Software Requirements Specification

AUTO QUOTES

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Executive Summary

Background

Mechanic shops deal with a lot of inefficiencies regarding the generation of quotes to customers.

When clients need a service or inspection done, they need to call a shop and negotiate a suitable time via the phone. If the job includes an actual repair to the vehicle, then the service advisor manually generates a quote and reaches out to different suppliers to acquire parts quotes and availabilities. After this, the advisor sends the assembled quote to the customer, at which point they again need to negotiate a time range acceptable for both parties.

This Manual Quoting process is extremely labor intensive, costly, and feels like a chore to both the customer and the mechanic shop alike.

Description

This document outlines a platform that serves multiple purposes to various kinds of mechanic shops and dealerships. Auto Quotes can work on every shop, without regard to the size, the number of franchises, and the business model.

Creating multiple quotes for different customers with diverse needs has been a hustle for service advisors through the years. Using an automated quote generation system, Auto Quotes makes this task easier both for the customers and employees.

Quotations are divided into two different sections.

1. Quotations with all required parts available in stock will be given immediately using our database data,

2. When some parts are not available or included in our database, Auto Quotes must contact multiple reserved suppliers and ask for parts availability and details. This task is done by sending emails to contracted suppliers with auto-generated links that lead them to a form on a website. This form includes customers' car specifications using user inputs and information on the asking part. Suppliers are responsible for entering the details, including sale price, retail price, warranty, manufacturer, and condition. Then customers get noticed through email to complete their quotation by choosing between the options.

Company Value Add
Auto Quotes allows our company to create a close relationship with many mechanic shops and builds valuable connections with part suppliers. With the first iteration of the software, either a monthly fee or a per-use fee is charged to customers. With the next iteration, Auto Quotes can transcend the current SaaS setup and offer an integrated payment system with POS terminals. Being directly tied into the payment process would allow for a cut from every sale the mechanics shop makes, making Auto Quotes a very lucrative business.

Customer Value Add

Auto Quotes will bring value to businesses in multiple ways.

- It helps the company's marketing since it helps to get customers' attention and build a list of clients for sending out promotions and seasonal deals.

- It pushes the customer into using the services after getting a quote. Customers can look up the shop schedule and book an appointment for service on quotes on the same webpage. This option will make services much easier for customers since they get informed of the time, price, and availability in advance.

- Another advantage of using this system would be reducing the workload of the service advisors.

- The system incorporates an internal UI, where staff members can update the inventory, register recalls, and keep track of parts inventory and catalog.

End-User Value Add

Auto Quotes will allow customers with zero to little knowledge of auto services to understand the various available services at the designated shop and do different actions based on their needs.

Getting immediate informative quotes for all the available services that include service details such as:

- Accurate labor cost estimation,

- Required parts prices with diverse options,

- Detailed information on parts, including the manufacturer, warranty, condition (New or Remanufactured), and wait time if applicable,

- And Service time estimation.

Scope

What is Included

The project includes the development of a Back-end system, run on a PaaS provider like Heroku. Its code is written in NodeJS, and it provides internal REST APIs for the front-end interfaces. It stores all relevant information in MongoDB (Atlas) and uses SendGrid as a complete email-sending solution.

Four separate Web GUIs are to be implemented, built on top of React:

- A customer-facing one, where the end-user can manage booking, view service information, manage quotes, etc.

- One for the parts suppliers, where they can use to enter their quotes based on the emails they receive,

- One, for the internal use of mechanic shops where they can do basic administration, add/remove users, manage stalls, view orders, customer contact information, etc.,

- And one for configuring the licences for the mechanics shops themselves.

These interfaces can be hosted on any of the large CDN providers such as Netlify or Amazon S3.

What is Not Included

The project, in its MVP form, will not provide the following features, that the company can develop as an upgrade for subsequent releases later:

- An accounting/billing module, that offers POS integration, and would allow the company to take a cut from all sales

- A direct marketing/email campaign module, that could leverage the information collected from end-users

- A price lookup feature using a "specificity backoff" logic (try to look up the price for a service based on make, model year, then make model, then make, then fall back to a generic price)

- Integration to supplier APIS. As the platform drives increasing revenue, many suppliers will be interested in us using direct access to their databases.

Justification

Auto Quotes solves a real-world issue that many auto-repair shops face throughout the world. It provides a turn-key solution that single businesses or even franchises could adopt and use to manage and help their day-to-day operation, decrease the number of chores, and drive revenue. From a technical standpoint, it builds on a PaaS provider and provides a SaaS-like experience to our company's customers. In this project, the team includes the following pieces, as building blocks:

- Complete database design built on top of MongoDB,

- A modern, node 18-based Back-end application featuring database integration, authentication/authorization, session management, e-mail sending capabilities, Payment system integration, and more, providing a Restful API for our front-end interfaces to connect to,

- An internal API documentation, using Swagger and OAS3,

- Four separate front-end web applications, to be used by separate stakeholder groups, built using cutting-edge, React18 features,

- And a CI integrated End-to-End testing suite that makes sure every production deployment works as expected.

This project presents a true capstone to our journey with Seneca. It makes effective use of the knowledge provided in many different branches of study, like OOP (IPC144, OOP244, OOP345, JAC444), Communications (CPR101, DCF255), Database (DBS211, DBS311), Web (WEB222, WEB322, WEB 422), Project management (SYD366, SYD466) and other mandatory and optional courses.

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Section 1 – Introduction and Overview

1.1 Document Authors

- Arman Valaee Asr – Team Leader/Cheerleader

- Anam Abdul Rahim Maniar - Developer

- Denes Adam Dolhay – Developer/Architect

- Van Hoan Tran - Developer

1.2 Document Revision History

WEEK	DATE	Revisions
3	Sept 25, 2022	Initial revision, adding sections 1 – 2.2
4	Oct 2, 2022	Completed sections 2.2 to 2.4 (Stakeholders, Requirements, and Scope)
5	Oct 9, 2022	Completed Screen mock-ups and completed sections 2.5 to 2.7 (System Risks, Operating Environment and UI/UX - Interface Mock-ups)
6	Oct 16, 2022	Completed the list of activity diagrams and added to the document. All activity diagrams are store in the AutoQuotes GitHub repository.
7	Oct 30, 2022	Completed use cases and business rules. The table of the use case, activity diagram, and business rules relationship has been added to the document
8		
9		

1.3 Document Purpose

This document serves as a proposal to the company's decision-makers regarding the Auto Quotes system such as software designers, developers, project sponsors, and system analysts. There are three main purposes of this document. Firstly, it is meant to specify the requirements of the Auto Quotes system including the functionalities, features, inner workings, basic design, and limitations. These requirements are broken down into small, detailed parts to keep the project on track. Secondly, it includes an agreement and work breakdown between members of the team. It keeps track of the project progress and helps the development team record changes throughout the project. Finally, it also provides useful information, and a clear picture for a marketing team to get their job done.

1.4 Terminology

In Auto Quotes documentation a set of terms will be used to be specific and prevent any type of confusion for our audience. The exact purpose and definition of each term are listed below:

- Auto Quotes: This is the chosen name of the intended product and application.
- Business Owner: Auto Quotes targeted business owners. Individuals or companies that may use this product for their business, typically auto shops, dealerships, and mechanic shops.
- Mechanic Shop: The main businesses which will benefit from Auto Quotes.

- Mechanic Shop Admins: The mechanic shop's employees who are able and responsible for updating the website based on the business needs.
- Mechanic Shop Employees: The mechanic shop employees that use Auto Quote services throughout their work, but are not able to make any updates.
- End-User: Mechanic shops' customers that will use and benefit from Auto Quote Services.
- Third-Party Supplier: Companies providing aftermarket part supplies for mechanic shops.
- Part Supplier Rep: Third-party suppliers' employees who are responsible for giving information on the requested aftermarket parts.
- Support staff: AutoQuotes developers' company's employees who are responsible for maintaining, licensing, and supporting AutoQuotes customers.

1.5 Audience

The intended audience breaks into two categories: intended document audience and intended application audience.

1.5.1 Intended Document Audience

This document serves multiple purposes. Firstly, it manages and tracks the different tasks throughout the design process. It records common interests, goals, and outlines the work breakdown through the course of this project.

This document is also the best way to get information and understand the details of Auto Quotes. Reading this document is recommended for every stakeholder of the project, such as investors, business owners, and marketing professionals.

1.5.2 Intended Application Audience

The application has a wide range of audiences & users. Individuals with small garages to large auto shops with multiple branches can equally benefit from this application to expand their network and improve their business workflow.

Employees of auto shops, from service technicians to managers, can use this application to help them with their daily tasks as it simplifies chores, simplifies, and automates processes. This drives revenue and enhances employee satisfaction and talent retention rates. It also improves the company's marketing abilities and reach.

Finally, anyone owning or operating a vehicle can use the services of this application to get more information about the services provided and get familiar with honest, transparent businesses.

1.6 Group Agreement

Team 2

Project Title
Auto Quotes

Project Time Frame

In two academic semesters, the first semester is dedicated to the project plan and design. The next semester is to implement the designed project.

Team Members

Arman Valaee Asr
Anam Abdul Rahim Maniar
Denes Adam Dolhay
Van Hoan Tran

Team Leadership

Arman Valaee Asr

Team Functions/Roles

Anam Abdul Rahim Maniar / Developer
Denes Adam Dolhay – Developer / Architect
Van Hoan Tran - Developer

Development Environment

- Information will be shared through MS Teams, OneDrive, email, and in-person/online meetings.

- GitHub: https://github.com/Awrmani/AutoQuotes

- Project Management Tools: GitHub PM

Team Meetings

- One meeting one-line – Mondays (time) with professor partial participation

- One meeting in-person – Thursday M416 with professor partial participation

- One meeting online – Sundays at 8:30 PM with team members' participation

Team Problems

In all projects, there is the possibility of disagreement between teammates. In cases such as this, the team agrees to hold a vote. Since there are an odd number of teammates, in case of a draw, the project manager is to be the deciding vote.

Team Commitment

The undersigned members agree to work together on the project as long as their obligations permit. They recognize that as a team and individually they are equally responsible for the quality of all deliverables.

Name	Date	Signature
Arman Valaee Asr	September 22, 2022	A.V.A

Anam Abudl Rahim Maniar	September 22, 2022	Anam Maniar
Denes Adam Dolhay	September 22, 2022	Denes Adam Dolhay
Van Hoan Tran	September 22, 2022	Van Hoan Tran

Section 2 – Project Overview

2.1 Project Proposal

2.1.1 Project Background

An automated quote system for mechanic shops that can be used to provide quotations for repairs of cars and book appointments for the said repair. The system targets all local mechanic shops that want to reach out to a wider customer base. The system also allows the business owner to keep track of inventory and notifies the owner when the inventory runs low.

2.1.2 Problem Statement

The lack of readily available tools online to get a quick quote when clients need a service or inspection done, they need to phone up the shop and negotiate a suitable time via the phone. If the job includes an actual repair to the vehicle, then the service advisor manually generates a quote, reaches out to different suppliers to acquire parts quotes and availabilities, and sends the assembled quote to the customer, at which point they again need to negotiate a time range which is good for both parties.

This process is extremely labor intensive, costly, and feels like a chore to both the customer and the mechanic shop alike.

2.1.3 Product Vision

Auto quotes will provide a way for users to get a quick quote online for car repairs and maintenance simply by providing some basic information to the website, which will then generate a quote, based on the information provided. If the user agrees to the quote they can go ahead and book an appointment for the repair through the website.
The client side of the system will allow the mechanic shop to use the system to manage their inventory and notify the shop when the inventory runs low. Auto Quotes would reduce the labor required and save time for both the user and mechanic shop alike as it would be faster to get the quotes online than to call up a mechanic shop to get one.

2.2 Stakeholders and Users

The project recognizes the following stakeholders:

- Investor; the company responsible for developing, maintaining, and licensing the Auto Quotes system,
- Support staff; Employees of the Investor, responsible for maintaining the software, supporting customers, and managing licenses,
- Mechanic shops; The companies the Investor is contracted by to provide the Auto Quotes system,
- Mechanic shop admins; Employees of the Mechanic shops, with elevated privileges,
- Mechanic shop employees; Employees of the Mechanic shops, who use the system during their daily work,
- And end-users; Individuals or companies who employ the services of Mechanic Shops through the Auto Quotes system.

2.3 Requirements

The following requirements tables list the requirements; sorted by each functional area of the system. Requirements are divided into a top level of classification: Functional and Non-Function Requirements.

Functional: Things the system must do, tasks user can complete within the system

Non-Functional: Properties the system must have: Operational, Performance, & Security Requirements

2.3.3 Requirements Prioritization

Each requirement is classified under a level of priority within the scope of the project:

- (MH) MUST HAVE – the requirement must be present in the current version design

- (SH) SHOULD HAVE – the requirement should be present, but if time does not permit, then could be delayed to a future version

- (NH) NICE TO HAVE – the requirement would be nice to have, but is not mandatory, and could be pushed off to a future version if implemented at all. Most often these are the quality-of-life kind of features.

2.3.1 End-User Interface

Functional Requirements

Req. #	Requirement	Priority
R-EUI-F1	An end-user must be able to request an immediate quote without logging into the website.	MH
R-EUI-F2	An end-user must be able to register on the website.	MH
R-EUI-F3	The required registration fields are email, phone number, password, and Name.	MH
R-EUI-F4	A registered end-user must be able to log in to the website.	MH
R-EUI-F5	An end-user can register and later sign in using SSO.	NH
R-EUI-F6	An end-user logged into the website must be able to book an appointment.	MH
R-EUI-F7	An end-user should be able to log into the website by providing the correct email and password.	MH
R-EUI-F8	The end-user should only be able to provide a password that is at least 8 characters long and includes at least one upper case and one lower case letter.	MH
R-EUI-F9	An end-user must be able to reset their password using the email address they signed up with.	MH
R-EUI-F10	Custom quotes and booking appointments are only available to registered end-users.	MH
R-EUI-F11	End-users who sign up with their email address should verify their email address before they can use the platform	MH

R-EUI-F12	An end-user should be able to get the parts required to fix their car delivered to them.	NH
R-EUI-F13	A list of the most popular cars along with the year and model should be available on the quoting page.	MH
R-EUI-F14	A list of services offered by the mechanic shop should be available on the quoting page.	MH
R-EUI-F15	An end-user should be able to change the appointment time of the booked service 24 hours before their appointment.	SH
R-EUI-F16	An end-user can only change the appointment time once.	SH
R-EUI-F17	An end-user should not be able to change the appointment time within 24 hours of the appointment.	SH
R-EUI-F18	A logged-in end-user should be able to view their upcoming appointments.	MH
R-EUI-F19	An end-user should be sent a reminder for the appointment 24 hours and 2 hours before their appointment.	NH
R-EUI-F20	Clicking the logo should redirect the user to the main quoting page.	MH
R-EUI-F21	The interface should allow the user to log out.	MH
R-EUI-F22	An end-user should be able to return to the site and check the status of their quotes.	MH
R-EUI-F22	End-users should be able to select from multiple suppliers' offers for each part that is required for the repairs.	SH
R-EUI-F23	End-Users should be able to schedule an appointment after their quote is completed.	MH
R-EUI-F24	End-Users should be able to place a deposit for the parts needed for their repairs.	SH
R-EUI-F25	End-users should be able to filter the list of parts by the combination of make, model, year, and engine variant.	MH
R-EUI-F26	End-users should be able to filter the list of parts by product name.	MH
R-EUI-F27	The quoting page should show the number of matched parts when filtering.	SH
R-EUI-F28	The quoting page should allow the filtering and sorting of parts simultaneously.	NH
R-EUI-F29	End-users should be able to remove filters on the quoting page easily and intuitively.	SH

