

BUSINESS MARKETPLACE/AGGREGATOR



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Company: SFDevShop

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Class: CS690 Fall 2022

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1. Project Overview

1.1. Sponsor

Sponsor's organization	SF DEV Shop
Sponsor	Jose Alvarado
Email	josealvarado111@gmail.com
Relation with the Sponsor's company	The current project has started from scratch and is not related to the Sponsor's company.

1.2. Project Motivation

1.2.1. System Overview.

- We are building a user-friendly website with attractive dashboards, which help Brokers or business owners to post their businesses on the website, and buyers can browse and buy based on their preferences.
- Users can search by text and filter based on the parameters like type, price, etc.
- Sellers can provide the necessary documents to support their listings.
- Ads and monthly fees will monetize the platform.

1.2.2. Overall Purpose

- Current competitors don't provide an option for sellers to search/filter/sort the businesses they have listed on websites. Our website will provide such an option for sellers for their convenience.
- Sometimes, buyers wish to create multiple favorite listings based on their criteria like type, price, etc. existing platforms don't have that option. Our website will provide that.
- In the existing platform, the only way for buyers to connect with sellers is via email, and emails are ignored most of the time. Our website will resolve these issues by offering email and ChatApp communication methods.
- Existing platforms are very old and need to be updated from a design perspective. Our platform will provide the end user more attractive UI.

1.3. Project Description

The main motive for this project is to allow users to browse through the businesses as per their preferences and to allow them to contact the owner/broker of the business via email. Authorized users can save the business to their favorite list, and authorized owners, the broker, can post new businesses and edit it. Based on particular searches, Authorized users can set up email notifications immediately, daily, or weekly.

1.4. Comparative and Competitive Systems

1.4.1. Competitors:

BizBuySell & BizBen

They are an online company marketplace where users may search for businesses to buy or list one they already own for sale. BizBuySell is available for the entire US, whereas BizBen is only available for California.

1.4.2. Comparisons:

	BizBuySell & BizBen	Business Marketplace
Favorite	Only one list containing all the saved business	Users can create multiple favorite listings like Amazon.
Contact Seller	Can contact via email.	Can contact via email and an inbuilt chat application
User Interface	Old and hasn't been updated in a while	Attractive user interface. Up to date with the current time.
Search/Sort/Filter	Is not supported in My Listings and Favorite Listing.	Is supported in My Listings and Favorite Listing.

1.5. External Systems

We are using Cloudinary to store photos uploaded by users.

2. Users

2.1. Intended Users

The following are the types of users of the system:-

- Buyer - Individual who is interested in buying a business.
- Owner- Individual who owns the businesses and wants to sell them.
- Broker- Licensed and verified individual who posts the business for sale on behalf of the business owner.

