

Candor Transportation LLC. Scheduler

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Problem Statement:

Describe the Problem:

- Candor Transportation Co. LLC needs an efficient robust web-based scheduling system to facilitate scheduling of inbound and outbound trucks.

Identify the Customer:

- Candor Transportation Co. LLC, a third-party logistics company who will utilize the software.
 - In control of approving the drop off and pick up requests of clients
 - They will be able to schedule drop off and pick up on the calendar
 - They will be able to view the fully populated calendar.

Identify the users:

- Candor Transportation Co. LLC employees.
- Candor Transportation Co. LLC clients who will be using the software to request drop-off and pick-up appointments.

Identify constraints imposed by customer:

- Time: The application must be completed in three months to ensure a seamless transition from the existing solution.
- Scalability: The application must be designed to accommodate the future growth demands of Candor Transportation's Co. LLC operations.

Elicitation Plan:

Plan:

- Develop a website that is able to do 3 main things:
 1. Candor Transportation clients can schedule their drop-offs & pick-ups effectively.
 2. Candor Transportation employees can approve the scheduled drop-offs & pickups of the clients.
 3. Keep track of everything scheduled on a website that doesn't need anything to be downloaded to be used.

Assumptions:

- End-users possess basic computer literacy and have access to an internet connection.
- End-users are comfortable using either a mouse and keyboard or a touchscreen device.
- The warehouse has stable wi-fi.
- The administrator will create login credentials.
- Only the Candor employees and Candor clients will access the website.

Risks:

- Technical Challenges: Development hurdles might arise due to the complexity of the scheduling algorithm and user interface.
- Adoption Resistance: Candor Transportation employees and external companies might initially resist the shift from their familiar systems.
- Data Security: Ensuring the security of sensitive scheduling data against potential breaches is a critical concern

Use Case Scenarios:

Context Diagram: Figure 1

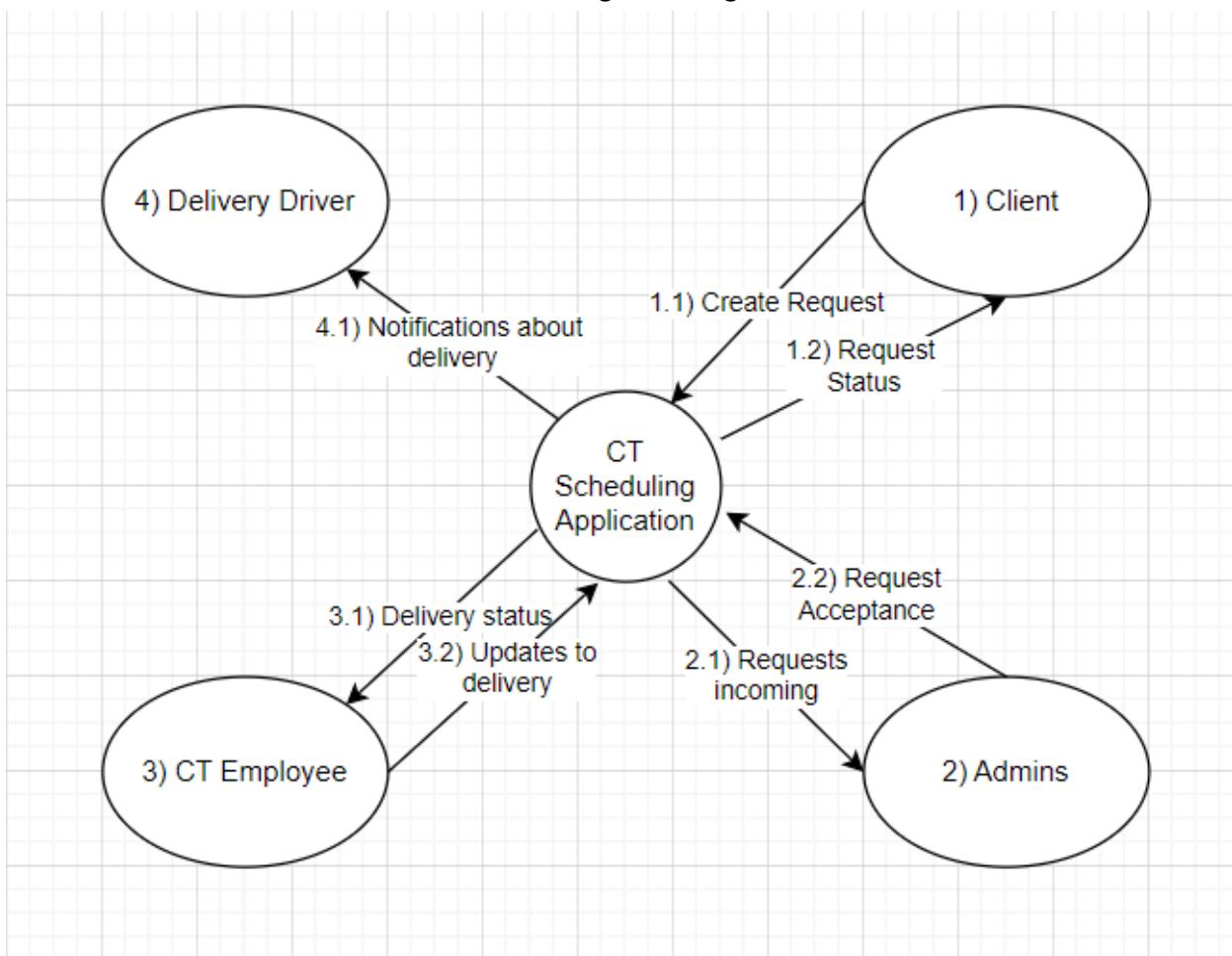


Figure 1 Narrative:

1. Beginning with a client's need for a dropoff or delivery,
 - 1.1. A request is generated by said client.
 - 1.2. Status updates on the request are provided in semi-real-time to the client
2. The request is then sent through the application to an admin.
 - 2.1. Admins will have a full view of all incoming requests

- 2.2. Acceptance and denial of requests is handled at this point.
3. That acceptance status is reflected for both the client (2.2) and a CT Employee (3.1) who will be handling the delivery request. (Requests are granted on a FCFS basis by admins).
 - 3.1. Any other updates made to the request by a client or admin will be reflected to the employee.
 - 3.2. The employee then makes updates to the request as drivers arrive and need direction.
 4. Instructions are sent to the delivery driver.
 - 4.1. Instructions are sent through the scheduling application and arrive at the delivery driver's mobile device