Non-Functional Requirements

Req. #	Requirement	Priority
R-EUI-NF1	End-users should be able to log in from any public page and register from the login page if not yet registered.	SH
R-EUI-NF2	Auto Quotes' Logo should be visible on the top of every page.	SH
R-EUI-NF3	Contact Information & Address of the mechanic shop should be visible at the bottom of every page.	SH
R-EUI-NF4	The web application should be able to work on different browsers including Google Chrome, Mozilla Firefox, Edge, and Safari. Internet Explorer is not supported.	MH
R-EUI-NF5	The loading time of a page should be no longer than 2 seconds	SH
R-EUI-NF6	The webpage should be responsive within a 360 to 1200 px logical screen width range.	SH
R-EUI-NF7	Powered By Auto Quotes Trademark should be visible at the bottom of every page.	SH
R-EUI-NF8	Accepting a privacy policy should be required by the End-users to register.	MH
R-EUI-NF9	End-users should be shown the return policy before a payment.	MH
R-EUI-NF10	Links to Policies, Terms, and Conditions should be always visible in the footer of the webpage.	MH
R-EUI-NF11	An account should be suspended for 1 hour after 5 failed login attempts.	NH
R-EUI-NF12	The website should support internationalization (language, currencies, measurements, time zones).	NH
R-EUI-NF13	The services should be divided into three different categories: General, maintenance, and tire services.	MH
R-EUI-NF14	The service category should be listed in a drop-down list.	MH
R-EUI-NF15	End-user should be able to choose the service category first, and then the specific service in a second drop-down list based on the category.	SH

2.3.2 Internal Administrative Area

Functional Requirements

Req. #	Requirement	Priority
R-IUI-F1	The UI should be able to manage 2 different types of users, Shop admins, and mechanic shop employees.	MH
R-IUI-F2	Shop admins should be able to do all the tasks that a Shop employee can.	MH
R-IUI-F3	Shop employees should be able to view customers' appointments.	MH
R-IUI-F4	Shop employees should be able to modify or cancel customers' appointments.	SH
R-IUI-F5	Shop employees should be able to process a refund on the canceled orders.	SH
R-IUI-F6	Shop employees should be able to log in.	MH
R-IUI-F7	Shop employees should be able to modify their profiles, including their passwords.	MH
R-IUI-F8	Shop employees should be able to view order statuses.	NH
R-IUI-F9	Shop employees should be able to change inventory item availability.	SH
R-IUI-F10	Shop admins should be able to add or remove Shop Admins and Shop employees.	MH
R-IUI-F11	Shop admins should be able to modify service prices.	MH
R-IUI-F12	Shop admins should be able to modify branding visuals; And base data like address, phone number, email address, and opening hours.	SH
R-IUI-F13	Shop admins should be able to add or remove services from the list of available services.	MH
R-IUI-F14	Shop admins should be able to apply promotions to certain services.	NH
R-IUI-F15	Shop admins should be able to edit service stall availability for booking purposes.	SH
R-IUI-F16	Shop admins should be able to modify hourly labor price, and parts markup percentage which will affect all services costs.	MH
R-IUI-F17	Shop employees should be able to log out.	MH
R-IUI-F18	Shop employees should be able to view stall schedules.	MH
R-IUI-F19	Shop employees should be able to view order (work order) details for each appointment.	MH

Non-Functional Requirements

Req. #	Requirement	Priority
R-IUI-NF1	Auto Quotes service providers' contact details should be visible at the bottom of every page.	MH

2.3.3 3rd Party Supplier UI

Functional Requirements

Req. #	Requirement	Priority
R-SUI-F1	The system should send automated quote request emails containing a unique, one-time use URL that leads to the appropriate Web GUI (hereon UI).	MH
R-SUI-F2	The interface should not require authentication.	SH
R-SUI-F3	The interface should contain the details about the vehicle to which the quote request belongs.	MH
R-SUI-F4	The interface should contain the (generic) list of parts that need to be quoted.	MH
R-SUI-F5	The interface should allow the Part Supplier rep to enter multiple specific parts to each generic part quotation request.	SH
R-SUI-F6	The interface should allow entering each specific part's name, description, price, condition (new/remanufactured), source (OE/OEM /aftermarket), and warranty period.	MH
R-SUI-F7	The interface should allow the Part Supplier rep to mark each (generic) part as not available.	SH
R-SUI-F8	The part supplier rep should be able to submit a quote on the requested part.	MH
R-SUI-F9	After the quote is submitted, it should no longer be editable.	MH

Non-Functional Requirements

Req. #	Requirement	Priority
R-SUI-NF1	Auto Quotes support team contact information should be displayed on all page footers.	SH
R-SUI-NF2	Auto Quotes logo and link should be displayed on all page headers.	SH

2.3.4 Internal Licensing UI

Functional Requirements

Req. #	Requirement	Priority
R-ILUI-F1	The interface should allow the creation and deletion of licensing agents.	MH
R-ILUI-F2	The interface should allow for adding and deleting mechanic shops.	MH
R-ILUI-F3	The interface should only allow access for authenticated, "licensing agent" users.	MH
R-ILUI-F4	During the mechanic shop add process, licensing agents should provide the mechanic shop name and the initial administrator password of the shop.	MH
R-ILUI-F5	The interface should allow suspending and unsuspending mechanic shops.	SH
R-ILUI-F5	The interface should allow the user to log out.	MH

Non-Functional Requirements

Req. #	Requirement	Priority
R-ILUI-NF1	The interface should display the Auto Quotes logo on the login page.	NH

2.3.5 Hosting Services

Functional Requirements

Req. #	Requirement	Priority
R-H-F1	The infrastructure should be able to serve a modern NodeJS (16 or 18) application.	MH
R-H-F2	The infrastructure should handle automated testing and deployment (CI/CD).	SH
R-H-F3	The infrastructure should handle automated database backups.	NH
R-H-F4	The infrastructure should act as a CDN for the React front-end interfaces' assets.	MH

Non-Functional Requirements

Req. #	Requirement	Priority
R-H-NF1	The infrastructure should have no upfront cost	MH

2.3.6 Database Services

Functional Requirements

Req. #	Requirement	Priority
R-DB-F1	The system should store data in a MongoDB database.	MH
R-DB-F2	The system should store the name and licensing information for all mechanic shops in the system database	MH
R-DB-F3	The system should store the routing information (domain – DB correlation) for each mechanic shop in the system database	MH
R-DB-F4	The system should store login credentials and user information for the licensing users (users who can add/remove and license mechanic shops) in the system database	MH
R-DB-F5	The system should store multiple shop databases, one for every mechanic shop. Each database should be identical in structure	MH
R-DB-F6	Each shop database should store the shop's general configuration: Logo, Slogan, email address, phone number, address, opening hours, price of a "person hour", parts markup percentage	MH
R-DB-F7	Each shop database should store information on popular vehicle makes, including model, year, engine, and body type.	MH
R-DB-F8	Each shop database should store information on the list of services provided by the shop services (time, cost, parts requirements).	MH
R-DB-F9	Each shop database should be able to store End-Users.	MH
R-DB-F10	Each shop database should be able to store business owners, support staff, and shop employees in the same collection.	MH
R-DB-F11	Each shop database should be able to store the parts catalog.	MH
R-DB-F12	Each shop database should store the shop's inventory.	MH
R-DB-F13	Each shop database should store the list and properties of the shop's stalls.	MH
R-DB-F14	Each shop database should store the work orders (including stall reservation), and to which stall it is assigned.	MH
R-DB-F15	Each shop database should store the quotes without regard to status (pending/declined/fulfilled).	MH

Non-Functional Requirements

Req. #	Requirement	Priority
R-DB-NF1	The database service should have no upfront cost.	MH

2.3.7   Reporting System

Functional Requirements

Req. #	Requirement	Priority
R-RE-F1	There should be a reporting section on the business owner and support staff accounts.	MH
R-RE-F2	The business owner should be able to view everything that support staff can view.	MH
R-RE-F3	The total amount of deposit paid by the end-users on a daily, weekly, and monthly basis. It should be visible to the business owner.	SH
R-RE-F4	The number of quotes generated by the end-users should be reported to the support staff.	NH
R-RE-F5	The number of booked appointments should be reported to the support staff.	NH
R-RE-F6	By having the number of generated quotes and booked appointments in a certain time, the percentage of booked appointments to all quotes should be reported to the support staff.	NH

Non-Functional Requirements

Req. #	Requirement	Priority
R-RE-NF1	The business logo should be visible on the reporting section page.	SH
R-RE-NF2	The data should be viewed as different types of charts, such as pie charts.	NH

2.4 Project Scope

The scope of this project is to create an MVP (Minimum viable product) of the Auto Quotes system. It should contain all the functionality that is needed to provide useful service to Mechanic Shops. The length of the implementation part of the project is 1 term (14 weeks). The cost of implementing the software is estimated to be 115 000 CAD, calculated with the median wage of 4 full-time software developers (NOC 2173). The application to be delivered will allow the users to:

For end-users:

- Request a quote of labor and parts for servicing or mechanically repairing a specific make/model/year/variant vehicle
- Book an appointment with a mechanic shop employing the Auto Quotes platform
- Manage/cancel booked appointments
- Select between offered parts
- Place a deposit on the parts selected
- Register, log in / out with the system

For Mechanic Shops:

- Log in/out (both admins and non-privileged users)
- Add and remove accounts (both admins and non-privileged users)
- For admins, to manage the settings of the mechanic shop (contact details, opening hours, branding, stalls, price of labor, markup percentage of parts)
- For admins to manage the services offered by the shop
- Manage their inventory
- View and manage their bookings

For 3rd party parts suppliers

- Get notified about requests for quotes
- Provide their parts offers/quotes

For the support staff:

- Add / remove / suspend / unsuspend Mechanic shops

The current version of the application will include the following features:

- Authentication/authorization system for support staff, mechanic shops, and end-users.
- Registration for end-users, using email or SSO system.
- Allow admins to create new admins to add new shop employee accounts.
- Payment system to allow placing deposit
- Automated email sending for email confirmations, and notifications
- A basic inventory management system.
- A booking and booking-management system that takes available stalls into account
- An automated quoting system that takes quote requests from end-users, collects quotes from 3rd party parts suppliers, marks the prices up, and presents the information back to the end-user

The following features will **not be included** in the current version, but may be considered in a future version of the software:

- The system may include invoice generation to create an invoice for the end-users including end-user information, parts' prices, and dates. End-users will be able to download the invoice as a PDF file. Followed by this update, the system will be upgraded with an invoice management tool that allows support staff to access past invoices and payment history.
- After having rich end-user data, the system may include an automatic marketing campaign through email that sends commercial messages to the registered end-users. This will help the mechanic shops to grow their business, build loyalty, and attain customers' trust and brand awareness.
- As the platform drives increasing revenue, many suppliers would be interested in Mechanic Shops and want to reduce the workload for them. The system will develop an integration to supplier APIS that will synchronously update price and data to Mechanic Shops. It will reduce the workload for both sides.
- The infrastructure may provide data backups to handle automated database backups for mechanic shops and provide them with a safer place to store their data.

- The system may provide a tracking order system that helps shop employees on getting order information.
- The system may support multi-language content for end-users who come from different countries.

2.5 System Risks

All systems design and implementation processes have risk associated with them. The following is a list of risks that could potentially impact the ability for the application to be delivered on-time, within scope, and on budget.

RISK	RESPONSE
The PaaS provider (I.e., Heroku) may become unavailable for a prolonged period (I.e., Datacenter damage, hack, or DoS attack) or increase prices dramatically	The team will have to move to an alternate provider, (I.e., Amazon AWS Elastic Beanstalk) redeploy the code there, and change the DNS records to point to the new infrastructure
The MongoDB (I.e., Atlas) provider may become unavailable for a prolonged period (I.e., Datacenter damage, hack, or DoS attack) or increase prices dramatically	The team will have to migrate the application database to an alternate MongoDB provider (like Amazon AWS), either by restoring the DB from a fresh export or, if not available, from a periodic backup.
The Email sending provider (I.e., SendGrid) may become unavailable for a prolonged period (I.e., Datacenter damage, hack, or DoS attack) or increase prices dramatically	The team will have to switch to a competing solution (I.e., Postmark)
The back end may go down because of a faulty version release	The team will have to roll the application back to a previous, working version (Heroku has a one-click solution for this)
The database may become corrupted because of a faulty application release	The team will have to roll the application back to a previous, working version and either manually fix the database or restore a periodic backup
Our application may encounter a DoS attack	The team will have to employ the services of a DoS mitigation company (like Cloudflare), increase the server size (like larger Heroku Dynos), scale horizontally (add more nodes) or deploy the application in a serverless manner (like AWS Lambda)
An NPM library may overgo major breaking changes	The team will have to either pin the version of the dependency or if this is not possible for security or compatibility reasons, would have to alter the code and adapt to the signature change.
An NPM library may become unmaintained	The team can keep using the latest version or will have to replace the library with a competing or superseding alternative

An NPM library may get hacked or get maliciously altered by the owner	The team can pin a previous version of the library, or will have to replace the library with a competing solution
Member(s) of the development team may become unavailable	The team will have to ask for a replacement, or will have to cut from the scope to deliver on time
The project may prove to be more difficult to implement than originally anticipated	The team will have to cut from the scope
There might be a disagreement between team members about the implementation	The team can hold a majority vote. In case of a tie, the tie braker is the project manager's vote.
A developer's machine is lost or stolen	All source codes and connection secrets should be encrypted (I.e., BitLocker) so no sensitive information can be obtained. For safety, passwords and API keys should be rotated. The source code can be re-cloned from a Git remote (I.e., GitHub) and the work is to be continued
Database leak / successful hacking attack	The system should be brought offline. The source if the intrusion determined and fixed. All passwords and keys are to be rotated; database should be restored / merged with the last known safe backup. Sensitive pieces of information are stored in a hashed (preferably salted) manner. Relevant agencies are to be notified about the possible leak, and system can be brought back up

2.6 Operating Environment

- The back-end code leverages a PaaS provider like Heroku or AWS Elastic Beanstalk, that provides a turn-key solution for running modern NodeJS applications
- The back-end code connects to a MongoDB database provider Like MongoDB Atlas
- The front-end code is either hosted in an S3 bucket, or is served by the back-end application in the MVP version
- Notification and confirmation emails are sent out with the use of a specialized provider like SendGrid
- The front-end code requires only a modern browser to function (I.e., "Last two major" policy)
- The source code is hosted on a remote git provider like GitHub
- CI/CD functions are served using a provider like GitHub actions or Semaphore.ci
- A modern IDE (I.e., Visual Studio code) is need for development
- Code integrity and formatting is enforced on the developers' machines using Prettier and Eslint. Centralized Editor, lint and formatting configs are coupled with the source code
- Modern JavaScript code is used (ES6+) in both back-end and front-end. Node 16+ will natively handle the required language elements, while the front-end bundle is transpiled to ES5 using the Create-React-App / React-scripts pre-assembled toolset.
- Secrets, like API keys and passwords are injected build-time from the CI/CD provider's per-repo storage
- The application is end-to-end tested using Cypress.io, integrated into the CI/CD process

- Client-side caching is handled by correctly setting up the HTTP response headers striking a balance between caching and deploy speed
- In the MVP version the system does not use public domains, but rather takes advantage of the operating system's HOSTS file to point to the back-end server's IP(v4) address
- Performance monitoring happens through the PaaS provider's built-in tools. For later versions, adding extra monitoring and error reporting solutions is advised (I.e., DataDog, Honeybadger, etc.)
- The system in its MVP version does not require any on-premises hardware that the company would need to provide, but for later versions, providing Stripe's POS terminals may be required for complete payment flow integration

2.7 UI/UX Interface Mock-ups

The following screenshots are an initial mock-up of the screens to be provided within the application. They are initially creating using wireframes and a content review, and later created with more defined graphics, look and feel, in addition to other user experience considerations.

End-User Interfaces

EU-UI-1 Log In Page

EU-UI-2 Registration Page

Text

https://www.Example.com/registration

Mechanic Shop Logo

Registration

First Name

First Name

Last Name

Last Name

Phone Number

+1 (647) - 777 - 7777

Email

example@gmail.com

Password

Password

Repeat Password

Password

Passwords should match.

