**DriverPass System Analysis and Requirements**

## System Components and Design

### Purpose

The purpose of the system design is to build a comprehensive platform to better help people prepare for their student driving tests at the Department of Motor Vehicles. We will construct this application for DriverPass, a company dedicated to driver safety and enhancing driver education services. The required system will provide online training classes, allow drivers to register for training classes, and offer training packages and in-person driving lessons.

### System Background

The background of the proposed system is provided to address the gap in the market for adequate driver education services. DriverPass Identified the need for improved training services because of the high rate of students failing the DMV driving test. To address this issue, DriverPass plans to enhance the accessibility and quality of student driving lessons by introducing online scheduling and driving education services. The solution they want to offer includes the following:

**Overview:**

* Account registration with password recovery.
* Online classes and practice tests.
* On-the-road lesson scheduling with location details.
* Customer registration with personal and payment information.
* Ability to choose from three different driving packages.
* Tracking of lesson details, drivers, and vehicles.
* Mobile and computer device accessibility.
* Downloadable and printable reports.
* User access control.
* Driving package management.
* DMV policy update notifications.
* Web and cloud-based system.
* User interface displaying test progress and lesson details.

**Driving Packages:**

* Package One: Six hours in a car with a trainer.
* Package Two: Eight hours in a car with a trainer, and an in-person lesson explaining DMV rules.
* Package Three: Twelve hours in a car with a trainer, an in-person lesson explaining DMV rules, and access to online classes and practice tests.

**User Accounts:**

* Owner: Full access, generate reporting tools, disable packages.
* IT Officer/Manager: Full access to accounts, reset passwords, and block access.
* Secretary/Assistant: Make and modify appointments.
* Customers: Make and modify appointments and take online courses and tests.

### Objectives and Goals

The objectives in a system analysis offer a specific breakdown of the functionality that the system should have, while the goals provide measurable criteria to determine the completion of each objective.

**Objective 1**: Registration and access to web applications.

* Goal: Website is accessible by users.
* Goal: Allows users to log in, register a new account, and recover passwords.
* Goal: Platform works on mobile and desktop devices.

**Objective 2**: Enable access to training resources.

* Goal: Users can take online courses and practice tests.
* Goal: Track user progress and past completion of resources.

**Objective 3**: Allow driver package enrollment.

* Goal: Allow users to sign up for any of the three available packages.
* Goal: Requires the user to enter payment information when ordering a package.

**Objective 4**: Lesson reservation and management system

* Goal: Allows customers to sign up for a driving lesson.
* Goal: show current availability and update future availability after completion of reservation.
* Goal: Request customer's personal data, time, pickup location, and drop-off location.
* Goal: The lesson tracks time, driver, vehicle, and customer information.
* Goal: The ability to input lesson notes upon completion of the lesson.

**Objective 5**: User role management

* Goal: The owner role exists with full access to all accounts, and the ability to disable current packages.
* Goal: IT role exists with access to remove and update accounts
* Goal: The secretary role exists and can make or modify all customer lesson appointments.
* Goal: The customer role exists and can make or modify their lesson appointments.

**Objective 6**: User Interfaces

* Goal: Login interface exists.
* Goal: A main menu interface exists that allows users to navigate to online resource’s, package requests, and lesson reservations.
* Goal: Online resources interface exists.
* Goal: Lesson package interface exists.
* Goal: A lesson reservation interface exists.
* Goal: An interface exists that shows customer online test progress, customer information, and driver notes.

**Objective 7**: DMV integration

* Goal: Receive policy updates directly from the DMV.

**Objective 8**: Admin and system features

* Goal: The web server is hosted on the cloud.
* Goal: Download and print activity reports for auditing and tracking purposes.

## Requirements

### Nonfunctional Requirements

The non-functional requirements of the system analysis are provided in detail below and offer an understanding of the specific system requirements of the DriverPass platform that do not inherently offer business-related functionality. Dennis Wixom and Tegarden (2012) describe non-functional requirements as “behavioral properties that the system must have” and provide examples “such as performance.” Their explanation further backs the characteristics of non-functional requirements and how they aren’t directly related to DriverPass’s operational goals but instead are requirements that are needed for the system to behave as expected.

**Performance Requirements**

* The system must consist of a website where users can access the content from the web.
* The system will need to be updated in real-time. This requirement is critical, especially to the lesson reservation module where live availability is needed to accurately schedule appointments.
* Moderate performance speed will need to be implemented. Although the system is small in scale, it handles the sensitive customer information that will need to be properly managed, which can be resource-intensive.

**Platform Constraints**

* Database integration to support storing customer information, online resources, and lesson appointments.
* Platform will run on a cloud-based server to eliminate the need for backup and security.
* Windows Operating system for increased compatibility and support.

**Accuracy and Precision**

* The system will require a unique user ID for each registered user to distinguish between users.
* Fields related to time and date should be selected or checked from available options to prevent inaccurate scheduling from wrong data types or invalid options.
* Username, password, and comment type fields will need to be case-sensitive.
* Comment fields will need spelling verification logic to prevent illegible submissions.
* Admin will need to be notified of scheduling overlaps, user account update requests, payment discrepancies, and all exceptions that are thrown.
* The system will need to track all changes for traceability in the case of a system error.

**Adaptability**

* Ability for admin and owner roles to update all data fields in the case of unexpected entries or scheduling discrepancies.
* The owner role will need to be able to disable package options as needed.

