DRIVEHUB: A MULTI-PLATFORM DRIVING SCHOOL MANAGEMENT SYSTEM WITH DRIVING SCHOOL FINDER

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INTRODUCTION

Situation Analysis

Driving schools are an essential component of the transportation industry, providing individuals with the skills and knowledge necessary to safely operate Motor Vehicles (MV) on public roads. A global market size and growth report by Kentley Insights for driving schools in 2023 has reached $8.0 billion across 216 countries worldwide. In 2011, the total sales reached 12 million USD, which increased to 53 million USD in 2022. Furthermore, the projected global market sales in 2027 are poised to reach 69 million USD.

The growth of the driving school industry can be attributed to several factors. One of the primary reasons is the increasing demand for licensed drivers. As of 2022, there are about 1.45 billion vehicles across the world (Bonnici et al., 2022). Additionally, with more people living in urban areas, public transportation may not always be an efficient or convenient option, making driving a necessary skill for many. Furthermore, government regulations and requirements for obtaining a driver's license have become stricter.

Under Republic Act No. 4136, Chapter III of Article I, Section 19, The law mandates the Duty to have a license, which states that it shall be unlawful for any person to operate any motor vehicle without having in his possession a valid license to drive a motor vehicle. In Addition, a driver's license must be issued by the government, which serves as an authorization to operate a vehicle. To further enhance public safety, the Land Transportation Office (LTO) implemented changes to the license application process in

2021. The Republic Act of 10930 mandates that the prospective drivers are required to procure driving course completion certificates from accredited driving schools to secure a license. It typically involves a combination of written and practical tests, as well as meeting certain age and residency requirements. These qualifications include being at least 17 years old for a Non-Professional license and 18 years old for a Professional license. Additionally, individuals must be physically and mentally fit to operate a motor vehicle and be literate in either Filipino, English, or a local dialect. They must also be holders of a valid student permit and present themselves in a clean, neat, and presentable manner, adhering to specific dress codes during examinations and picture-taking. Lastly, individuals must pass both a written and practical driving examination to obtain their driver's license (Ignacio, 2021).

In 2020, LTO introduced the Land Transportation Management System (LTMS) Portal, an online platform to facilitate contactless and online transactions for motorists during the COVID-19 pandemic. Since then, the portal has become a crucial component of the LTO's daily operations, and motorists are now required to access it before visiting an LTO office for services, including driver's license renewals. The LTMS Portal serves as a one-stop-shop for various transactions such as application for new and renewal of all types of licenses, providing convenience and accessibility to the public (Grecia, 2022).

Digital transformation is crucial for the survival and success of businesses in the age of Industry 4.0, and driving schools are no exception. Technology has transformed data management processes including the driving school sector, which has recognized the potential benefits of automation to optimize their operations. In a recent study conducted

in Greece, it was found that driving schools have a positive attitude towards digital transformation and recognize its significance in their industry (Nousopoulou et al., 2022). The study provides valuable insights for driving school owners, highlighting the importance of digital transformation and the benefits it can bring to their businesses. By embracing digital technologies, driving schools can streamline their operations, enhance the learning experience for their students, and stay competitive in an increasingly digital landscape.

Sudarmilah & Wahendra (2021) noted that the web-based management information system for managing driving schools' aids in handling student data, income reports, and expanding marketing by assisting prospective students in registering for courses. As a result, prospective participants can easily obtain information such as course schedules and training packages, options, and prices through this website rather than having to contact the driving school directly, making it easier to manage data so that it is more secure and not easily lost or damaged.

Bhatia, A. (2023) suggested eight effective driving school marketing ideas, including creating a website for driving schools, as it helps to address the problem of students struggling to find the nearest driving schools, likewise Driving Schools who are having a hard time promoting their services. With a website potential clients can easily access information about the driving school's location and services and receive recommendations for the nearest driving schools to their location. Digital tools like websites are essential for Driving schools to expand their reach and attract new student drivers who may have previously been difficult to reach. This is particularly important as

students face challenges in finding driving schools due to a lack of effective marketing platforms.

However, as noted by Mitrasena (2021), driving schools are limited to basic registration and record viewing, indicating a need for more advanced solutions. Despite the advantages of digitalization, Khanvailkar et al. (2022) observed that driving schools still rely on conventional and manual methods for managing their data, which can lead to errors and communication problems among stakeholders. To address these challenges, driving schools need to adopt comprehensive data management solutions that can streamline processes, minimize errors, and enhance communication among users.

Driving is a very essential life skill in the Philippines, where cars and motorcycles are the primary modes of transportation. According to Statista Research Development data, the number of registered private vehicles in the Philippines is approximately 1.27 million. This shows the gradually increasing number of registered private cars in the Philippines. As the number of Filipinos buying vehicles for personal and business use increases, the demand for skilled drivers gets higher. Hence, there is a need for driving schools to provide professional driving skills education and training.

Based on 2023 data from the Philippine Information Agency, there are around 1,400 driving schools accredited by the LTO nationwide that teach students how to drive safely and confidently, offering various kinds of services from basic driving lessons to advanced driving courses. There are numerous driving schools that offer a wide range of services in the country. It is crucial to select the appropriate driving school that can cater to the student's needs and requirements. The best driving school in the Philippines should

be capable of providing quality instruction, have experienced and certified instructors, and have a positive reputation. Additionally, it is essential to consider the price of the driving lessons, as some schools offer discounts for bulk purchases.

The main goal of the project, "DriveHub: A Multi-Platform Driving School Management System with Driving School Finder," is to provide a comprehensive driving school management system that effectively caters to the needs of driving schools. In light of the challenges mentioned earlier, the developers propose DriveHub, which offers management capabilities encompassing student enrollment, scheduling, progress tracking, and reporting. This provides driving schools with efficient tools to effectively manage their classes and resources. Additionally, DriveHub's finder feature facilitates the search for driving schools based on the student's location, reducing the time and cost associated with manual searches. This enables student drivers to efficiently improve their driving skills by quickly finding the most suitable driving school for them through DriveHub.

Statement of Objectives

The project aims to design, develop, and evaluate the "DriveHub: A Multi-Platform Driving School Management System with Driving School Finder" that will help streamline and optimize the operations of driving school and serve as a platform for students to find the best driving schools within its area.

Additionally, it seeks to answer the following:

1. Determine the current processes and policies of a driving school in terms of the following:

    a. Registration;

    b. Payment;

    c. Practical Test and Theoretical Driving Course Assessment

    d. Report Generation

2. To determine the factors that affects student drivers in choosing a driving school.
3. To determine the functional and non-functional requirements of the system.

4. Develop the proposed system using Agile Scrum methodology, and

5. Evaluate the usability of the developed system using the System Usability Scale.

Significance of Study

The development of the "DriveHub: A Multi-Platform Driving School Management System with Driving School Finder" is beneficial for the following.

Driving Schools. The system can help streamline operations, from managing instructors, students, contracts, lessons, progress tracker and scheduling, to generating reports on various aspects of their operations. The app allows driving schools to monitor their performance, identify areas for improvement, and provide a better overall experience to their students.

Instructors. The system feature allows instructors to monitor their students' progress and identify areas for improvement. They can use this feature to adjust their teaching methods to better suit their students' needs.

Student Drivers. This project provides a one-stop platform to search, register and book their driving lessons. The feedbacks of driving schools will benefit both student drivers and driving school in making informed decisions on where to take their lessons and asses the performance of driving school. The features allow students to stay on track with their session.

Developers. The study will allow the developers to apply their software development knowledge and skills while also improving their overall competency in information technology.

Future Developers. The study can be used as a reference for potential future developers on similar research areas.