Register

Already have an account?   **Login**

Contact Details	**Navigation**	**Terms of Service**	Auto Quotes Logo
Email Address: someEmail@gmail.com Phone Number: (437) 975-6985 Address: 517 Maple Road, North York, Ontario Opening Hours: Monday to Friday - 8 to 5 Weekends - 9 to 5	Get a Quote About us	Privacy Policy Return Policy Terms and Conditions	Powered By: Auto Quotes Co.

EU-UI-3 Reset Password Page

Text

https://www.Example.com/login

Mechanic Shop Logo

Request password reset

Email

example@gmail.com

If a user with the given address exists, an email has been sent

Request password reset

Contact Details

Email Address: someEmail@gmail.com
Phone Number: (437) 975-6985
Address: 517 Maple Road, North York, Ontario
Opening Hours:
Monday to Friday - 8 to 5
Weekends - 9 to 5

Navigation

Get a Quote
About us

Terms of Service

Privacy Policy
Return Policy
Terms and Conditions

Auto Quotes
Logo

Powered By: Auto Quotes Co.

EU-UI-4 Immediate Quoting Page

Page 1

https://www.AutoQuotes.com

Mechanic Shop Logo   UserName

Vehicle Specifications

Make Option 1   Model Option 2   Year Option 3   Engine Option 4   Body Option 4

Custom Quotes | **Immediate Quotes**

#	Service/Item Description	Unit Price	Quantity	Discount	Final Price
1	Front Brake Pads - OE+ Series	$80.69	1	$0.00	$80.69
	Front Brake Rotors - Economic Series	$120.69	2	$20.69	$100.00
	Front Brakes Replacement	$125.00	2	$0.00	$125.00
2					

Delete

Price $305.69
Tax $40
Total Price $345.69

Service Category   Service Sub-Category   Options

Category   Sub-Category   Service Category   **Add Service**

Book an Appointment

Contact Details	**Navigation**	**Terms of Service**	
Email Address: someEmail@gmail.com	Get a Quote	Privacy Policy	Auto Quotes Logo
Phone Number: (437) 975-6985	About us	Return Policy	
Address: 517 Maple Road, North York, Ontario		Terms and Conditions	
Opening Hours:			
Monday to Friday - 8 to 5			
Weekends - 9 to 5			Powered By: Auto Quotes Co.

EU-UI-5 Custom Quoting Page

EU-UI-6 Booking Appointment Page

Page 1

https://www.AutoQuotes.com

Mechanic Shop Logo   Active   Link   Link   Link   UserName 👤 [←

Book an Appointment

Email address

name@example.com

Select The Subitable Time Slot

1
2
3
4

Example textarea

First Product

Short Desc

Second Product

Short Desc

Third Product

Short Desc

Book Appointment

Contact Details	**Navigation**	**Terms of Service**	
Email Address: someEmail@gmail.com Phone Number: (437) 975-6985 Address: 517 Maple Road, North York, Ontario Opening Hours: Monday to Friday - 8 to 5 Weekends - 9 to 5	Get a Quote About us	Privacy Policy Return Policy Terms and Conditions	Auto Quotes Logo Powered By: Auto Quotes Co.

EU-UI-7 Paying Deposit Page

Mechanic Shop's Internal Interface

I-UI-1 Creating New Admin Page

I-UI-2 Entity List Page (Inventory Items, End-Users, …)

I-UI-3 Adding New Entity

I-UI-4 Mechanic Shop Base Setting Page

I-UI-5 Mechanic Shop Schedule Page

3rd Party Part Supplier Interface

S-UI-1 Providing Requested Part Page

Support Staff ..

https://www.AutoQuotes.com

Mechanic Shop's Logo   **Parts Quotes Requested**   1/2

Vehicle: 2011 Honda Accord 2.4L - 2 Door

Part: Rear Driver Shock   **Not Available**

Manufacturer: [   ]

price: [   ]

Core Price: [   ]

Warranty: [   ]

Description   [   ]

☐ This Item can be returned if unused.

Submit

Contact Details

Email Address: someEmail@gmail.com
Phone Number: (437) 975-6985
Address: 517 Maple Road, North York, Ontario
Opening Hours:
Monday to Friday - 8 to 5
Weekends - 9 to 5

Auto Quotes
Logo

Powered By: Auto Quotes Co.

Support Team Interface

IL-UI-1 Adding New License Page

IL-UI-2 Editing License Page

https://www.AutoQuotes.com

Auto Quote Logo   Active   Link   Link   Link   UserName

Admin: Edit Licensing Page

Mechanic Shop Name

Title	Value
Customer number	
Address	
Email address	
Phone	
Date generated	
Expiry day	
Domain	
Status	

Suspend   Unsuspend   Remove

Section 3 – Process and Data Modelling

3.1 Workflow Diagrams

3.1.1 Application Navigation

3.1.2 End User Workflow

3.1.3 Administration Workflow

3.2 Data Modelling and Flow

3.2.3 Data Flow Diagrams

3.3 Use Case Scenarios

The following Use Case Scenarios (UCSs) have been identified. The following table is a summary of the UCSs followed by detailed descriptions.

Use Case Scenario #	Description
UC-EU1	End-User Log In
UC-EU2	End-user registration
UC-EU3	End-user forgotten password
UC-EU4	End-user quoting process
UC-EU5	End-user custom quoting process
UC-EU6	End-user book an appointment
UC-EU7	End-user make a deposit
UC-IU1	Shop employee add entity
UC-IU2	Shop employee add inventory item
UC-IU3	Shop employee edit entity
UC-IU4	Shop employee delete entity
UC-IU5	Shop admin edit shop basic info
UC-SU1	3rd party supplier rep provide quote
UC-ILU1	Support staff member add new mechanic shop license
UC-ILU2	Support staff member remove mechanic shop license
UC-ILU3	Support staff member suspend mechanic shop license
UC-ILU4	Support staff member unsuspend mechanic shop license
UC-ILU5	Support staff delete Support Staff account

3.3.1 UC-EU1 – End-User Log In

Scenario Name	End-User Log In		
Actors	End-User		
Stakeholders and Interests	End-User, Auto-Shop		
Description	Allows End-user to log into the web page		
Assumptions, Constraints, and/or Pre-Conditions	The end-user is on the login page.		
Trigger – Starting Point	End-user decides to log in		
Post condition	User is logged in		
Related Use Cases	UC-EU1		
Normal Flow of Events	#	End-user	System
	1	Enters email and password and clicks login button	Validates the data and if unsuccessful sends back error messages.
	2	Repeat step 1 till correct credentials are entered	Validates the data and redirects the end-user to the main quoting page.
Sub-Flows			
Alternate/Exceptional Flows	End-user chooses to cancel the login or exceeds the given tries to log in successfully.		

3.3.2 UC-EU2 - End-user registration

Scenario Name	End-User Registration		
Actors	End-User		
Stakeholders and Interests	End-User		
Description	Allows End-user to register for the web page		
Assumptions, Constraints, and/or Pre-Conditions	The end-user is on the registration page.		
Trigger – Starting Point	End-user decides to register		
Post condition	A new end-user is registered		
Related Use Cases	UC-EU2		
Normal Flow of Events	#	End-user	System
	1	End-User is on the registration page.	Prompts to enter the first name, last name, email, phone number, and password.
	2	End-user enters the first name, last name, email, phone number, and password	Validates the data and gives proper error messages if validation fails.
	3	Repeat the above steps till validation passes.	Validates the data and redirects the user to the main quoting page.
Sub-Flows			
Alternate/Exceptional Flows	End-user chooses to cancel registration.		

3.3.3 UC-EU3 - End-user forgotten password

Scenario Name	End-user forgotten password		
Actors	End-User		
Stakeholders and Interests	End-User		
Description	End user resets their password		
Assumptions, Constraints, and/or Pre-Conditions	End-User forgets their password		
Trigger – Starting Point	End-User cannot login and clicks on the forget password option.		
Post condition	Password has been reset		
Related Use Cases	UC-EU1, UC-EU2		
Normal Flow of Events	#	End-user	System
	1	Clicks on forget password button	Display the reset password form
	2	Enters their registered email	Send an email with the reset password option to the user
	3	Click on the link received via email	Display the reset password form
	4	Enter a new password twice	Check for validation and Display "Password reset successfully" if it passed the validations
Sub-Flows			
Alternate/Exceptional Flows	The entered email is invalid or non-registered. User decides to cancel the process.		

3.3.4 UC-EU4 - End-user quoting process

Scenario Name	End-user quoting process		
Actors	End-User		
Stakeholders and Interests	End-User, 3rd party supplier rep (in case of a custom quote) Mechanic shop staff, Mechanic shop owners		
Description	The end user requests a quote		
Assumptions, Constraints, and/or Pre-Conditions	The end-user is on the main quoting page (the site's main landing page)		
Trigger – Starting Point	End-user decides to request a quote		
Post condition	A quote is generated, time slot is booked, deposit is placed		
Related Use Cases	UC-EU5		
Normal Flow of Events	#	End-user	System
	1	Visits the main quoting page	Displays the main quoting form
	2	Enters the vehicle specifications	waits
	3	Adds a package to the quote request	waits
	4	Repeats step 3 until all packages are added	waits
	5	Clicks submit button	Displays immediate quote for available items
	6	waits	If quote includes items not in stock goes to step 11
	7	waits	If user is logged in (previous session) goes to step 10
	8	If user has an account executes login flow (UC-EU1)	
	9	If user does not have an account executes registration flow (UC-EU2)	
	10	Executes custom quoting process (UC-EU5)	
	11	Executes deposit flow (UC-EU7)	
	12	Executes book a timeslot flow (UC-EU6)	
	13	waits	Displays summary
Sub-Flows	UC-EU1, UC-EU2, UC-EU5, UC-EU6, UC-EU7		
Alternate/Exceptional Flows	End-user decides to abort		

3.3.5 UC-EU5 - End-user custom quoting process

Scenario Name	End-user custom quoting process		
Actors	End-User		
Stakeholders and Interests	End-User, 3rd Party Supplier		
Description	End-User requesting quotes which include unavailable or out of stock parts.		
Assumptions, Constraints, and/or Pre-Conditions	End-User should be logged In. End-User is on the main quoting page.		
Trigger – Starting Point	End-User decides to get a quote		
Post condition	A complete quote which include all the required parts is sent to the customer as an Email.		
Related Use Cases	UC-EU4, UC-SI1		
Normal Flow of Events	#	End-user	System
	1	Go to the main quoting Page	Display the quoting form and options
	2	Enters the vehicle specifications	waits
	3	Adds a package to the quote request	waits
	4	Repeat step 3 until all requested packages are added	Waits
	5	Clicks on submit button	Check for the unavailable/out of stock items and creates a list of unavailable items.
	6		Display "Quote request successful."
	7		Send the list of Unavailable items to the 3rd party suppliers including the vehicle specifications
	8		Receive the parts information from the 3rd party suppliers
	9		Add the received parts information and details to the quote.
	10		Send the completed quote to the customer via email.
	11	Executes book a timeslot flow (UC-EU6)	
	12	waits	Display Summary
Sub-Flows	UC-EU1, UC-EU2, UC-EU5, UC-EU6, UC-EU7		
Alternate/Exceptional Flows	3rd Party Suppliers fail to submit info on the requested parts		

3.3.5 UC-EU6 - End-user book an appointment

Scenario Name	End-user book an appointment	
Actors	End-User	
Stakeholders and Interests	End-User	
Description	Allows a logged-in user to book an appointment for their desired service.	
Assumptions, Constraints, and/or Pre-Conditions	The end-user is on the appointment page.	
Trigger – Starting Point	The end-user decides to book an appointment	
Post condition	Successfully books an appointment for the end-user.	
Related Use Cases	UC-EU6	
Normal Flow of Events	#	End-user	System
	1	End-user is on the book an appointment page	Retrieves the list of available appointments and displays the list of appointments and prompts the user to select a time slot.
	2	Selects a time slot from the list and clicks the book the appointment button or the user chooses to cancel booking an appointment.	Books the appointment for the user and displays a success message or if the user chooses to cancel go to step 3.
	3	wait	Redirects the user to the main quoting page.
Sub-Flows		
Alternate/Exceptional Flows	The user chooses to cancel.	

3.3.5 UC-EU7 - End-user make a deposit

Scenario Name	End-user make a deposit		
Actors	End-User		
Stakeholders and Interests	End-User		
Description	Allows a logged-in user to make a deposit for the custom quote.		
Assumptions, Constraints, and/or Pre-Conditions	The end-user has chosen a time to book an appointment for a custom part and is on the deposit(checkout) page.		
Trigger – Starting Point	The end-user has chosen a custom quote and needs to book an appointment.		
Post condition	Allows the user to book an appointment after successful deposit.		
Related Use Cases	UC-EU7		
Normal Flow of Events	#	End-user	System
	1	End-user is on the deposit page.	Retrieves and displays the list of products/services in the cart Prompts the user to enter first name, last name, address, city, country, province, and postal code.
	2	End-user fills in the first name, last name, address, city, country, province, and postal code.	Prompts to enter the cardholder name, card number, expiration, and cvv.
	3	Enters cardholder name, card number, expiration and cvv.	Validates the info and if successful charges the card for the total amount. Display a confirmation message saying the card has been charged. If unsuccessful displays the error messages and repeat step 1.
Sub-Flows			
Alternate/Exceptional Flows	The end-user cancels or exits the deposit page.		

3.3.5 UC-IU1 - Shop employee add entity

Scenario Name	Shop employees add entity		
Actors	Shop employee		
Stakeholders and Interests	Mechanic shop owners and staff		
Description	Shop employee adds an entity of a specific type (service / inventory item, etc.)		
Assumptions, Constraints, and/or Pre-Conditions	Employee is on the entity-type-specific list page		
Trigger – Starting Point	Employee decides to add an entity (service / inventory item, etc.)		
Post condition	Entity is added		
Related Use Cases	UC-IU2, UC-IU3, UC-IU4		
Normal Flow of Events	#	Shop employee	System
	1	Clicks on the add button	Displays the entity-specific add page
	2	Fills out the form	waits
	3	Clicks submit	Creates entity
	4	waits	Displays success screen
Sub-Flows	UC-UI2		
Alternate/Exceptional Flows	Employee decides to cancel		

3.3.5 UC-IU2 - Shop employee add inventory item

Scenario Name	Shop employees add inventory item		
Actors	Shop employee		
Stakeholders and Interests	Mechanic shop owners and staff		
Description	A shop employee adds a new item with its info to the inventory database		
Assumptions, Constraints, and/or Pre-Conditions	The shop employee is logged in as an employee.		
Trigger – Starting Point	A new inventory item is received in the shop.		
Post condition	A new inventory item with information is added to the inventory database.		
Related Use Cases	UC-IU1, UC-IU3, UC-IU4		
Normal Flow of Events	#	Shop employee	System
	1	Clicks on the add new inventory item button	Display the adding new inventory item form
	2	Complete the form	Waits
	3	Submits the form	Validate the form inputs
	4	Fix the inputs if there were any errors and clicks on submit button	Validate the inputs, if the item name already exists, prompt the user to update the existing item instead of adding.
	5	Repeat step 4 until all inputs pass the validation or user choose to update the existing item.	
	6		Add the item to the inventory and Display "Item added successfully"
Sub-Flows			
Alternate/Exceptional Flows	Employee decides to cancel		

3.3.5 UC-IU3 - Shop employee edit entity

Scenario Name	Shop employee edit entity		
Actors	Shop employee		
Stakeholders and Interests	Mechanic shop owners and staff		
Description	Shop employee edits an entity of a specific type (service / inventory item, etc.)		
Assumptions, Constraints, and/or Pre-Conditions	Employee is on the entity-type-specific list page		
Trigger – Starting Point	Employee decides to edit an entity (service / inventory item, etc.)		
Post condition	Entity is updated		
Related Use Cases	UC-IU1, UC-IU2, UC-IU-4		
Normal Flow of Events	#	Shop employee	System
	1	Selects an entity from the list and clicks edit	Displays the prefilled form
	2	Edits the information	waits
	3	clicks submit	Updates entity
	4	waits	Displays success screen
Sub-Flows			
Alternate/Exceptional Flows	Employee decides to cancel		