Full Use Case Diagram: Figure 2

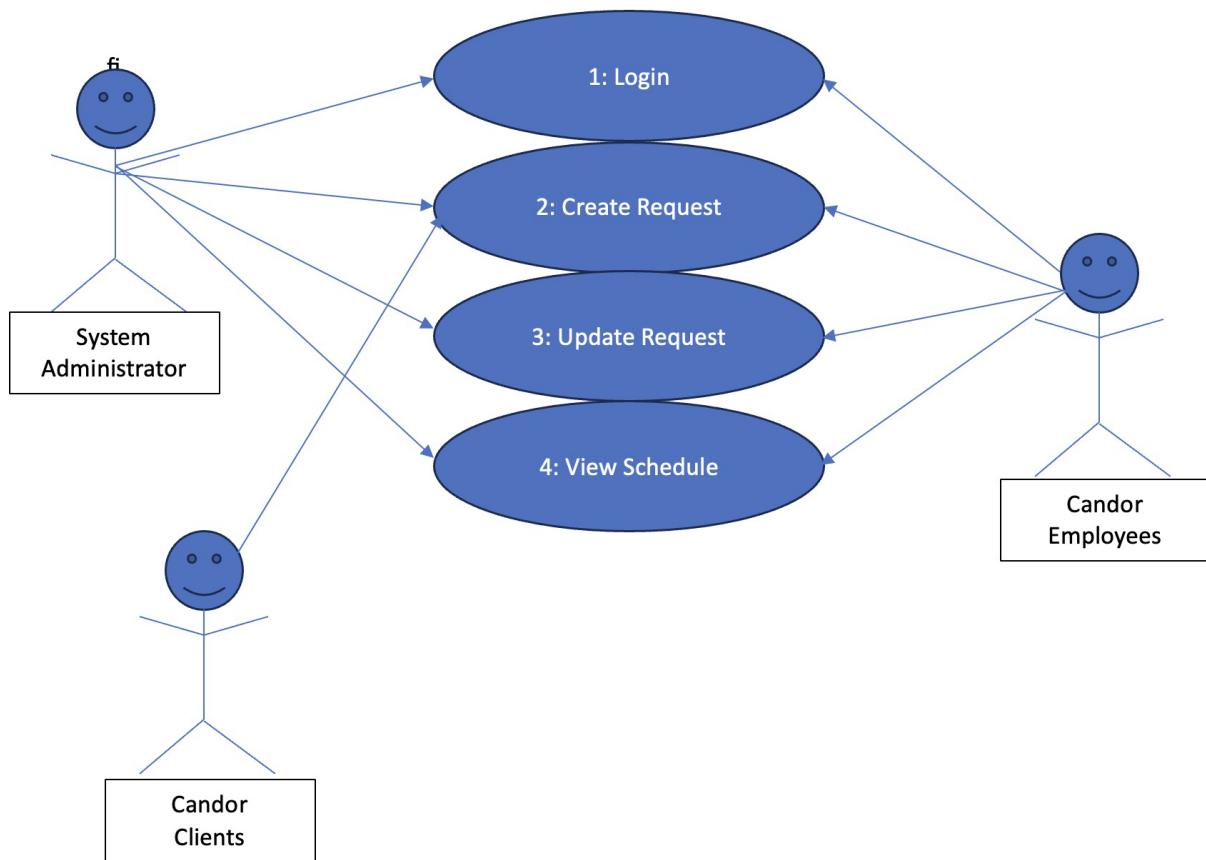


Figure 2 Narrative:

1. The login page will be necessary for employees and admins in order to view or make any updates to a request.
2. All parties are capable of creating a new request as circumstances see fit. Most frequently this will be handled by Clients.

3. Only employees and admins can make updates to a request after it has been created.
4. Only employees and admins will be able to see the schedule of accepted and incoming requests for the day/week/month

Login Use Case Diagram: Figure 3

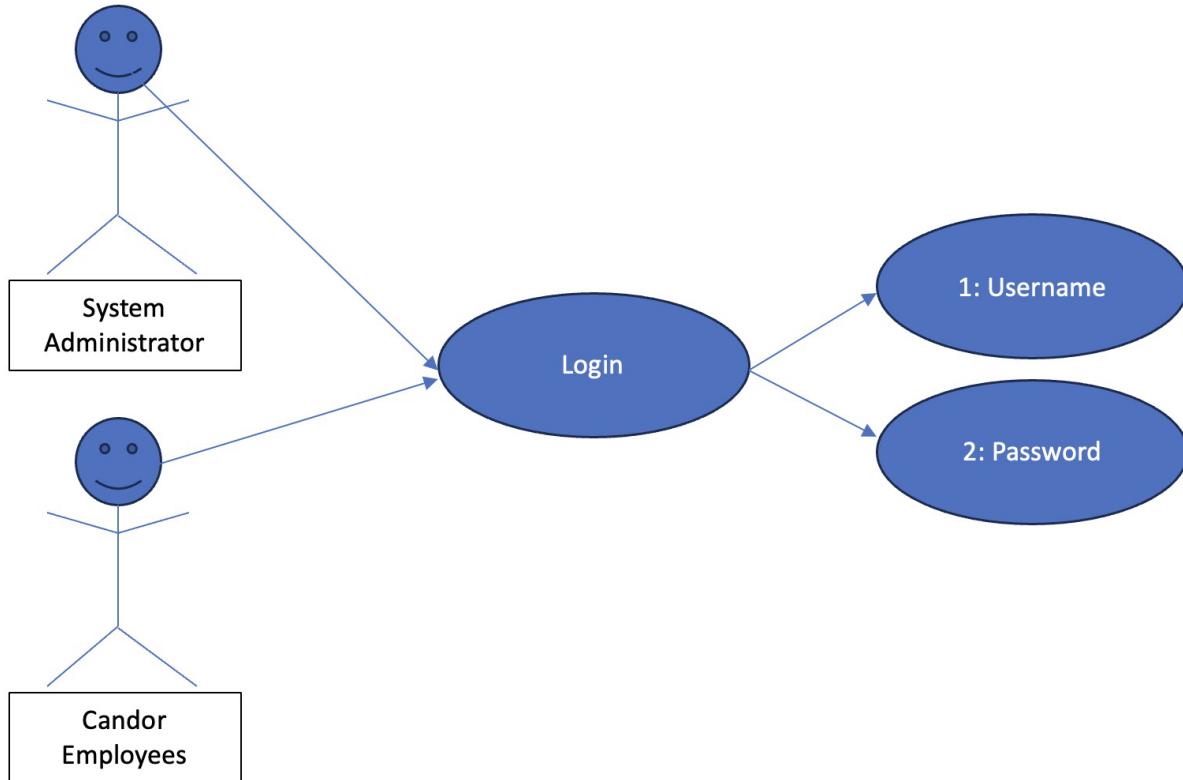


Figure 3 Narrative:

1. System administrators will provide the (1)username and the (2)password to the employees working at Candor.
2. Candor employees will be able to login in the system, and view the calendar of requests made for either pickup or drop off and filter by location.