Scope and Limitations of the Project

DriveHub: A Multi-Platform Driving School Management System with Driving School Finder is a mobile app and web-based application that provides ease in finding the best driving schools to manage. The system will integrate a map that will suggest the nearest driving school based on the student's driver location. The application will serve as a driving school finder for student drivers. Students can access additional learning materials and mock tests to supplement their driving lessons and prepare for the actual

driving test. The system will include an in-app messaging feature that allows students, driving schools, and instructors to communicate with each other directly. Furthermore, the system provides students with a progress tracker feature that allows them to keep track of their progress. A contract management feature will be included in the DriveHub. Furthermore, the report generation feature will provide comprehensive reports on business performance to keep track of their revenue and student progress, including the instructor's performance. The vehicle tracking system will also integrate with DriveHub to locate the vehicle while on the road. The backup restore feature will provide a backup of all stored information on the system. Customer support will also be provided in the DriveHub to report abusive instructors. The form analysis will be integrated into the system, which will analyze and assess the driving school's capacity to acquire new motor vehicles. The DriveHub will utilize the Pop-up Notification feature for both student drivers and instructors; likewise, the Printing of Reports will be accessible for driving schools, while students will generate application forms.

The features given are all within the scope of the proposed project. However, this project will not integrate a certificate generator with a QR code due to government restrictions and policies. The system is not responsible for the payroll of the instructors, which is not included in the instructor management; furthermore, the driving simulation will not be included in the system and will only provide a mock-up test. The system will not use dynamic forms and will use generalized information to meet the standards of various driving schools. Additionally, DriveHub will not integrate the Automated Document Verification system for validating proof of accreditation from the Land

Transportation Office (LTO). Manual verification will be used instead, as there are not enough datasets to compare original business documents from driving schools.

Definition of Terms

To aid in the understanding of the technical aspects of this paper, the following terms have been operationally defined.

Analytics. Refers to the process of examining information using statistical data provided by the user based on the gathered data from the system.

Application Programming Interface (API). Refers to a protocol, and tools that allows different software application to communicate and interact.

Booking. Process of reserving a slot for a driving lesson with a particular driving school

DriveHub. A Multiplatform Driving School Management System with Driving School Finder.

Driver's License. A legal document issued by the government which serves as a form identification and authorizes the holder to operate a vehicle on public roads.

Driving School Finder. Refers to a feature of the application that allows users, particularly students, to conveniently search and locate the best driving schools within their vicinity through a map presentation.

Driving School. A facility or institution that provides structured driving lessons and training programs to individuals who want to learn how to operate a motor vehicle safely and legally on public roads.

Github. A group of developers collaborating with the same source code systematically without conflicting or overwriting each other's work.

Land Transportation Office (LTO). A Philippine government agency responsible for the registration and licensing of motor vehicles and drivers, as well as the enforcement of land transportation laws, rules, and regulations.

Location/Map. Refers to the map feature within the application that displays the location of the driving school to help users easily locate and navigate to the desired driving school.

Motor Vehicle. Any propelled vehicle using a public highway that is powered otherwise than by muscular power.

Multi-platform. refers to software or technology that is designed to be used across multiple platforms, such as websites and mobile applications. This means that the software can provide two-way access to DriveHub, regardless of whether it is accessed from a website or a mobile application. Multiplatform software is developed to be compatible with different operating systems, devices, and browsers, allowing users to access the same features and functionality across a range of different devices and platforms.

Pay Maya. Refers to an electronic money provider regulated by the Bangko Sentral ng Pilipinas, which is an easy way to transfer and pay money digitally.

QR CODE. It is designed to store different information in a machine-readable format.

Theoretical Driving Course & Practical Driving Course. Refers to the mandatory courses required by the Land Transportation Office (LTO) for individuals who wish to obtain a driver's license. The Theoretical Driving Course (TDC) covers the basic traffic rules, road signs and signals, and other related topics, while the Practical Driving Course (PDC) involves actual driving lessons under the supervision of a certified driving instructor.

CHAPTER 2

REVIEW OF LITERATURE AND STUDIES

This chapter presents the review of related literature and studies that were published and deemed related to the present work to provide a broader understanding of the study.

Processes and Policies of Driving Schools

A driving school typically follows a structured set of activities and tasks to help student drivers attain their goal of becoming safe and confident drivers. Policies, on the other hand, are rules or guidelines that dictate how people should behave and interact with the mandated laws of the government. These are typically designed to ensure that everyone is following the driving school's standards.

Registration

As per Cambridge Dictionary (n.d.), registration is the process of creating an authoritative record containing names and various details, or it can also refer to a document that presents this information. This may involve aspects such as a registration fee, registration form, or the overall registration process.

According to a-1driving (n.d.) to complete the registration process individual providing the necessary documents, which may include identification proof, address verification, and any required permits or licenses. Then the individual should choose an appropriate driving course on their experience level and goals. Driving schools usually offer different courses for beginners, intermediate drivers, and those seeking specific

training (e.g., defensive driving). Lastly, pay the required fees for the chosen driving course. This may include tuition fees, administrative charges, and any additional costs for simulator training or other services.

Payment

According to Clark (2021), the seven benefits of accepting payments over the Internet are. (1) Save time, save money in comparison with manual invoicing, packing envelopes and sending them directly to the post office, posting an online invoice form or email address of a client on your website is much faster. (2). Decrease costs by offering online payments, reducing the cost of paper, supplies and mail while minimizing environmental impact. (3) Improve cash flow Thirdly, clients can make payments at any time of the day, which means they receive the money more quickly than waiting for checks to arrive and clear the bank. (4) If a client is regular, you should consider adding recurring payments to your billing schedule. To attract more clients (5): A surefire way of increasing your client base is an easy, convenient online payment method. (6) Simplify reporting and reconciliation – integrated payments in the event management software mean the transactions are all in one place reporting becomes centralized, and reconciling becomes fast and simple. And last (7) Offer secure payments – with an online payment form, sensitive payment information is typically stored by a third-party processor, minimizing your liability risk.

According to Unknown (n.d.), the theoretical driving course and other services accept payments through digital wallets and bank transfers. The students will first settle the full amount before booking their preferred schedules. After booking the services and

scheduled sessions, the student drivers must notify the driving school of the cancellation of their schedule. The student drivers should call the driving school at least 48 hours prior to their scheduled driving lesson. If the student drivers fail to attend the driving session without informing the driving school, their absence will be counted, and the payment is not refundable. In Addition, According to Smart Driving (n.d.), the payment policy of the driving school is also detailed in the contract signed and agreed upon by the student drivers. When availing of services, whether through the website or onsite, the student driver must present a copy of the enrollment confirmation together with a valid ID to the branch for checking the registration. A successful enrollment is valid for ninety (90) days upon registration. For enrollment cancellation and course downgrade, the driving school reserves the right to deny refunds of the fees, or any payments made to compensate for time and resources spent in preparations, purchases, and other expenses directly related to the enrollment.

Moreover, customers who become more confident in the use of these payment instruments are gaining trust through technological improvements which allow mobile payments to be carried out and improve their convenience and transparency. This change in customer behavior, which is indicative of a shift from traditional to more modern payment methods on the internet, can be seen not only at retail and banking outlets but also for virtually all wireless devices. The study revealed that the number of customers who use online payment methods and do business through them continues to grow, which implies that academia and industry support will continue to be relied upon for these systems. But new possibilities and problems for the deployment and development of secure Internet payment systems are being created resulting for adopting and use of

increasingly sophisticated technologies now and in the near future. The previous cash-based payment system was gradually replaced by electronic payment systems as exchanges among different business partners continued to take place on an online shopping platform.

Practical Test and Theoretical Driving Course Assessment

According to Unknown (n.d.) the assessment process at a driving school involves a theoretical knowledge test and a practical driving assessment. Candidates are evaluated on their understanding and adherence to driving rules, their ability to perform safety checks on the vehicle, maneuvering skills, eco-driving practices, knowledge of traffic regulations, hazard awareness, proper use of mirrors, and overall driving safety. The feedback and results obtained from the assessment provide valuable insights for candidates to improve their driving skills and knowledge.