**Security**

* Login will require a unique password and username combination.
* Sensitive data will be transferred using HTTPS along with additional layers of encryption.
* Three invalid login attempts in a row will lock the account and notify the admin.
* Users can recover forgotten passwords independently.

### Functional Requirements

Functional requirements are shown below, which provide direct functionality to the business process and are considered operational requirements. A key point made by Dennis Wixom and Tegarden (2012) is that “functional requirement relates directly to a process a system has to perform.” This explanation emphasizes that these requirements are critical to the operation of DriverPass and should provide the functionality necessary to meet overall business objectives

* The system shall require users to register for a DriverPass account.
* The system shall allow the user to log in and validate their credential at the login.
* The system shall allow the user to take online classes and practice tests.
* The system shall track completed current, and upcoming online class/test information.
* The system shall allow customers to purchase driving lesson packages and present information on their active packages.
* The system shall permit customers and secretary roles to schedule driving lessons with a driving instructor.
* The system shall ensure that the customer has the required package resources to schedule the lesson.
* The system shall ensure that the driving instructor and time slot are available upon scheduling.
* The system shall track the lesson information such as driver, vehicle, pickup location drop-off location, date, start/end time, and driver comments.
* The system shall require access handling by user type.
* The system shall allow customer users to modify and delete their reservations.
* The system shall enable the secretary role to update all customer reservations
* The system shall allow the administrator role to update all user account information and scheduling information as well as update server information.
* The system shall allow the owner role to update all user account information and scheduling information.
* The system shall allow the owner role to disable lesson packages.
* The system shall connect to the DMV and notify admin and owner roles of all policy updates.
* The systems shall provide a download and printable activity report.
* The system shall be compatible with mobile and desktop devices.

### User Interface

The user interface plays a crucial role in allowing a user and system to communicate and interact with each other. A good interface will seamlessly allow a user to navigate content in a way that isn’t overly complicated or exhausting. According to (Shneiderman, n.d.) some of the golden rules of interface design are, “Strive for consistency,” “Seek universal usability,” and “Keep users in control.” Universal usability is very important for the DriverPass app as it provides seamless functionality to different users. The system analysis requirements for this interface are as follows:

* The interface will need to allow the user to log in with a username and password.
* The interface will need to include a new user entry form for first-time users to register an account.
* The interface will need a central navigation hub that contains links to the online learning module, a store to purchase driving packages, and the lesson reservation form. This central point will also be the first place you are directed to after logging in.
* The interface will need an area to take online tests/quiz resources. It will need to present the course and test progress of the current user as well as recommend upcoming resources.
* The store will need to display the current online resource allowing navigation and entry/exit whenever.
* The interface will require a storefront that displays and allows the purchase of all lesson packages.
* The interface will need to securely handle all user payment information.
* The interface will also need to include a lesson scheduling menu that displays the current lesson schedule and allows a user to make a new reservation from the schedule. This section must also feature live updates to prevent duplicate scheduling.
* The interface needs a DriverPass contact page that shows their company contact information as well as a similar page for the admin, owner, and secretary roles to access customer information.
* The interface will also need a page to show the customer progress, Online course status, personal information, and driver notes.
* The interface will need to be compatible with mobile and desktop devices.
* The customer role should only be able to access the main screen, online resources, delivery schedule, storefront, and contact information portion of the interface.
* The secretary will need similar access but able to access all the user's schedules.
* The admin will need full access to all interfaces and additionally, an admin interface where they can make changes to user accounts and server settings.
* The owner will need full access to the system.

### Assumptions

The assumptions of the proposed system are presented to address potential functionality that isn’t directly backed by customer-sourced criteria. This explanation is backed by Usmani's (2023) article on project assumptions, in this article he mentions that system design requires “ You make assumptions based on your experience or the information available on hand.” During the design phase, analysts get as much detail and requirements as they can, but critical details are often overlooked and not noticed until later in the design phase. The following are potential assumptions that may need to be addressed when the system is fully cleared.

* The system only needs to relay the payment information to DriverPass and not allow for direct online payments. The interview does not specifically address how payment will be made but the system will require payment information to acquire a lesson package.
* The system shall require customers to be of an appropriate age to sign up for lessons.

### Limitations

The limitations of system analysis address potential shortcomings in the design of the system as well as highlight potential project constraints. In a recent article by Usmani (2023) he mentions a type of constraint called “Technical Constraints” and defines them as problems that “limit your design choices.” The system limitations address the need for potential alterations from the desired functionality to incorporate limitations and constraints. The following are known limitations:

* Not implementing a driver role limits the overall automation of the system. A driver role would allow the drivers to be notified automatically of pending driving lessons as well as allow for direct feedback from the driver to the DriverPass system.
* Providing updates for all system updates will require additional performance and storage resources.
* Updates from the DMV may not be feasibly automated since this would require integration with a 3rd party. How policies are updated might need to be updated
* Web services, although accessible, don’t offer the same performance and security as a traditional application. Additional performance requirements might need to be discussed to better suit web server limitations.
* Cloud-based services can be expensive and offer more restrictions for applications due to performance and dealing with a hosting service provider. Budget considerations may need to be considered over accessibility of cloud-based servers.

### Gantt Chart

The below Gantt Chart will provide project scheduling and task assignment for required task and team members.

A screenshot of a computer screen

Description automatically generated

**References:**

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