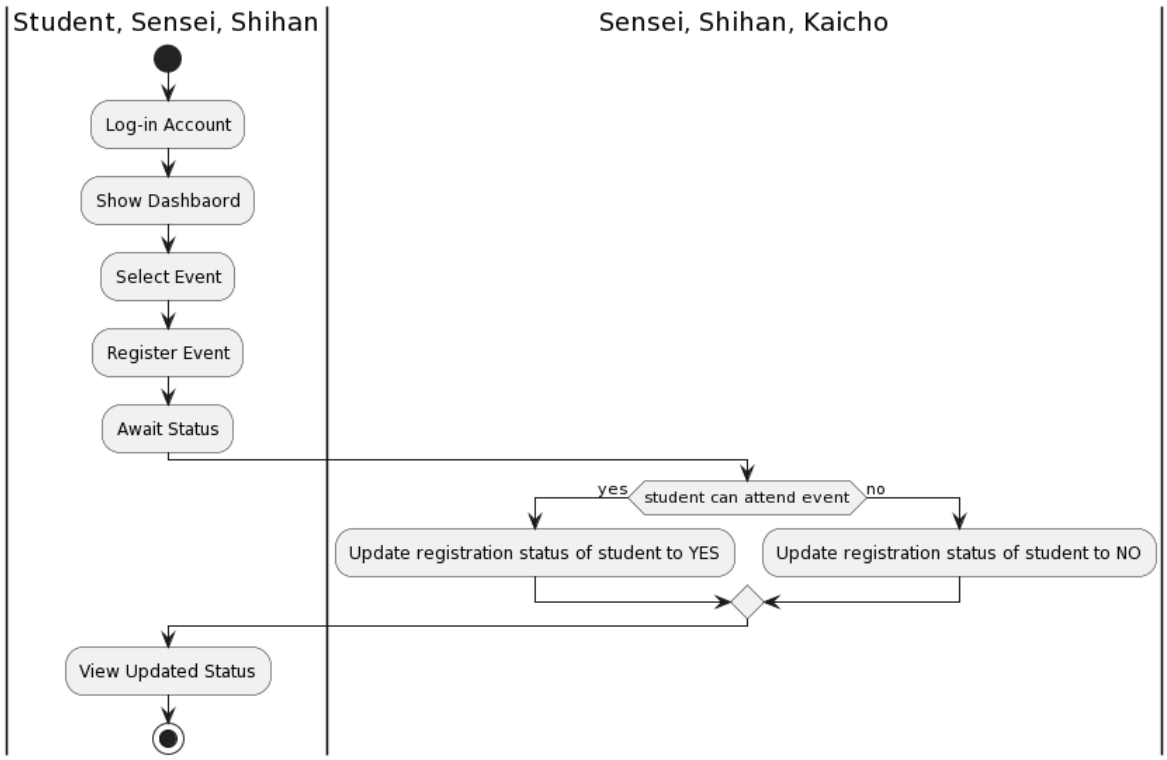



*Figure A-7. Activity Diagram for Event Registration*

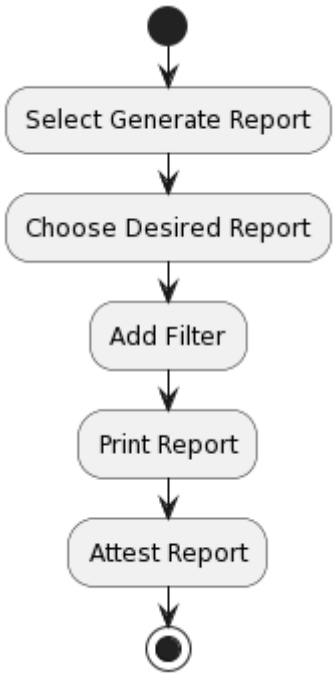



*Figure A-8. Activity Diagram for Generating Reports*

The membership tracking information system will have the following modules: home page, about, branches, contact us, log-in page, user dashboard, upload documents, create events, register events, and generate reports. The figures below will present how the proposed system will be shown to the users.