Create Request Use Case Diagram: Figure 4

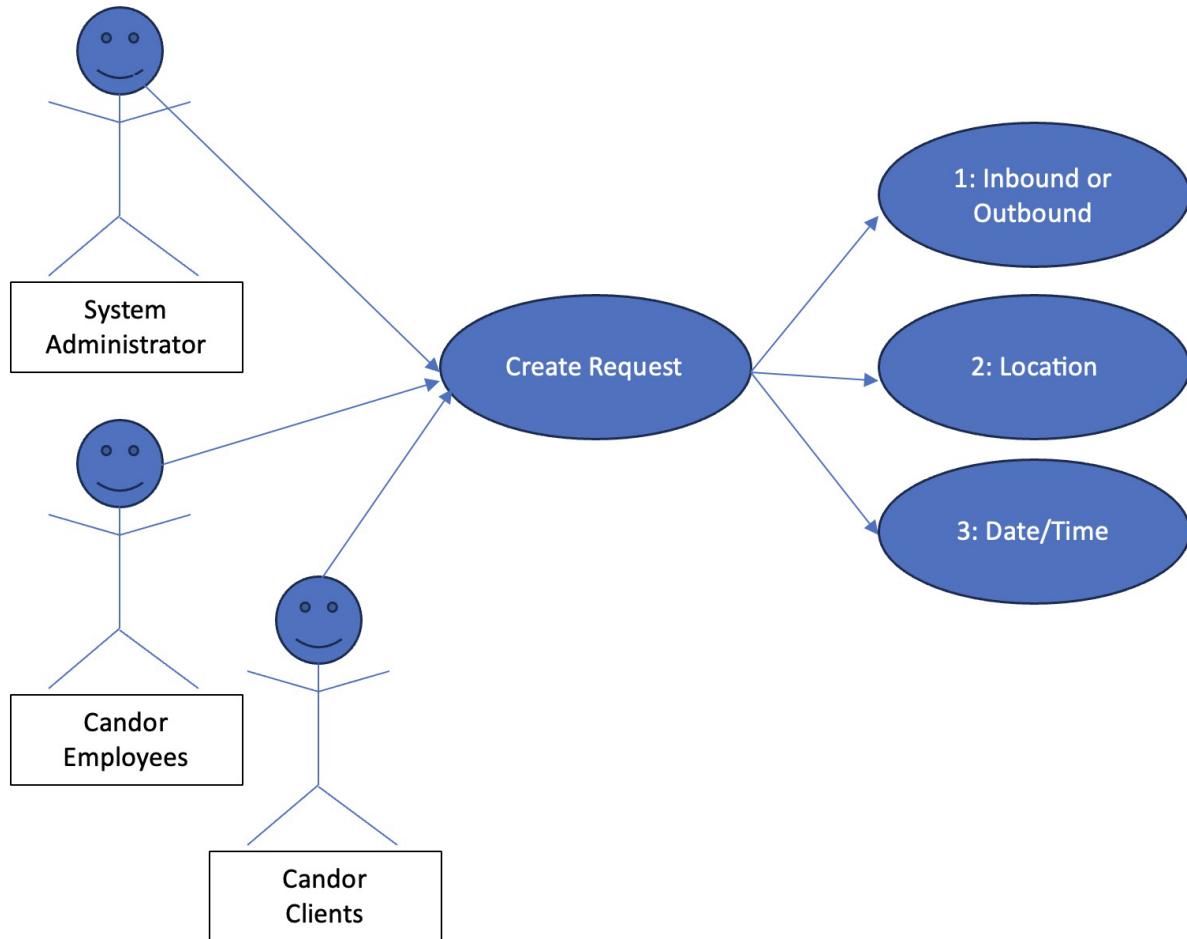


Figure 4 Narrative:

- System administrators, Candor Employees, and Candor Clients will be capable of creating a request
1. Inbound/Outbound information will be modifiable by all parties at the time of creation.
 2. Location information will be modifiable by all parties at the time of creation.
 3. Date and Time information will be modifiable by all parties at the time of creation.

Update Request Use Case Diagram: Figure 5

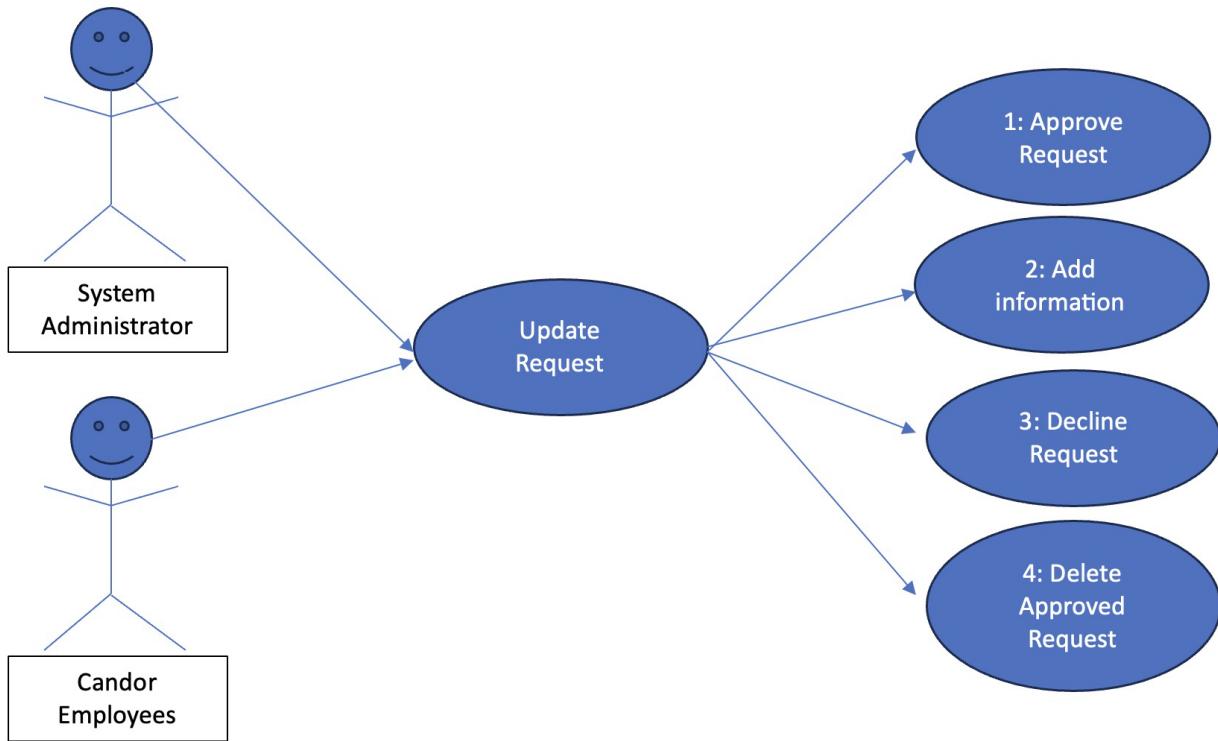


Figure 5 Narrative:

1. Both employees and admins can approve requests
2. Candor employees can update requests which include approved requests and add additional information as needed.
 - a. Certain fields (company name, phone number, and email) are only changeable by admin
 - b. Remaining fields are changeable by both admin and employee.
3. Both admins and employees are able to decline requests.
4. Delete approved requests can only be done by system administrator.

