FleetWave

Senior Design Team Contract

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Table of Contents

Intent

The following contract was written and agreed upon by Rashminder Gill, Rishabh Sharma, Raj Sekhon, Jaspreet Singh, and Elizabeth Bissinger. The contract provides expectations, objectives, and results for developing the Senior Design Project

The contract is effective for all team members participating in the Senior Design Capstone class series in the 2023-2024 academic year.

Senior Design Contract

Project Summary

In logistics cycle, there are brokers, carriers, and drivers. Carriers act as the liaison, providing a service to connect brokers (suppliers) with drivers (transporters). Small Business carriers lack a way to manage loads, trucks, and drivers on one platform. This project's goal is to bridge this gap by saving time, hassle, and potential mistakes. This application will allow information to be relayed in a time effective manner allowing efficient passing of information to one another. Without similar software small businesses have inefficient ways of managing documents, payroll, tracking loads, payments, and account receivables etc.

Problem Statement

In the logistics industry, there's a glaring need for a unified platform that enables carriers to efficiently manage loads, trucks, and drivers while also providing brokers with timely access to critical information. The absence of such a comprehensive solution has created operational challenges for small businesses in logistics. This project aims to bridge this gap by delivering an integrated platform that not only saves valuable time but also streamlines operations and minimizes potential errors.

As highlighted by Americatruckdriving.com, dispatchers often grapple with various challenges such as impatient customers, adverse weather conditions, and complex scheduling when managing a sizable fleet of 30-50 drivers simultaneously. However, the introduction of software can significantly alleviate these difficulties, as affirmed by 'The truth about dispatching.'

Furthermore, insights from Matt Cole at overdriveonline.com reveal that the implementation of Transportation Management System (TMS) software as a load management tool in the industry has led to increased profitability for companies. This underscores two essential points: first, there is a clear market demand for this software, and second, it offers significant financial benefits to trucking companies.

Solution

We are developing a comprehensive web-based application designed to empower carriers. This solution offers a wide range of features, including real-time tracking of loads, driver information, load status updates, year-end reports for tax compliance, revenue and expense reports, seamless invoice generation for efficient broker payments, and a load aging history. With our application, small business carriers will have the tools they need to streamline their operations and stay on top of critical information.

Contact Information

TEAM MEMBER	DEGREE + TRACK	EMAIL	PHONE NUMBER OR OTHER CONTACT INFO

Rashminder Gill	BSCS + MBA	randhars@mail.uc.edu	(513) 462-5849
Raj Sekhon	BSIT + MBA	sekonsj@mail.uc.edu	(513) 807-9638
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Jaspreet Singh	BSIT + MBA	Singh2je@mail.uc.edu	(513) 448-6879
Elizabeth Bissinger	BSIT	bissinel@mail.uc.edu	(614) 832-9456

Project Source

Jaspreet Singh, Raj Sekhon, and Rashminder Gill each come from family-owned trucking businesses, offering them extensive experience in managing carrier trucking companies. These individuals confront the very challenges we aim to address daily, and their first-hand knowledge positions them perfectly to develop an application tailored to assist small business carriers across the United States who grapple with similar issues.

The synergy between their technical expertise, trucking industry insights, and business acumen makes them exceptionally well-suited to tackle these problems. Furthermore, the inclusion of Elizabeth and Rishabh in this project stems from their genuine interest in its potential impact. They will receive valuable industry knowledge from Jaspreet, Raj, and Rashminder to equip them for the project's initiation. In addition to their collective experience, the team intends to conduct further online research to validate our initial assumptions and insights.

Project Objectives/Goals

The primary goal of our solution is to create an integrated platform that streamlines communication and processes within the logistics cycle involving brokers, carriers, and drivers. By providing A unified environment for managing loads, trucks, and drivers, we aim to achieve the following:

- Unified Platform: Create a single platform for carriers to manage loads, trucks, and driver, eliminating the need for disjointed systems.
    - Impact: Streamlined operations, reduced data duplication, and improved data integrity.
- Efficient Load Management: enable carriers to track load details, including pickup and delivery times, documentation, and driver information.
    - Impact: Faster load processing reduced manual input, and accurate load tracking.
- Real-time Communication: Facilitate effective communication between carriers, drivers, and brokers for timely updates and decision making.
    - Impact: Improved collaboration, faster response times, and better load coordination.