*Figure A-9. Home Page presented as Web Page*

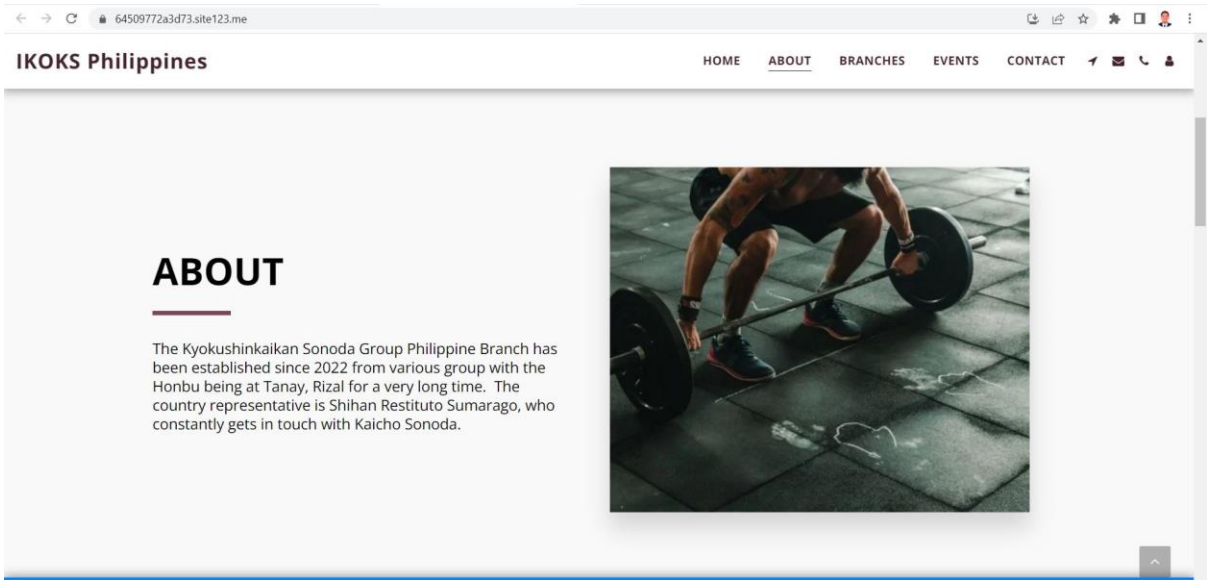



*Figure A-10. About presented as Web Page*

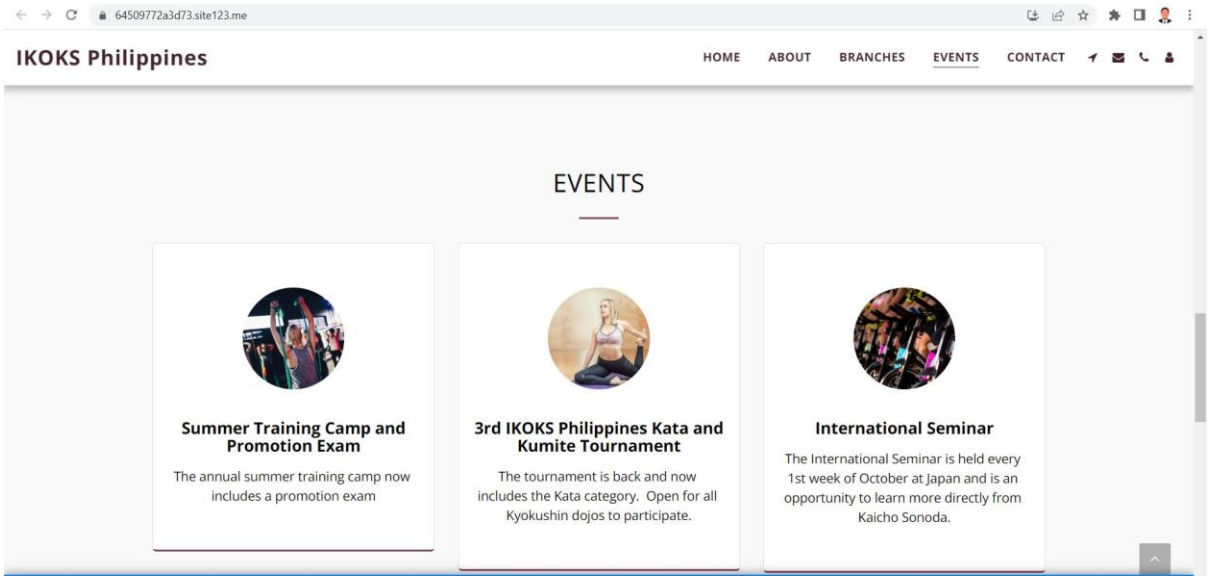



*Figure A-11. Events presented as Web-page*

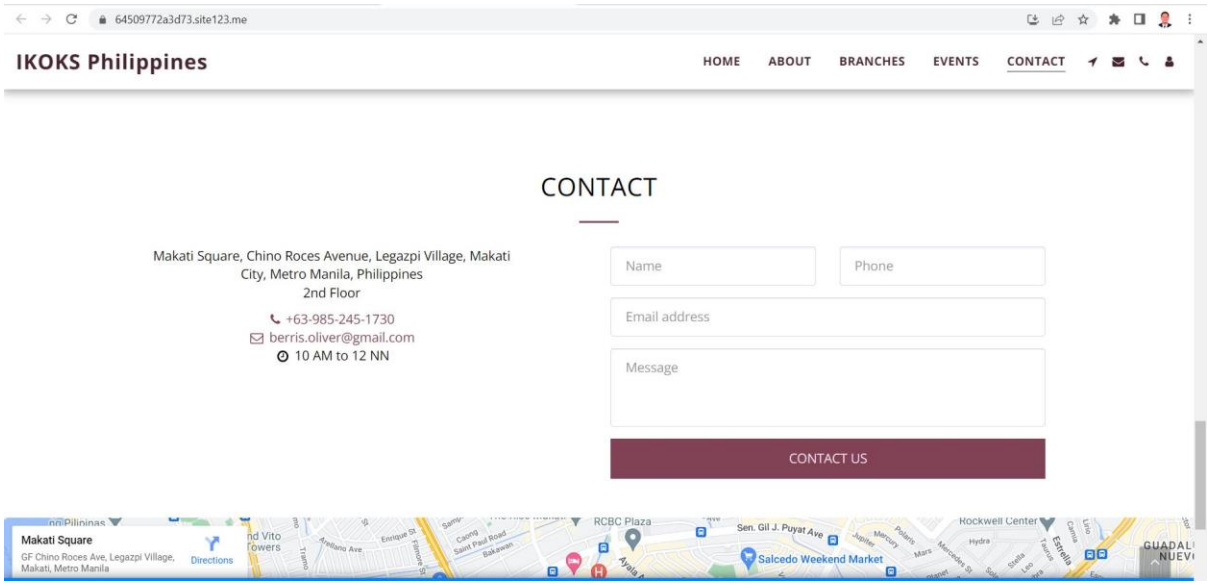



*Figure A-12. Contact presented as Web Page*

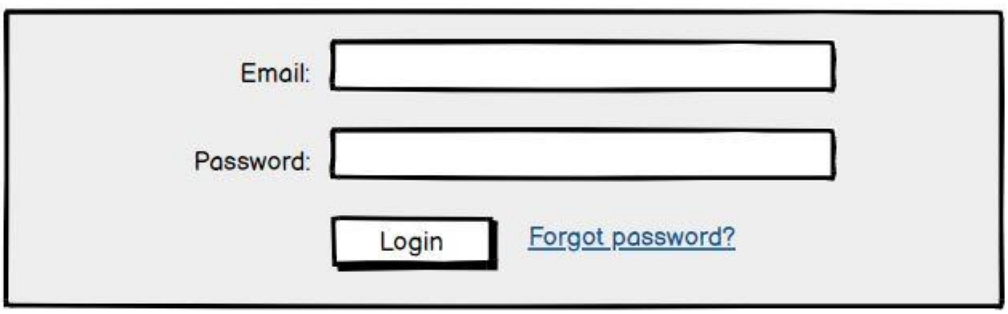



*Figure A-13. Log-in presented as Wireframe*

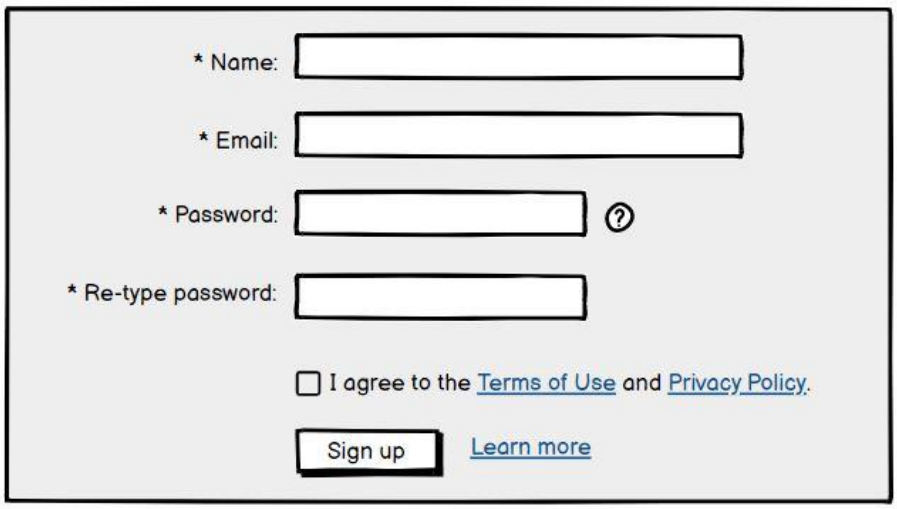



*Figure A-14. Sign-up presented as Wireframe*


*Figure A-15. Forgot Password presented as Wireframe*

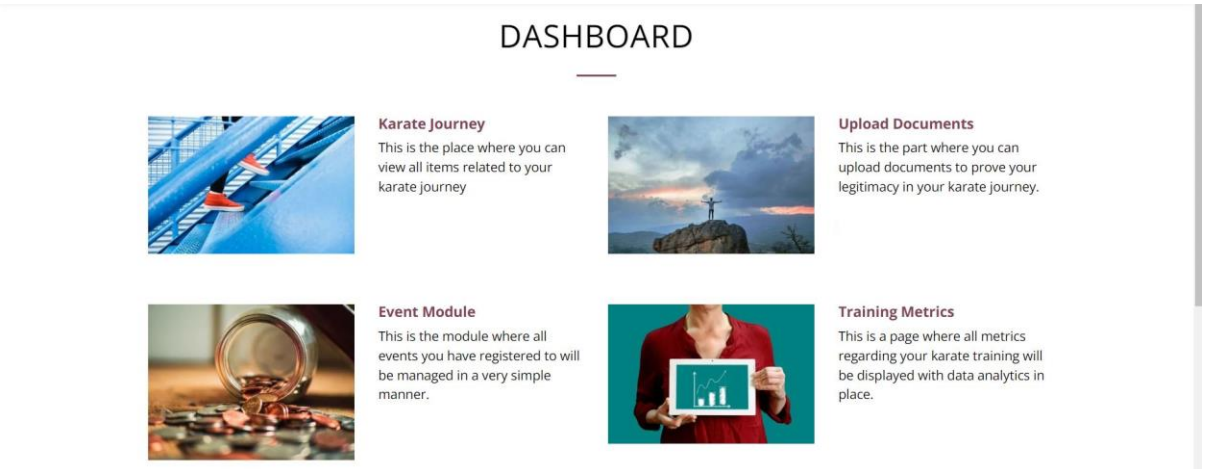



*Figure A-16. User Dashboard presented as Web Page*


*Figure A-17. Upload File or Document as Wireframe*

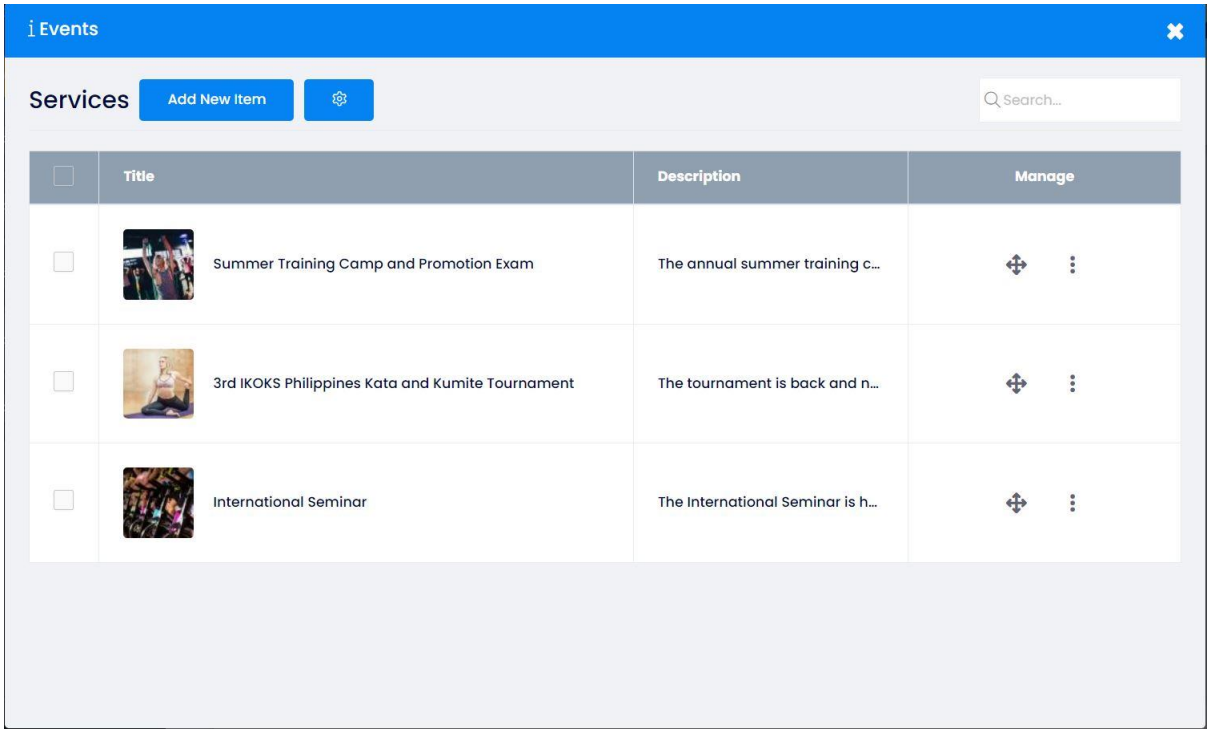



*Figure A-18. Create Event as Web Page*

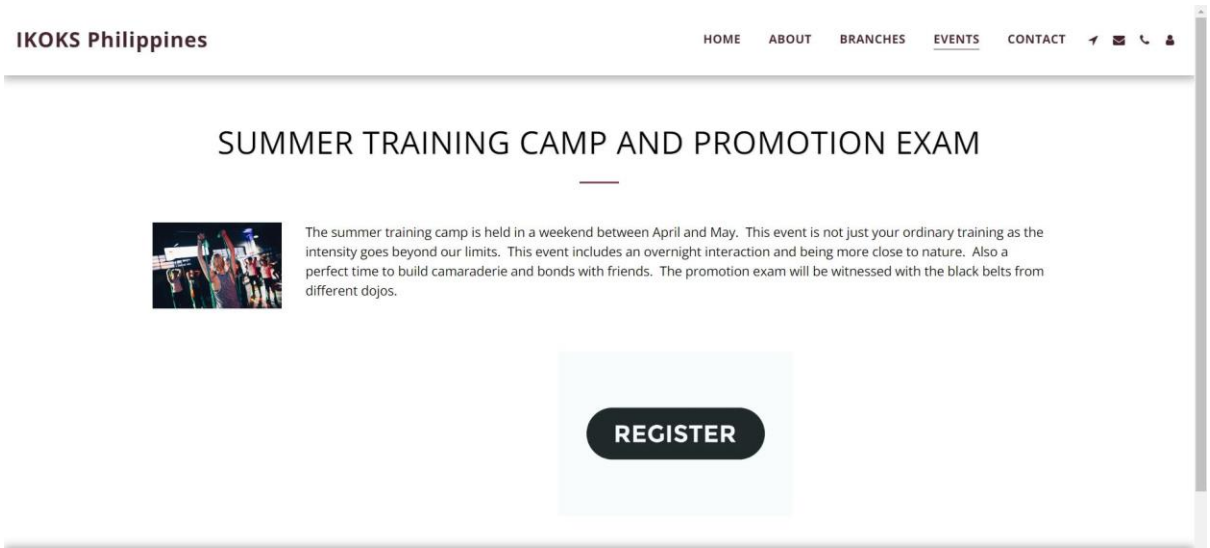



*Figure A-19. Register Event as Web Page*


*Figure A-20. Generate Report as Web Page*

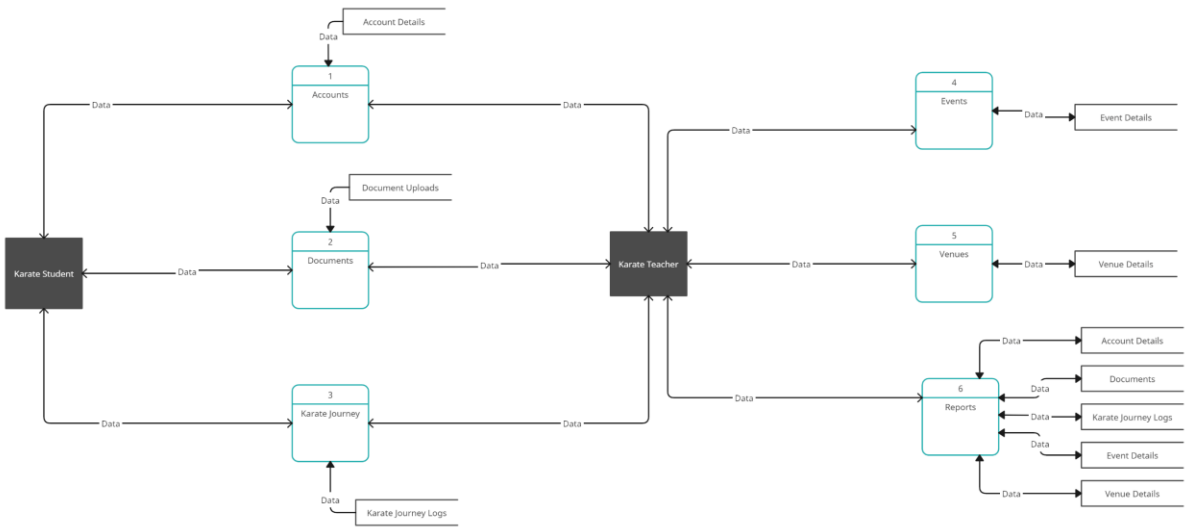



*Figure A-21. Data Flow Diagram*

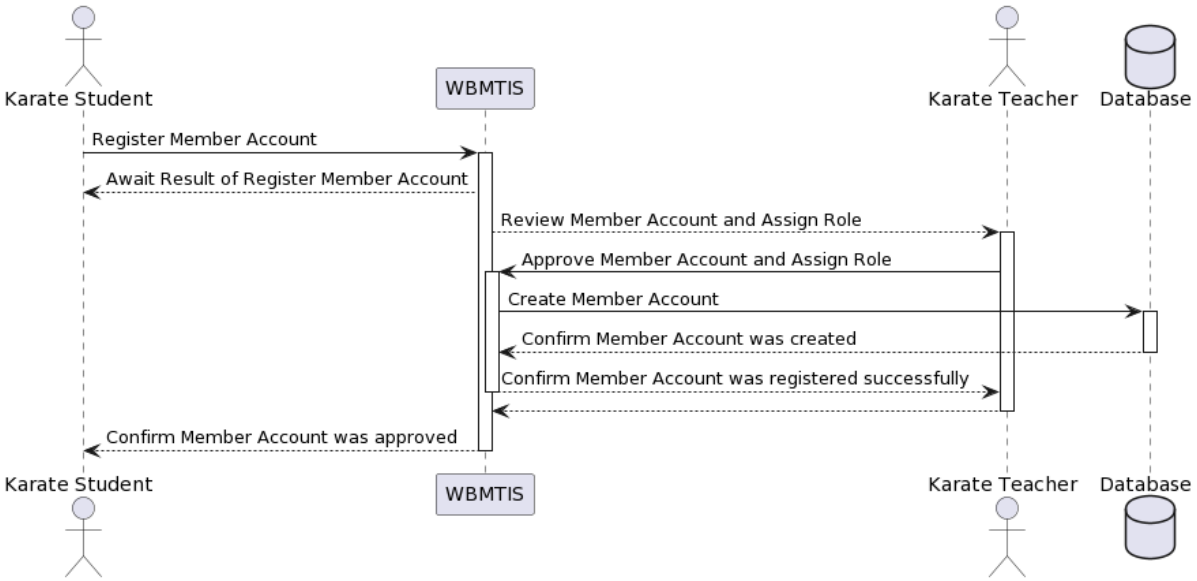



*Figure A-22. Sequence Diagram – Create Account Approved*