View Schedule Use Case Diagram: Figure 6

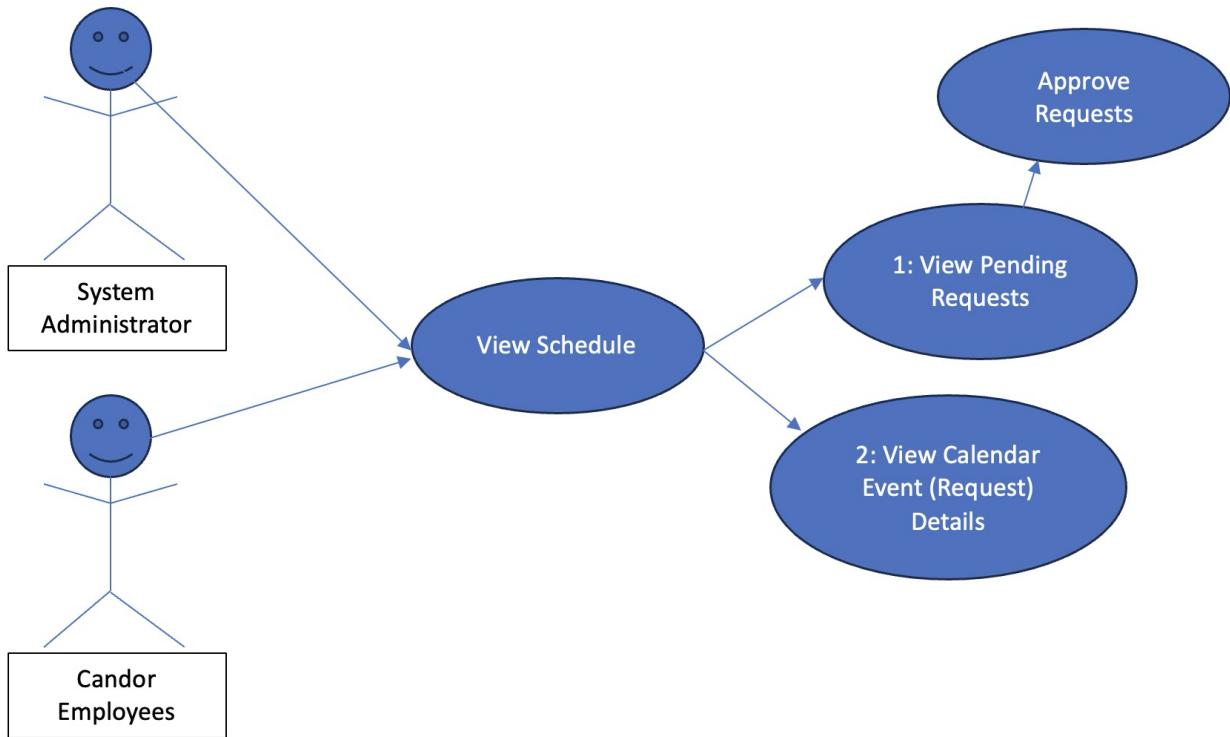


Figure 6 Narrative:

- System Admins and Candor Employees can View the Schedule
 - 1. Both can view pending requests.
 - a. Then subsequently approve or alter requests
 - 2. Both can view the calendar page and details of the requests that are on the calendar.

User Interfaces (screenshots)

Home: figure 7

The screenshot shows the homepage of Candor Logistics LLC. At the top, there is a blue header bar with the Candor Logistics logo on the left, 'PENDING REQUESTS' and 'MAKE A REQUEST' buttons in the center, and a circular 'R' icon on the right. Below the header is a photograph of a large white semi-truck cab parked in front of a warehouse building. The building has a sign that reads 'Logistics LLC' and 'Welcome to CT-Scheduling'. Above the doors of the building, there are five numbered bays (1 through 5). A white callout box is overlaid on the image, containing the text 'CandorTransportationCo.LLC' and a descriptive paragraph about the service. At the bottom of the callout box is a blue button labeled 'REQUEST PICKUP/DELIVERY'. In the footer, there is contact information for Candor Transport, including the address '22801 Aurora Rd Suite 1 Bedford Hts, Ohio 44146', and phone numbers 'P: 866.941.9100', 'P: 216.378.7100', and 'F: 216.378.9232'.

CandorTransportationCo.LLC

Experience seamless logistics management with CT-Scheduling. Our user-friendly platform connects Candor Logistics clients and employees to streamline requests, manage warehouse operations, and deliver top-notch service.

For more information about Candor Logistics and Candor Transportation, visit our websites [Here](#)

REQUEST PICKUP/DELIVERY

Candor Transport
22801 Aurora Rd Suite 1
Bedford Hts, Ohio 44146
P: 866.941.9100 P: 216.378.7100 F: 216.378.9232

- Figure 7 Narrative:
 - If you are not logged-in then it will take the user/ client to the home page.
 - You can also visit candor's current website.
 - Request and pickup delivery can be directly made from here.
 - It has a footer which includes address and the contact information of the company.

Navbar

Fig. 1



^1.1

^1.2

Fig. 2



Fig. 3



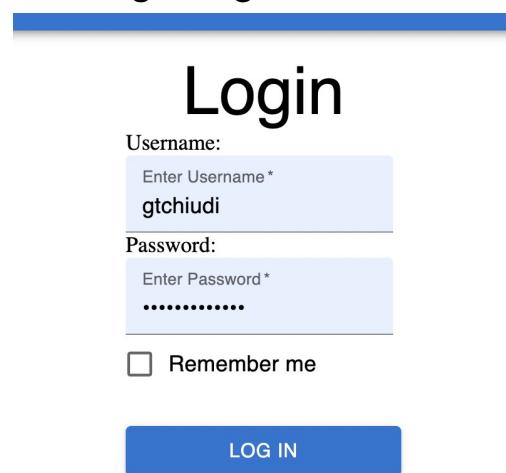
Fig. 4



Navbar narrative:

- If the user clicks the logo in the top left corner (see 1.1) it will return the user to the main page.
- If the user is not signed in they will only see the option to make a request (see 1.2).
- When the user logs in, their navbar will change to give them the option to go to pending requests or the calendar (Fig 4).
- If the user is on the calendar page (and hence signed in) they will be given the option to go to the pending requests page (Fig 2).
 - Likewise if the user is on the pending requests page the user will be given the option to go to the calendar page (Fig 3).