In addition, as stated in "How to pass your driving assessment (Booklet)" from the Department of Transport, Government of Western Australia (n.d.), during practical driving assessment the assessor will look at the components of good driving skills and how well the student driver put the components together. The assessor then checks from a checklist while the student driver are accomplishing the everyday driving tasks as part of the practical driving assessment.

Report Generation

According to Winward Studios (n.d.), the seven practical ways that generated reports will benefit businesses are: (1.) Automating document generation ensures

accuracy by eliminating human errors, providing up-to-date information, and avoiding embarrassment from inaccuracies, misspellings, and missing data. Approved templates guarantee correct content without the need for multiple edits. (2.) expedite process with generated documents, Drafting, Editing, and Proofing are all done in the creation stage of the document. This means a lot of time savings with document automation that would have been spent typing and creating a document are eliminated. (3.) Saves Money Considerably, one of the biggest expenses that so many businesses try to bring down is paper. Money goes into buying paper that needs to be print a draft before printing the final copy. Generated documents do not have to be printed often when it comes to the best document generation software. This will save the business a lot of money in the long run. These documents can be created and then shared without having to use paper. (4.) Less Time Spent on Initiation Training: recruiting new employees, must have to spend a lot of time explaining the document generation process and the standards that they will have to follow. Most of this is already in the template, and the auto-generation takes care of the important aspects of the business standards, so new employees do not need to learn so much to be able to create documents. (5.) Easy Storage and Access: Automatic report generation is easier to store since it can be stored on a general server or in the cloud. This means that there will be no worry at all about physical files and cabinets to store these documents. And this kind of storage makes access easier through the internet. (6.) Better Collaboration with Clients: Generated documents gives the business the ability to efficiently collaborate on projects with a client. If you need a client's input on a document, you simply need to give them clearance to access the document wherever they are (7.) Robust Security and Confidentiality Maintained: For some businesses, the issue of

document sensitivity is very important. They need to ensure that sensitive documents do not land in the wrong hands. With generated documents will ensure different levels of security that suit your business.

Factors that Affect Student Drivers in Choosing a Driving School

There are numerous driving schools that offer a wide range of services in the country. It is crucial to select the appropriate driving school that can cater to the student's needs and requirements. The best driving school in the Philippines should be capable of providing quality instruction, have experienced and certified instructors, and have a positive reputation. Additionally, it is essential to consider the price of the driving lessons, as some schools offer discounts for bulk purchases. Based on the Land Transportation Portal (n.d.), the best driving school should be conveniently located near the students' place of residence.

According to Unknown (2022), when finding a driving school and instructor, an individual should consider important factors such as location, certifications, availability, and teaching style. Individuals should opt for a school that is conveniently located to avoid inconvenience. Ensure that the driving instructors have the necessary certifications and licenses. Look for a school that can accommodate their schedule and offers flexible learning options like online courses. Consider the teaching style of the instructors and find one that aligns with the student driver's learning preferences and current driving abilities.

Additionally, reading online reviews and testimonials can provide valuable insights into the quality of instruction and overall experience. Considering options like one-on-one lessons, comprehensive packages, and modern facilities with interactive tools can enhance the learning process. Speaking directly with instructors and assessing their qualifications can further aid in making an informed decision (Drivisa, 2023).

Functional and Non-Functional Requirements

According to Baker (2023), a functional requirements help divide complex projects into manageable tasks, providing a clear understanding of the work that needs to be accomplished. Essentially, they outline the desired capabilities of the product, the services it should provide, its operational mechanisms, and the technical details pertaining to its usability, security, scalability, and performance.

Gavhane and Mokampalle (2021) developed Driving School Monitoring Sytem which streamlines paper-based processes and centralizes student and master data in a database. The system is composed of three modules: admin, manager, and student. The admin module allows for system administration through an admin dashboard. Students can create an account online and view all the training options available, including vehicle, timing slot, fee packages, and sessions. The system estimates the total fees and provides online payment options via credit card. Students receive receipts via email and notifications for each session. The manager login allows for session manipulation, student training assignment, and viewing of data. This system effectively reduces administrative work and improves the overall management of the driving school.

Hence, the utmost aim of this project is to supply a feature-rich digital solution to manage limited resources efficiently and effectively in a driver training institute.

Mithrasena (2021) developed TrainMe, a web-based management system for driving schools that caters to the needs of customers. Driver students can register and make payments to access the system's features. The system supports the allocation of predefined training slots to trainees on a first-come, first-serve basis. An algorithm was implemented to avoid conflicts in scheduling the same time slot by two or more persons. The proposed system architecture was a client-server system where the client accessed the web application over the internet, and the web server processed the data and sent back the required results to the client.

According to Sudarmilah and Wahendra (2021), the Global Training Centre (GTC) in Sragen currently uses a manual registration system, resulting in ineffective and inefficient data management. To address this issue, they developed a web-based management information system using the waterfall software development method and UML tools such as ERD, case diagram, activity diagram, and wireframe. The system aims to improve student data handling, generate income reports, and expand marketing by assisting prospective students in registering for courses. The research outcomes include a website that simplifies the course registration process for participants and optimizes GTC's course management. With the new system, GTC can provide better services to its students.

Gomes, Araujo, Guedes, Mendonca, Santos, and de Alencar (2022) conducted a study on the use of the Achar Driving App, which utilized GPS technology to assist in the

search for school driving in Manaus. The study aimed to provide a solution for parents to easily locate and book driving lessons for their children, addressing concerns related to urban violence and traffic accidents in the area. By leveraging GPS technology, the Achar Driving App allowed for accurate and location-based searches, providing a convenient and safe option for parents. The study is relevant to the development of a driving school finder app that utilizes similar technologies for improved user experience.

According to LTO Portal PH, the Land Transportation Management System (LTMS) Portal is a newly developed online platform created and managed by the Philippine Land Transportation Office (LTO). LTMS portal provides a self-help option for individuals who wish to learn the dos and don'ts of the Philippines' traffic rules. There is a wide range of available information and materials on licensing, driving, road markings and signage, as well as traffic rules, regulations, and all existing laws related to land transportation. The portal also includes practice exams to help applicants prepare for the theoretical exams required by the LTO for licensing applications.

Non-functional requirements pertain to the operational aspects of a system. When these requirements are not fulfilled, users may experience frustration with the system (Gorbachenko, 2021).

One of the most crucial techniques for web security is authentication. Two-factor authentication is a security system that requires two separate, distinct forms of identification to access something Typically, this involves a combination of a username and password. It is designed to prevent unauthorized users from gaining access to an account with nothing more than a stolen password (Kenton, 2022).

In a study by Kruse (2023) titled "Economic Value of User Interface Design," she highlighted that one of the essential elements of a "good" design is to provide simple error handling. When errors occur, providing clear instructions on how to resolve them is crucial. Rather than using vague error messages, offering specific guidance such as "Prohibited character in Name field" allows users to quickly correct their mistakes. This specific direction aids users in rectifying the issue promptly.

Murphy (2022) stresses that a website's success depends on its learnability. When businesses and web designers prioritize learnability, they can improve the user experience, make it easier for users to navigate the site, save their time and effort, increase engagement, and ensure accessibility. By considering learnability during website design, they can create intuitive and user-friendly platforms that leave a lasting impression on visitors. Ultimately, a website that is easy to learn leads to higher user satisfaction, positively impacts how people perceive the brand, and provides a competitive edge in the online world.

As per Seibert (2023), businesses should prioritize website accessibility as it enables them to reach a wider audience. By making their website accessible to all users, including those with disabilities, businesses can tap into a large and often overlooked market. This inclusive approach can lead to enhanced revenue, increased engagement, improved sales, and higher customer satisfaction, as the site becomes easier to navigate for everyone.

According to Sharma (2023) maintainability is crucial in software development for several reasons. It allows for seamless updates and extensions over time, reduces

support and maintenance costs, improves software quality by facilitating bug-fixing, and enhances collaboration among developers by making the codebase easier to understand and work with. Prioritizing maintainability ensures a robust, cost-effective, and user-friendly software system.