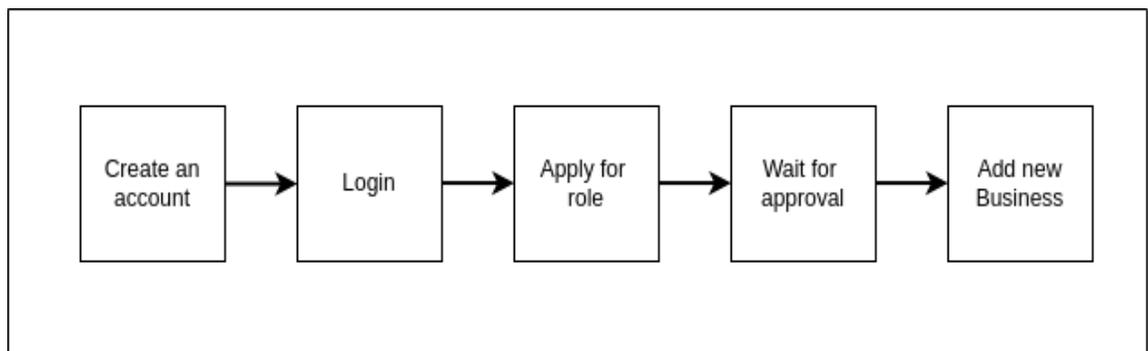
2.2. User Goals

2.2.1 Goals:

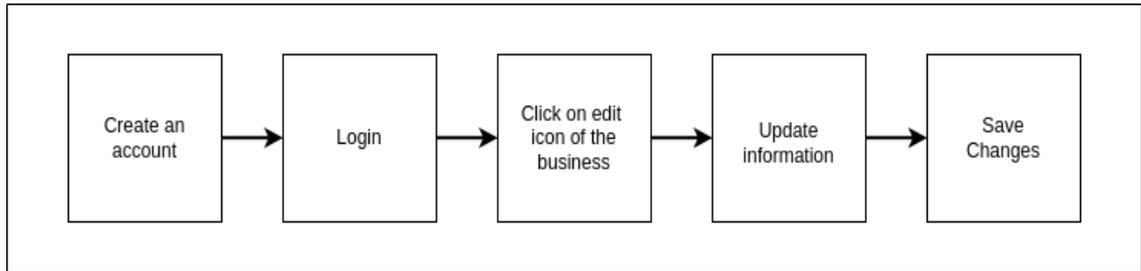
Buyer:	By default, all users are buyers, and their roles are to browse businesses for buying purposes. They can contact Sellers (Owner/Broker) via Email. They can save the listings which they like.
Owner:	The business owner must apply for the role before posting the business. They can add new business once approved by the Admin. They can edit their businesses. Owners can only post businesses that they own.
Broker:	The broker must apply for the role before posting the businesses. They can add new business once approved by the Admin. They can edit their businesses. Brokers can post the businesses of multiple owners.

2.2.2 Workflow Diagrams:

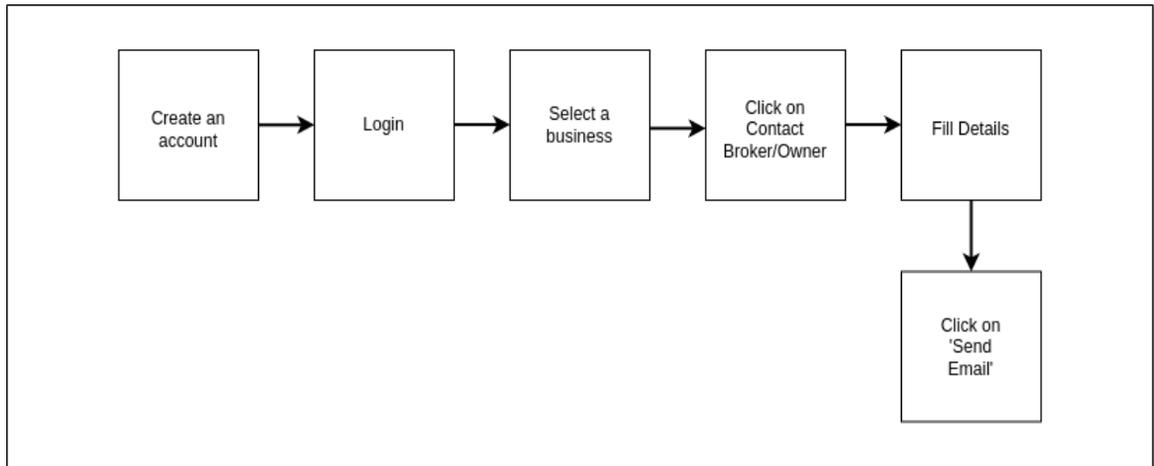
Activity: Selling a business (Owner/Broker)