Login: figure 8



The image shows a login form with a blue header bar. Below it, the word "Login" is centered in a large, bold, black font. Underneath "Login", there are two input fields: one for "Username" containing "gtchiudi" and one for "Password" containing several dots. To the right of the password field is a checkbox labeled "Remember me". At the bottom is a large blue button with the text "LOG IN" in white.

Username:
Enter Username *
gtchiudi

Password:
Enter Password *
.....

Remember me

LOG IN

- Figure 8 Narrative:
 - Login page will be used by the candor employees
 - Password and username will be provided by the administrator
 - The page will take you directly to the calendar page

Calendar:

Calendar Full View: Figure 9

Sat	Sun	Mon	Tue	Wed	Thu	Fri
28	29	30	31	01	02	03
		PO #: 19283457498 PO #: 9817234757 PO #: 19283475743 1 More...				
04	05	06	07	08	09	10
				PO #: 123456		
11	12	13	14	15	16	17
			PO #: 9812734578 PO #: 696969696969 PO #: 696969696969 1 More...	PO #: 696969696969 PO #: 7583492837 PO #: 984723789 1 More...		
18	19	20	21	22	23	24
				PO #: 15000		
25	26	27	28	29	30	01

- Figure 9 Narrative:

This is the calendar page that houses all of the scheduled pick ups and drop offs.

9.1. Different views:

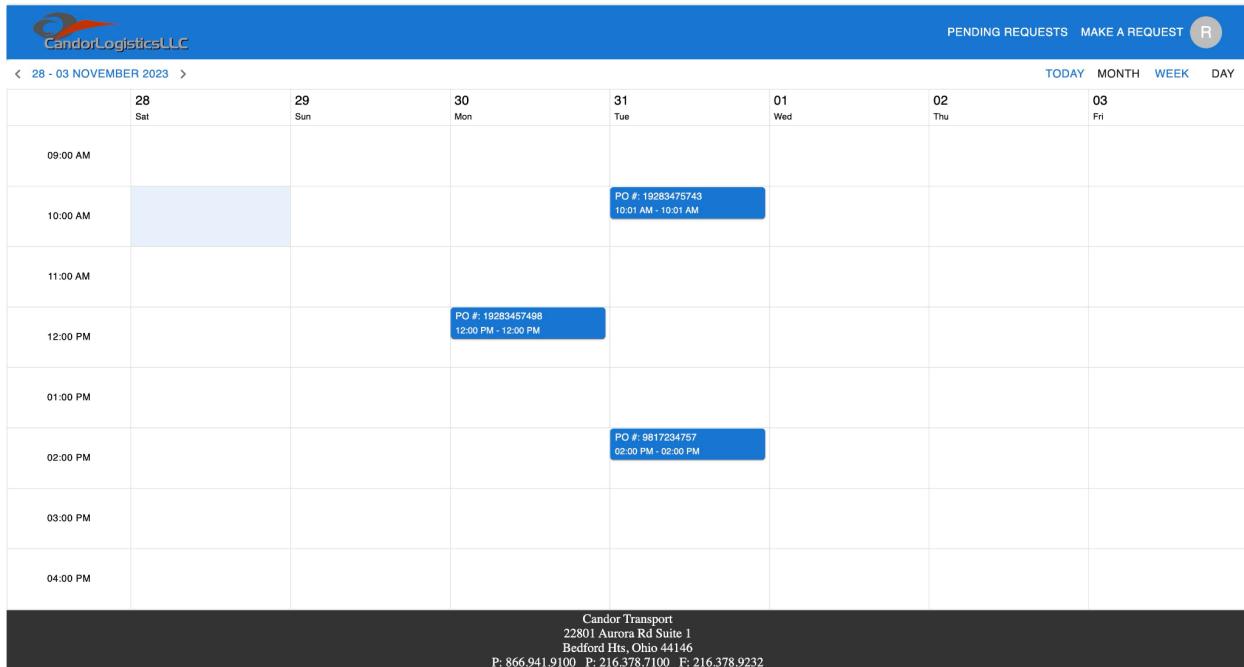
- 9.1.1. Today :Current date is shown in the current range.
- 9.1.2. Month: Month view is shown (figure 9)
- 9.1.3. Week: Week view is shown. (figure 10)
- 9.1.4. Day: The hours of operations viewed by the selected day.
(figure 11)

9.2. This changes the range that is being seen currently

- 9.2.1. The arrows: Allow users to go to the next month, week, or day considering which calendar view.

- 9.2.2. The highlighted date: Allows users to change view to a different month (figure 11) and then a different day in the chosen month (figure 12).
- 9.3. Displays the Purchase Order (PO #) number for the pick up or drop off .
- 9.3.1. Clicking this opens a filled form with more information on the pick up or drop off. (figure 13)

Calendar Week View: Figure 10



- Figure 10 Narrative:

- This is the week view of the calendar.
- The default view is the current week, populated with the pick up or drop off scheduled.
 - The blue square on the calendar represents the Purchase Order (PO #) number of the scheduled pick up or drop off.
 - Clicking on the blue square leads to a filled form with more information on the pick up or drop off (figure 13).

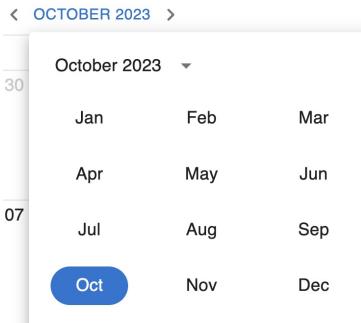
Calendar Day View: Figure 11



- Figure 11 Narrative:

- This is the day view of the calendar.
- The default view is for “Today” or the current day in which you view it.
 - The blue square on the calendar represents the PO number of the scheduled pick up or drop off.
 - Clicking on the blue square leads to a filled form with more information on the pick up or drop off (figure 13).

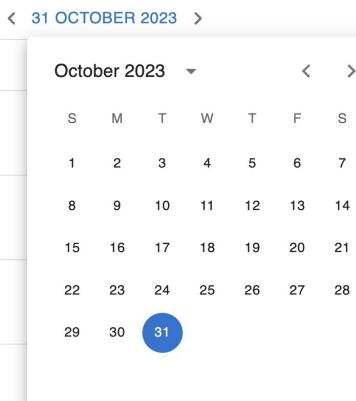
Calendar Month Range : Figure 12



- Figure 12 Narrative:

- This is part of the editable selected range that is on each variation of the calendar.
- The default is the current year and month.
- The drop down menu gives the user the opportunity to select a different year.
- Then the user is allowed to select a different month in the year. Once they decide on a different month the website leads to Figure 12.

Calendar Day Range: Figure 13



- Figure 13 Narrative:

- This is part of the editable selected range that is on each variation of the calendar.
- The default is the current year, month, and day.
- The user is allowed to select the specific date range or date to be shown here. (calendar view dependent) The circle currently showing the left bound of the selected date range.