System Development using SCRUM Methodology

According to Peek (2023) Agile Scrum methodology is a fusion of two concepts - the Agile philosophy and the Scrum framework. Agile emphasizes an incremental approach to project development, allowing teams to work on projects in small, manageable increments. On the other hand, Scrum is a popular type of Agile methodology that involves dividing projects into smaller, more manageable parts called "sprints". During sprint planning, the project team selects a small portion of the scope to be accomplished during the next sprint, which typically lasts two to four weeks. The work should be ready to deliver to the client at the end of the sprint. The sprint ends with a sprint review and retrospective—or, more accurately, lessons learned. This cycle is repeated throughout the project lifespan until the complete scope has been delivered (Stobierski, 2021).

In addition, according to a study by Fanny, Bengy, and Andrade-Arenas (2021), many organizations still follow traditional methodologies for developing their systems, which may result in systems that fail to meet requirements and lack proper information security. To address this, the developers aimed to design an e-commerce web system using the Agile Scrum methodology. The methodology allowed the system to be based more on

the fulfillment of the requirements of the customers, so that it was better adapted to the organization and its needs since the changes in the requirements were welcomed in the agile environment worked, in addition the continuous communication between the stakeholders have made possible the estimation and prioritization of the user stories studied and also gave a path of development in the Product Roadmap to finally be separated by sprint as deliverables.

A study of Grebic, and Stojanović (2021) entitled "Application of the Scrum Framework on Projects in IT Sector" found that Scrum offers significant advantages. It enables continuous process improvement, enhances communication and cooperation within teams and with stakeholders, increases team productivity, improves responsibility distribution, and ensures faster and better delivery of project products. The integration of risk and change management simplifies planning and project documentation, minimizes potential losses, and maximizes potential opportunities. These findings highlight the success of Scrum in developing software solutions, making it a preferred choice for organizations and employees in the IT sector and other domains that require an agile and iterative approach.

The literature mentioned above demonstrates that Scrum is well-suited for system development, particularly in designing web and mobile-based applications. According to Keita (2021), there are two major advantages to using the Scrum method in any organization. The first is that Scrum teams deliver higher quality projects, and the second is that they operate with maximum efficiency. By planning and budgeting proactively, Scrum teams can optimize their use of time and financial resources, minimizing the risk

of unexpected expenses and delays. Additionally, Scrum teams test their product before release during each sprint to identify and address any issues that may have arisen.

Usability of the System using the SUS

According to Chi (2021), usability testing is a method for assessing the user experience of a product or website. Developers can determine if their actual consumers can easily and intuitively use their product or website by evaluating them with a representative group of users or customers.

Churm (2022) explains that usability testing aims to evaluate the user-friendliness of a website or app by observing how actual users interact with it, and then making necessary adjustments based on the feedback received. The main objective is to collect data that can reveal any usability issues and improve the overall design of the website or app. Usability testing is crucial to ensure that users can easily navigate the website or app and perform tasks efficiently. The process helps even the most skilled web design and development teams to identify any problematic areas and make necessary improvements.

The System Usability Scale, or SUS, was created in 1986 by John Brooke a reliable method for measuring the usability of a system and has been used extensively by a variety of industries to test numerous applications and systems. This method is efficient and provides statistically valid data to give an application and website a clear and reasonably precise score. The scale consists of 10 questions that users must answer, using a Likert Scale ranging from 1 to 5 to indicate their level of agreement with each statement. The purpose of the System Usability Scale is to quickly and effectively gather data to

identify areas for improvement and enhance the overall usability of a system (Thomas, 2022).

A study of Sudarmilah, et al. (2021) entitled "Educational Practices and Management Information System in Managing Driving School on Website-Based GTC" The system was tested using two different test methods: blackbox testing and the System Usability Scale (SUS). Based on the results of the system testing, it can be concluded that the Blackbox test indicates that the system is performing as expected, while the SUS test suggests that the system is acceptable to the user.

The study titled "Usability Analysis in Paasaar.com Application Using the System Usability Scale (SUS) Approach" by Roosdhani, Widagdo, and Amelia (2022) noted that usability and accessibility are crucial for ensuring user satisfaction and system effectiveness. They used the SUS method, which provides a clear and easily understandable score on a scale, making it useful for a wide range of people involved in product and service development.

The System Usability Scale (SUS) is a commonly used method for evaluating usability due to its various advantages. It is a quick, free, and user-friendly assessment tool that is perceived as fair and easy to use by participants.

Synthesis

Studies and related literature have been reviewed which are regarded as needed in the conceptualization and making of the proposed project "DriveHub: A Multi-Platform

Driving School Management System with Driving School Finder" that would greatly help in integrating the most efficient way to produce the expected result. The "Driving School Monitoring System," developed by Gavhane & Mokampalle et al. (2021), has provided insights on centralizing student master data, which streamlines paper-based processes in the driving school that need service. Insights to allow the admin to manage the system and students to view all the training options available, including vehicle, time slot, fee packages, and sessions; likewise, insights to allow the manager to manage sessions, student training assessment, and viewing of data. Additionally, DriveHub will allow the driving school owner and student driver to utilize the in-app messaging, which allows both parties to communicate, and it will make the transaction clearer and more convenient, which is not included in the presented studies above. The DriveHub allows the student driver to track its progress per session, which feature is not included on the "Driving School Monitoring System," which is only limited to the viewing of its driving session. Contrary to the developed "Driving School Monitoring System", the a-1driving.com website does not have an account login and registration for student drivers to manage all the training options available; the website only provides a viewing of the driving school services offered, which includes the viewing of pricing and browsing of all courses. Additionally, the prestigedrivingschoolph.com website only provides an enrollment form that contains personal information, the chosen branch, and the course that the student driver will avail of. The payment method only asks their customer how they can pay for their transaction, which seems unfunctional for business needs. The aforementioned developed system and website features are unlikely to be relevant to the proposed application. DriveHub will integrate payment systems that provide convenience for both

driving schools and student drivers using electronic wallets such as Maya and debit cards. It also provides a payment management and report generation system to monitor the transaction on both ends. Regarding the a-1driving.com and prestigedrivingschoolph.com websites, which do not have a mobile application and are only accessible using a browser, the DriveHub allows owners to manage their driving school through a web application, while student drivers can freely use the mobile application to reserve a driving session, and instructors can access students' progress.

DriveHub: A Multi-Platform Driving School Management System with Driving School Finder is somewhat similar to the past study of Gomes, Araujo, Guedes, Mendonca, Santos, and de Alencar et. At, (2022), which is the use of the "Archar Driving App", which utilizes GPS technology and comes with the Android OS (operating system) to assist in the search for a driving school. The Archar Driving App is a location-based search that is similar to DriveHub; however, the proposed project will allow the student driver to find the best driving school based on their location. If there are plenty of choices in the area, the application will suggest a driving school based on its customers reviews and ratings and also the DriveHub will integrate vehicle tracking system to track instructor's location while on the road.

In terms of functional requirements, the studies mentioned above identified common functional requirements in the proposed project, such as registration, selecting payment methods, a Driving School location finder, and reservation. The DriveHub's main functional requirements are: (a) the system should allow the student driver to find the nearest driving school based on their location; (b) the driving school can pin its

location in the map; and (c) it should allow student drivers to create an account in order to access the DriveHub mobile application. On the other hand, the presented studies provide better insights and understanding to the developers in conceptualizing the study and address its goal to develop the DriveHub: A Multi-Platform Driving School Management System with Driving School Finder that provides student drivers with the ability to find the best driving school through a location-based finder that can replace the traditional way of reserving a driving session at a driving school.

Project Framework

The project's researchers will use the Input-Process-Output (IPO) model as a general structure and guides for the project's development. Having a well-defined framework that provides structure and direction for planning, managing, and executing projects. The Input-Output-Process model is a functional graph that serves as the basis for conceptualizing project teams, identifying the necessary inputs, outputs, and processing activities to achieve project objectives.