3.3.5 UC-IU4 - Shop employee delete entity

Scenario Name	Shop employee delete entity		
Actors	Shop employee		
Stakeholders and Interests	Mechanic shop owners and staff		
Description	Shop employee deletes an entity of a specific type (service / inventory item, etc.)		
Assumptions, Constraints, and/or Pre-Conditions	Employee is on the entity-type-specific list page		
Trigger – Starting Point	Employee decides to delete an entity (service / inventory item, etc.)		
Post condition	Entity is removed		
Related Use Cases	UC-IUI2, UC-IUI3, UC-IUI3		
Normal Flow of Events	#	Shop employee	System
	1	Selects an entity from the list and clicks delete	Displays entity information and requests to confirm
	2	User confirms	Deletes the selected entity
	3		Displays success screen
Sub-Flows			
Alternate/Exceptional Flows	Employee decides to cancel		

3.3.5 UC-IU5 - Shop admin edit shop basic info

Scenario Name	Shop admin edit shop basic info		
Actors	Shop admin		
Stakeholders and Interests	Mechanic shop owners, staff, end-users		
Description	A shop admin edits the shop base information		
Assumptions, Constraints, and/or Pre-Conditions	Admin is on the shop info page		
Trigger – Starting Point	A shop admin decides to edit the shop base information		
Post condition	Base information is updated		
Related Use Cases			
Normal Flow of Events	#	Shop employee	System
	1	Clicks on the edit button	Displays the prefilled form
	2	Edits information	waits
	3	Clicks submit	Updates information
	4	waits	Displays success screen
Sub-Flows			
Alternate/Exceptional Flows	Employee decides to cancel		

3.3.5 UC-SU1 - 3rd party supplier rep provide quote

Scenario Name	3rd party supplier rep provide quote		
Actors	3rd party supplier rep		
Stakeholders and Interests	Mechanic shop owners and staff, 3rd party supplier, end-user		
Description	3Rd party supplier rep provides a quote on a part		
Assumptions, Constraints, and/or Pre-Conditions	3Rd party supplier rep clicked on the link sent to them in an email		
Trigger – Starting Point	3Rd party rep received an email about a quote request		
Post condition	Quote is submitted		
Related Use Cases			
Normal Flow of Events	#	3rd party supplier rep	System
	1	Opens page	Displays the vehicle details, and the part to be quoted
	2	Adds an offer line and enters offer information	waits
	3	Repeats step 2 as needed	waits
	4	Clicks submit offers	Saves offers for part.
		waits	If there are more parts to be quoted, goes to step 1
		waits	Shows success screen
Sub-Flows			
Alternate/Exceptional Flows	Supplier rep decides to cancel		

3.3.5 UC-ILU1 - Support staff member adds a new mechanic shop license

Scenario Name	Support staff member add new mechanic shop license		
Actors	Support staff member		
Stakeholders and Interests	Mechanic shop owners and staff, Auto Quotes owners and staff		
Description	Allow Support Staff to create a New Mechanic Shop profile		
Assumptions, Constraints, and/or Pre-Conditions	Have signed on a contract with a New Mechanic Shop		
Trigger – Starting Point	Support Staff hit the Add New Mechanic Shop on the navigation bar		
Post condition	A New Mechanic Shop profile is created, and Mechanic Shop is licensed		
Related Use Cases			
Normal Flow of Events	#	Support Staff	System
	1	Request to add a new mechanic shop	Display a form and prompt to enter information
	2	Enter Company name, administrator name, passwords, address, email address, Expiry waning period days	Validate the information, and display the information.
	3	Hit the Submit button	Create Mechanic Shop profile, and display success message
Sub-Flows			
Alternate/Exceptional Flows	Staff member decides to cancel		

3.3.5 UC-ILU2 - Support staff member removes a mechanic shop license

Scenario Name	Support staff member remove mechanic shop license		
Actors	Support staff member		
Stakeholders and Interests	Mechanic shop owners and staff, Auto Quotes owners and staff		
Description	Allow Support Staff to remove a Mechanic shop profile		
Assumptions, Constraints, and/or Pre-Conditions	New Mechanic Shop Profile has been created		
Trigger – Starting Point	A list of mechanic shops has been retrieved		
Post condition	A New Mechanic Shop profile is removed, and Mechanic Shop is unlicensed		
Related Use Cases			
Normal Flow of Events	#	Support staff member	System
	1	Select a mechanic shop	Display the mechanic shop's detail including customer number, address, email address, phone number, date generated, expiry day, domain, status.
	2	Request to remove the mechanic shop	Display confirmation window
	3	Accept to remove	Remove the mechanic shop, and display the success message
Sub-Flows			
Alternate/Exceptional Flows	Staff member decides to cancel		

3.3.5 UC-ILU3 - Support staff member suspends mechanic shop license

Scenario Name	Support staff member suspend mechanic shop license		
Actors	Support staff member		
Stakeholders and Interests	Mechanic shop owners and staff, Auto Quotes owners and staff		
Description	Allow Support Staff to suspend a Mechanic shop profile		
Assumptions, Constraints, and/or Pre-Conditions	New Mechanic Shop Profile has been created		
Trigger – Starting Point	A list of mechanic shops has been retrieved		
Post condition	Mechanic Shop is suspended		
Related Use Cases			
Normal Flow of Events	#	Support staff member	System
	1	Select a mechanic shop	Display the mechanic shop's detail including customer number, address, email address, phone number, date generated, expiry day, domain, status.
	2	Request to suspend the mechanic shop	Display confirmation window
	3	Accept to suspend	suspend the mechanic shop, and display the success message
Sub-Flows			
Alternate/Exceptional Flows	Staff member decides to cancel		

3.3.5 UC-ILU4 - Support staff member unsuspends mechanic shop license

Scenario Name	Support staff member unsuspend mechanic shop license		
Actors	Support staff member		
Stakeholders and Interests	Mechanic shop owners and staff, Auto Quotes owners and staff		
Description	Allow Support Staff to unsuspend a Mechanic shop profile		
Assumptions, Constraints, and/or Pre-Conditions	New Mechanic Shop Profile has been created		
Trigger – Starting Point	A list of mechanic shops has been retrieved		
Post condition	Mechanic Shop is activated		
Related Use Cases			
Normal Flow of Events	#	Support staff member	System
	1	Select a mechanic shop	Display the mechanic shop's detail including customer number, address, email address, phone number, date generated, expiry day, domain, status.
	2	Request to unsuspend the mechanic shop	Display confirmation window
	3	Accept to unsuspend	unsuspend the mechanic shop, and display the success message
Sub-Flows			
Alternate/Exceptional Flows	Staff member decides to cancel		

3.3.5 UC-ILU5 - Support staff deletes Support Staff account

Scenario Name	Support staff admin delete Support Staff account	
Actors	Support staff admin	
Stakeholders and Interests	Auto Quotes owners and staff	
Description	Allow Support Staff Admin to delete a Support Staff Account	
Assumptions, Constraints, and/or Pre-Conditions	Support Staff Account has been created	
Trigger – Starting Point	A list of Support Staff Account has been retrieved	
Post condition	Support Staff account is removed	
Related Use Cases		
Normal Flow of Events	#	Support staff member	System
	1	Select a support staff account and request to delete the account	Display a confirmation window
	2	Accept to delete the account	Delete the support staff account and display the success message
Sub-Flows		
Alternate/Exceptional Flows	Staff member decides to cancel	

3.4 Activity Diagrams

The following is a summary table of the Activity Diagrams provided followed sub-sections of the actual diagrams.

Activity Diagram #	Description	Related UCS #
AD-EUI1	End-User Log In	
AD-EUI2	End-User Registration	
AD-EUI3	End-User Forget Password	
AD-EUI4	End-User Quoting Process	
AD-EUI5	End-User Custom Quoting Process	
AD-EUI6	End-User Appointment	
AD-EUI7	End-User Deposit	
AD-IUI1	Mechanic Shop Employee Add Entity	
AD-IUI2	Mechanic Shop Employee Add Inventory Item (AD-IUI1 Detailed)	
AD-IUI3	Mechanic Shop Employee Edit Entity	
AD-IUI4	Mechanic Shop Admin Delete Entity	
AD-IUI5	Mechanic Shop Admin Edit Mechanic Shop Basic Info	
AD-SUI1	3rd Party Supplier Rep Providing Quote on Requested Parts	
AD-ILUI1	Support Staff Adding a New Mechanic Shop License	
AD-ILUI2	Support Staff Removing a Mechanic Shop License	
AD-ILUI3	Support Staff Suspending Mechanic Shop License	
AD-ILUI4	Support Staff Unsuspending Mechanic Shop License	
AD-ILUI5	Support Staff Deleting Support Staff Account	