Calendar Pick Up/ Drop Off Information: Figure 14

PO #: 7587438293857

Company Name
test4

Phone Number

Email
test4@gmail.com

PO Number
7587438293857

Warehouse
Euclid

Load Type
Container

Select for Container Drop

Container Number

10/17/2023 05:00 AM

Delivery

[CANCEL](#)

- Figure 14 Narrative:
 - This is a form that is editable by Candor employees, just in case they would like to edit an already posted request.
 - Please reference figure 15 to further understand what each part means.

Make a Requests:

Create a Pick up or Drop Off: Figure 15

Create Request

Request A Delivery

Company Name *

Phone Number

E-mail *

PO Number *

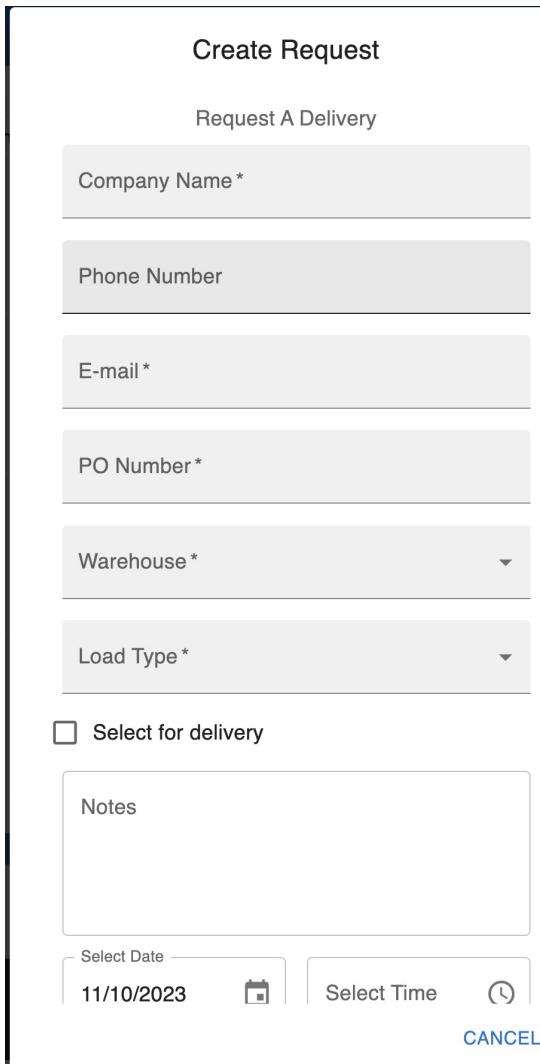
Warehouse *

Load Type *

Select for delivery

Notes

Select Date 11/10/2023 Select Time CANCEL



- Figure 15 Narrative:

- This form is only editable by the Candor employee.
- Company Name: Name of the Candor client who is arranging either the drop off or pick up.
- Phone Number: Phone number of the Candor client.
- Email: Email of the Candor client .
- PO (Purchase Order) Number: PO number is given to the client at the point of sale.
- Warehouse: The selection of Candor warehouse properties.
 - Options being:
 - Aurora
 - Euclid

- Cochran
- Load Type: Is a way to describe the different types of loads a Candor client will have on behalf of the Shipper (Candor Transportation).
 - Options being:
 - Full Load
 - LTL (Less than Truckload)
 - Container
 - Select for Container Drop: This only shows when the user selects Load type being container.
 - The Client will bring the container and drop it in the “yard”, Candor Employees will unload this at a later time.
 - Container Number: This is a unique alpha-numeric combination of seven numbers and four letters used to identify containers internationally.
 - Select Date:
 - Left box: Select the specific month, day , and year.
 - Right box: Select the time of pickup or drop-off.
 - Delivery: If this is clicked then the request is for a drop-off.

Pending Requests Page

Pending Requests: Figure 16

Company Name	Email	PO Number	Load Type	Date Time ↑	Delivery
Posie Poots	pp@gmail.com	41923847574	LTL	10/26/2023 12:00 PM	Yes
Posie Poots	pp@gmail.com	31294875984	Container	11/01/2023 11:00 AM	Yes
Rows per page: 5 ▾ 1–2 of 2 < >					

- Figure 16 Narrative:
 - This is a table of requests that are pending approval.
 - The information here offers a snapshot of the important request information.
 - Company Name, Email, PO Number, Load Type, Date Time, and Delivery
 - Clicking on a table row(that contains a request) to go to the edit and approve request page(refer to Figure 17).
 - Users are able to sort the table by Company name.
 - Users are able to set the number of rows per page, and also switch the pages to go to the overflow rows.

Pending Requests: Figure 17

Edit and Approve Request

Company Name	Posie Poots
Phone Number	
Email	pp@gmail.com
PO Number	41923847574
Warehouse	Aurora
Load Type	LTL
10/26/2023 12:00 PM <input type="button" value="Calendar"/>	
<input checked="" type="checkbox"/> Delivery	
APPROVE REQUEST	
CANCEL	

- Figure 17 Narrative:

- Here the user will edit the pickup or dropoff requests and approve the requests.
- Only the approved requests show on the calendar.

Application Functionality

Functionality:

- What will the system do
 - The system will basically accept the request from Candor Transportation clients, which are subject to approval, then display them in a calendar.
- When will the system do it
 - Whenever the request for the pickup or dropoff has been submitted via the web application. It will be available 24/7.
- What kind of computations/data transformations must be performed

- Data is changed when a Candor employee changes a request.
- What are the appropriate reactions to possible stimuli?
 - User finding the request form from the homepage based on multi-button display
 - Candor employees logging in with ease

Data:

- For both input and output, what should be the data format
 - To input data should be a form format.
 - To output data should be in a calendar.
- Must any data be retained for any period of time
 - All data is retained permanently, for the time being.