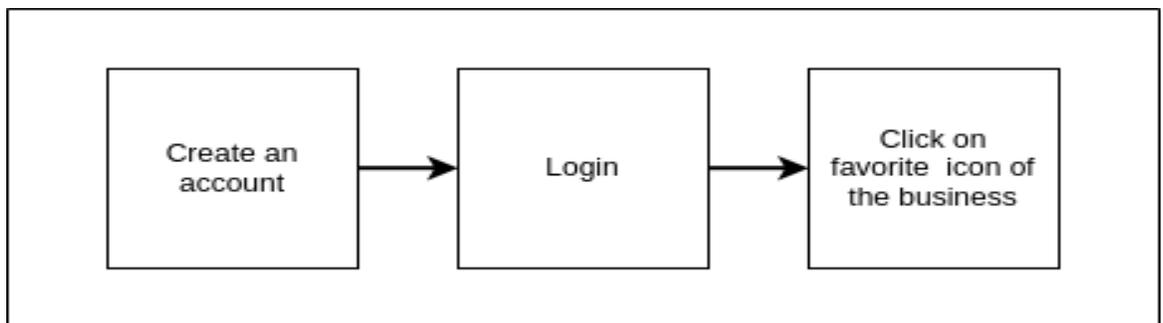
Activity: Edit the business



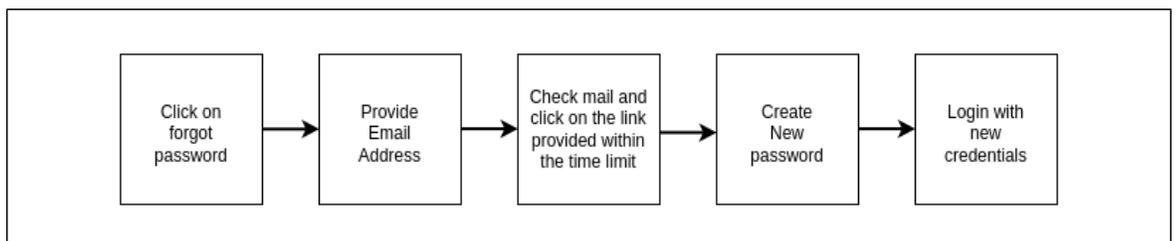
Activity: Buyer contacting owner/broker



Activity: Saving the listing



Activity: Forget password



2.3. Use Environment

The users can interact with the website via the browser. The website is primarily made for and available to people who want to sell or buy businesses.

Buyers must be proficient enough to look for the location, price, license, etc., during browsing.

3. Terminology

3.1. Definitions and Acronyms

EIN	Employer Identification Number, also known as Federal Tax Identification Number, is used to identify a business entity.
JWT	Stands for JSON Web Token, a compact URL-safe means of representing claims to be transferred between two parties.
Revenue	Revenue is the money generated from normal business operations, calculated as the average sales price times the number of units sold
Cashflow	Cash flow refers to the net balance of cash moving into and out of a business at a specific point in time
Monetization	Monetization means converting everything to money.
Hashing	Hashing is the process of transforming any given string of characters into another value/code.
API	API stands for Application Programming Interface, which is used for communication between two hosts.
Version control	A system used to maintain records of changes to one or more files over time so that you can recall specific versions later.
Git	It is an open-source distributed version control system.
ESLint	ESLint is a static code analysis tool for identifying problematic patterns in JavaScript.
Access Token	Access tokens are used in token-based authentication to allow an application to access a protected API.
Interceptor	Axios interceptors are the default configurations that are added automatically to every request or response that a user receives.
SMTP	The Simple Mail Transfer Protocol is an Internet standard communication protocol for electronic mail transmission.
Refresh Token	A refresh token is a special token that is used to obtain additional access tokens.
Cookie	An HTTP cookie (web cookie, browser cookie) is a small piece of data that a server sends to a user's web browser.
CORS	Cross-origin resource sharing is a mechanism that allows restricted resources on a web page to be requested from another domain outside the domain from which the first resource was served.

4. Project Functionality

4.1. Core Features: Minimal Viable Product (MVP)

Feature	Description
Sign-up	Users can create accounts on this platform using email and password.
Login	Users can log in to the system using a username and password. If they are valid users, then they will be logged in to the system.
Logout	Logged-in users can log out by clicking on the logout button.
Change the password	Users can change their existing password.
Forgot password	If the users forget the password, they can change their password and log in using a new password.
Update email address	Users will be allowed to change their email addresses. Users need to verify the email address before updating.
Edit profile	Registered users can edit their profile information after logging in.
Role (Owner, Buyer, Broker)	Each user will have a Buyer role by default, and they can apply for Broker and Owner roles.
Add business	Brokers or Owners can post their businesses to sell by providing the following information: <ul style="list-style-type: none">• Title, city, state, asking price, revenue, cash flow, description, Reason for selling,• Type of business: restaurant, cleaning, health, software, etc.• Can attach max 15 images (Max size: 2MB)
Edit business	Owners and Brokers can change details, add new photos, and remove old ones for their listed businesses.
View Business	Users can view all the information regarding the business, like title, price, location, photos, etc.
View all businesses	View all the businesses listed by Owners/Brokers on the home screen.
Search/Filter/Sort Options	Users will see a dashboard where they will be able to search by keywords in the title, filter using any of the following [type of business, location, price min, price max], and sort using any of the following [asking price, revenue, cash flow].
My Listing	Users will be able to see all the listings which they have posted.
Contact Owner/Broker	Authenticated buyers can contact the Owner/Broker via Email.
Favorite Listing	Users can favorite/unfavorite listings.