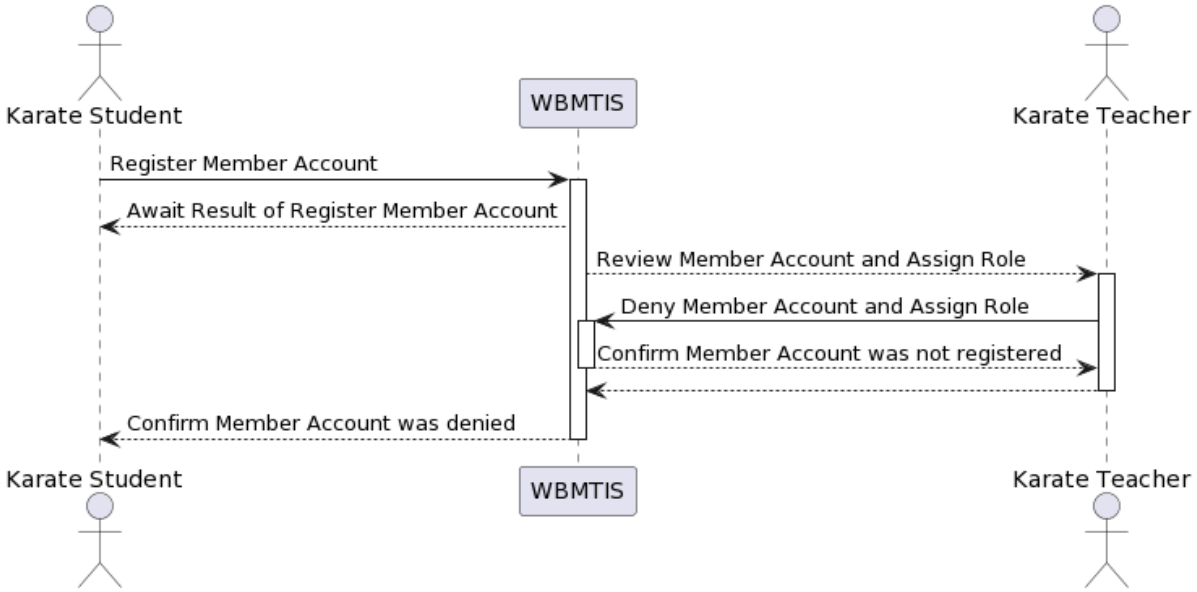



*Figure A-23. Sequence Diagram – Create Account Not Denied*

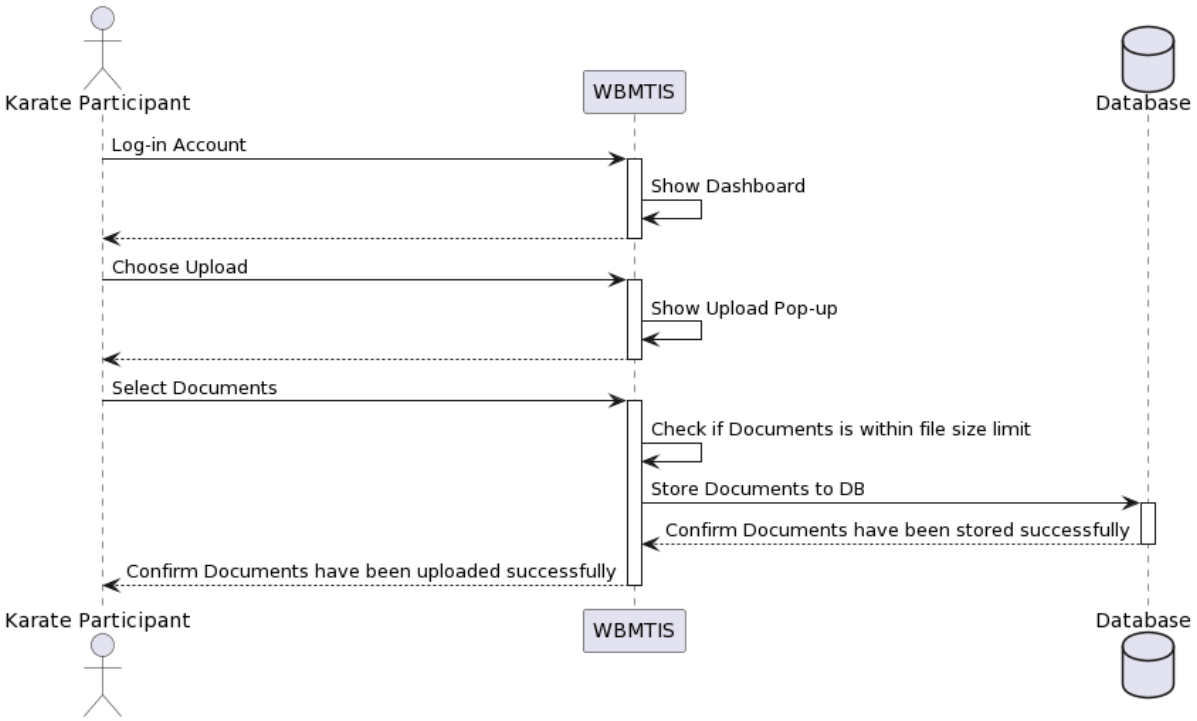



*Figure A-24. Sequence Diagram – Upload Documents OK*

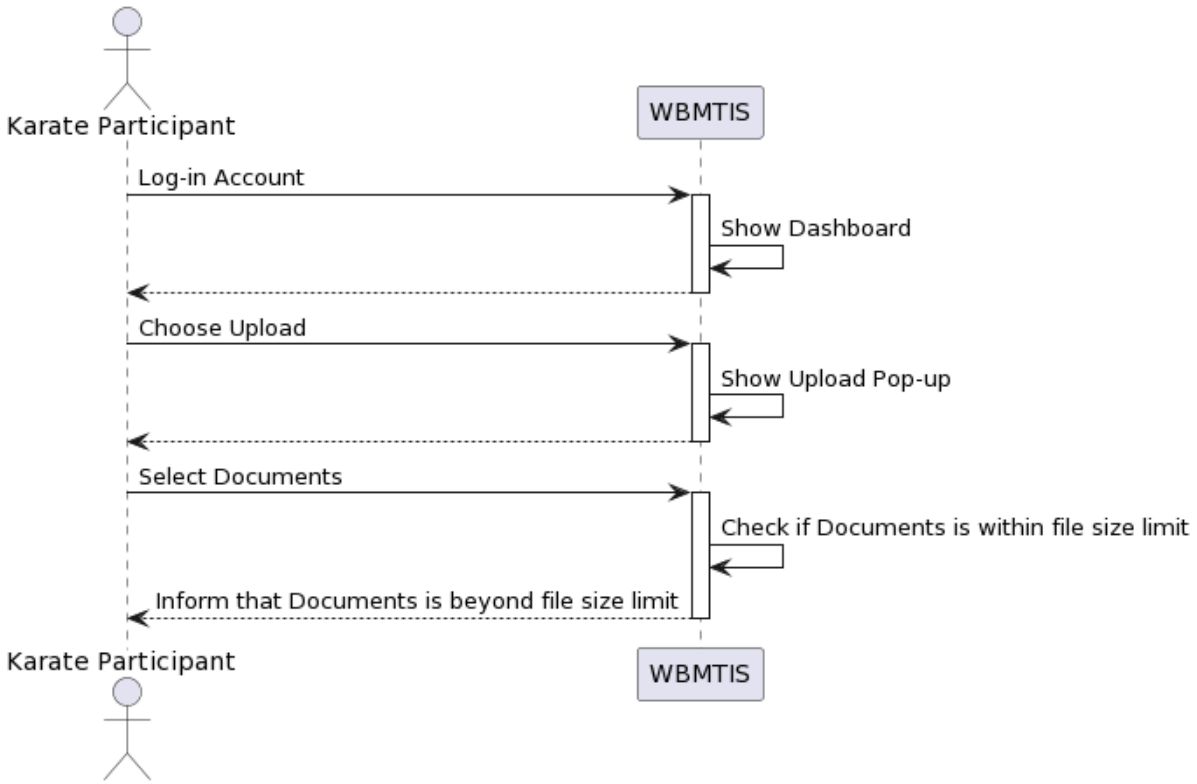



*Figure A-25. Sequence Diagram – Upload Documents Not OK*

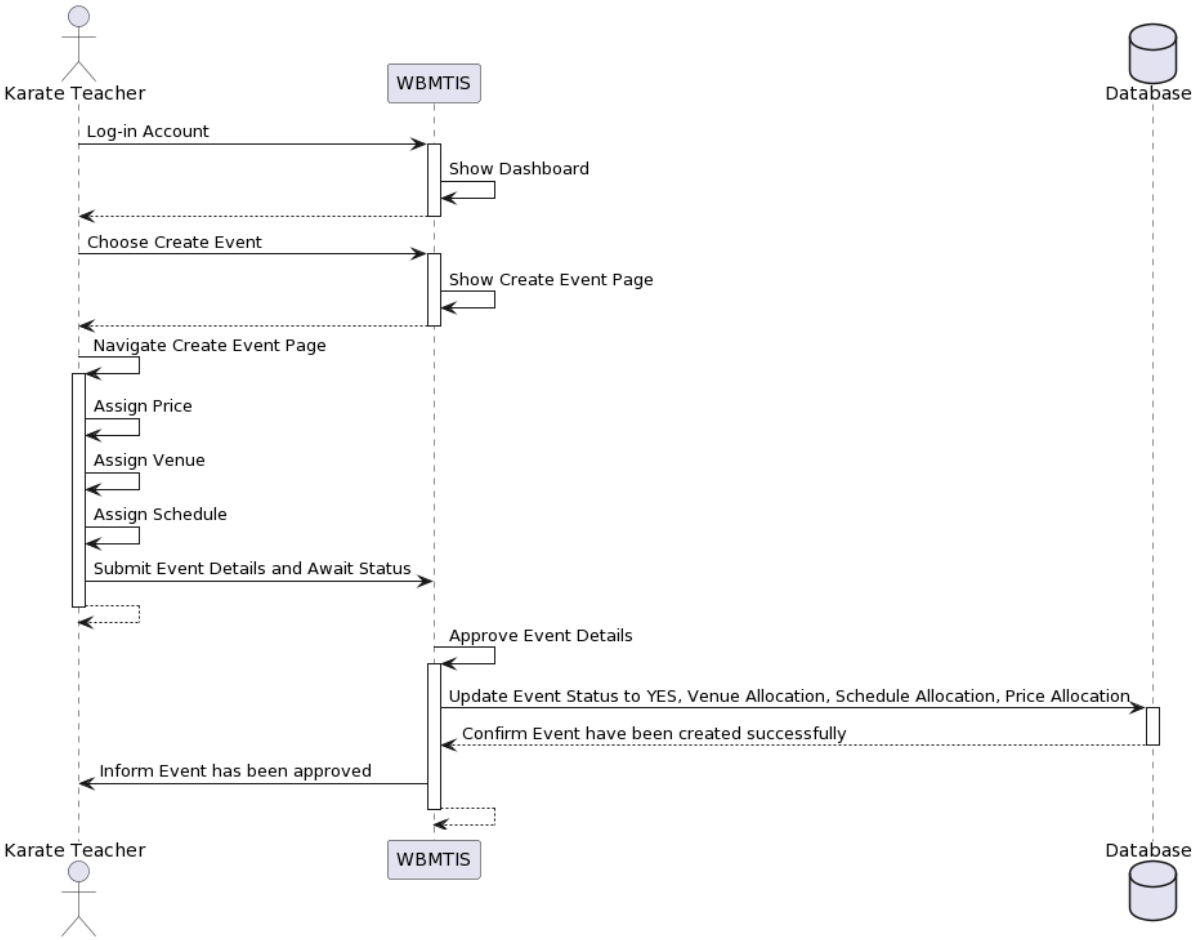



*Figure A-26. Sequence Diagram – Create Event Own Place*

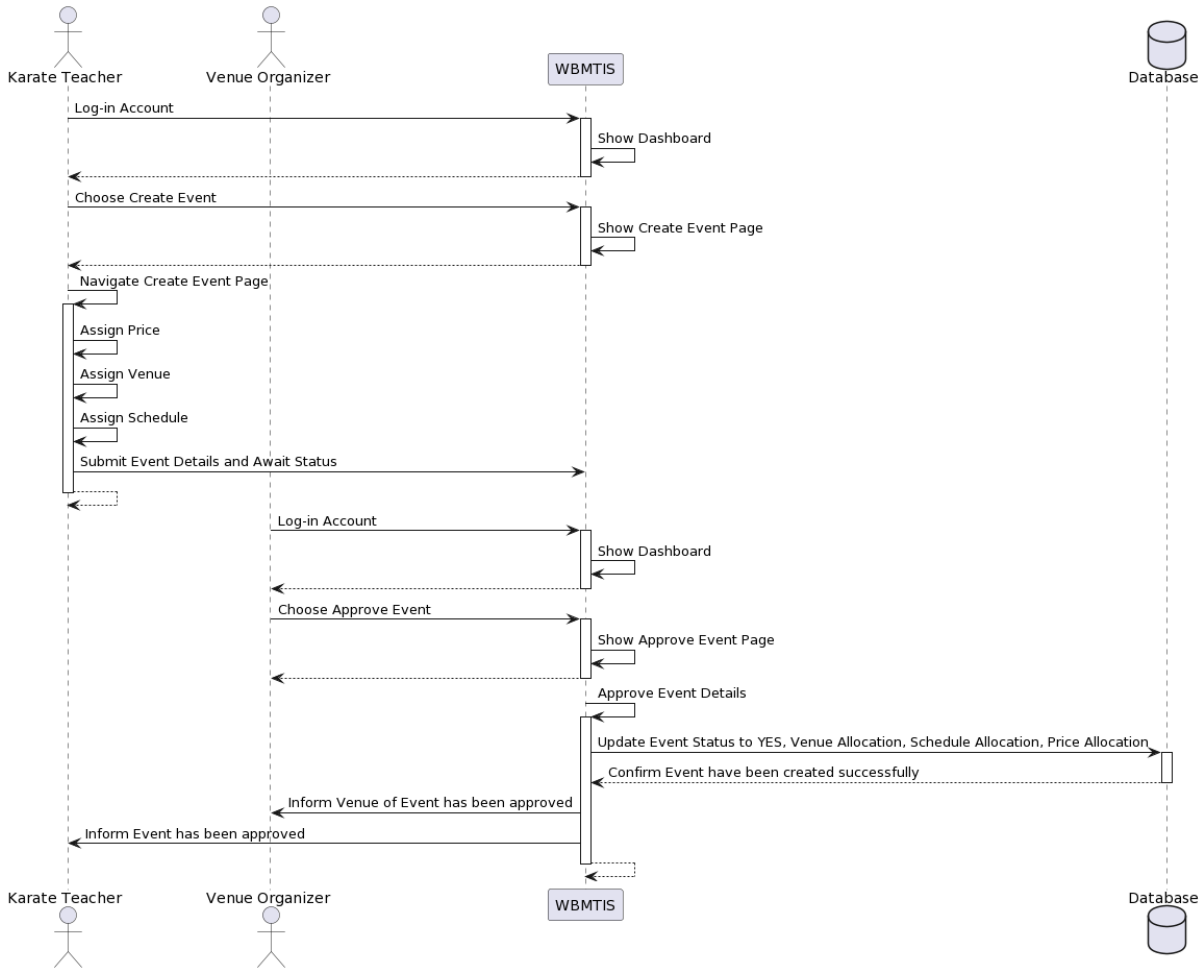



*Figure A-27. Sequence Diagram – Create Event Different Place OK*

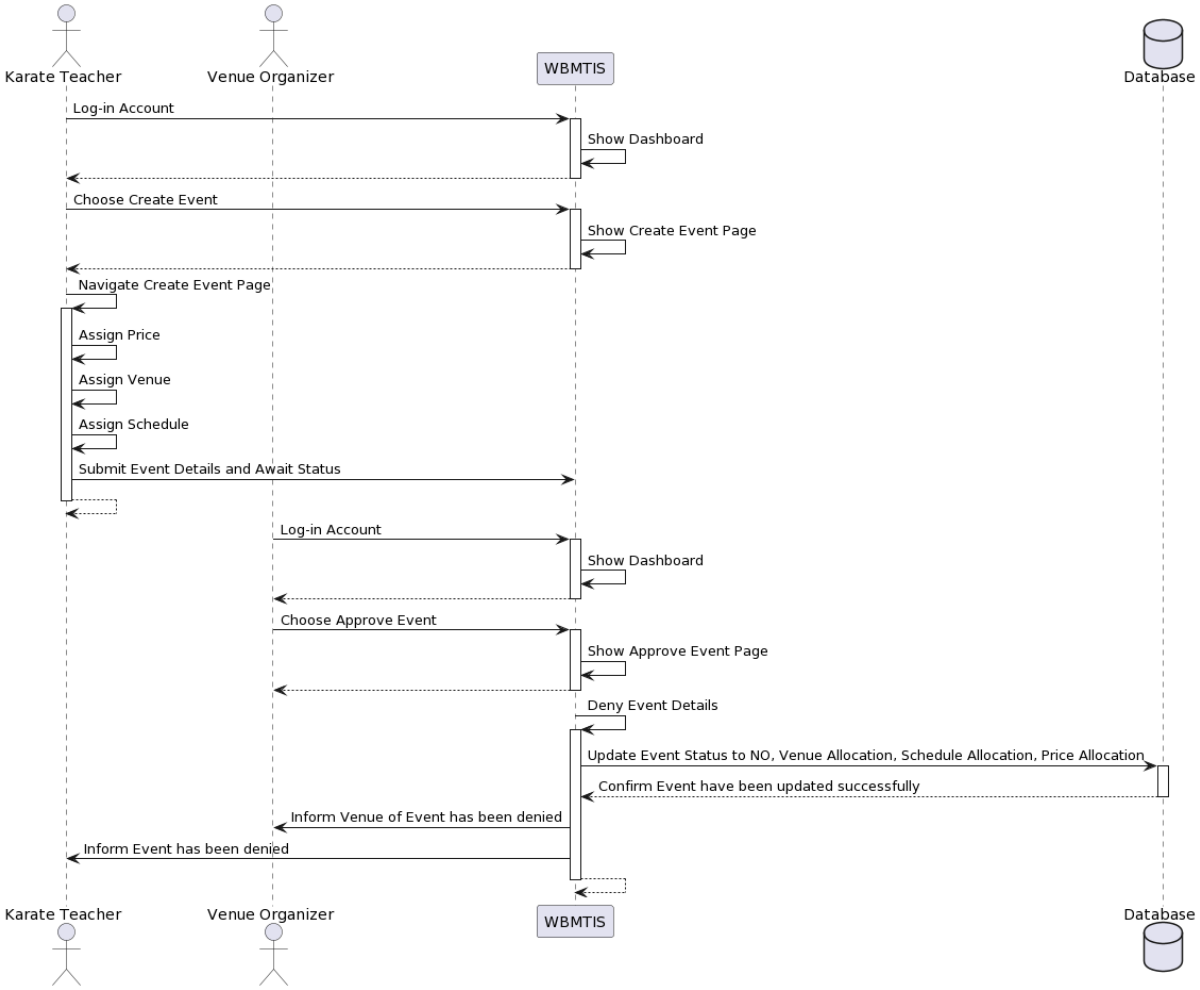



*Figure A-28. Sequence Diagram – Create Event Different Place Not OK*

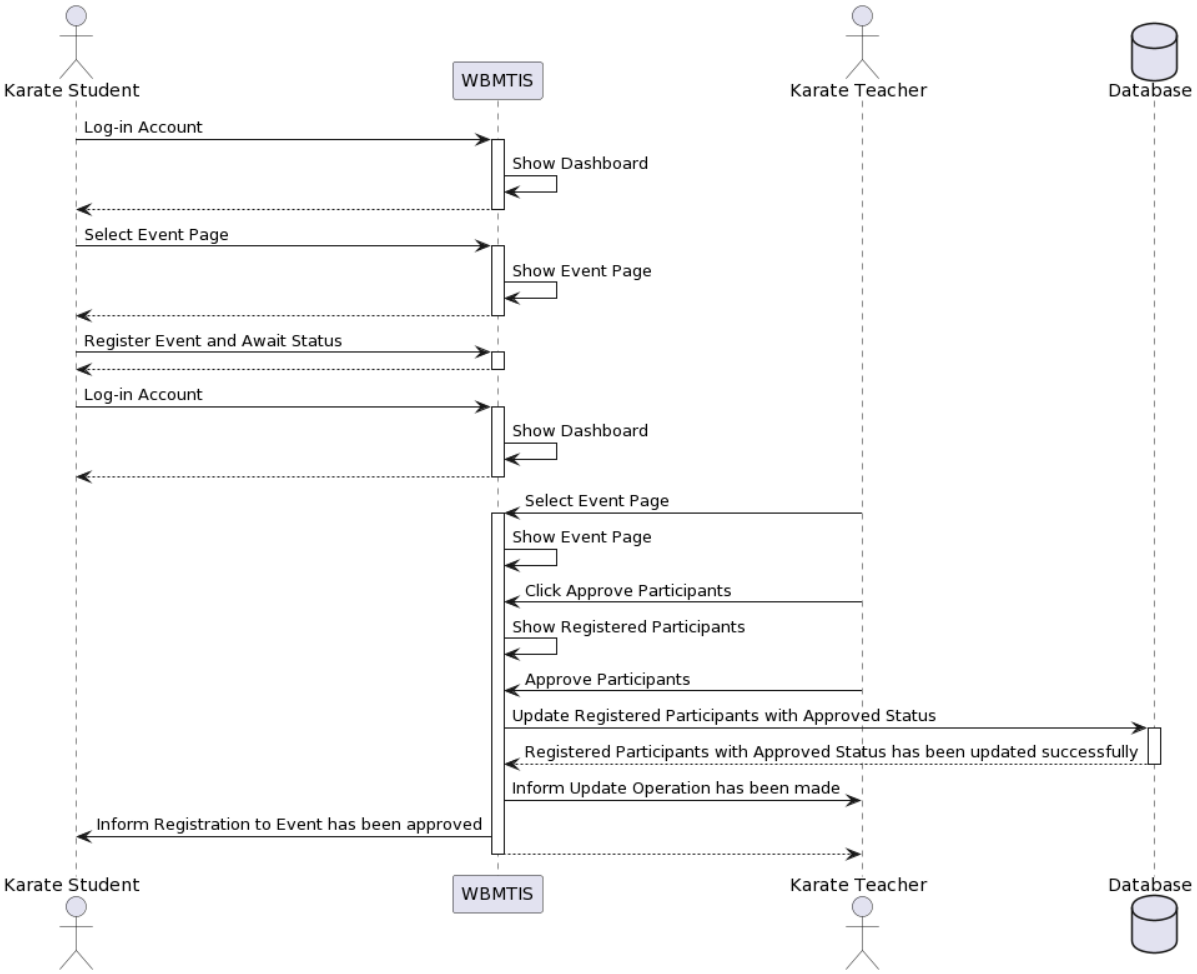



*Figure A-29. Sequence Diagram – Register Event OK*

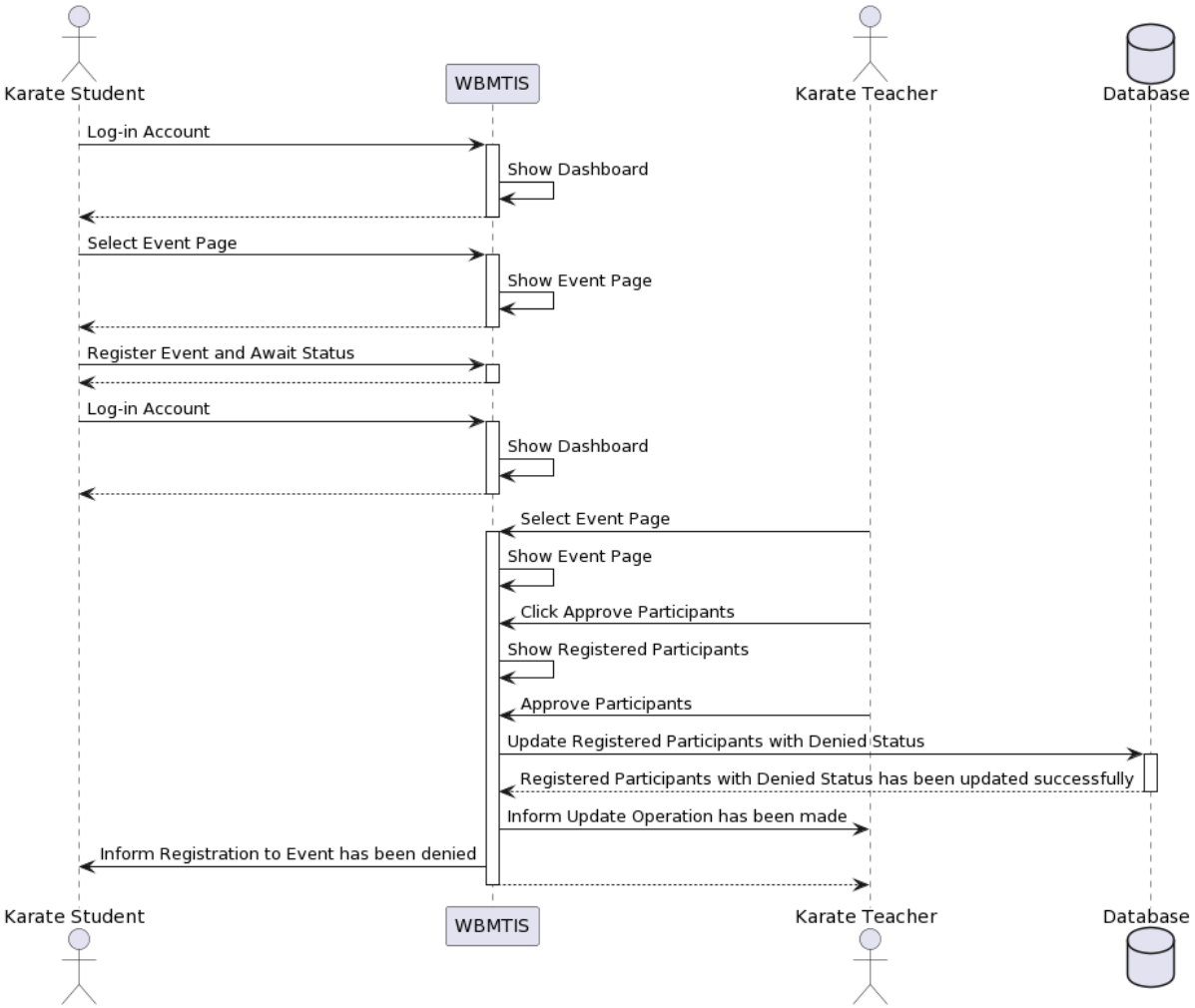



*Figure A-30. Sequence Diagram – Register Event Not OK*

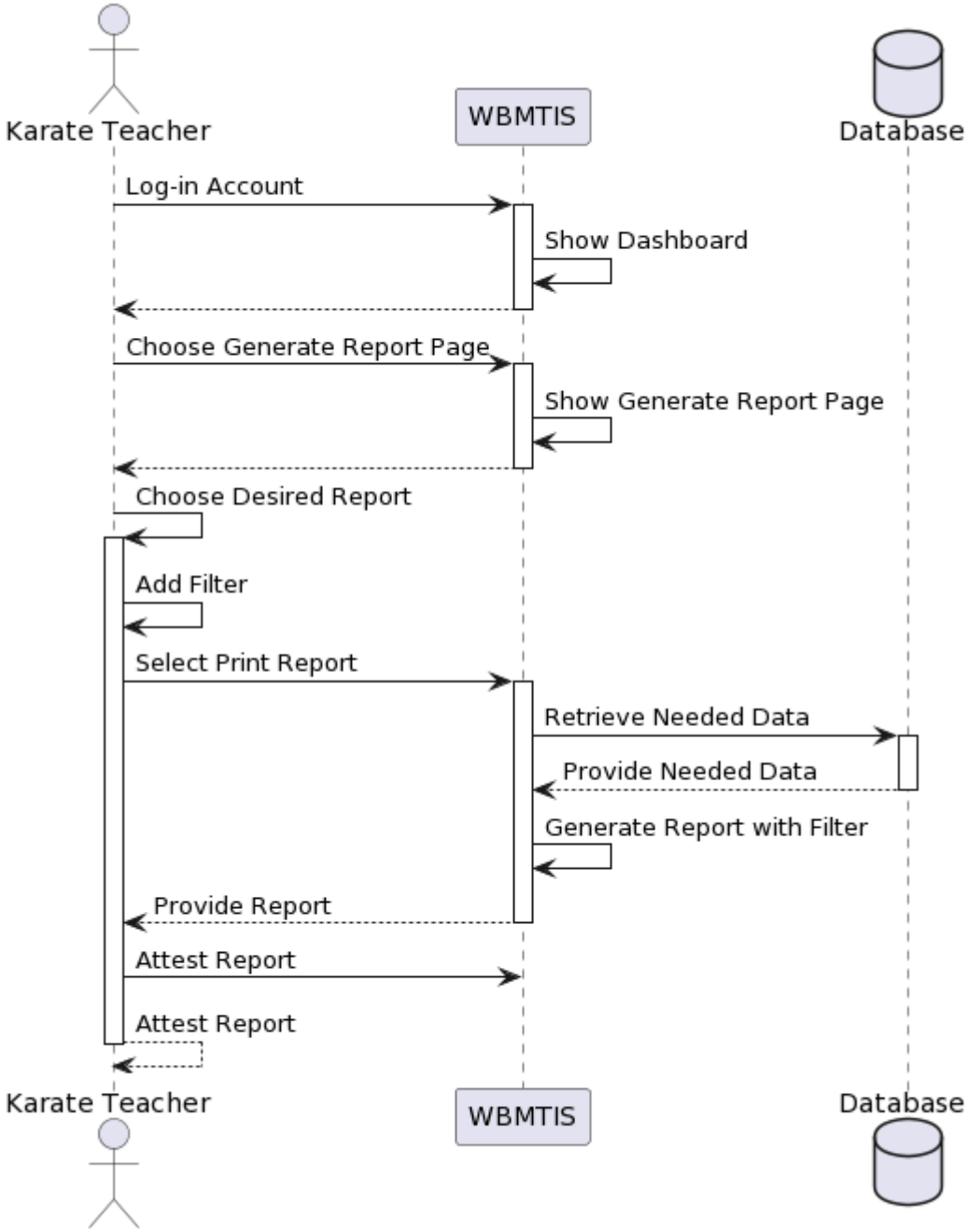



*Figure A-31. Sequence Diagram – Create Report*

## Contributors / Collaborators

TBD – None to declare so far

## Functions

| *Features or Modules* | *Students / Guardian* | *Teachers / Senseis* | *Admin* |