Figure 1 illustrates the research paradigm of the study wherein input consists of Determine the current processes and policies of a driving school in terms of a) Reservation, b) Payment, c) Report Generation, d) Assessment, Determine the process involved in finding a driving school, To determine the functional and non-functional requirements of the proposed mobile and web application, and evaluate the usability of the developed system using the System Usability Scale (SUS). The inputs will be

processed through system development using the Agile Scrum Methodology which includes a) Initiate, b) Planning and Estimate, c) Implementation, d) Review and Retrospect, and e) Release. The output of this project is the DriveHub: A Multi-Platform Driving School Management System with Driving School Finder.
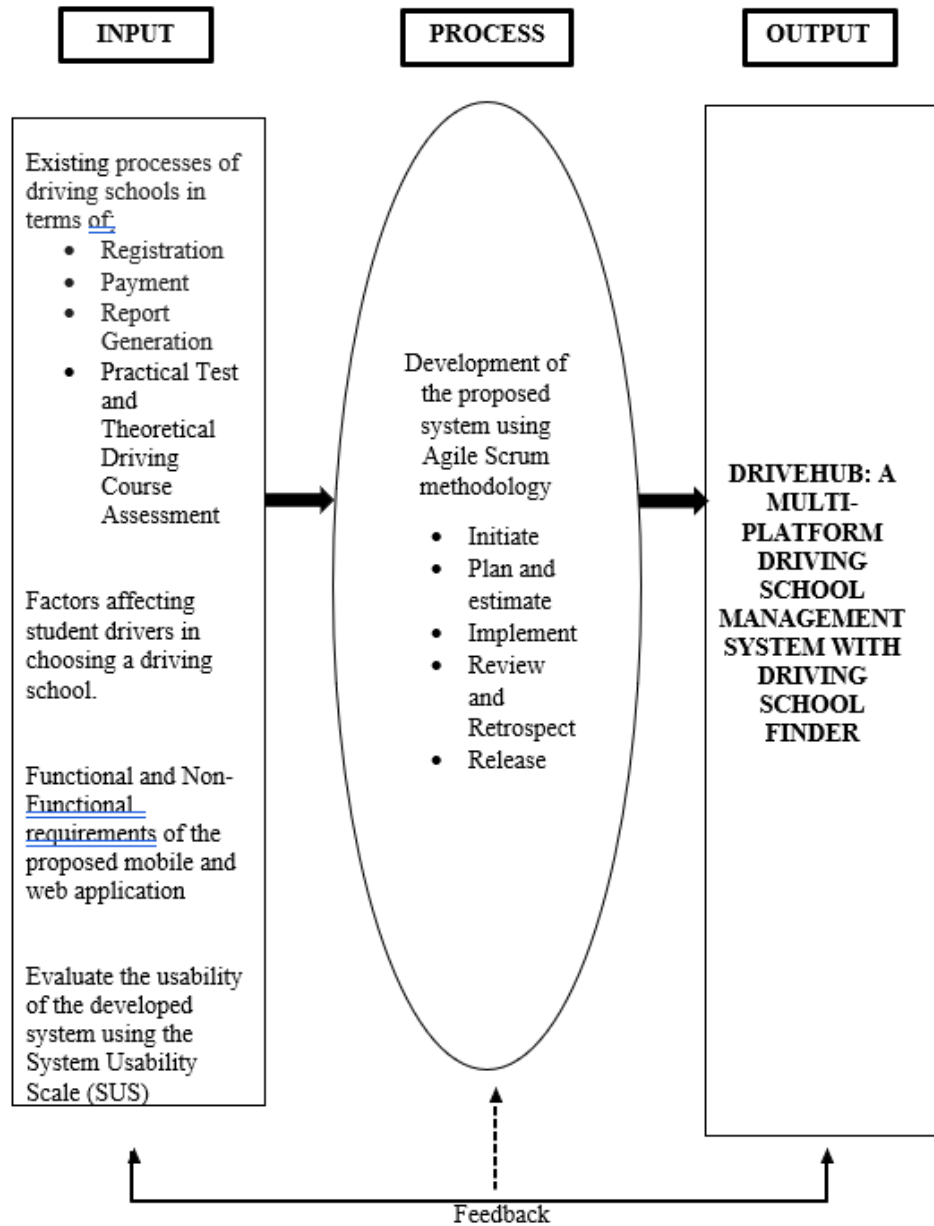
| INPUT | PROCESS | OUTPUT |

Existing processes of driving schools in terms of:
- Registration
- Payment
- Report Generation
- Practical Test and Theoretical Driving Course Assessment

Factors affecting student drivers in choosing a driving school.

Functional and Non-Functional requirements of the proposed mobile and web application

Evaluate the usability of the developed system using the System Usability Scale (SUS)

Development of the proposed system using Agile Scrum methodology
- Initiate
- Plan and estimate
- Implement
- Review and Retrospect
- Release

DRIVEHUB: A MULTI-PLATFORM DRIVING SCHOOL MANAGEMENT SYSTEM WITH DRIVING SCHOOL FINDER

Feedback

Figure 1: Research Paradigm of DriveHub: A Multi-Platform Driving School Management System with Driving School Finder

CHAPTER 3

METHODOLOGY

This chapter explains the research methodology that the developers will use in gathering data and analysis which is relevant to the research. It presents a precise presentation of research design, population and locale of the study, data instrumentation, data analysis, and the proposed implementation plan.

Research Design

The researchers will use the descriptive and developmental type of research for the development of the DriveHub: A Multi-Platform Driving School Management System with Driving School Finder

Sahin and Mete (2021) state that the descriptive research pertains to the description of a particular population, situation or phenomenon being investigated. This design aims to address questions such as "how", "what", "when" and "where", instead of delving into the "why" aspect. Its primary objective is to provide a detailed depiction of the characteristics of a demographic group without necessarily explaining the reasons behind a specific phenomenon. Therefore, this research is intended to be descriptive in nature as it will use survey questionnaires, interviews, and document analysis as research instruments. Furthermore, descriptive surveys will be employed to determine user needs and conduct usability testing.

In addition, according to the study of Cirebon et al. (2023) from the study of (Seels & Richey, 1994), developmental research is defined as "the systematic study of designing, developing and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness". Therefore, Agile Scrum Methodology will be used for the development of the DriveHub: A Multiplatform Driving School Management with Driving School Finder.

The developers opt for SCRUM methodology as a guide in the development of the project. Agile scrum methodology the combination of the agile philosophy and the scrum framework. It is a sprint-based project management system with the goal of delivering the highest value to stakeholders (Peek, 2023). The project researchers will follow the Scrum phases, which will address the actions accomplished during the development flow. The phases and procedures involved are the a) initiate, b) plan and estimate, c) implement, d) review and retrospect, and e) release.

Initiate. In this phase, the developers will form a Scrum team, establish the business case and vision for each release, assemble the team, and assign roles to each team member during the Initiation phase. The initial Product Backlog is also examined to see if there is enough work, and the tasks are arranged to produce the project timeline.

Plan and Estimate. The developers will create a plan for designing and creating a system that meets the end users' requirements. It requires effort to accomplish the task and develop the functionality described required to a student's or driving school/instructor. It will let developers define the system's expected outcome by

establishing User Stories, approving the estimate, committing the user stories, defining the activities and preparations required, and finally, creating the Sprint Backlog.

Implement. This phase is concerned with accomplishing the tasks and activities necessary to create a project's product. These tasks involve creating various deliverables, holding daily standup meetings, and grooming (i.e., reviewing, fine-tuning, and regularly updating) the product backlog regularly.

Review and Retrospect. The developers will test the functioning system to see if it is already efficient and if it has satisfied the end-users' (student and driving school/instructor) expectations. The tasks will be assessed to see if the sprint was completed appropriately and if the approach was followed.