- Automated Invoice Generation: Automatically generate invoices based on load details, reducing manual invoicing efforts.
    - Impact: Time and cost savings, minimizing invoicing errors, and improved payment accuracy.
- Driver Payroll Calculation: Calculate driver pay based on load assignments and delivery data, ensuring fair compensation.
    - Impact: Accurate payroll, reduced disputes, and improved driver satisfaction.
- Financial Insights and Reports: Provide analytics on revenue, expenses, and IFTA reports, giving carriers a comprehensive view of their operations.
    - Impact: Informed decision-making, better financial management, and strategic planning.
- Document Management: Store and manage essential documents, such as proof of delivery and rate confirmations, in a centralized location.
    - Impact: Easy document access, reduced paperwork, and improved compliance.
- User-Friendly Interface: Develop an intuitive user interface for easy navigation and quick adoption by carriers, drivers, and brokers.
    - Impact: Increased user engagement, reduced learning curve, and enhanced user satisfaction.
- Data Security: implement robust data security measures to protect sensitive user information and maintain compliance.
    - Impact: Enhanced user trust minimized data breaches, and compliance with privacy regulations.

By focusing on these major features, our application aims to transform the logistics cycle by providing an integrated, efficient, and user-friendly platform that brings together carriers, drivers, and brokers, resulting in a positive impact.

Team Members and Responsibilities

Software Engineer: Rishabh Sharma

- Responsible for writing code.
- Writing unit tests
- Building the UI

Software Engineer: Elizabeth

- Responsible for writing code.
- Writing unit tests
- Building the UI

Software Engineer: Jaspreet Singh

- Responsible for writing code.
- Writing unit tests
- Building the UI

Software Engineer: Raj Sekhon

- Responsible for writing code.
- Writing unit tests
- Building the UI

Software Engineer: Rashminder Gill

- Responsible for writing code.
- Writing unit tests
- Building the UI

Project Scope

Our team will develop a functional application that enables users to address the challenges in load management within the logistics industry by utilizing the following features and functionality:

Scope of the Solution:

- Administrator roles:
    - Implement a user authentication system that allows multiple user roles for carriers, drivers, and brokers, each with specific privileges and functionalities.

- Load Management:
    - Develop a user-friendly interface for carriers to input load details, including load number, truck and trailer information, driver details, pickup, and delivery times.
    - Enable carriers to upload and manage load-related documents such as proof of delivery and rate confirmations.

- Real-time Communication:
    - Build a messaging system that facilitates seamless communication between carriers, drivers, and brokers.
    - Provide notifications and alerts to keep users informed about load updates, changes, and important milestones.

- Document Management:
    - Create a centralized repository for storing and managing essential load-related documents.
    - Implement document version control and access controls to ensure data integrity.

- Automated Invoicing and Payroll:
    - Design an automated invoicing system that generates invoices based on load details and rates.
    - Develop a payroll module that calculates driver payments based on load assignments and delivery data.

- Analytics and Reports:
    - Implement data visualization tools to provide carriers with insights into revenue, expenses, and load performance.
    - Generate IFTA reports that accurately record miles traveled and fuel consumption for compliance.

- User Interface and Experience:
    - Design an intuitive and responsive user interface for easy navigation and efficient task execution.
    - Prioritize user experience by ensuring a consistent and visually appealing design.

Timeline Considerations:

- Phase Planning: Break down the development process into phases to ensure timely completion within the Senior Design timeline.
- Prototyping: Focus on creating functional prototypes for key features to demonstrate the application's core capabilities.
- Iterative Development: Implement an iterative development approach, focusing on implementing essential features first while leaving room for improvements and refinements.

Scope Limitations:

- Advanced Features: Due to the project timeline, some advanced features such as OCR image scanning and integration with external GPS services will be deferred to future development phases.
- Customization: While customization options for different invoices are valuable, initial versions may offer standardized invoice templates to expedite the development process.
- Additional Integrations: Integration with third-party services beyond user authentication and basic messaging may be limited to maintain focus on core functionalities.

By scoping the project to focus on essential features, timely development, and iterative improvements, we will create a functional application that addresses load management challenges within the logistics industry and aligns with the goals of the Senior Design timeline.