Saved Searches	Users can save filter preferences and can set up email notifications for them.
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4.2. User Stories

Role	Functionality	Description
Buyer/Broker/ Owner	Logout	As a Buyer/Broker/Owner, I want to log out from the website so that nobody can access my account from the same system.
	Forgot password	As a Buyer/Broker/Owner, I want to be able to reset my password when I forget the current one so that I can log in to my existing account without creating a new one.
	Update email address	As a Buyer/Broker/Owner, I want to be able to change the email address so that I can use a different email to access my existing account.
	Edit Profile	As a Buyer/Broker/Owner, I want to be able to edit my profile details, like phone number, so that I can keep my profile up to date.
	View Business	As a Buyer/Broker/Owner, I want to view all the details of a business, like photos, description, price, etc., so that I can decide if the business fits my requirements to buy.
	View all Businesses	As a Buyer/Broker/Owner, I want to be able to browse the businesses being listed till now so that I can have multiple options to choose from.
	Search/Filter/Sort Options	As a Buyer/Broker/Owner, I want to be able to put some filters or search by keyword or sort by when viewing the businesses so that I can view only the businesses in which I am interested.
Buyer	Sign up	As a Buyer, I want to create an account so that I can contact the seller of the business, save the business for future reference and apply for a Broker/Owner role if I want to sell the owned business.
	Login	As a Buyer, I want to be able to log in with my credential so that I can contact the seller of the business, save the business for future reference and apply for a Broker/Owner role if I want to sell the owned business.
Broker	Sign up	As a Broker, I want to create an account so that I can apply for Broker and add new business to sell.

	Login	As a Broker, I want to log in with the credentials so that I can view all my listed businesses and add new businesses to sell as a Broker.
	Apply for Role	As a Broker, I want to apply for the Owner's permission so that I can add/edit my businesses to sell as an Owner.
	Add business	As a Broker, I want to add a business to sell with the details like title, city, state, asking price, revenue, cash flow, description, the reason for selling, type of business, and images so that interested Buyers can contact me.
	Edit Business	As a Broker, I want to edit my business so that I can keep my listing up-to-date.
Owner	Sign up	As an Owner, I want to create an account so that I can apply for Owner and add new business to sell.
	Login	As an Owner, I want to log in with the credentials so that I can view all my listed businesses and add new businesses to sell as an Owner.
	Apply for Role	As an Owner, I want to apply for Broker permission so that I can add/edit my business to sell as a Broker.
	Add business	As an Owner, I want to add a business to sell with details like title, city, state, asking price, revenue, cash flow, description, the reason for selling, type of business, documents, and images so that interested buyers can contact me.
	Edit business	As an Owner, I want to edit my business so that I can keep my listing up-to-date.

4.3. Extended Features

Feature	Description
View particular business	The page can have some analytics about the listing, like how many people have viewed the business, how many people have contacted the seller, how many people saved the business as a favorite, etc.
	The page can show similar listings at the bottom of the page.
Saved Businesses	Authenticated users can create multiple favorite lists for saving businesses.
Listing state	State of listing: Initial state is always active when creating it.
	Other states: Pending, Sold, Unlisted.

	Only listings with an active state can be searched for. All other states are hidden from search.
Admin Page	There will be an admin page for the admin from where they can approve user role requests.
Chat Application	This platform will have a built-in chat application that logged-in users will use to contact the Broker/Owner of that business.
Monetization	Advertisements
	Charge sellers a monthly fee
Business from similar platforms	Crawl similar platforms and take their listings and add them under the admin account
Deployment	Deploy project to Cloud and run it with HTTPS protocol.

4.4. Non-functional Requirements

4.4.1 Security and Privacy requirements:

- We are hashing passwords using bcrypt and storing the hashed passwords in the database for security purposes.
- We use JWT for User Authentication.

5. Technology & Tools

5.1. Technical Stack

5.1.1. Packages:

	Packages		Description
Frontend	Code Frameworks	React.js	Front-end javascript library for building user interfaces.
	User Interface frameworks	Material UI	For re-using fully loaded components for a better user-friendly UI experience.
	Third-party packages	react-hook-form	For input validation
		swiper	For image gallery
		mui-file-dropzone	For image upload section
	Client Server	Axios.js	Promise-based HTTP client for Node.js and browser
Backend	Code Frameworks	Node.js	Back-end javascript runtime environment
	Web Application Framework	Express.js	For building RESTful APIs for backend service running with Node.js
	Third-party packages	bcrypt.js	This is good for password hashing as the original password could not be guessed even if the system was attacked.
		cloudinary	For storing images to avoid keeping image data in the database.
		dotenv	Using for keeping constants specific to the environment where we are running the project like JWT secret key, nodemailer service provider (Gmail/Yahoo), etc.
		cors	CORS package provides middleware that can be used to enable Cross-Origin Resource Sharing.
		jsonwebtoken	This package helps with creating JSON Web Token(JWT) which is used for user authentication.