3.4.1 AD-EU1 - End-User Log In
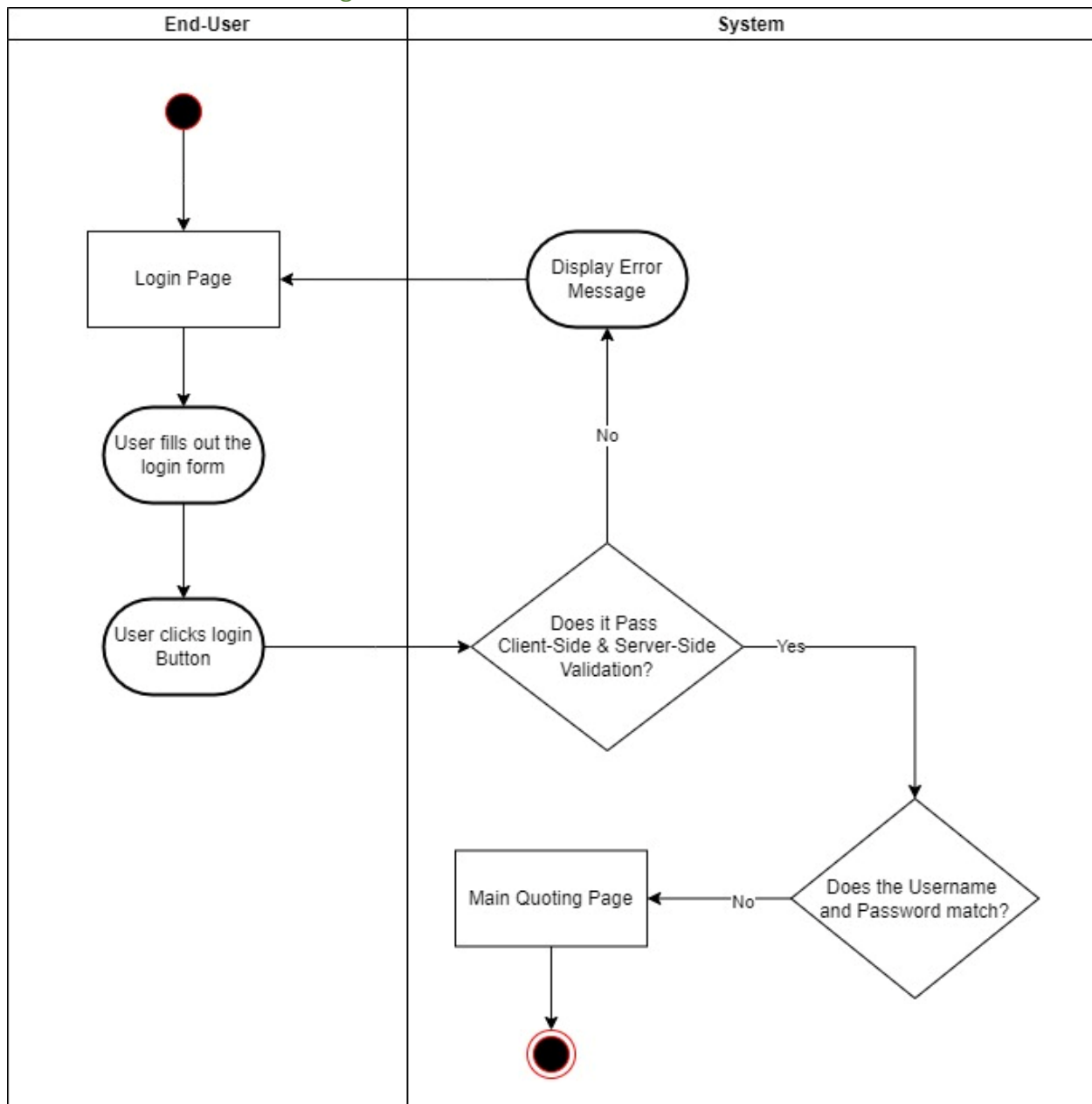
3.4.2 AD-EU2 - End-User Registration
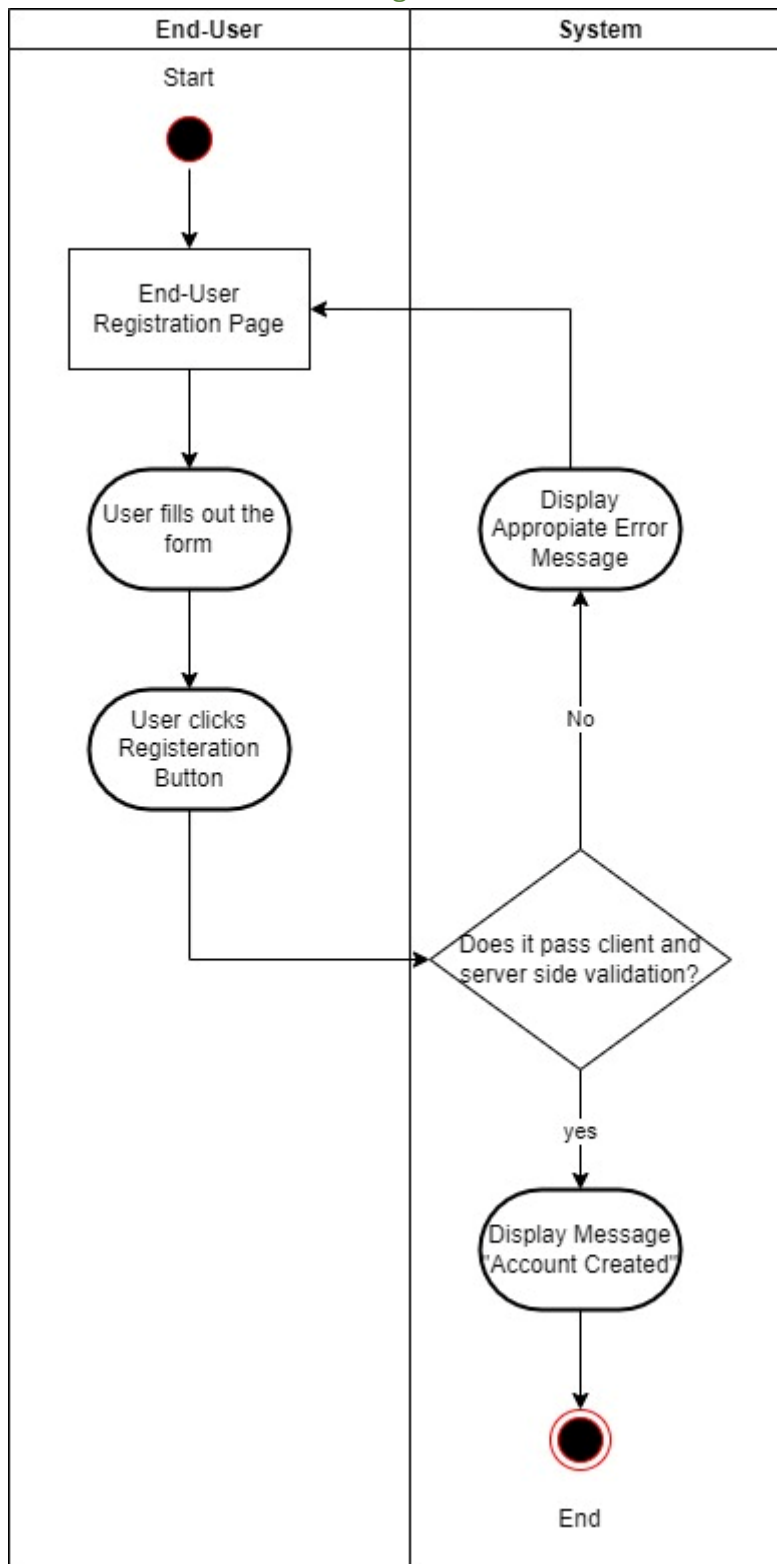
3.4.3 AD-EU3 - End-User Forget Password
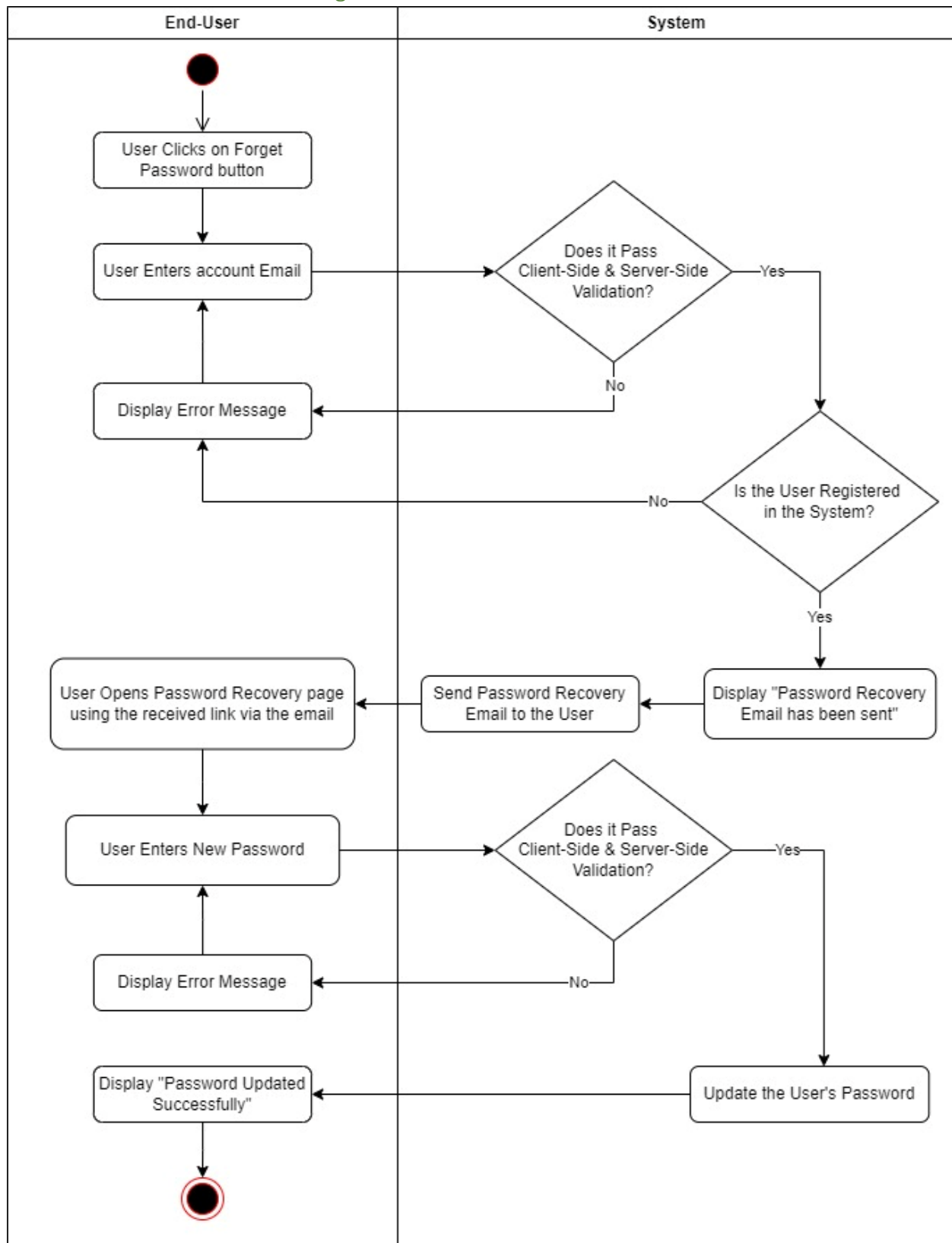
3.4.4 AD-EU4 - End-User Quoting Process
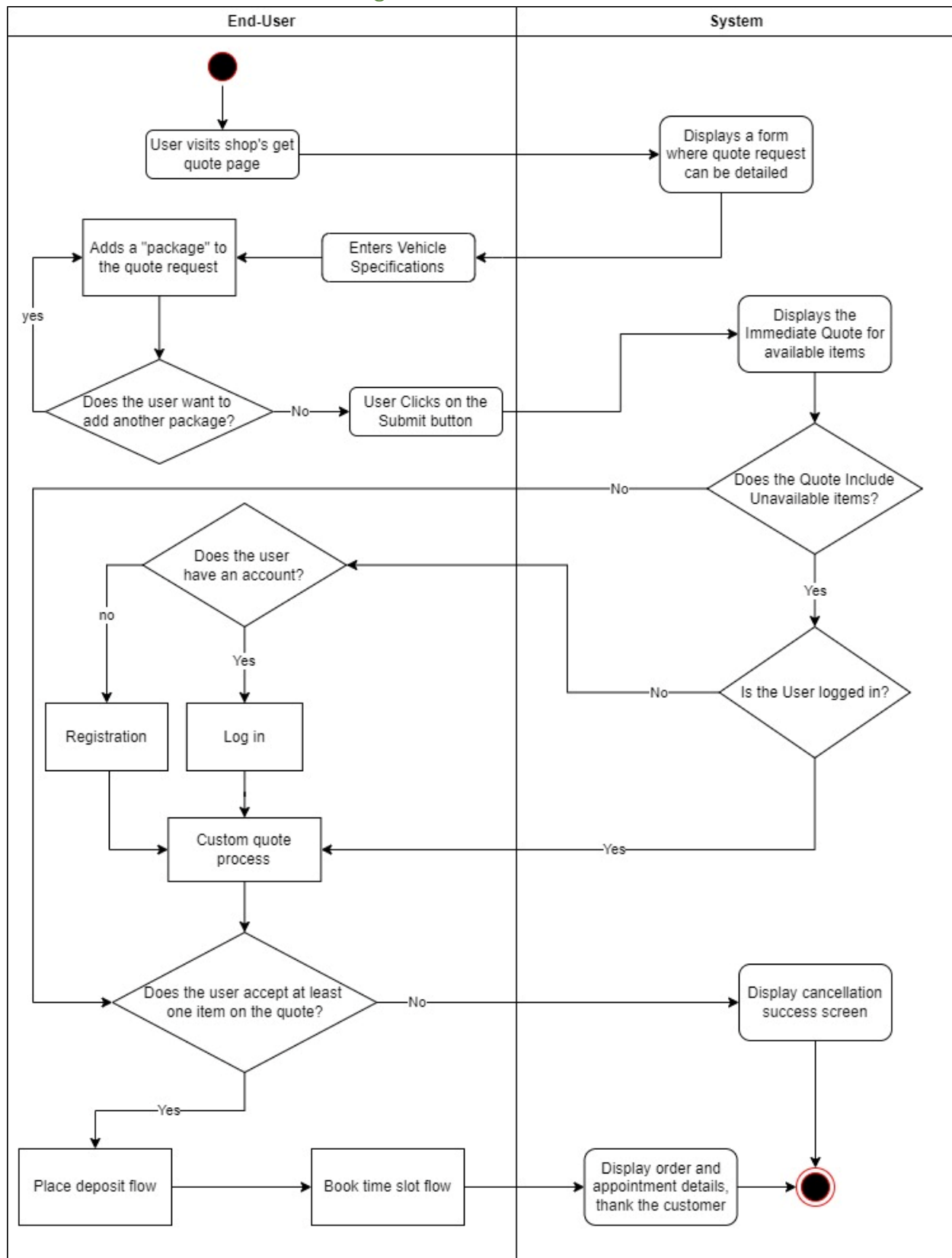
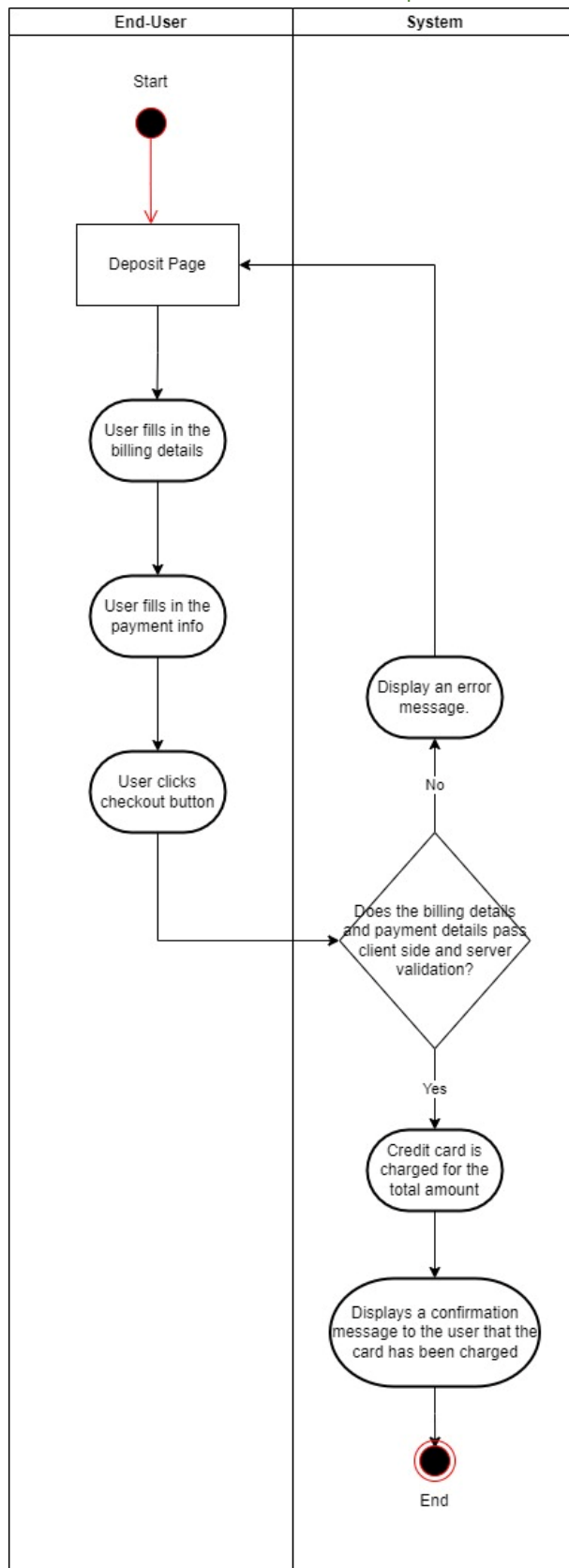### 3.4.5 AD-EU5 - End-User Custom Quoting Process
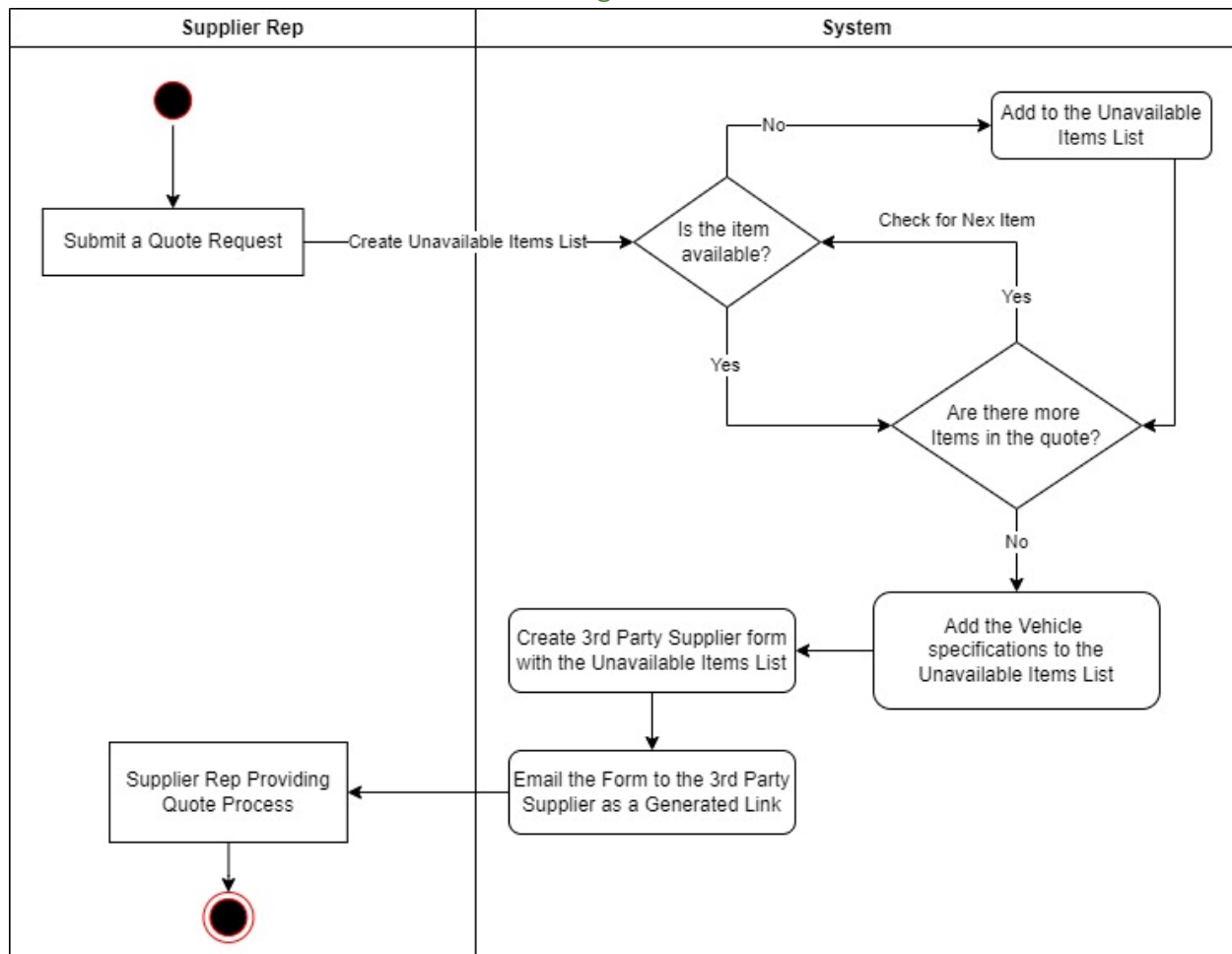
3.4.6 AD-EU6 - End-User Appointment
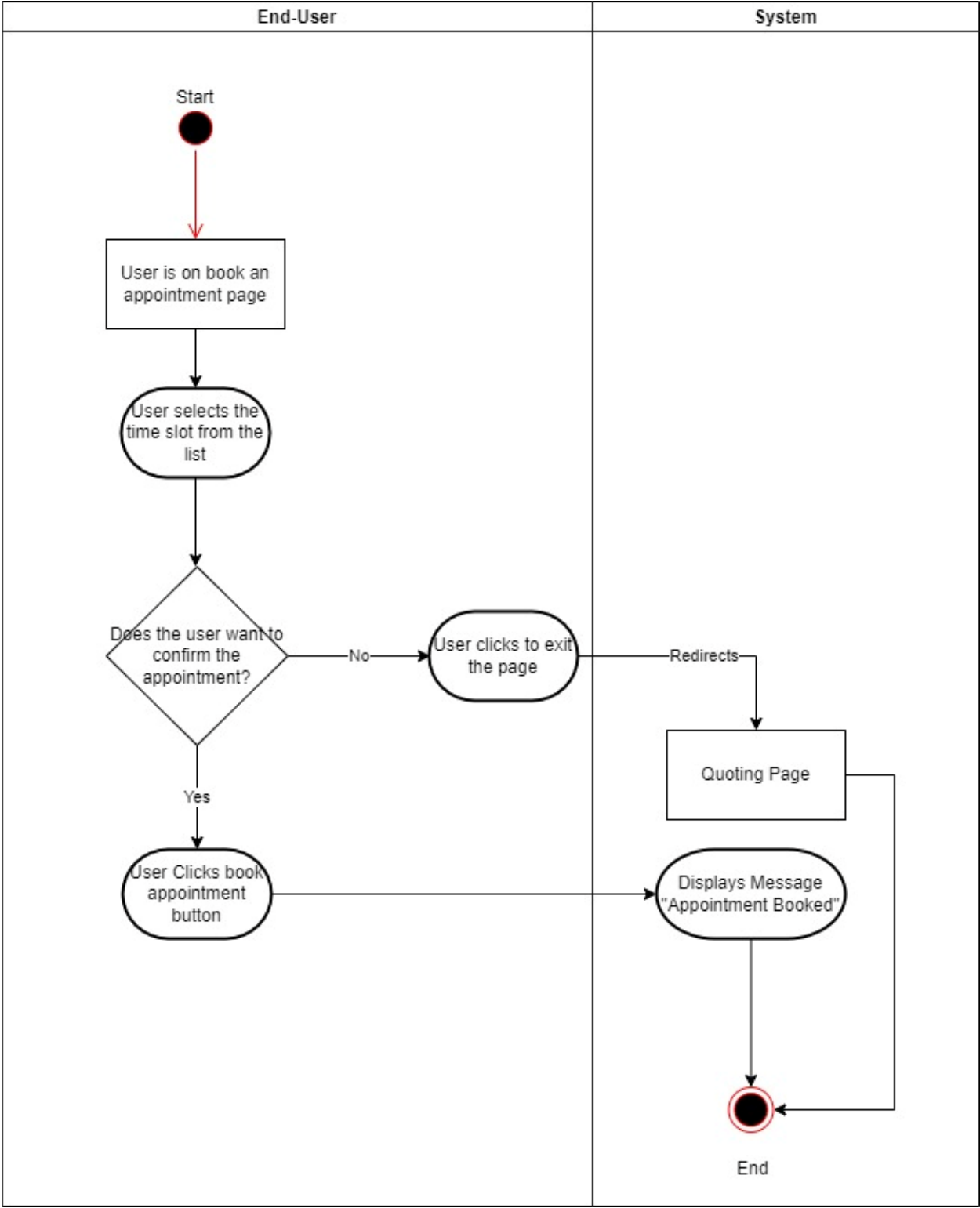
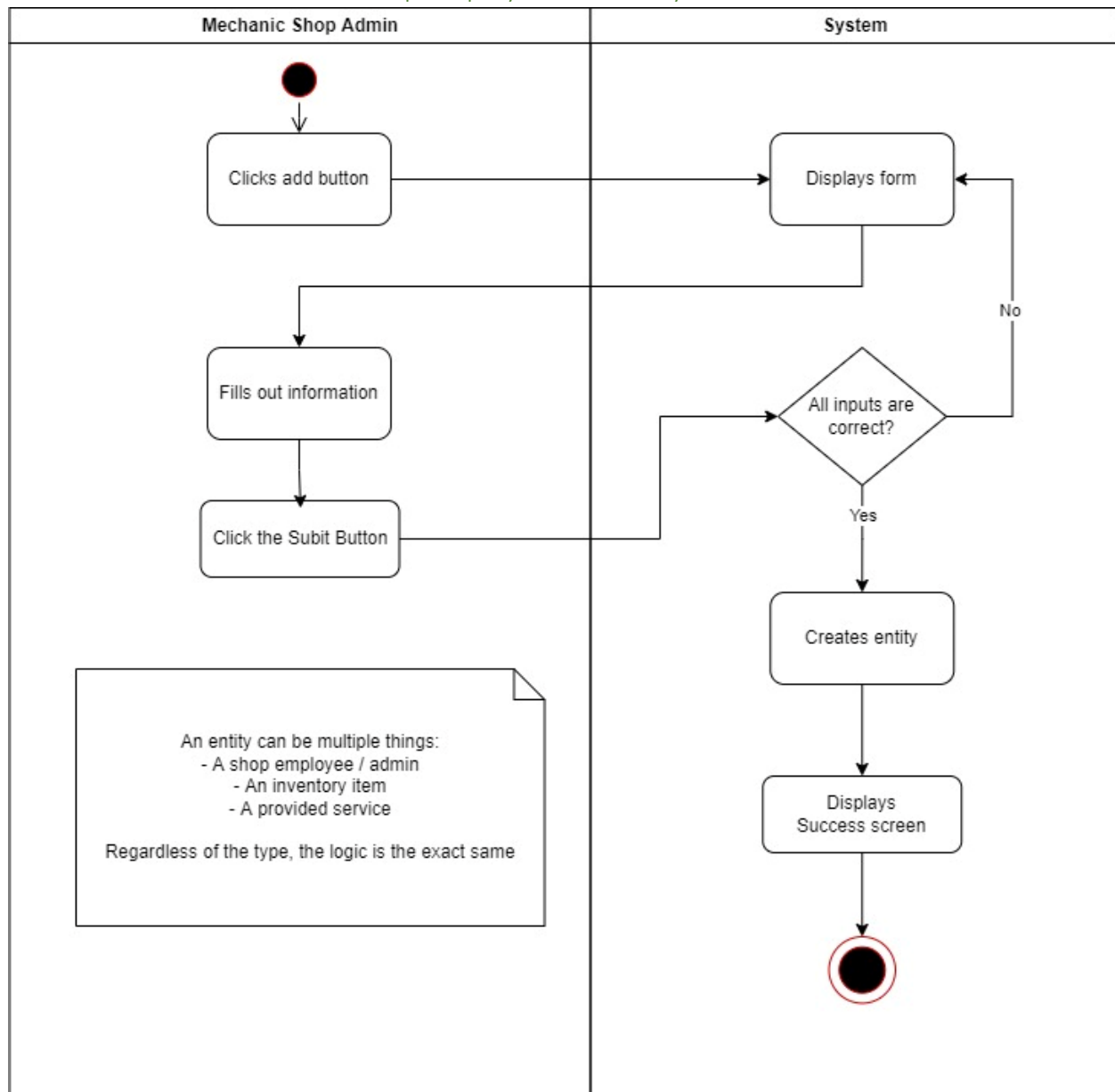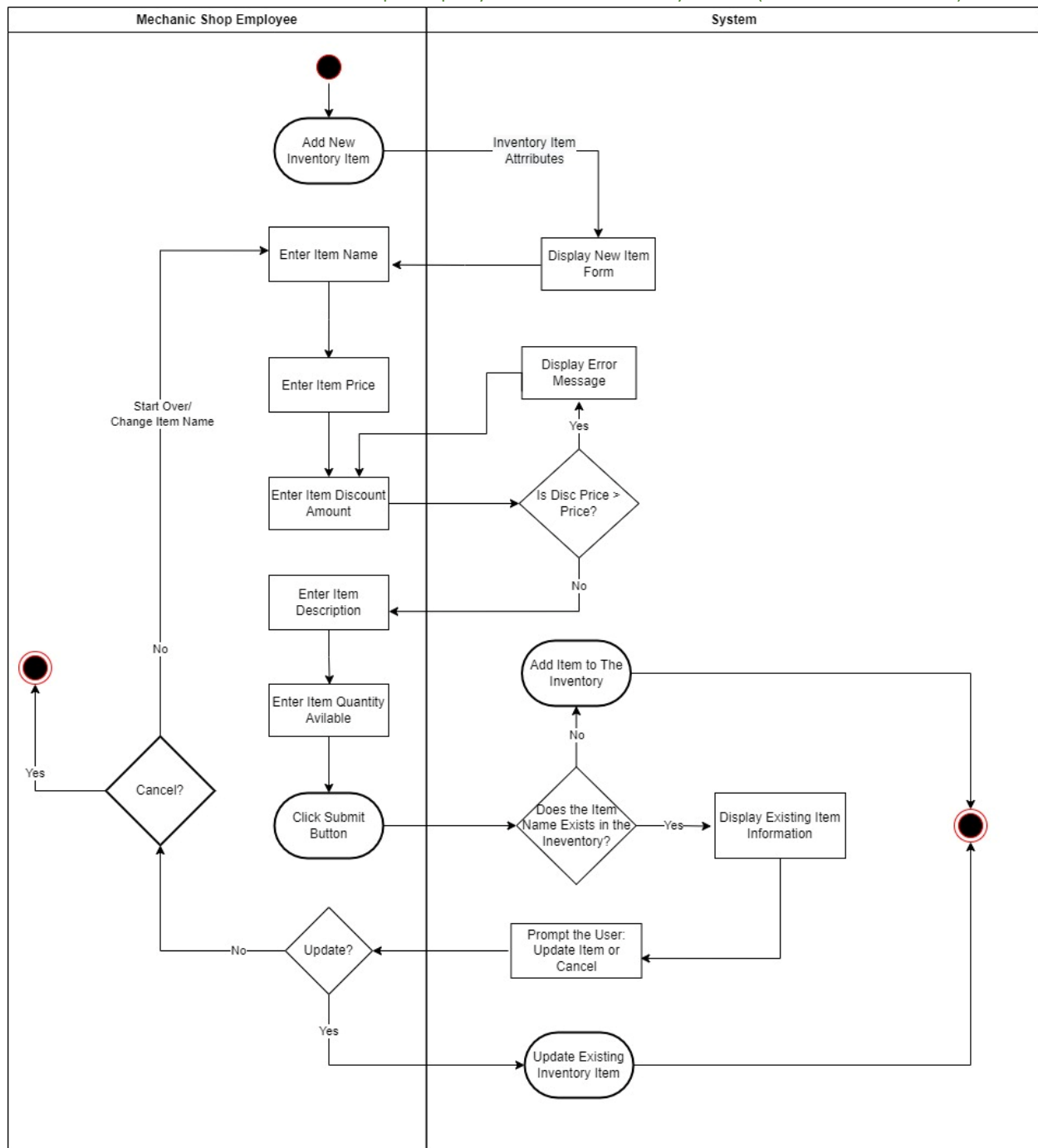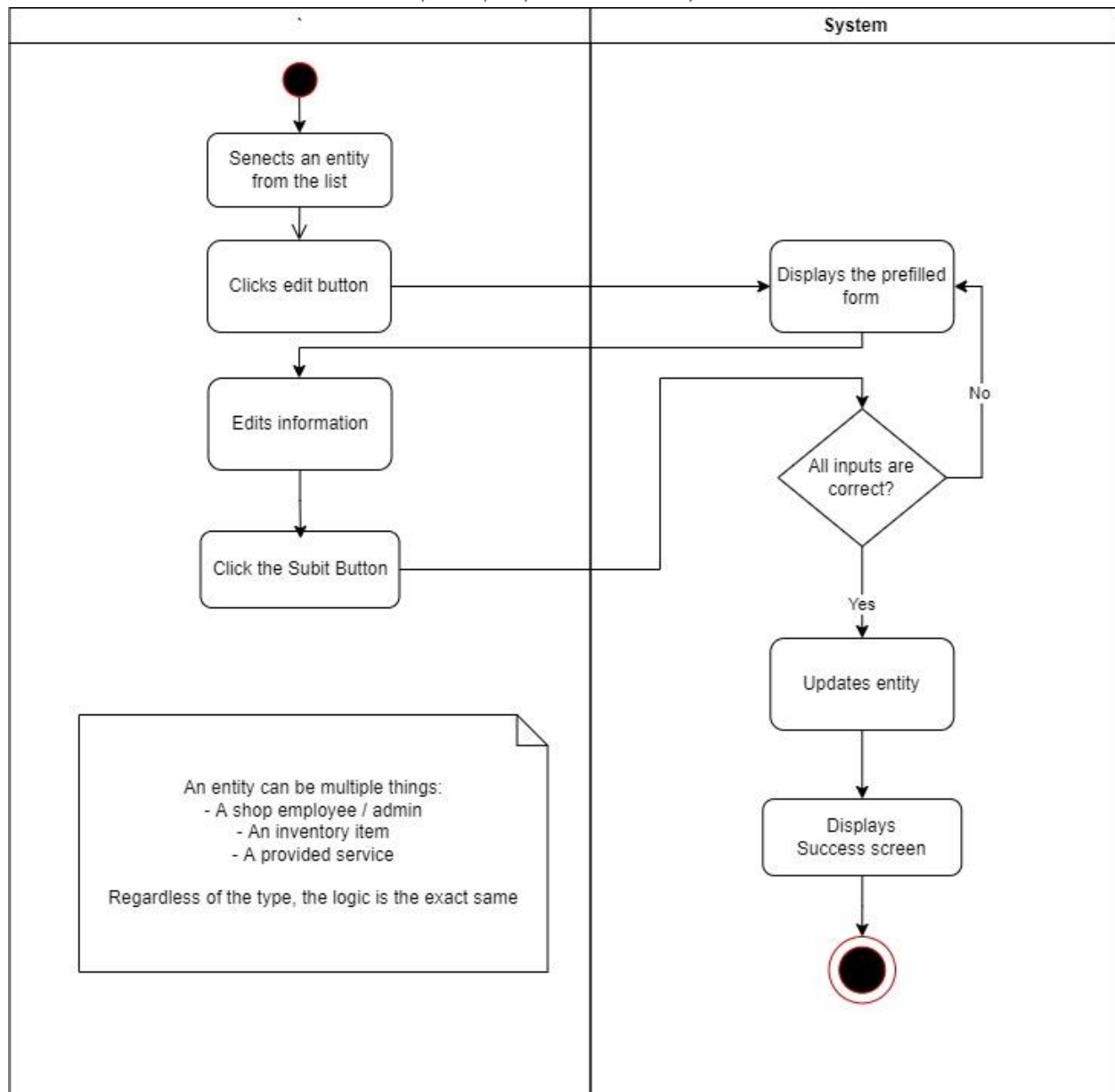### 3.4.7 AD-EU7 - End-User Deposit
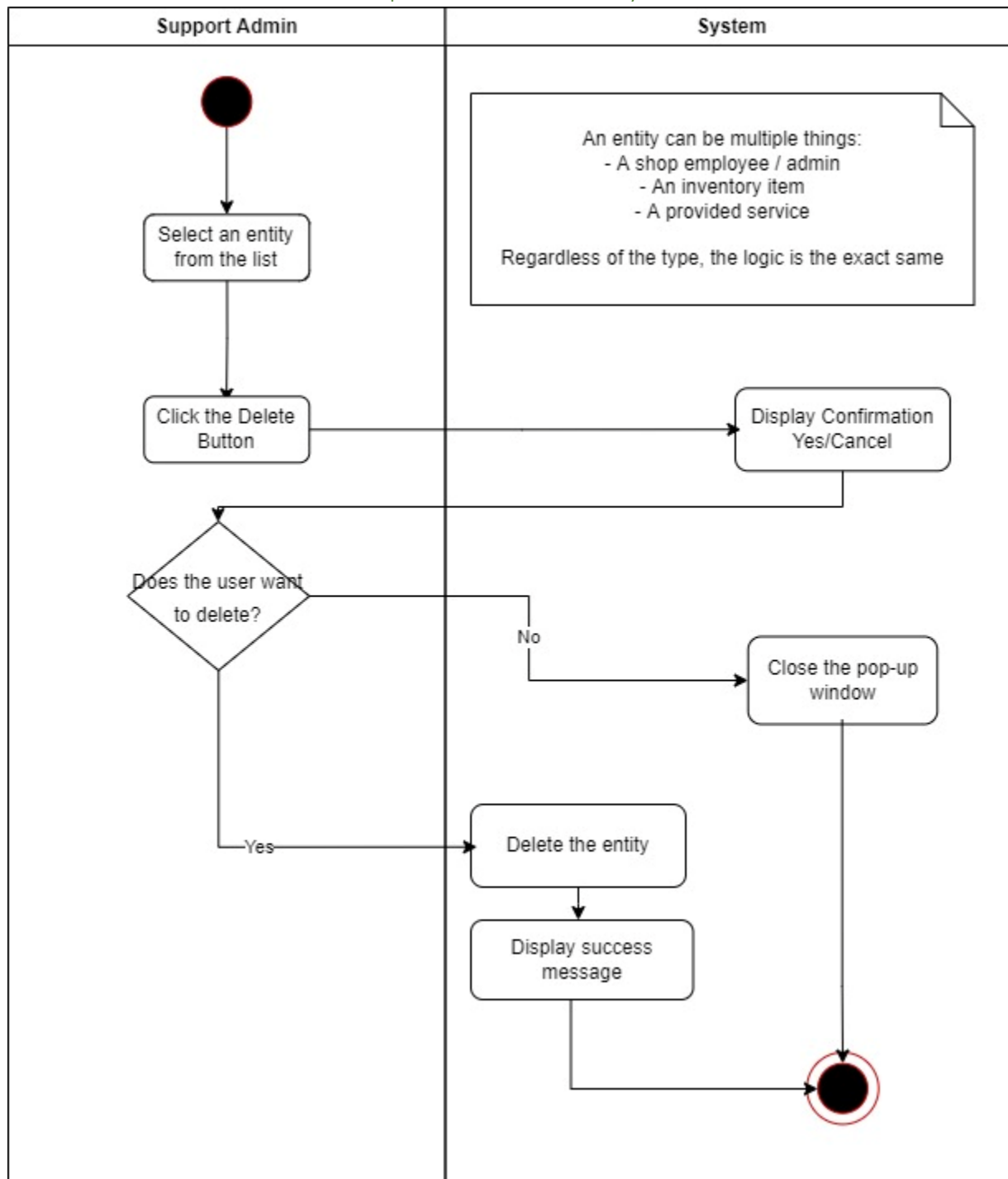
3.4.8 AD-IUI1 - Mechanic Shop Employee Add Entity