|---|---|---|---|
| Log in / Sign Up / Reset Password / Approve or Deny User | Done | Done | Done |
| Manage Users / Assign Role | N/A | N/A | Done |
| Manage Students / List Students or Teachers | N/A | Done | Done |
| View Profile via My Profile / Student Record / QR Code | Done | Done | N/A |
| Manage Student Records and Karate Journey | N/A | Done | N/A |
| Manage Teacher Records and Karate Journey | N/A | Done | Done |
| Manage Events / Create Events | N/A | Done | N/A |
| Register Event / Print Ticket / Scan QR Code Ticket | Done | Done | N/A |
| Accessibility Functionality (via Mobile App) | Done | Done | N/A |
| Offline Support (Local DB + Repository Design Pattern via Mobile App) | Done | Done | N/A |
| Generate Reports | N/A | Done | Done |
| Manage Logs / Verify Blockchain | N/A | Done | Done |

## Hardware and Software

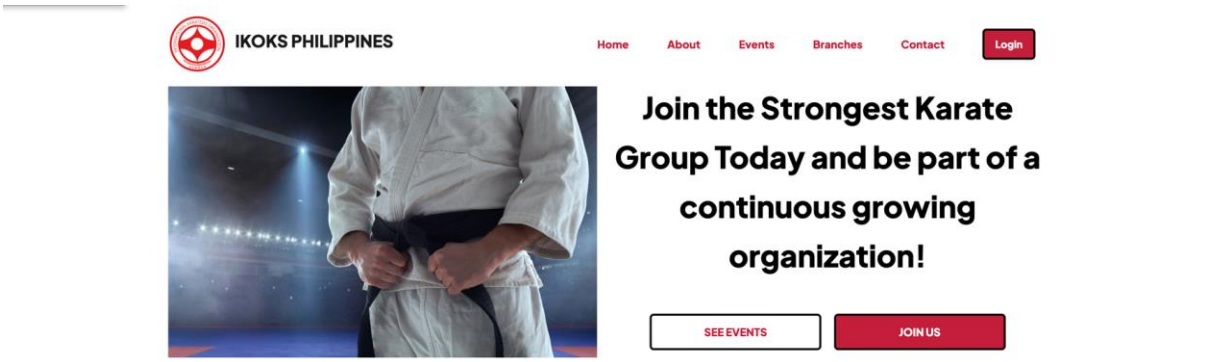
- AWS Cloud instance running a Web Server with PHP 8.0 and MySQL installed running on 64-bit Amazon Linux 2/3.3.1 with Proxy nginx
- 2 Instance to be deployed (1 Virtual PC each): t2.micro (1GB), t2.small (2 GB)