Third party systems used:

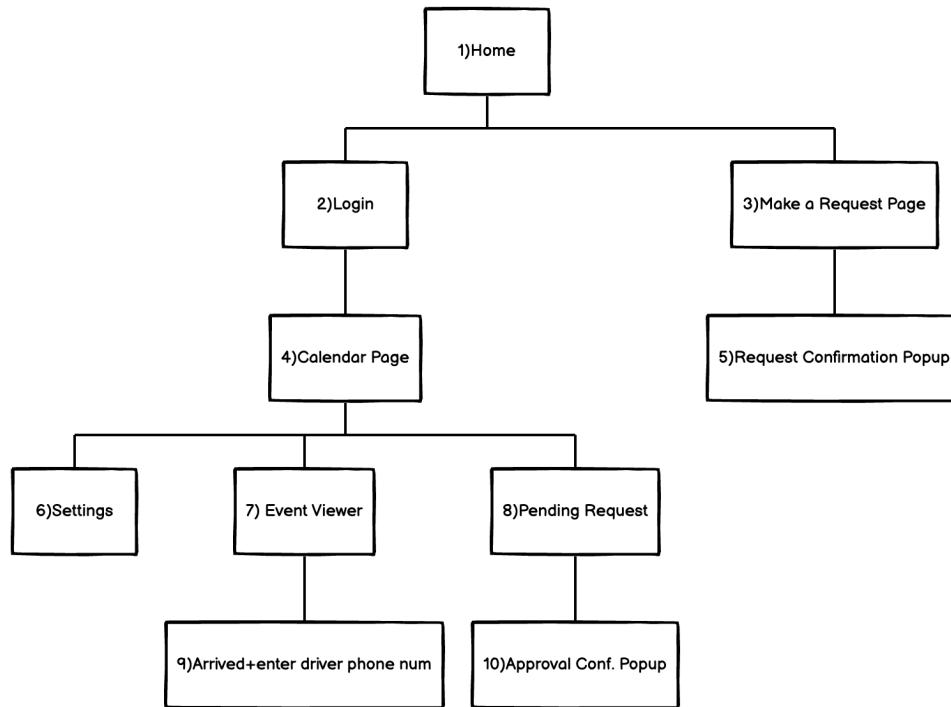
- PythonAnywhere: PythonAnywhere is a cloud-based hosting service for Python web applications. It allows developers to develop and deploy Python applications in the cloud without having to worry about system administration tasks such as server setup and maintenance.
- MaterialUI: Material UI is a popular React UI framework that implements Google's Material Design. It provides ready-to-use components that help to build attractive, consistent, and functional web pages and web applications while adhering to modern web design principles like browser portability, device independence, and graceful degradation.
- React: React is a JavaScript library for building user interfaces, primarily for single-page applications. It's used for handling the view layer in web and mobile apps. React allows you to design simple views for each state in your application, and it will efficiently update and render the right components when your data changes.
- NPM(Javascript): NPM (Node Package Manager) is a package manager for the JavaScript programming language. It is the default package manager for the JavaScript runtime environment Node.js. It consists of a command-line client, also called npm, and an online database of public and paid-for private packages, called the npm registry.
- Django: Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design. It provides developers with a complete set of tools and features for building web applications, including an ORM, template engine, routing system, and more. It's designed to help developers take applications from concept to completion as quickly as possible.
- Django Rest framework: Django Rest Framework, often abbreviated as "DRF", is a powerful and flexible toolkit for building Web APIs in Django. It provides a set of views, serializers, and other utilities that make it easy to

build, test, and debug RESTful APIs. It also comes with built-in support for authentication, permissions, pagination, and more.

- Vite: Vite (French word for "fast", pronounced /vit/) is a new build tool from Evan You, the creator of Vue.js. It provides a faster and leaner development experience for modern web projects. It offers features like instant server start, hot module replacement, and true on-demand compilation.
- Jotai: Jotai is a primitive, flexible state management library for React. It's focused on providing the simplest API possible without sacrificing the performance and scalability of your application. It's based on the concept of "atoms", which represent individual pieces of state and can be composed together to build complex state structures.
- ReactQuery: React Query is a data fetching and state management library for React. It makes fetching, caching, synchronizing, and updating server state in React applications a breeze. It offers features like automatic caching, background updates, and synchronization .
- JWT (JSON Web Tokens): JWTs are a compact, URL-safe means of representing claims to be transferred between two parties. In our context, it's used for authentication and secure information exchange. Claims in a JWT are encoded as a JSON object that is used as the payload of a JSON Web Signature (JWS) structure or as the plaintext of a JSON Web Encryption (JWE) structure, enabling the claims to be digitally signed or integrity protected with a Message Authentication Code (MAC) and/or encrypted freecodecamp.org.

Systems Architecture /Software Design

System Architecture: Figure 18

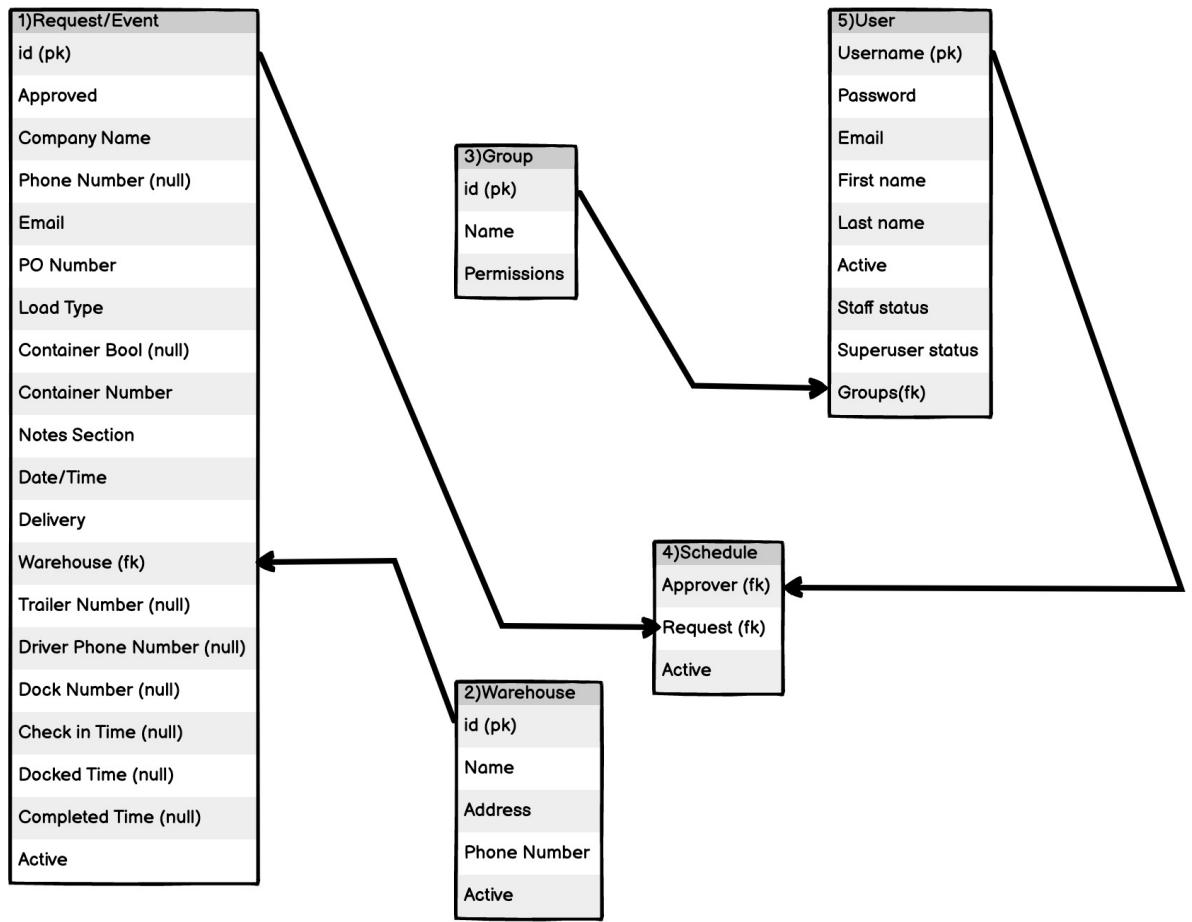


Description of Components: (See Fig. 7)