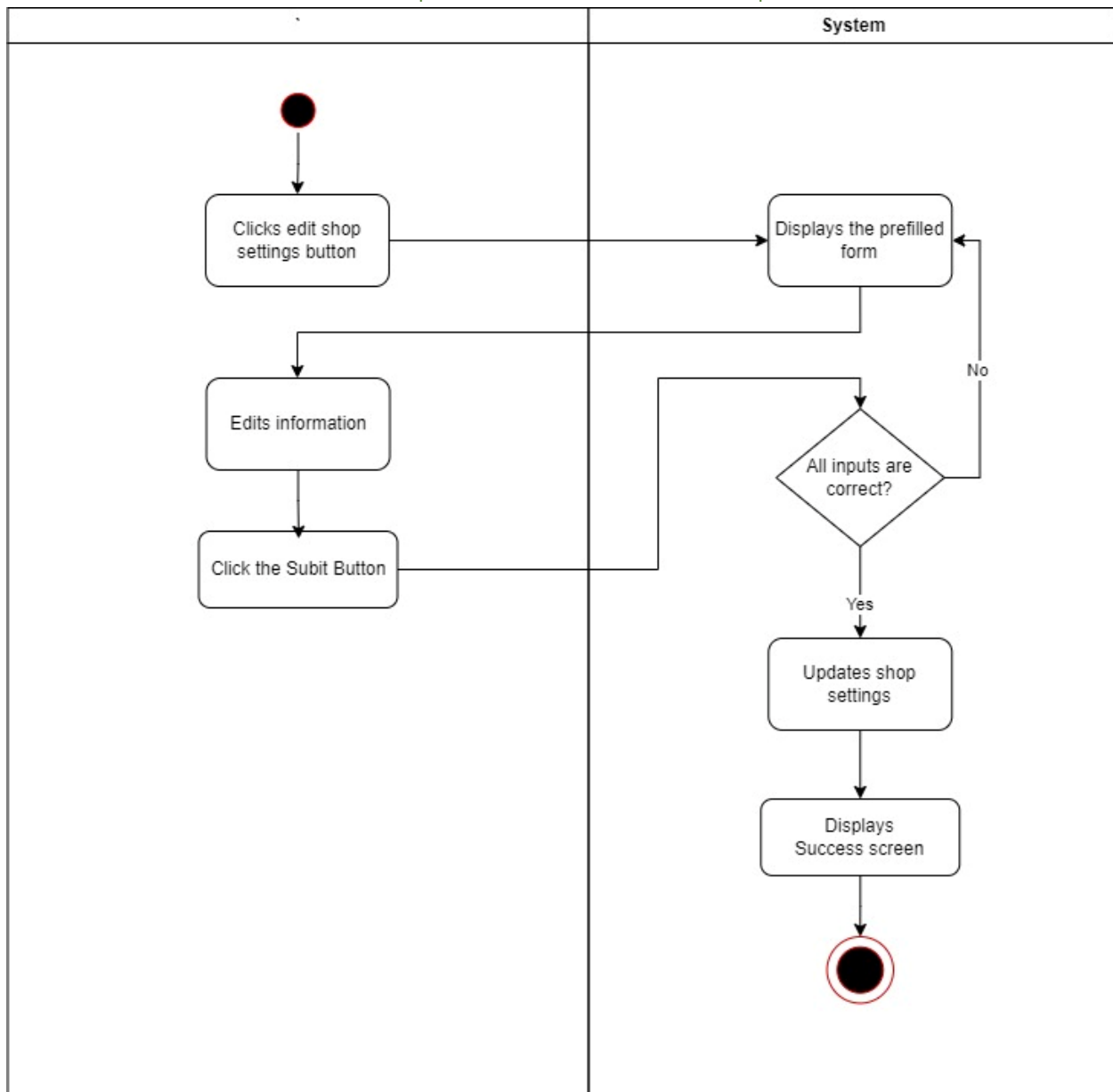### 3.4.9 AD-IUI2 – Mechanic Shop Employee Add Inventory Item (AD-IUI1 Detailed)
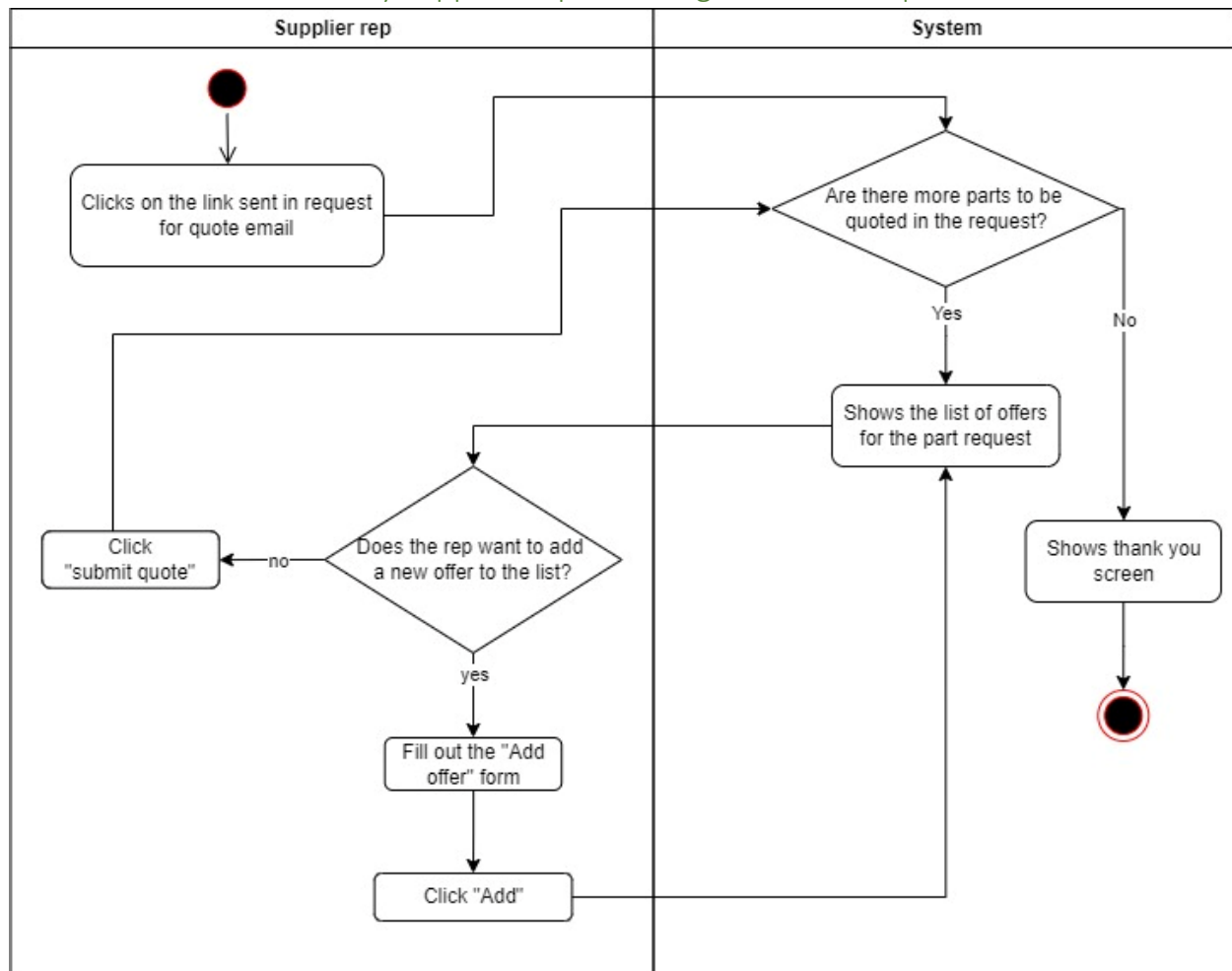
3.4.10 AD-IUI3 - Mechanic Shop Employee Edit Entity