Release. In this phase if the system has already met the user criteria, the developers will release the final version to the end users. As well as the developers will internalize the lessons learned during the development of the system. This phase emphasizes the accepted deliverable to the student and driving school/instructor.

According to Dunggal (2023). The scrum test describes the framework within which people can address complex adaptive problems while productively and creatively delivering products of the highest possible value. The scrum team defines a cross-functional, highly productive, and self-organized groups that collaborate to deliver high-quality product increments. A Scrum Teams has three distinct roles, namely the Scrum Master Product Owner, and development team, which collectively form the Scrum Team (Coursera, 2022).

Scrum Master is responsible for overseeing the Scrum team and ensuring that they adhere to Scrum values. They lead meetings, remove any obstacles the team encounters, and keep the team focused. They may also help organizations integrate Scrum concepts into their work. The Scrum Master is considered a servant leader since they fulfill both the role of a leader and a supportive team member.

Product Owner ensures that the Scrum team's work aligns with the overall product goals by understanding the business needs, customer expectations, and market trends. To ensure the Scrum team's work aligns with these goals, the Product Owner typically stays in contact with other stakeholders outside the team, such as product managers.

Development Team consists of professionals who perform the hands-on work of completing tasks within a Scrum sprint. The team can include computer engineers, designers, writers, data analysts, or any other roles required to achieve sprint goals. The development team collaborates to establish goals and plans for achieving them instead of just waiting for orders.

Population and Locale of the Study

Based on the Land Transportation Office (LTO), there are 21 accredited driving schools within the Province of Pangasinan, Region 1, Philippines as per reflected to the LTO website as of February 17, 2023. The study will focus on the five driving schools within the Province of Pangasinan as the initial geographical area of DriveHub. The developers plan to expand the coverage of the DriveHub application to other provinces

and regions in the future. The developers considered two main cities/municipalities within the Province of Pangasinan for the types of Motor Vehicle (MV) that would be taught by driving school. The study will be conducted from (2) different cities and municipality in Pangasinan.

The participants in this study will be selected using a convenience sampling method, whereby the five driving schools in the province of Pangasinan were chosen based on their accessibility and availability. Convenience sampling was employed for its practicality and ease of access to potential participants, rather than using a random or systematic sampling approach.

A semi-structured interview will be conducted at the five driving schools to address objective number 1. Subsequently, a survey will be administered to 25 Student Drivers to address objective number 2. Also, a survey will be utilized among the five driving schools and 25 student drivers to identify the functional and non-functional requirements that pertain to objective number 3. For the assessment of the system addressing objective number 5, 385 Student Drivers will be involved. The sample size of the student drivers from the five driving schools in Pangasinan were determined using Cochran's formula *(See Appendix A)*. Due to only limited areas selected by the developers has the respondents depending on the currently enrolled on a driving course at the time and the availability of the student driver also a significant factor in the number of respondents which considered their availability due to work, school or commitments, which could make it challenging for them to take the time to complete the assessment.

	Student Drivers	Driving School	Total
Objective 1	0	5	5
Objective 2	25	0	25
Objective 3	25	5	30
Objective 5	385	5	390

Table 2 – Distribution of Respondents

Data Instrumentation

To identify the project's system requirements, several techniques will be used to gather information in developing DriveHub: A Multi-Platform Driving School Management System with Driving School Finder, which served as the primary basis for development.

Semi-Structured Interview. To gather the necessary information, the developers will conduct a semi- structured interview with the driving schools. This is to identify the driving schools' current processes and policies. *See Appendix B for the letter to conduct a study.* Additionally, document analysis will be carried out to analyze the driving schools' existing forms to better understand their procedures and processes of such driving schools. *See Appendix C for interview guide questions.*

Checklist Survey Questionnaire. To gather the necessary information, the developers will conduct a checklist survey questionnaire to determine the factors affecting student drivers in choosing a driving school. *See Appendix D.*

Checklist Survey Questionnaire. A checklist questionnaire will be distributed to identify the functional and non-functional requirements of the proposed system that will provide a concrete information from the driving schools and student drivers. *See Appendix E.*

Observe Similar Applications. The developers will explore and observe similar applications based to the proposed project to re-evaluate what they can improve and enhance the similar applications or add to make a new functionality.

Survey Questionnaire. The usability of the system will be evaluated by the developers using the System Usability Scale, which involves presenting ten questions to the respondents. The questions included five response options that ranged from Strongly Agree to Strongly Disagree. *Refer to Appendix F.*

Data Analysis

This section covers the tool that the developers will utilize for data analysis to collect and evaluate data. Central Tendency, a type of descriptive statistic utilized as the statistical method for data collection.

Objective No.1. To analyze the information gathered from the structured interviews, and document analysis, the developers will use descriptive analysis. The

resulting data will be used to create a process flowchart, illustrating the existing procedures and process flow of driving schools in terms of reservation, report generation, and payment.

Objective No.2. To analyze the factors that affect the choice of a driving school through gathered information from the checklist survey questionnaire , the developers will use frequency count techniques for better understanding of how student drivers find a driving school.

Objective No.3. The data that will be collected from the checklist questionnaire will be analyzed by the developers using ranking and frequency count techniques to identify the functional and non-functional requirements. Additionally, the developers will utilize use case diagram to provide a graphical representation of how the system functions, allowing them to provide highly useful feedback and identify requirements that meet the needs of users. This approach will help the developers to better understand the flow of each feature in the system and make necessary improvements to enhance its usability.

Objective No.5. The developers aim to conduct SUS (System Usability Scale) usability testing to assess the usability of the system. They will calculate the average weighted mean of the test results and interpret them using the Likert scale below:

Numerical Equivalent	Statistical Range	Descriptive	Interpretationon (Usability)
5	4.21 –5.0	Strongly Agree	Usable
4	3.41 -4.20	Agree	Usable
3	2.61 –3.40	Neutral	Usable
2	1.81 –2.60	Strongly Disagree	For Revision
1	1 - 1.80	Disagree	For Revision

Table 3: Likert Scale for Usability Testing

Responses between 2.61 and 5.00 will be considered usable, acceptable, and easy to use, demonstrating that the program met users' needs. For the average responses from 1.00 to 2.60, the system would be deemed unusable, indicating that the application did not fulfill user requirements and thus will be subjected to revision. Testing and revision will be repeated until the average response reaches the acceptable value.

The Proposed Implementation Plan

DriveHub: A Multi-Platform Driving School Management System with Driving School Finder would be implemented in the province of Pangasinan, Region 1, Philippines. It is a mobile and web application that will provide driving school, instructors, and student driver with a reliable and effective studying through user-friendly application and interface. The project will be using a map API a custom online map for

web and mobile locate the nearest driving school depending on the user's location, the application will serve as a driving school finder for the student driver. Furthermore, it would cover the management of transaction record, student driver progress tracker that keep tracks the progress of the student driver throughout the driving course, the in-app messaging that allows driving schools, instructors, and students to communicate each other and a payment gateway to manage payment transactions. It also has in-app mockup examination to test if the student driver learned a skills from driving school instructors. It has a pointing system whether the student pass or fail, the app will suggest if the student driver need to retake the theoretical driving course based on the scores during the mockup examination within the mobile application. It will cover data analytics, revenue reports and a dynamic application interface for the driving school owners. The administrator can manage transactions and evaluate driving school performance based on the collected data from the driving schools.