1. Home: This gives anyone visiting the site a quick overview of what CT-Scheduling is as well as a link to Candor Transportation's website and navigation options to the site's login and request form submission.
2. Login: This component exists to allow Candor employees the ability to login, then access and edit information regarding requests via the components below
3. Make a request page: This exists as a way for clients of Candor to request deliveries and drop off appointment windows as well as include information regarding the shipping request. CT employees will also be able to use the make a request page for creating requests.
This page makes use of a reusable and dynamic form which will be employed throughout the site.
4. Calendar Page: The calendar exists to provide Candor employees a visual guide to their day/week/month as it pertains to upcoming approved requests. It acts as a homepage for logged-in users. The calendar will also make use of the display form to show information to employees and allow them the ability to progress a request.
5. Request Confirmation popup: This exists to give the person creating a request a chance to verify that what they are submitting is accurate.

6. Settings: This page will allow users to modify their information such as email, phone number, etc.
7. Event Viewer: The event viewer will be a pop-up from the calendar page that gives information regarding a particular request. This will be used for progressing any requests that the employee has for the day/week/month. It also makes use of the dynamic form for showing users information.
8. Pending Requests: This is a table of requests that still need to be accepted. The table was created for Candor employees to select pending requests and view/edit information regarding these requests. This table makes use of the dynamic display form for showing then editing and approving requests.
9. Arrived + enter driver phone number: This component will stem from the event viewer component. The Candor employee will press a button triggering a confirmation message and a field to input the driver's phone number. Thus adding their phone number to the request. That will be used for direct communication from Candor to the truck driver.
10. Approval confirmation popup: This will display from the table on the pending request page. Once an employee accepts a request this will make sure that the employee is certain of their acceptance and give them a second chance to review the information or even deny the request.

Database Schema: Figure 19



Description of DB Schema: (See Fig. 8)

1. This table contains a master list of all information required by our stakeholder for their clients' appointment information. After approval of the request, candor employees will be adding information relating to the status of a request.
2. This table contains all information relevant to the warehouses operated by Candor Transportation. The table is separated from the request table as different requests will require different warehouses.
3. This table contains information relevant to a particular user. It will be used in determining the functions available to a user (employee) once they have logged in.
4. The schedule table will be used to track when a request gets approved and which user approved it.

5. The user table contains all information relating to Candor employees with login information. The information for a user will be modifiable by them once logged in excluding their password.

Architecture Rational:

- Performance: The site is constructed using React.JS which allows components to be dynamically loaded based on the path in the URL. This reduces computational overhead and allows for faster loading of functions within the web-app.
- Adaptability: The web-app has been created in such a way that new capabilities can be added with ease to adapt to ever changing stakeholder needs.
- User-Interaction: Users will interact with the website via various forms and buttons on each page. The interaction of the website is designed to be as familiar as possible to existing sites that users will already be acquainted with to make navigation and interaction easier.
- Technology: For front-end development, the system is built on Javascript library React which uses MaterialUI components because the language is responsive to multiple platforms and easier to use and manage. While for back-end development, django because it is known for its fast execution, server start, and easy for plug-ins. The system also uses some React-query to handle data fetching and django rest framework for the API.
- Security: The system uses django's REST framework to prevent sql injections, stores password in encrypted manner, checks for authentication of the user, etc.
- Availability: The system should be available any time of the day. It is currently hosted on pythonAnywhere (subject to change). The system will be updated in a timely manner to ensure no-fault.

Quality

Performance:

- Are there constraints on execution speed, response time, or throughput
 - None, <100ms, unknown
- How much data will flow through the system
 - Unknown
- How often will data be received or sent
 - Many times per day

Usability and Human Factors:

- What Kind of training will be required for each type of user
 - How to log in to the system
 - How to make a request for delivery
 - Process for receiving and sending out delivery

- How easy should it be for a user to understand and use the system
 - It should be really intuitive because it was set up with the understanding that the main users of this system have a low technical understanding.

Security:

- Who must access the system or information
 - Candor Clients
 - Candor Employees
- Should each user's data be isolated from other users?
 - Yes
- Should user programs be isolated from other programs and from the OS
 - Isolated from other programs
 - Requires knowledge of OS for display

Reliability & Availability:

- Must the system detect and isolate faults
 - Yes.
- What is the prescribed mean time between failures
 - > 1 month
- Is there a maximum time allowed for restarting the system after a failure
 - < 24 hours
- How often will the system be backed up?
 - Daily
- Must back up copies be stored at a different location?
 - Yes, backups will be stored separate of system location

Maintainability:

- When and in what ways might the system be changed in the future
 - System can be adopted to be implemented for different companies
- How easy should it be to add features
 - With the system being pretty modular, adding features would be easy.

OA&M (operations, administration, and maintenance)

Operations:

- Creating Pickup & Drop-off Requests:
- This will be done by both Candor Transportation employees and clients.
- Approving Pickup & Drop-off Requests:
- This will only be done by Candor Transportation employees.
- Viewing the populated calendar in month and day formats
- This will only be available for Candor Transportation employees.

Administration:

- The account information (password, username) is created by the system administrator.

Maintenance:

- The system will be put through maintenance once every two months to make sure everything is up and running correctly, no security breaches, and works efficiently.

Error Recovery

Define Errors the system needs to proactively detect:

- Denial of service attacks, detect traffic flow on website servers.
- Permissions for Candor clients, they should only be able to make pickup and dropoff requests. Candor clients should not be able to see the full Calendar or be able to approve their own requests.

Define what needs to be done during error recovery:

- Restore a database snapshot.

Summary / Conclusion

Summary of the system:

- The system we have created for Candor Transportation Co. LLC is a robust schedule management system. It allows for Candor clients to request pick-up/drop-off in a certain time frame. Then, the Candor Employee approves the pick-up/drop-off requests from the client. On top of having the ability to approve requests, a candor employee is able to make requests as well. Finally, all of the approved pick-up and drop-off requests are populated on to a main calendar.

Future work:

- Email & text employees when their requests are approved with the dock number for the pick-up/ drop-off.
- Have pop-ups throughout the navigation of the websites as a way of double checking what the client and the employees are submitting.

Acknowledgement:

- Thank you Candor Transport Co. LLC for allowing us to create a solution that provides scheduling efficiency.

Project Timeline