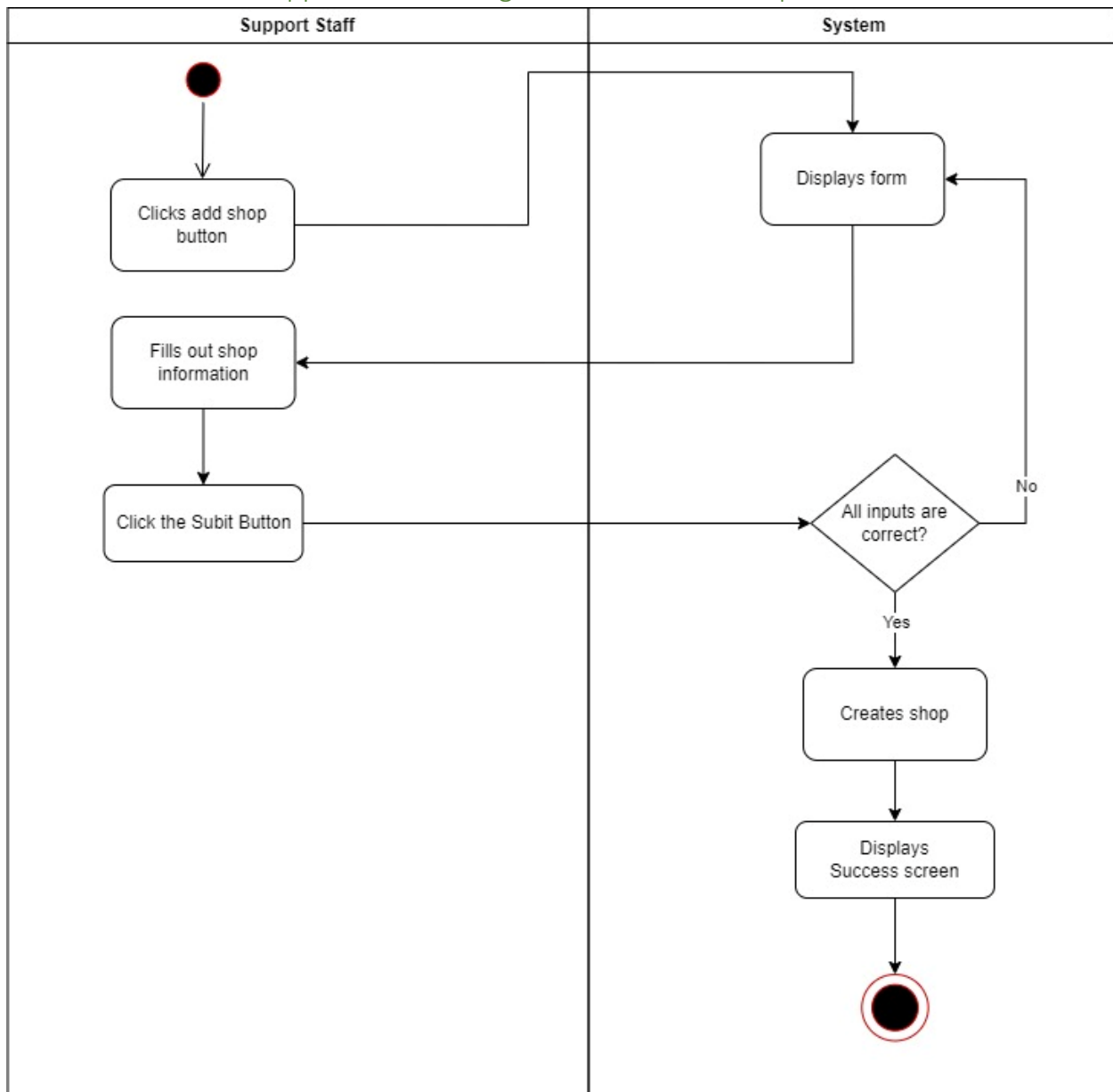### 3.4.11 AD-IUI4 - Mechanic Shop Admin Delete Entity

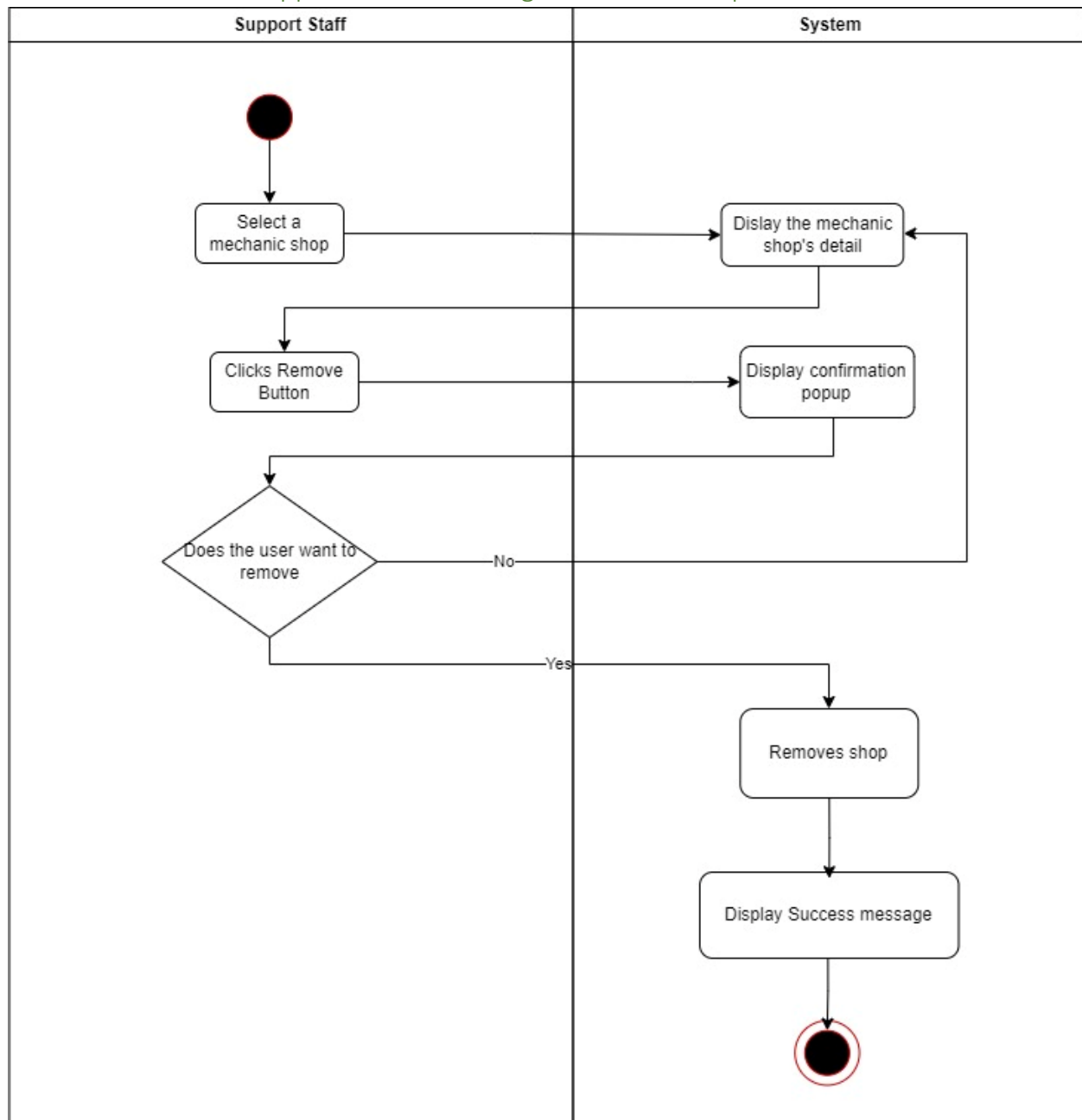### 3.4.12 AD-IUI5 - Mechanic Shop Admin Edit Mechanic Shop Basic Info