The developers will use Visual Studio Code as a code editor to utilize Laravel which is a PHP framework, Bootstrap, HTML, Cascading Style Sheets, JavaScript, and Ajax and other API packages for the development of web-based application meanwhile for creation of mobile application the dart programming language with flutter using Android Studio will be used to develop the mobile-based application. During the production stage the developers utilized Github as a code hosting platform for version control and collaboration. The resources needed in the development process require a capable computer system that can run and install required applications with a minimum system requirement with an operating system for Windows 11/10 with a 64-bit and a RAM storage of 8GB or higher. It must have a disk space available for 8GB and up not

including the space for required for the Android SDK, emulator system images, and caches. End-users can download the DRIVEHUB through Google Play Store. The end users can only access the mobile application through using of android mobile phones and for system administrator and driving school owners can be accessed from any computer with an internet connection, including laptops, desktops, and mobile phones supported by any modern browsers, such as Microsoft Edge, Google Chrome, and Firefox with the latest versions.
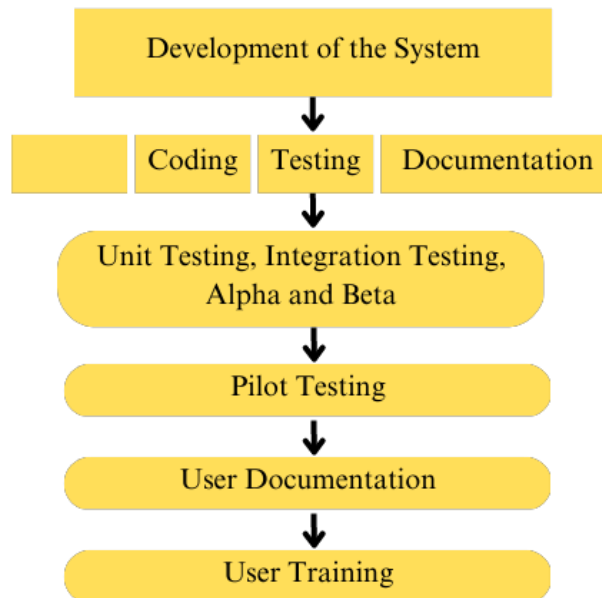

Figure 2: Illustration of the Proposed development Plan of the system

Development of the system. The developers will implement the functional requirements into a prototype using Figma, a designing tool that is used in prototyping and started the development of the project that make sure all the required guidelines and ideals were followed in place with the coding standards and best practices. The prototype will be presented to the Driving School owners, student drivers and instructors to gain

insights and suggestions from them based on the functionality and design of the User Requirements and User Interface. Thus, all the comments and suggestions from the Driving School owners, student drivers and instructors used as a measurement to improve the user requirements and design functionality of the system until the users were satisfied based on their experience. The insights and involvement of Driving school owners, student drivers and instructors continually matter to come up with the specified user requirements and design specification to be followed in the construction of the proposed system. The construction of the system will be next in line with the approved user requirements when the proposed system is all set.

Unit Testing. The developers will conduct and perform unit testing to increase the level of confidence in changing and maintaining of code. Moreover, the developers will test the individual modules to determine if there were backlogs or issues in the system. The developers isolated each unit of the system to evaluate, identify, analyze, and fix the detects.

Integration Testing. The developers will perform this by linking the modules of the system and evaluating it as a group to identify if the system is working properly and smoothly. The developers will find issues during the process of combining the individual modules to create the complete system. After conducting a thorough investigation, the developers will confirm if their code is functioning correctly with the external dependencies.

Alpha and Beta Testing. The alpha testing will be performed at the developer's site and Beta Testing will be performed by the Driving School owners, student drivers

and instructors with the 8 selected Driving Schools around 2 cities and 1 municipality from the Province of Pangasinan.

Pilot Testing. Pilot testing will be performed to 5 selected Driving Schools, Student Drivers, and Instructors to evaluate and identify the feasibility, time, cost risk and performance of the system.

User Documentation. The developers will create a video tutorial demonstrating the properly usage for both web-based and mobile application, which will be accessible online. This will enable potential users of the system to watch the video tutorial as a startup guide.

User Training. The developers will assist the users in effectively implementing the operating of the system. As part of the training process, each user will be provided with a user's manual that explained how the system used and worked as well as solving an issue that may arise. The training covered topics such as managing data, on how they can add, edit, update, and delete records. It also covers how to cater Driving School reservation from managing slots and confirmation of bookings from the Student Drivers.

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APPENDIX A: SAMPLE POPULATION SIZE COMPUTATION USING

COCHRAN'S FORMULA

The Cochran's Formula is:

$$n = \frac{Z^2pq}{e^2}$$

whereas:

Z^2 = abscissa of the normal curve

p = estimated proportion of an attribute

q = 1-p

e = desired level of precision

n = corrected sample size

Cochran's computation using 95% confidence level with ± 5% Precision.

$$n = \frac{Z^2pq}{e^2} = \frac{(1.96)^2\,(0.5)(0.5)}{(0.05)^2} = 384.16$$

$n = \mathbf{385}$

APPENDIX B: LETTER TO CONDUCT A STUDY

Republic of the Philippines
Pangasinan State University
Urdaneta City Campus
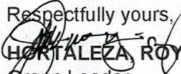San Vicente, Urdaneta City, Pangasinan
Telefax: (075) 632-2559

April 14, 2023

Driving School

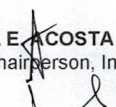**Urdaneta City, Pangasinan**

SIR/MADAM:

The undersigned are 3rd year BS IT students who are currently conducting a project entitled **"DriveHub: A Multiplatform Driving School Finder for Driving Skills with QR Code Certificate Generator"** in the partial fulfillment of the course Capstone Project 1. The developers aim to develop a multiplatform application that allow prospective students to find the best driving schools within its area and for driving schools to manage their operations more efficiently through its application features.

In connection with this, we would like to ask your cooperation to allow us to conduct an interview to help us with our project by providing information on the processes and problems encountered in the driving school and while doing providing service for a client. Please be assured that the information collected will be solely used for research purposes and kept confidential. Upon completion of our research, we will gladly share the findings with you. We believe that you are with us in our enthusiasm to finish our research.

Your participation in the conduct of this endeavor will be greatly appreciated.

Respectfully yours,

HORTALEZA, ROYCE D
Group Leader

Noted:

MICHAEL E. ACOSTA
Adviser/Chairperson, Information Technology Department

FREDERICK F. PATACSIL, PhD, DIT
Dean, College of Computing

ROY C. FERRER, PhD.
Campus Executive Director, PSU Urdaneta

**APPENDIX C: SEMI- STRUCTURED INTERVIEW GUIDE FOR THE
PROCESSES AND POLICIES OF DRIVING SCHOOL**

Name (Optional): _____ Age: _____

Sex: FEMALE   MALE

Address: _____

1) Do you have an existing system, such as website or application?

2) How many clients do you usually have in a month?

3) What are the requirements for students to enroll in your driving school? Are there any specific age limits or prerequisites?

4) Can you describe the current process of enrolling new students in your driving school?

5) What are the current problems you have encountered as the business owner of the driving school?

6) What are the current policies for implementing strict full attendance in every session with your client?

7) What features do you want to suggest if there's a platform to be built for your business?

8) Can you explain the payment and refund policies for your driving courses?

9) How do you handle scheduling and organizing driving lessons for students?

    • What policies do you have in place for rescheduling or canceling driving lessons?

10) How do you track and monitor the progress of students throughout their training?

- How do you handle student assessments, and what criteria are used to evaluate their driving skills?

11) How do you make your reports and lists of transactions? Are you currently using a logbook or an Excel spreadsheet? Do you prefer using an online website to automatically generate your report generation.