Quick Project Timeline

Task #	*Task Name*	*Duration*	*Start Date*	*End Date*
Phase 1				
	Tracking load details – user inputs	*4 months*	*09/05/2023*	*12/01/2023*

	Tracking load details – filter capabilities	*4 months*	*09/05/2023*	*12/01/2023*
	Tracking load details – search capabilities	*4 months*	*09/05/2023*	*12/01/2023*
	Invoice generation	*4 months*	*09/05/2023*	*12/01/2023*
	Login Accounts		*09/05/2023*	*12/01/2023*
Phase 2				
	Payroll	*1 month*	*01/10/2023*	*02/10/2023*
	IFTA	*1 month*		
	Reports/Visuals Analytics	*1 month*		
Phase 3				
	OCR	*TBD*		
	Truck maintenance schedule	*TBD*		
	GPS	*TBD*		

We will be using Agile Methodology. We will start with Phase 1 and start working on individual tasks. That's why the timeline is hard to determine and to be accurate.

Technologies Used

Certainly, here are the points in bullet format:

Tech Stack:

- Front-end: JavaScript and React for the user interface.
- Back-end: Node.js for server-side logic.
- Containerization: Docker for streamlined deployment.
- Data Management:
    - MongoDB for database storage.
    - Clerk for database and user authentication services.

Benefits of the Tech Stack:

- Enables the development of a robust application.
- Provides a user-friendly interface.
- Ensures security for data and user authentication.
- Facilitates seamless deployment across different environments.

Ethical and Legal Considerations

Building an application involves several ethical considerations, particularly in terms of privacy, data security, fairness, transparency, and potential impacts on individuals involved. here are some key ethical considerations for the project:

Privacy and Data Security:

- Ensures that sensitive user information, such as personal details and documents, is securely stored and transmitted.
- Implement strong authentication mechanisms to prevent unauthorized access to user accounts.
- Encrypt data both at rest and in transit to protect it from potential breaches.

Transparency and Consent:

- Clearly inform users about how their data will be collected, used, and shared within the application.
- Obtain explicit consent from users before collecting and processing their personal information.

Fairness and Bias:

- Ensure that any automated decision-making processes are fair and free from biases that could disproportionately affect certain groups.

User Control and Ownership:

- Allow users to have control over their data, including the ability to edit, delete, and export their information.
- Clearly state the ownership of the data uploaded to the platform and how it will be used.

We believe “Doing good ethically often corresponds closely with good business in the sense that ethically developed products and ethical policies are more likely to please consumers” (Baase, 2012, p.28). When leading ethically our application will tend to follow Deontological theories such as these three main principles, “…We should follow rules of behavior that we can universally apply to everyone”, “…that logic or reason determines rules of ethical behavior, that actions are intrinsically good because they follow from logic”, and “…One must never treat people as merely means to ends, but rather as ends in themselves” (Baase, 2012, p.29).

Team Rules

1. If you are busy, and can’t do the assigned work, please communicate, and let us know.
2. If a group member is absent on class days or for an extended period, they will notify the other team members and the instructors.
3. Plagiarism will not be tolerated. Any team member that plagiarizes will be subject to university policies and a team meeting will be called.
4. Each team member will stay current on their tasks to ensure the project milestones are met. If an event conflicts that will affect the completion of a deliverable, the team member will notify the other team members at least 24 hours in advance of the scheduled due date.

5. All team members are required to attend all scheduled meetings and provide updates to the acting project manager during the meeting. If a team member cannot make a scheduled meeting, they must notify all team members at least 4 hours in advance and provide an update via Teams.
6. All team members will review the oral presentation and final report.
7. All team members will respect the opinions and ideas of each team member, other students, and faculty.

Team Signatures:

Signature: *Raj Sekhon*

Date: 9/14/2023

Signature: *Rishabh Sharma*

Date: 9/14/2023

Signature: *Jaspreet Singh*

Date: 9/14/2023

Signature: *Elizabeth Bissinger*

Date: 9/14/2023

Signature: *Rashminder Gill*

Date: 9/14/2023

Advisor Signature: *yahya M Gilany*

Date: 9/18/2023

References

Baase, S. (2012). *A gift of fire: Social, legal, and ethical issues in computing and internet*. Pearson Education.

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