3.4.13 AD-SUI1 - 3rd Party Supplier Rep Providing Quote on Requested Parts

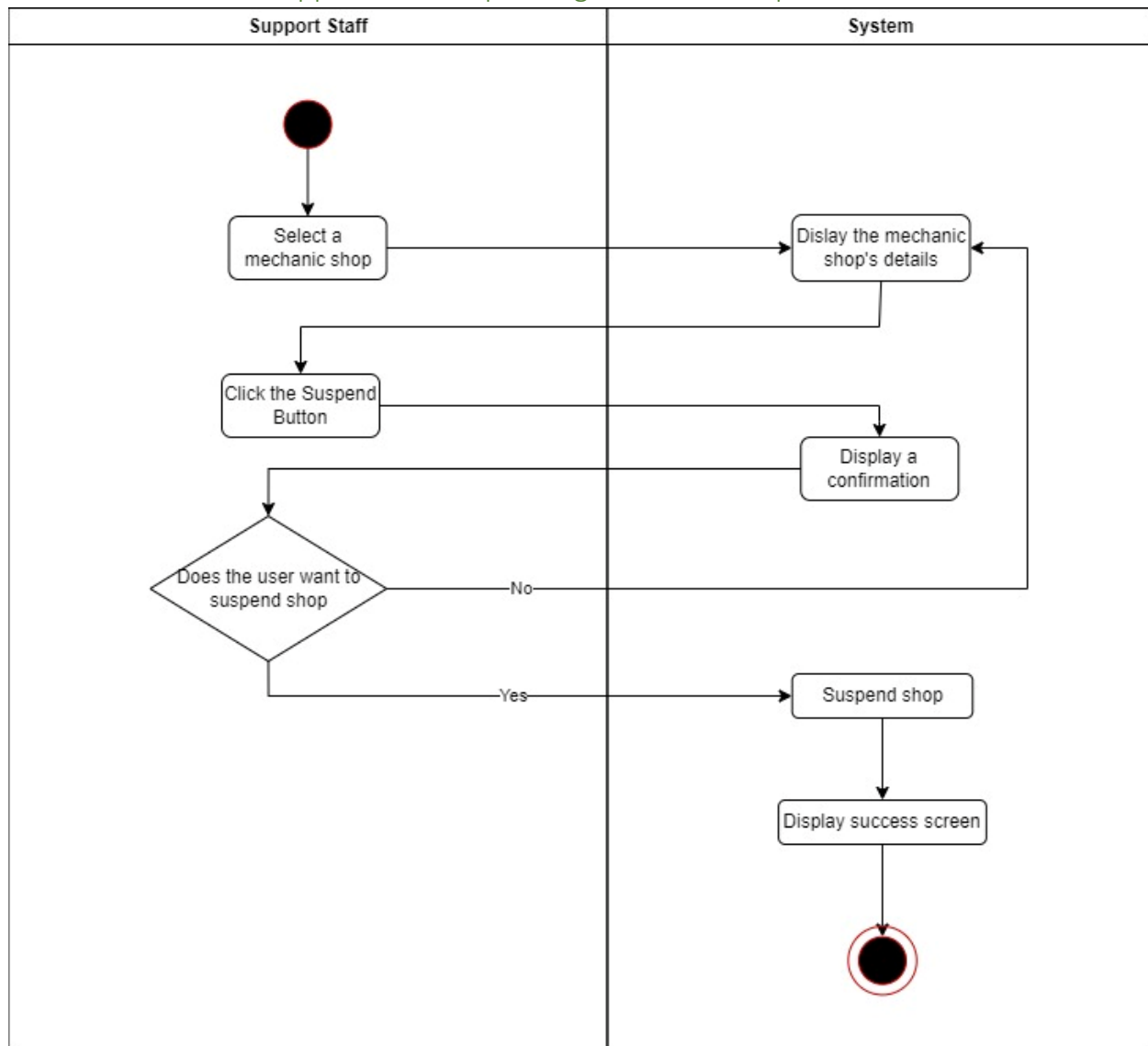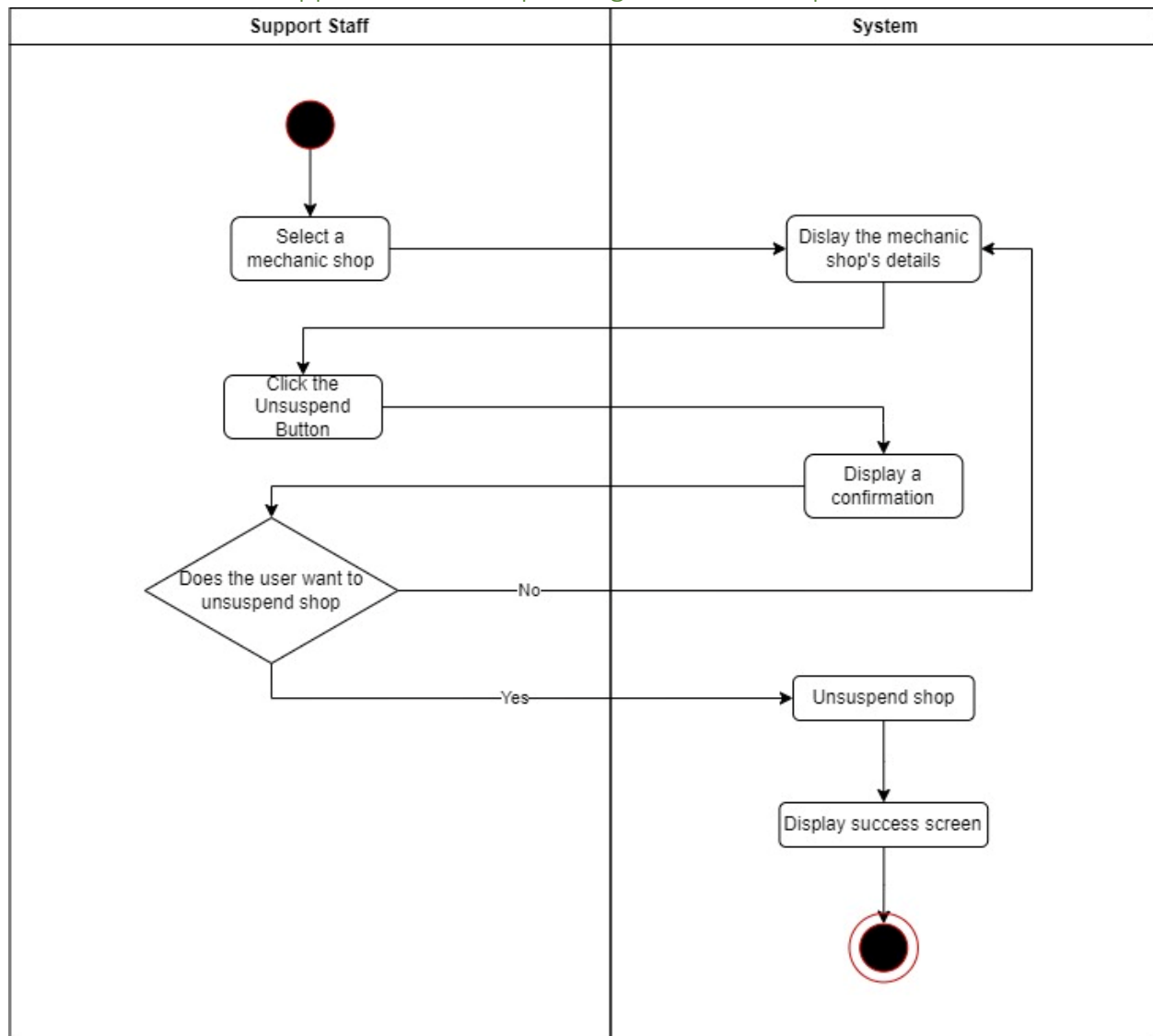### 3.4.14 AD-ILUI1 - Support Staff Adding a New Mechanic Shop License

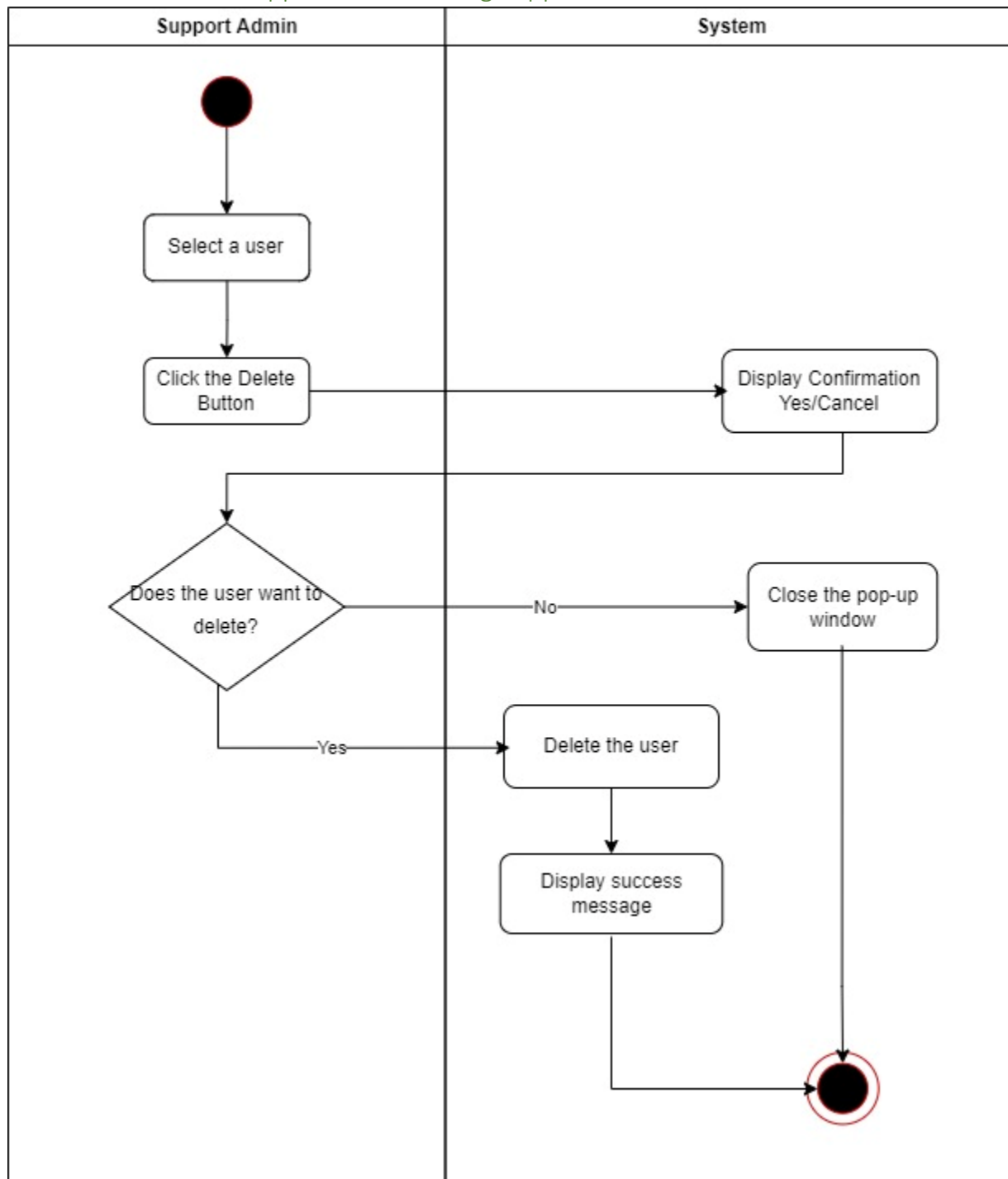### 3.4.15 AD-ILUI2 - Support Staff Removing a Mechanic Shop License

3.4.16 AD-ILUI3 - Support Staff Suspending Mechanic Shop License

3.4.17 AD-ILUI4 - Support Staff Unsuspending Mechanic Shop License

3.4.18 AD-ILUI5 - Support Staff Deleting Support Staff Account

3.5 Business Rules

The following is a list of Business Rules that must be met through the design of Auto Quotes. Each rule is described below and associated with the corresponding Activity Diagrans, Use Case Scenarios, and User-Interfac Mock-up.

Business Rule #	Description	Activity Diagram	Related UCS	UI Mockup
BR01	A mechanic shop cannot be overbooked	AD-EUI6	UC-EU6	EU-UI-6, I-UI-5
BR02	Immediate quotes do not require user to log in until they agree to book a timeslot	AD-EUI4	UC-EU4	EU-UI-4
BR03	Only logged in users can request custom quotes	AD-EUI4	UC-EU4	EU-UI-5
BR04	End-users must place a deposit to order parts, not in stock	AD-EUI4	UC-EU4	EU-UI-7
BR05	An appointment can be canceled only 24 hours before the appointment due	AD-EUI6	UC-EU6	EU-UI6
BR06	Mechanic shop profile must be removed within 30 days from termination date.	AD-ILUI2	UC-ILU2	IL-UI-2
BR07	Mechanic shop must be suspended on the 7th day after failure to pay the bill.	AD-ILUI3	UC-ILU3	IL-UI-2
BR08	Mechanic shop must be unsuspended within an hour after making a payment.	AD-ILUI4	UC-ILU4	IL-UI-2
BR09	The 3rd party part supplier will be given a notice after 10 consecutive failures to submit part request. After the next 10 failures the part supplier will be terminated from the suppliers list.	AD-SUI1	UC-SU1	
BR10	The quote prices are only valid for 7 days. After this period the prices may subject to change.	AD-EUI4, AD-EUI5	UC-EU4, UC-EU5	
BR11	Parts can be returned only if faulty and installed by the mechanic shop's licensed mechanics. Licensed mechanics should approve the deficiency of the installed part.			
BR12	Customers (End-Users) should be advised to be present 5-10 minutes before their appointment due.	AD-EUI6	UC-EU6	I-UI-5
BR13	The appointment time will not be honored if the customer (End-User) is more than 10 minutes late. Their job may be accepted but not regarding to the appointment details.	AD-EUI6	UC-EU6	I-UI-5

Section 4 – Domain Class

Section 5 – Database

Section 6 – Project Management

6.1 Work Breakdown Structure

6.2 Milestones

6.3 Acceptance Criteria

6.4 Implementation Schedule

Section 7 – Client/Faculty Sign-off