APPENDIX D: CHECKLIST SURVEY QUESTIONNAIRE FOR STUDENT DRIVERS: FACTORS THAT AFFECTS IN CHOOSING A DRIVING SCHOOL

Name (Optional): _____ Age: _____

Sex: FEMALE   MALE

Address: _____

1. How did you hear about the driving school you eventually chose? (Select all that apply)

    [ ] Word of mouth (recommendation from friends/family)

    [ ] Online search engine (e.g., Google)

    [ ] Social media (e.g., Facebook, Instagram)

    [ ] Driving school directories or listings

    [ ] Local advertisements (flyers, posters)

    [ ] Other (please specify): _____

2. What factors were important to you when selecting a driving school? (Select all that apply)

    [ ] Proximity to your residence or workplace

    [ ] Reputation and reviews of the driving school

    [ ] Course offerings and availability of specialized training

    [ ] Qualifications and experience of driving instructors

    [ ] Affordable pricing and payment options

    [ ] Modern and well-maintained vehicles for practical training

    [ ] Availability of simulator training or advanced technology

    [ ] Recommendations from friends or family

    [ ] Other (please specify): _____

3. How important is the driving school's accreditation and licensing in your decision-making process?

    [ ] Very Important

    [ ] Important

[ ] Neutral

[ ] Not Important

4. Did you visit the driving school's website or social media pages before making your decision?

   [ ] Yes   [ ] No

5. Which of the following aspects were highlighted on their website/social media that influenced your decision? (Select all that apply)

   [ ] User testimonials and reviews

   [ ] Details about their driving courses and curriculum

   [ ] Pricing and special offers

   [ ] Information about their driving instructors

   [ ] Photos or videos of their training facilities

   [ ] Information about their safety protocols and measures

   [ ] Other (please specify): _____

6. Did you contact the driving school directly before enrolling?

   [ ] Yes

   [ ] No

7. If yes, what were the main factors you considered during your conversation with them? (Select all that apply)

   [ ] Clarity and responsiveness of their customer service

   [ ] Availability of class timings that suit your schedule

   [ ] Additional services or customized training options

   [ ] Their approach towards accommodating your specific needs or concerns

   [ ] Other (please specify): _____

8. On a scale of 1 to 5, how satisfied are you with the overall experience and services provided by the driving school?

   [ ] 1 (Very Dissatisfied)

   [ ] 2 (Dissatisfied)

   [ ] 3 (Neutral)

[ ] 4 (Satisfied)

[ ] 5 (Very Satisfied)

9. Would you recommend this driving school to others based on your experience?

[ ] Yes

[ ] No

10. If there were a driving school application finder, what features would you suggest enhancing the user experience and make it more useful for the search for a driving school? (Optional open-ended question)

_____

APPENDIX E: CHECKLIST QUESTIONNAIRE FOR

FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

For Driving Schools

If the DriveHub: A Multi-Platform Driving School Management System with Driving School Finder implemented in Pangasinan, what are the features you want to see? (Check all that apply)

Functional:

☐ Registration: The system will include a registration form that collects essential information from driving schools, ensuring that their details are accurately recorded and stored.

☐ Instructor Management: The system will offer a comprehensive feature where driving schools can access and manage instructor information. This includes maintaining a database of instructor profiles with relevant details such as qualifications, certifications, and experience.

☐ Student Management: The system will provide driving schools with a dedicated feature to manage student information effectively. It allows driving schools to maintain a centralized database of students, including their contact information, progress, and other relevant details.

☐ Contract Management: The system will offer a robust contract management feature, enabling driving schools to create, store, and manage contracts efficiently. This feature ensures that all necessary contracts are securely stored and easily accessible for reference and renewal purposes.

☐ Lesson and reservation: The system will incorporate a user-friendly interface where driving schools can conveniently view and manage lesson and reservation. It allows driving schools to allocate lesson slots, track availability, and accommodate specific student preferences.

☐ In-App Messaging: The system will facilitate seamless communication between driving schools and students through an in-app messaging feature. This platform will enable driving schools to send messages, notifications, and updates directly to students, ensuring effective and efficient communication.

☐ Subscription System: The system will incorporate a subscription feature that allows driving schools to subscribe to specific plans or packages. This feature enables driving schools to access additional services, benefits, or resources based on their chosen subscription level.

☐ Resources and Review Test: The system will provide driving schools with a comprehensive set of resources and review tests. These resources may include online materials, practice tests, study guides, or instructional videos. Additionally, the system will offer review tests to assess students' knowledge and preparedness for driving exams, enabling driving schools to track their progress and provide targeted support.

Others, please specify:

_____

Non Functional:

☐ Performance: The system responds promptly and efficiently, ensuring smooth user interactions.

☐ Security: Robust security measures are implemented to protect sensitive data and user information.

☐ Reliability: The system operates consistently and reliably, minimizing downtime and disruptions.

☐ User-Friendly Interface: The system offers an intuitive and easy-to-use interface for driving schools and students.

☐ Compatibility: The system functions seamlessly across multiple platforms and devices.

☐ Maintainability: The system is designed for easy maintenance and updates to address future requirements.

☐ Error Handling: Clear and informative error messages are provided to guide users in resolving issues effectively.

☐ Data Backup and Recovery: The system regularly backs up data and ensures data recovery mechanisms are in place.

☐ Response Time: The system maintains a quick response time to enhance user experience.

☐ Privacy: The system respects user privacy and complies with data protection regulations.

Others, please specify:

For Students

If the DriveHub: A Multi-Platform Driving School Management System with Driving School Finder implemented in Pangasinan, what are the features you want to see? (Check all that apply)

Functional:

☐ Registration: The system will feature a registration process that collects comprehensive information from students, ensuring accurate record-keeping and data management.

☐ Book Driving School: The system enables students to easily search for and book driving schools that are registered within the app. It provides a convenient platform for students to find available driving schools and make bookings.

☐ Availed Driving Lesson: Once a booking is made, the system allows students to avail driving lessons based on their scheduled appointments. It ensures a seamless process for students to access and participate in their chosen driving lessons.

☐ Progress Tracker: The system provides a progress tracker feature that allows students to monitor and track their progress throughout their driving lessons. It offers insights into their skill development, areas for improvement, and milestones achieved.

☐ In-App Messaging: The system incorporates an in-app messaging feature to facilitate communication between students and driving schools. It offers convenient platform for students to interact with driving school representatives, inquire about lesson details, or seek assistance.

☐ Feedback and Ratings: Students have the opportunity to provide feedback and ratings within the system. This feature enables students to share their experiences, provide constructive feedback, and rate the quality of instruction or services received from the driving school.

☐ View Contract: Students can easily view and access their contract details within the system. It allows them to review the terms and conditions, contractual agreements, and any other pertinent information related to their engagement with the driving school.

☐ Transaction History: The system maintains a transaction history feature that allows students to view their past payment transactions. It provides transparency and allows students to track their payment records and history within the app.

☐ Payment: The system enables students to make payments directly within the app. It offers secure and convenient payment methods, ensuring a seamless payment process for students availing driving lessons.

Others, please specify:

Non Functional:

☐ Performance: The system responds promptly and efficiently, ensuring smooth user interactions.

☐ Security: Robust security measures are implemented to protect sensitive data and user information.

☐ Reliability: The system operates consistently and reliably, minimizing downtime and disruptions.

☐ User-Friendly Interface: The system offers an intuitive and easy-to-use interface for driving schools and students.

☐ Compatibility: The system functions seamlessly across multiple platforms and devices.

☐ Maintainability: The system is designed for easy maintenance and updates to address future requirements.

☐ Error Handling: Clear and informative error messages are provided to guide users in resolving issues effectively.

☐ Data Backup and Recovery: The system regularly backs up data and ensures data recovery mechanisms are in place.

☐ Response Time: The system maintains a quick response time to enhance user experience.

☐ Privacy: The system respects user privacy and complies with data protection regulations.

Others, please specify:

APPENDIX F

System Usability Scale (SUS) Survey Questionnaire

I.   Respondent Details

      Name (Optional): _____

II.   Questionnaire

          A. Rate the usability of the system/application with the following parameters.

Strongly Agree (5)	Agree (4)	Neutral (3)	Strongly Disagree (2)	Disagree (1)

Question number	(5)	(4)	(3)	(2)	(1)
1. I think that I would like to use this system frequently.					
2. I found the system unnecessarily complex.					
3. I thought the system was easy to use.					
4. I think that I would need the support of a technical person to be able to use this system.					
5. I found the various functions in this system were well integrated.					
6. I thought there was too much inconsistency in this system.					
7. I would imagine that most people would learn					

to use this system very quickly.					
8. I found the system very cumbersome to use.					
9. I felt very confident using the system.					
10. I need to learn a lot of things before I could get going with this system.					