- Environment to include load balancing and auto-scaling
- Security group in order to allow specific access of system to allowed users
- Data to be stored in SQL Database and import of database scheme to be done
- Support for Responsive Web Application to load web pages according to the display resolution of device (e.g. smartphones, desktop)
- Development of a mobile application with same functionalities available in the web version using Flutter (to add features on accessibility and offline support)

**User Manual**

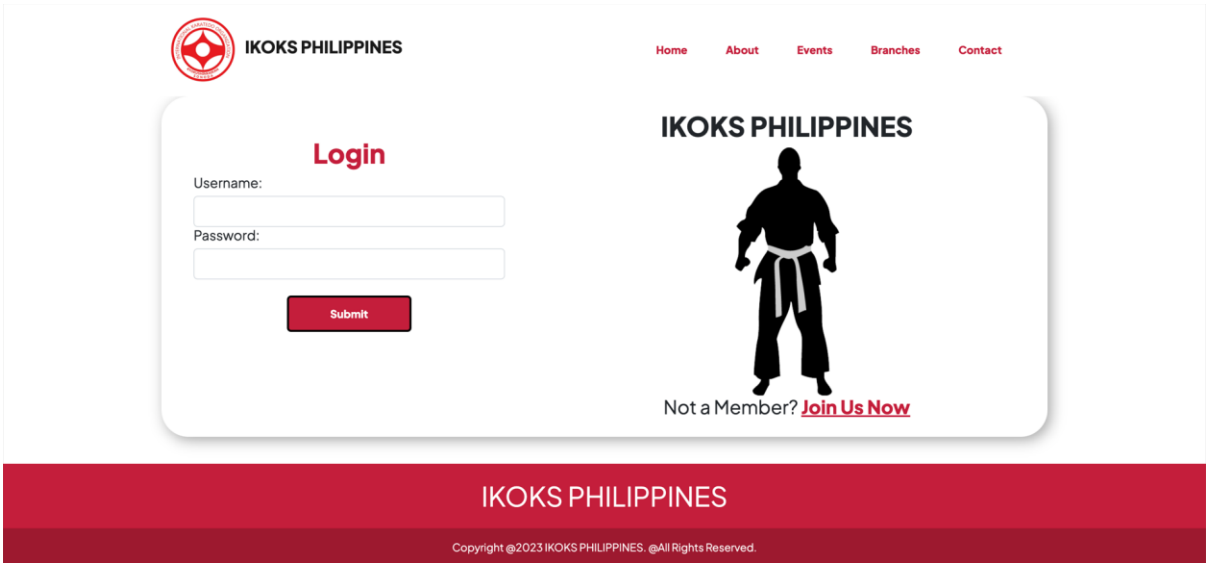
***Register as a new user***

Step 1. Go to https://wbmtis.ikoks-philippines.org

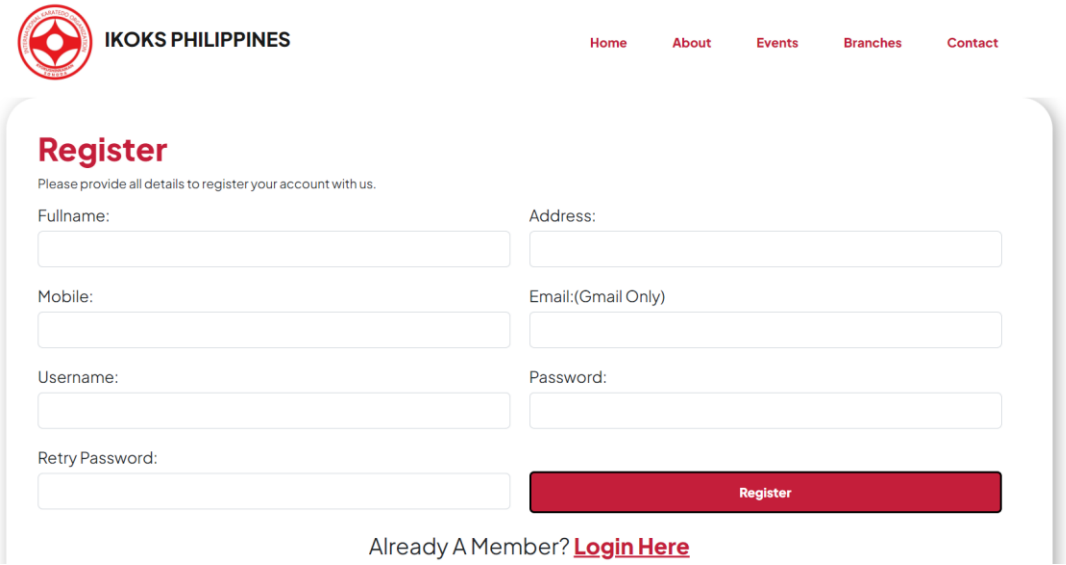
Step 2. Click on the “Log in” Button




Step 3. Select “Sign Up” here



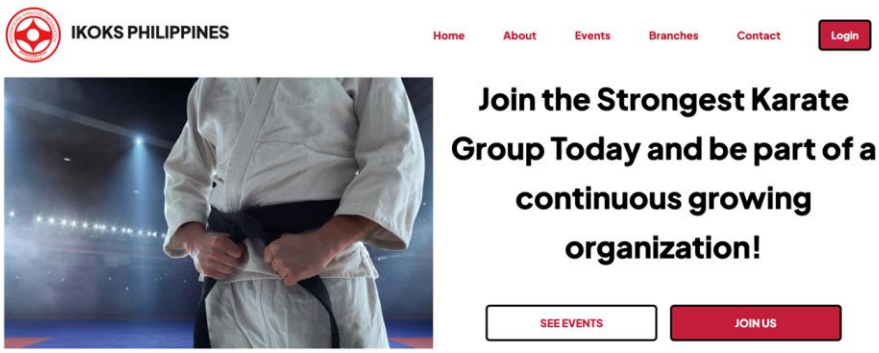
Step 4. Fill out the details provided



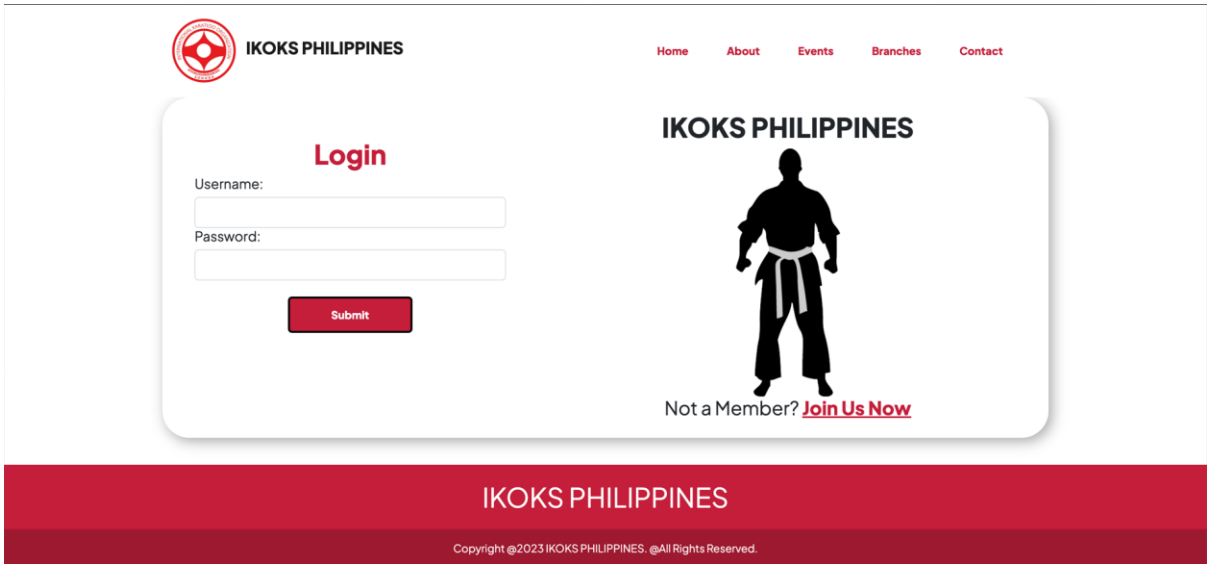

Step 5. Click on the “Register” button

***Approve new user (as teacher)***

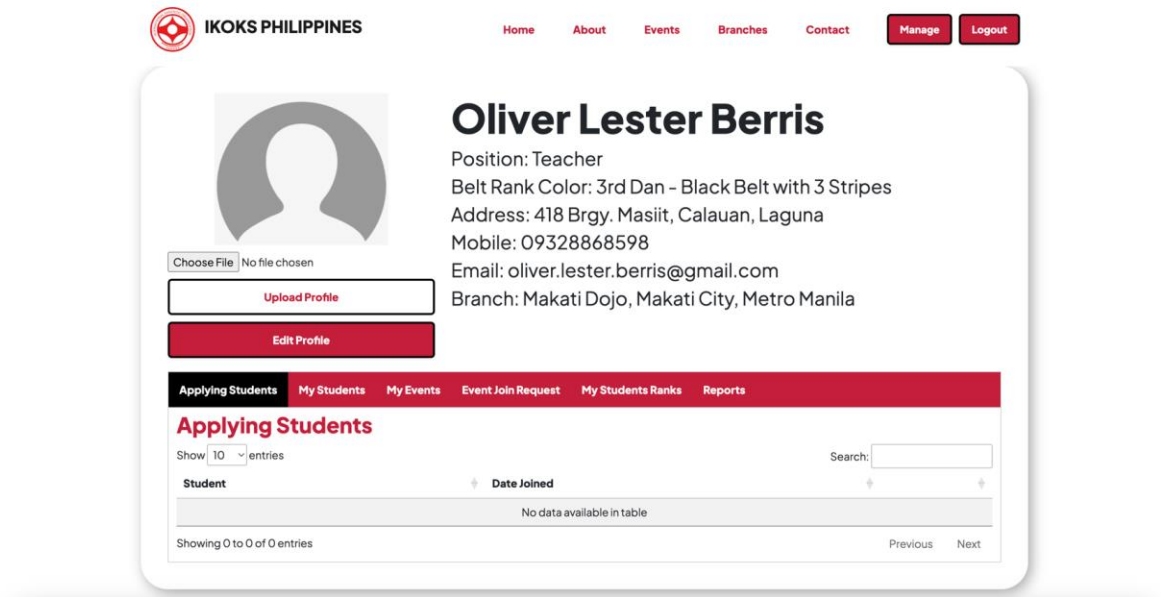
Step 1. Go to https://wbmtis.ikoks-philippines.org
Step 2. Click on the “Log in” Button