		Nodemailer	Using this package to send the email to the user.
		Sequelize	Sequelize is an ORM(Object Relational-Mapper). Using it because it makes managing a SQL database easy.
Database	PostgreSQL		Using this as Relational Database Management System.

5.1.2. Other Requirements:

Backend Environment Variables:	<p>Need to create .env file and provide correct values</p> <p>DB_USERNAME= <Database username> DB_PASSWORD= <Database password> JWT_SECRET= <Any string> JWT_REFRESH_SECRET= <Any string> JWT_RESET_PASSWORD_SECRET= <Any string> CLOUDINARY_NAME= <Cloudinary instance name> CLOUDINARY_API_KEY= <Cloudinary API key> CLOUDINARY_API_SECRET= <Cloudinary API Secret> NODE_MAILER_HOST= <SMTP server ex. smtp.gmail.com> NODE_MAILER_EMAIL= <Email> NODE_MAILER_PASSWORD= <Password> WEB_LINK= <Frontend URL></p>
Database requirement:	Need to create a database with the name as 'BMA'
	<p>Need to execute the "scripts.sql" on BMA database using terminal or pgAdmin4</p> <p><i>Command:</i> \$ psql -U postgres -d BMA -f "scripts.sql"</p>
Project Deployment environment:	Running locally

5.2. Development Tools

Development Tools	Visual Studio	For coding
	Postman	For testing APIs
	Browser (Google Chrome, Firefox)	For viewing UI
	Terminal & PG4Admin	Interacting with DB
Version Control	GitHub	
Coding Guidelines	Keeping react component file name's first letter as capital	
	Using camel case for variable initialization	
	Using ESLint for code formatting	

5.3. Testing

We have used

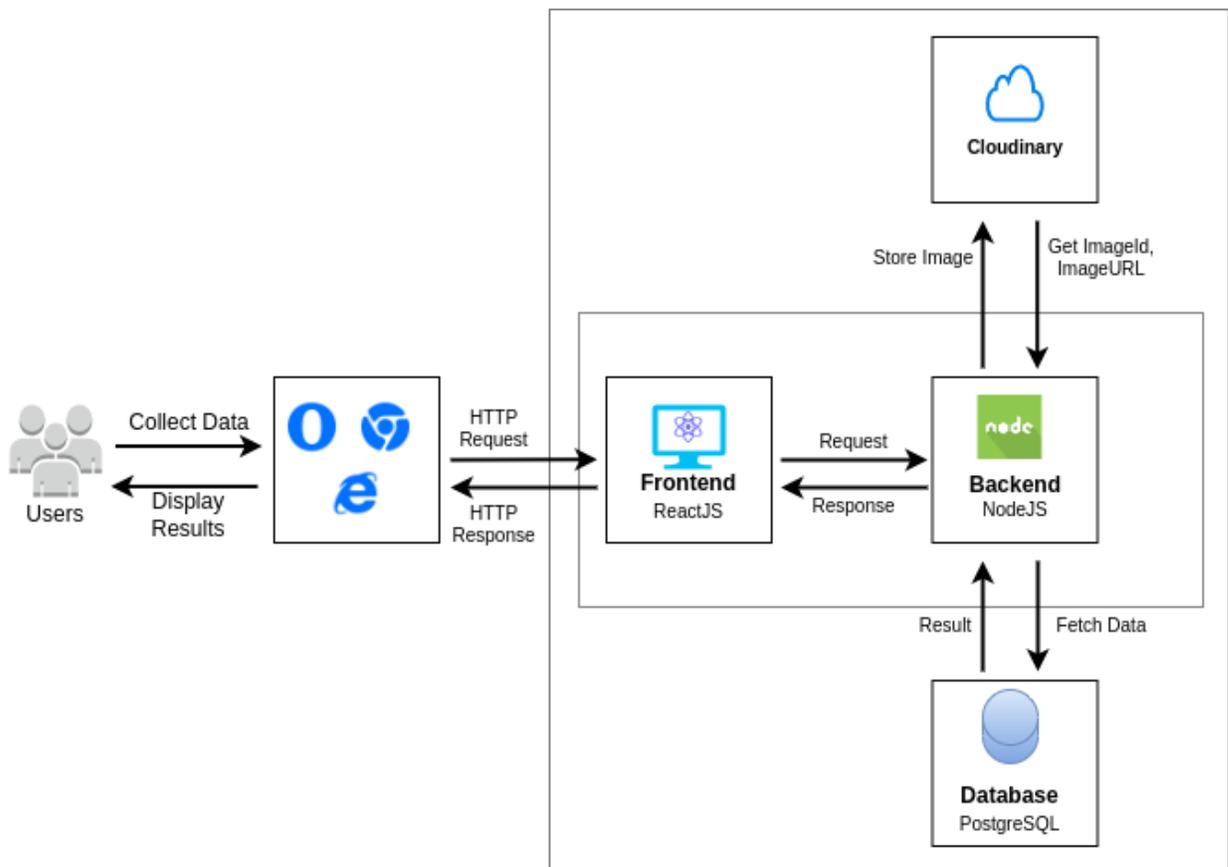
- Postman - For testing back-end RESTful APIs
- Browser - For manual testing front-end UI