Step 3. Enter valid log-in credentials of teacher



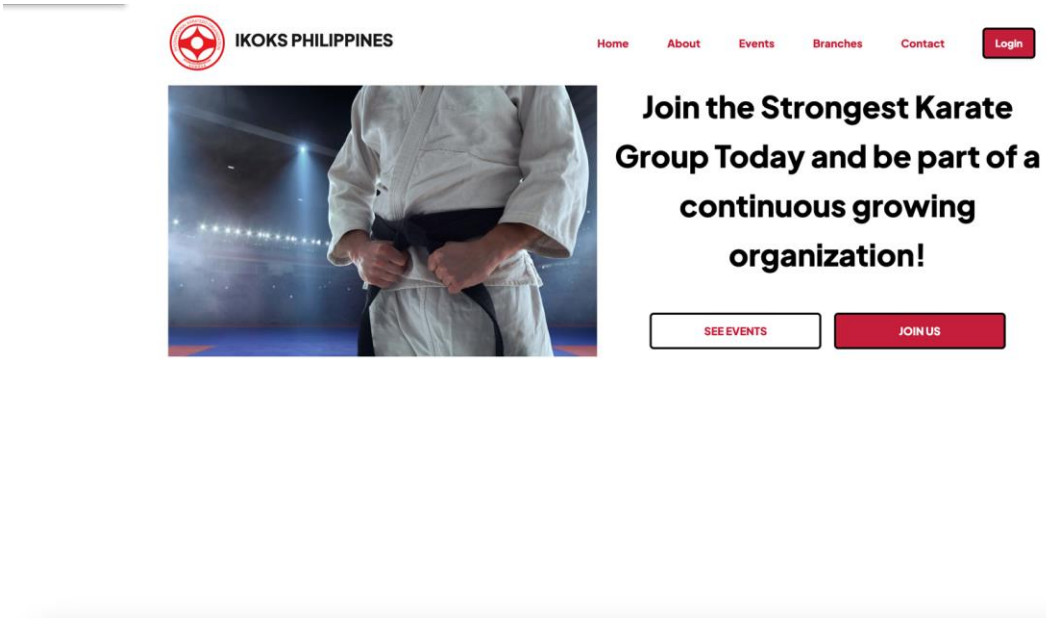

Step 4. In the dashboard, look for the table located at the bottom part of the page



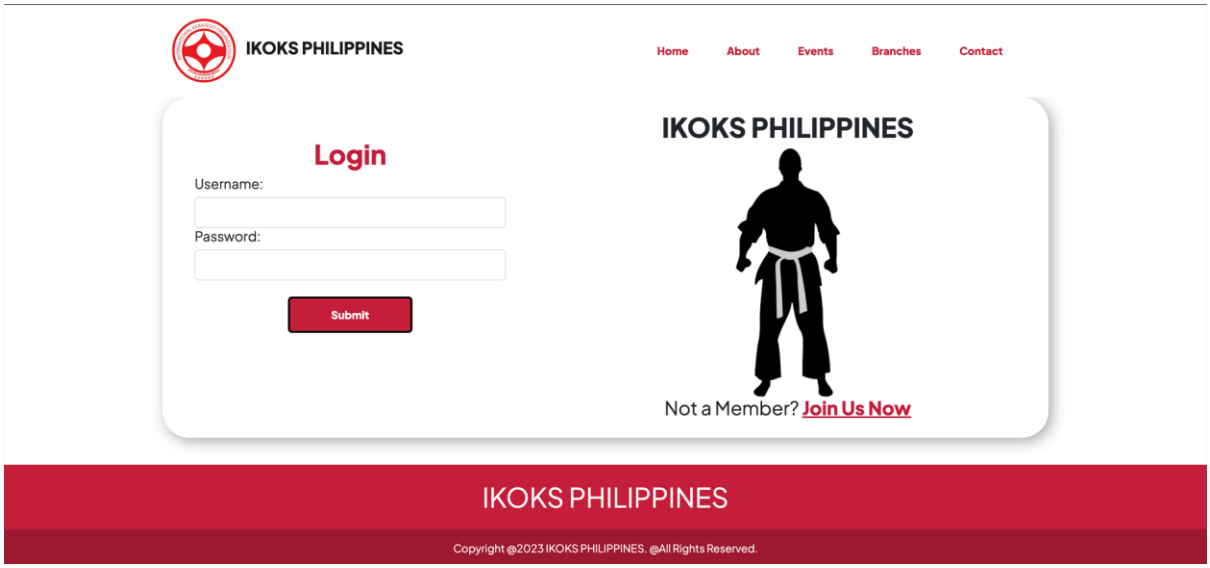

Step 5. In the student record row, select to approve new user

***Log in as student user***

Step 1. Go to https://wbmtis.ikoks-philippines.org
Step 2. Click on the “Log in” Button

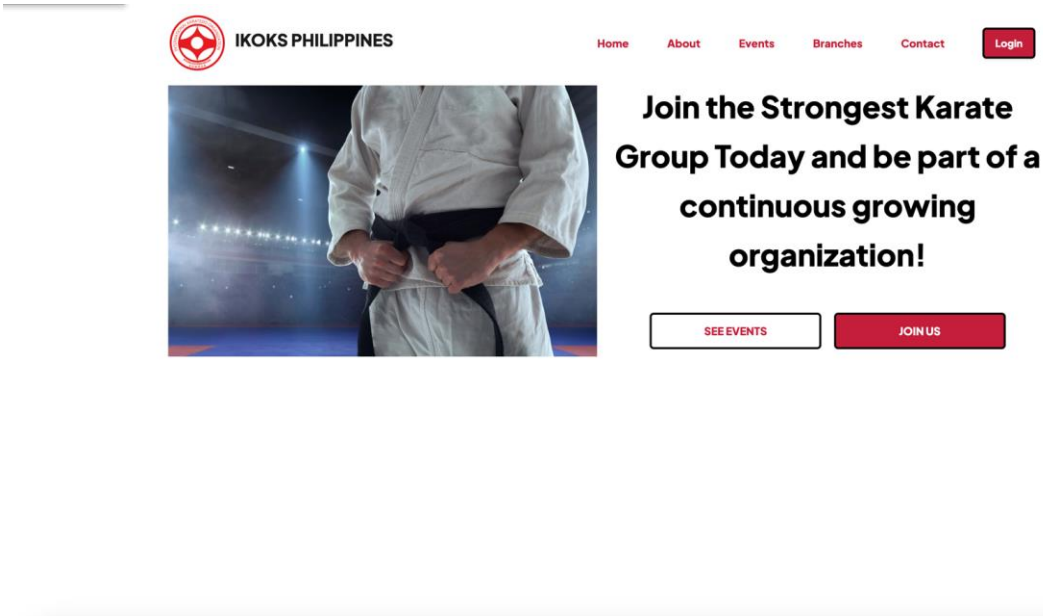



Step 3. Enter valid log-in credentials of student



***Log in as teacher user***

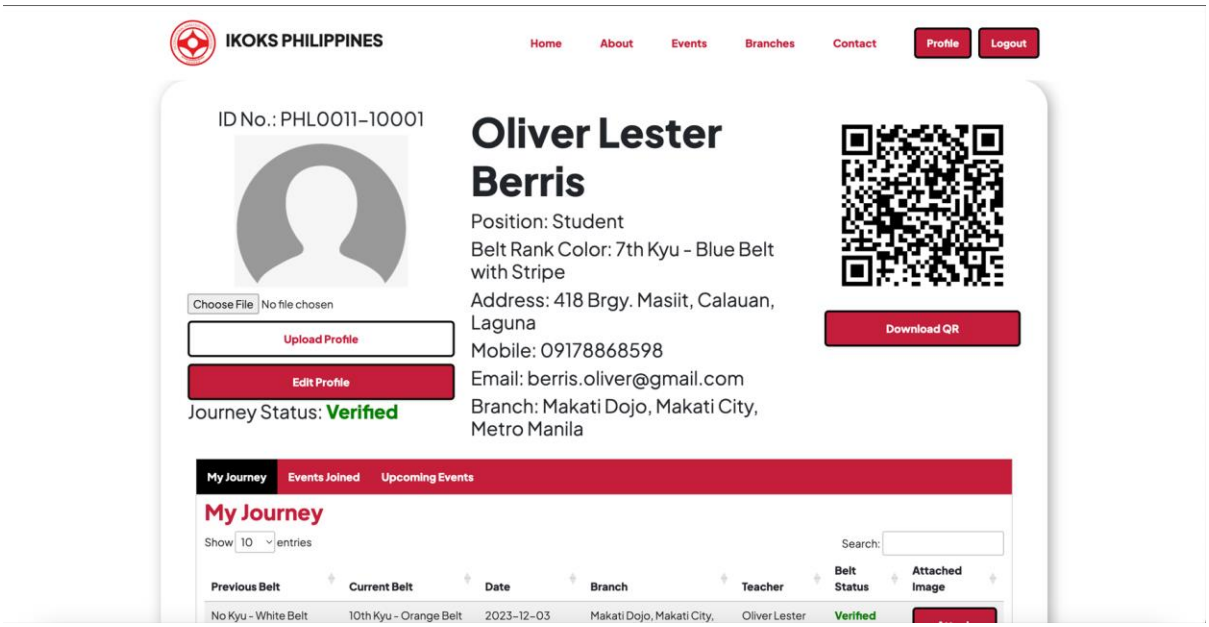
Step 1. Go to https://wbmtis.ikoks-philippines.org
Step 2. Click on the “Log in” Button




Step 3. Enter valid log-in credentials of teacher

***Join dojo as Student***

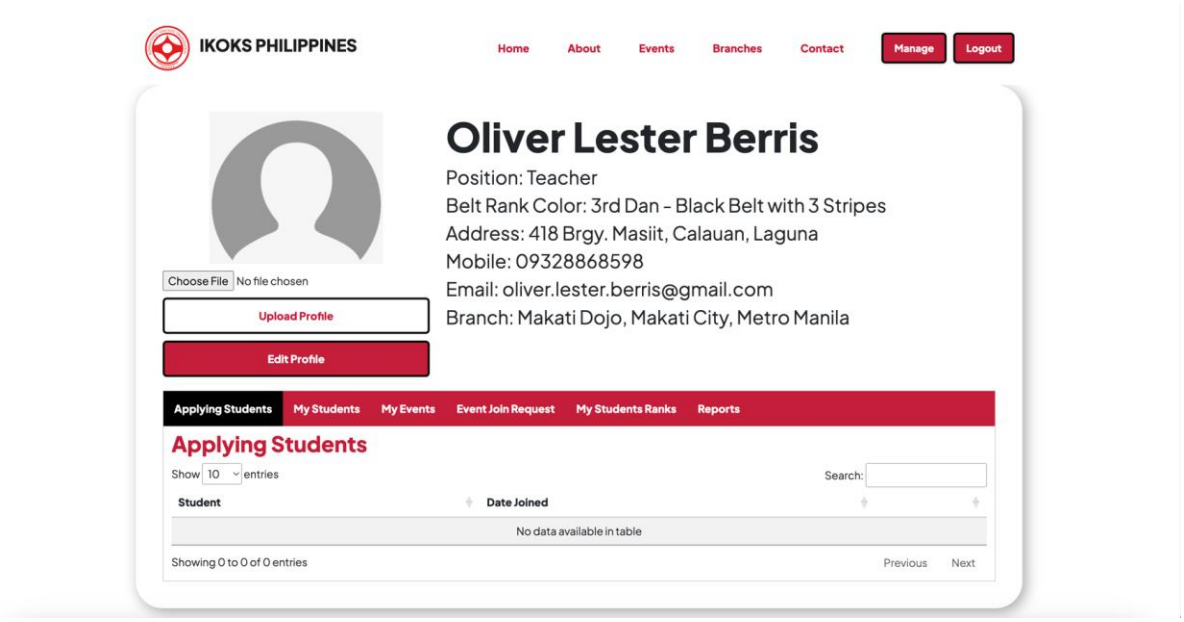
Step 1. In the dashboard (after logging in as student), look for the table located at the bottom part of the page and select Join dojo




Step 2. In a dojo record row, select to join dojo by clicking the “Join” button

***Approve join as Teacher***

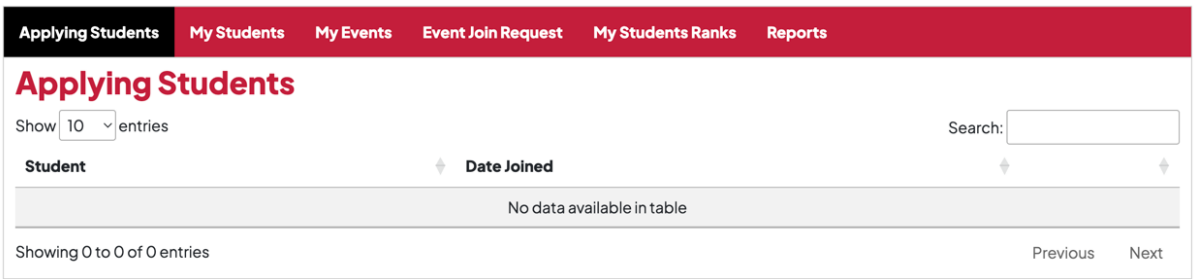
Step 1. In the dashboard (while logged in as Teacher), look for the table located at the bottom part of the page and select “Applying Students”



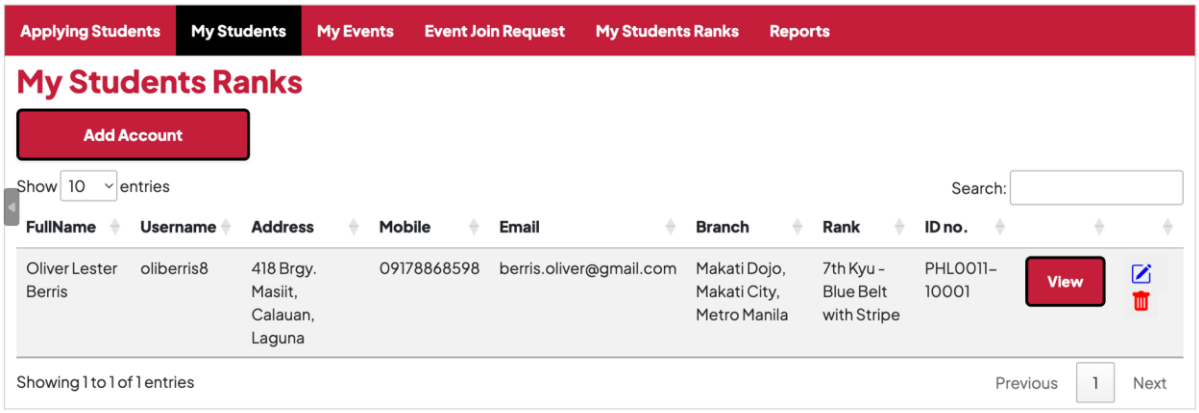

Step 2. In a student record row, select to join dojo by clicking the “Approve” button

***Tab View Capability as Teacher (shown through each bullet as tabs)***

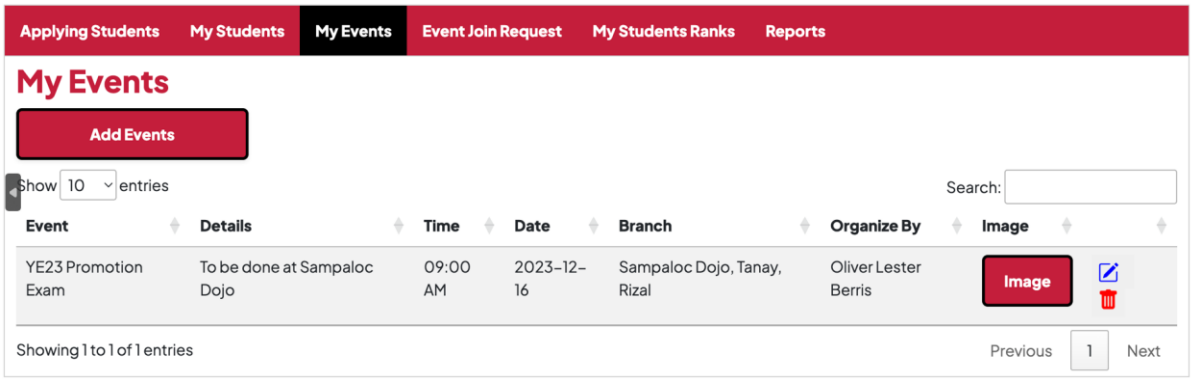
- Applying Students



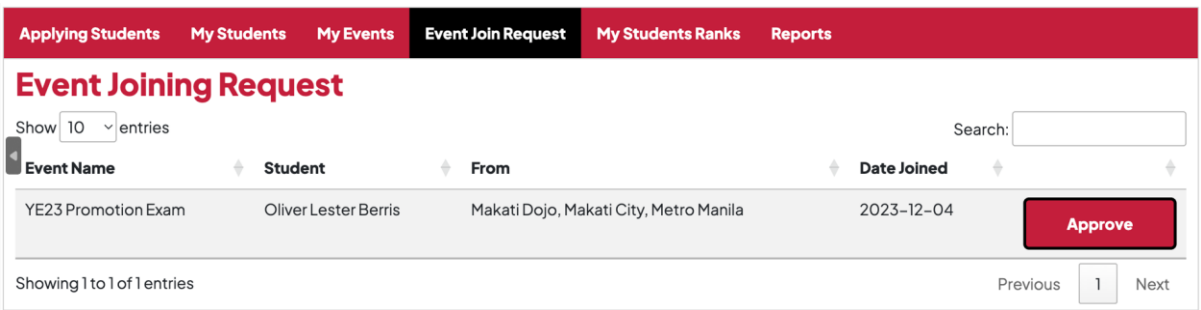
- My Students



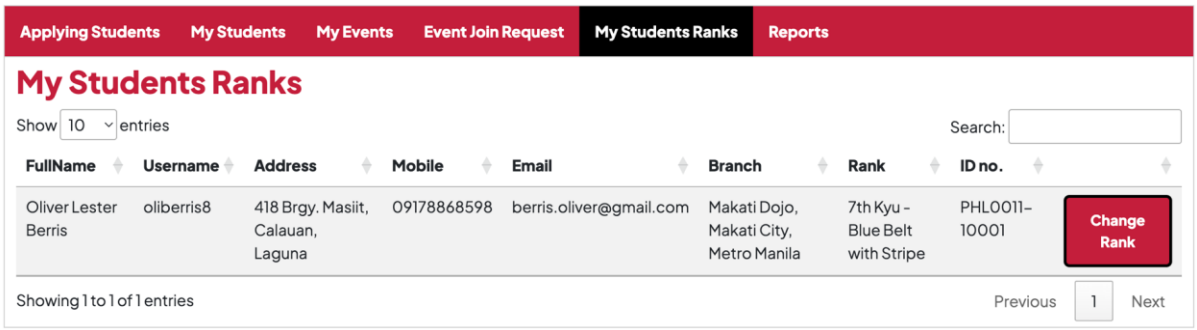

- My Events




- Event Join Request

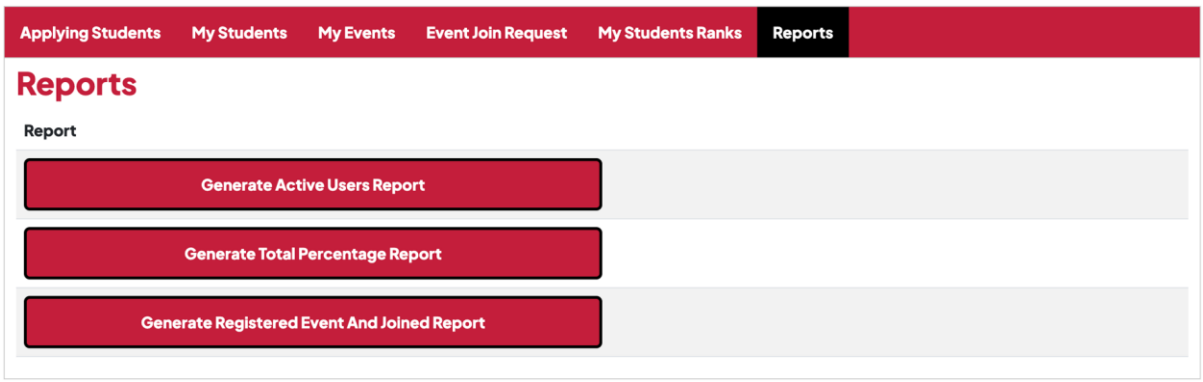


- My Student Ranks



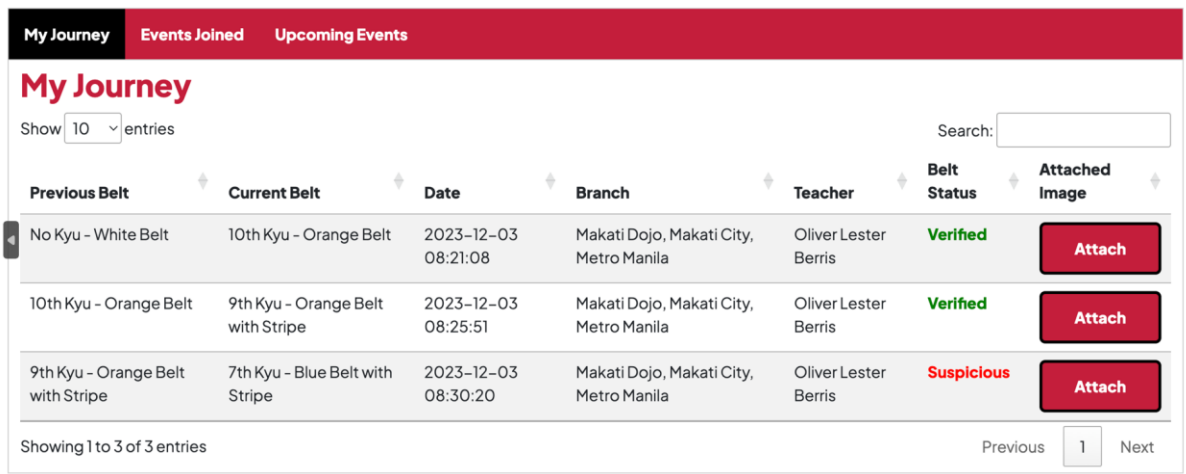

Promotion to the next belt level will be possible by clicking the “Change Rank” button of the student record and updating the belt level along with attaching a photo as proof.

- Reports



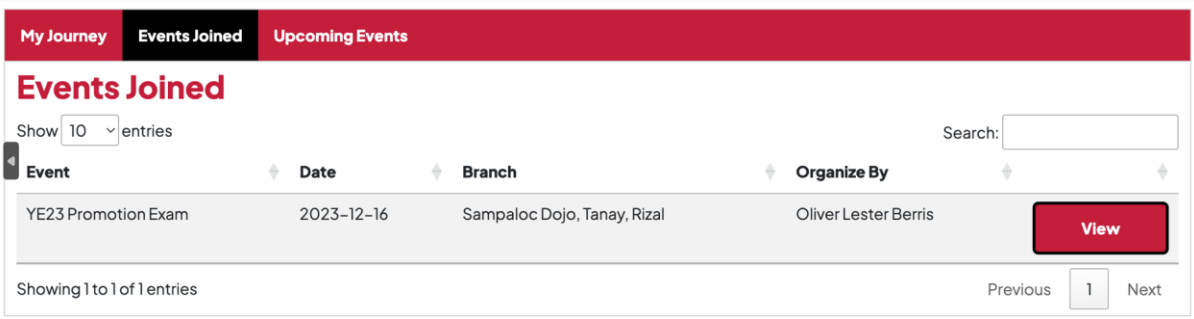

***Tab View Capability as Student (shown through each bullter as tabs)***

- My Journey

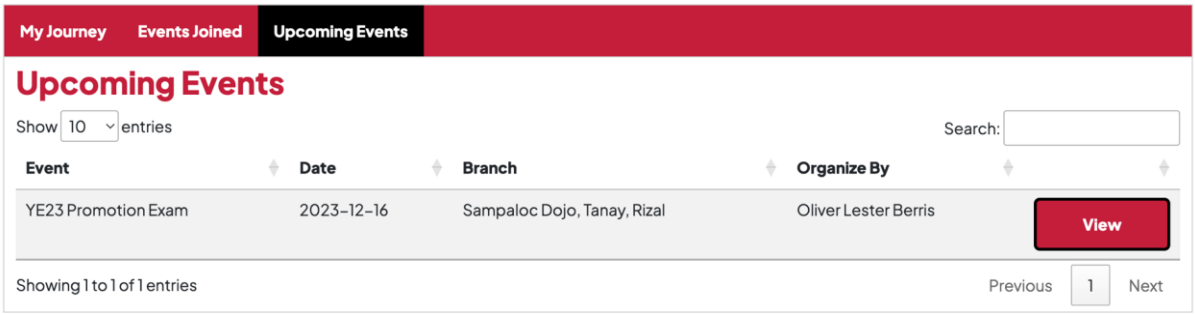



* NOTE: QR code and blockchain implementation in the profile page of the student

- Events Joined

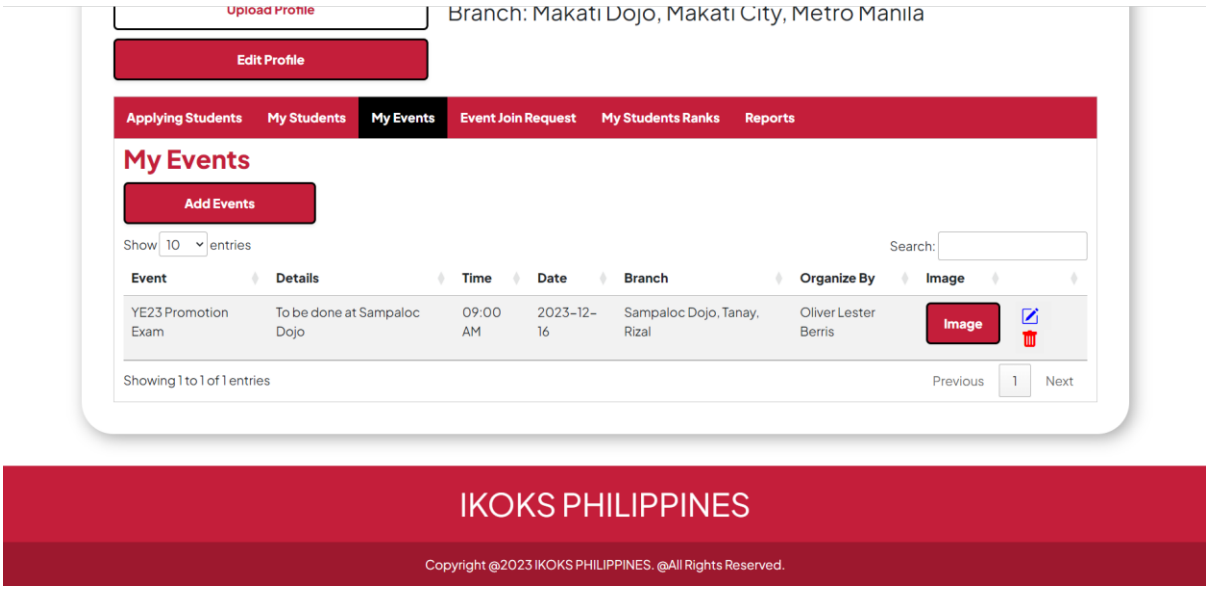



- Upcoming Event

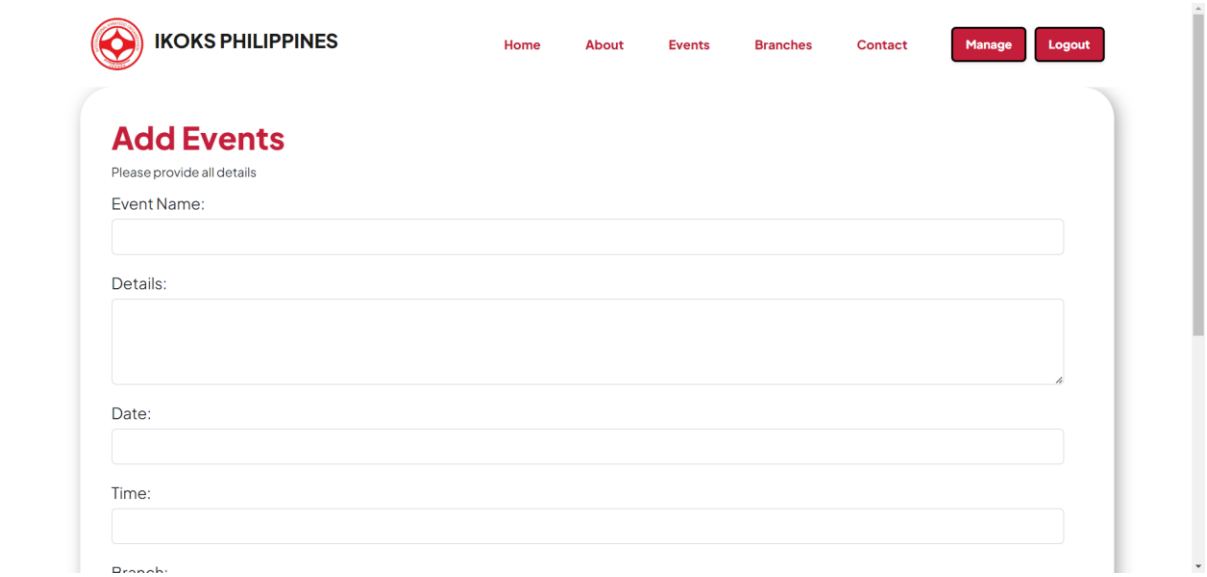



***Create event***

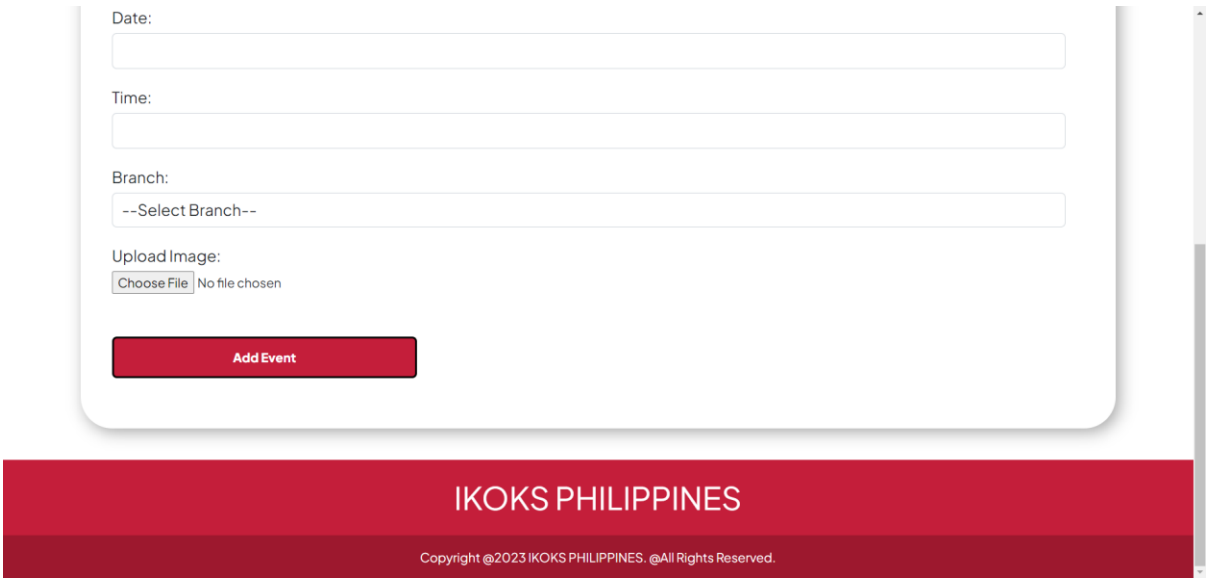
Step 1. In the dashboard (logged in as Teacher), look for the table located at the bottom part of the page and select My Events



Step 2. Fill out all details and place an image in the attachment part

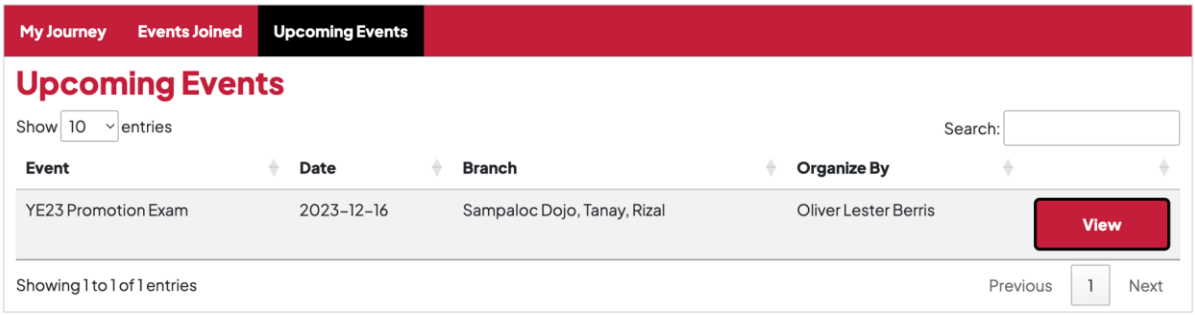



Step 3. Click the “Add Event” button



### *Join Event*

Step 1. In the dashboard (logged in as Student), look for the table located at the bottom part of the page and select Upcoming Events

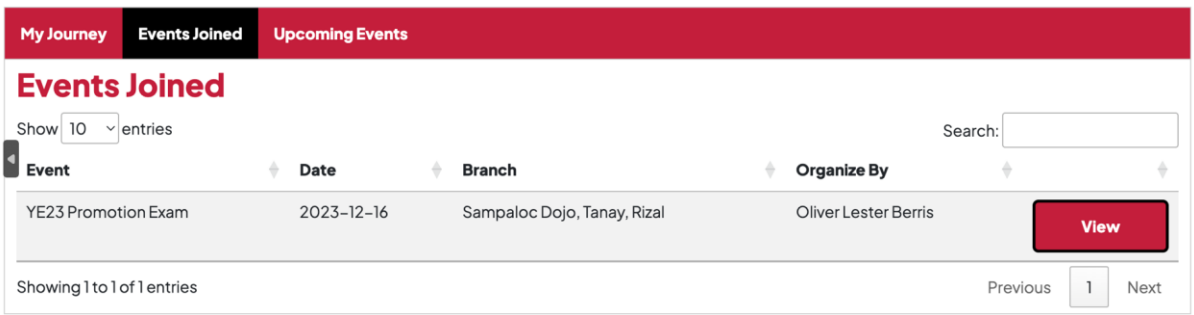



Step 2. In a event record row, Click on the “View” button

Step 3. Click on the “Join Event” button and await approval

### *View Event (Approved)*

Step 1. In the dashboard (logged in as Student), look for the table located at the bottom part of the page and select Events Joined

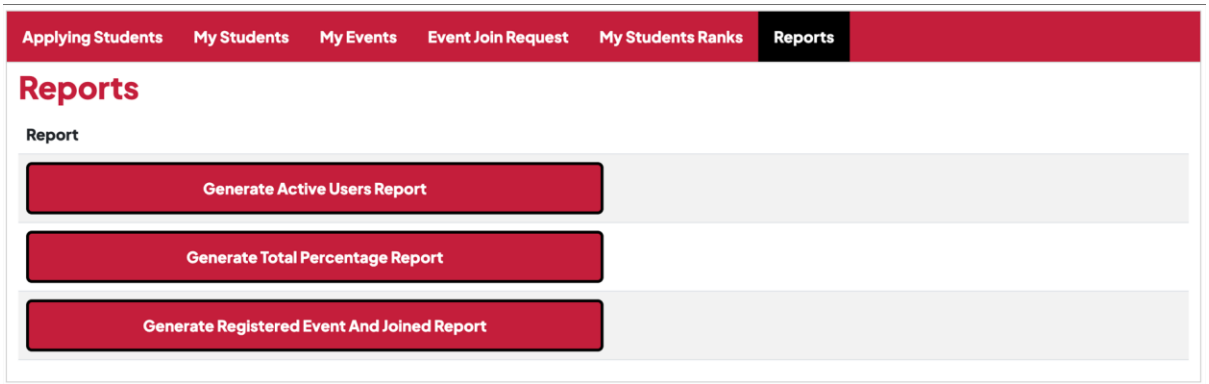



Step 2. In a event record row, Click on the “View” button

Step 3. Check on the Event Details and ensure the status is “Approved”

***View Generate Reports***

Step 1. In the dashboard (logged in as Teacher), look for the table located at the bottom part of the page and select Reports




Step 2. In a report record row, select the report to be viewed by clicking “Generate Report”

## H. Templates Used

### User Story Template

**Simple User Story Template**

| **Title:** | **Priority:** (Low, Medium, High) | **Estimate:** (1, 2, 3, 5, 8, 13, 21) |
|---|---|---|
| **User story**<br><br>*Sample:* **As a** [*type of user*], **I want to** [*perform some task*] **so that I can** [*achieve some goal*]. | | |
| **Acceptance criteria**<br><br>*Sample:* **Given that** [*some context*], **when** [*some action is carried out*] **then** [*a set of observable outcomes should occur*]. | | |

Google Drive URL:
https://drive.google.com/file/d/1QYgAexZ7AjaV2TO3180ZtTUJAL0k1dUl/view?usp=drive_link

## Test Case Template

| Test Case ID | | Test Case Description | | | |
|---|---|---|---|---|---|
| Created By | | Reviewed By | | Version | |

QA Tester's Log

| Tester's Name | | Date Tested | | Test Case (Pass/Fail/Not Executed/Suspended) | |
|---|---|---|---|---|---|

| S # | Prerequisites: |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

| S # | Test Data |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

Test Scenario

| Step # | Step Details | Expected Results | Actual Results | Pass / Fail / Not executed / Suspended |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |

Google Drive URL:
https://drive.google.com/file/d/1E3ZbkQ9bKWcmVzZpCARcurqs1eE1zMXB/view?usp=drive_link