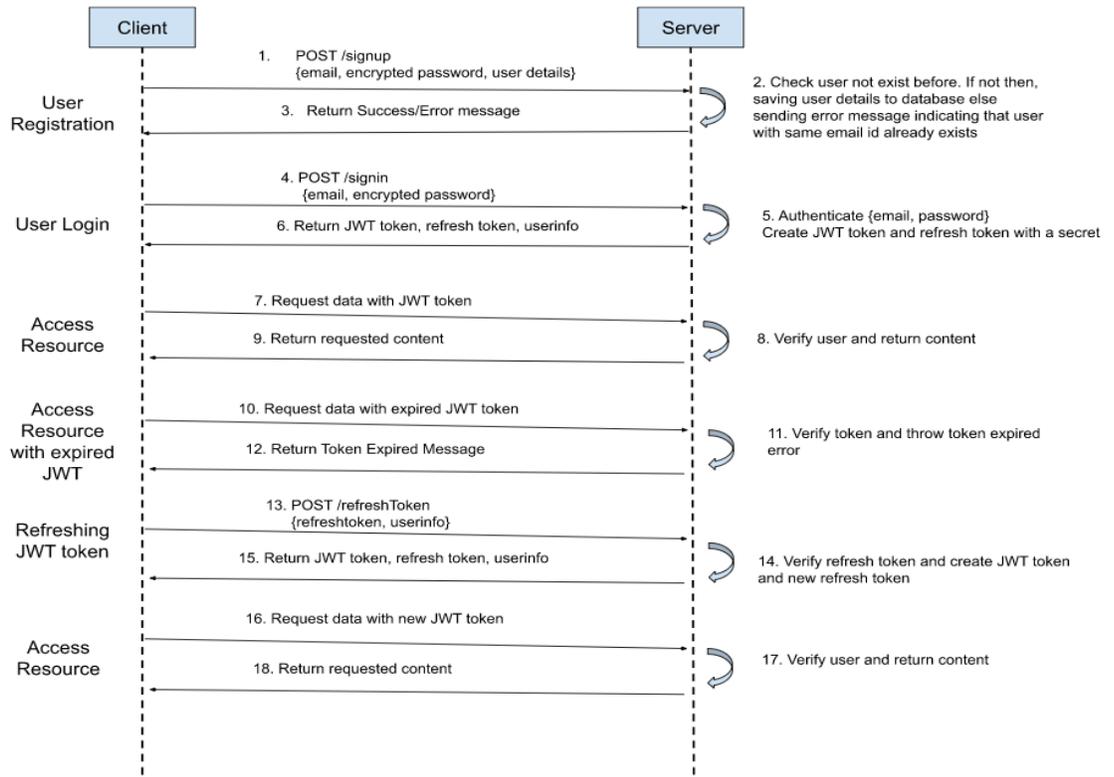
6. Design

6.1. Design Considerations

- *User authentication:* We added our own user authentication mechanism to support sign-up and login. We introduced JWT to handle user authentication.
- *Error handling:* Handling numerous error code types sent from the backend to the frontend for a request and showing only the necessary error information to the user.
- *Password management:* We used Bcrypt to hash the password to store it in DB securely.
- *Handling refresh tokens and unauthorized users:* We introduced the Axios interceptor to solve this issue.

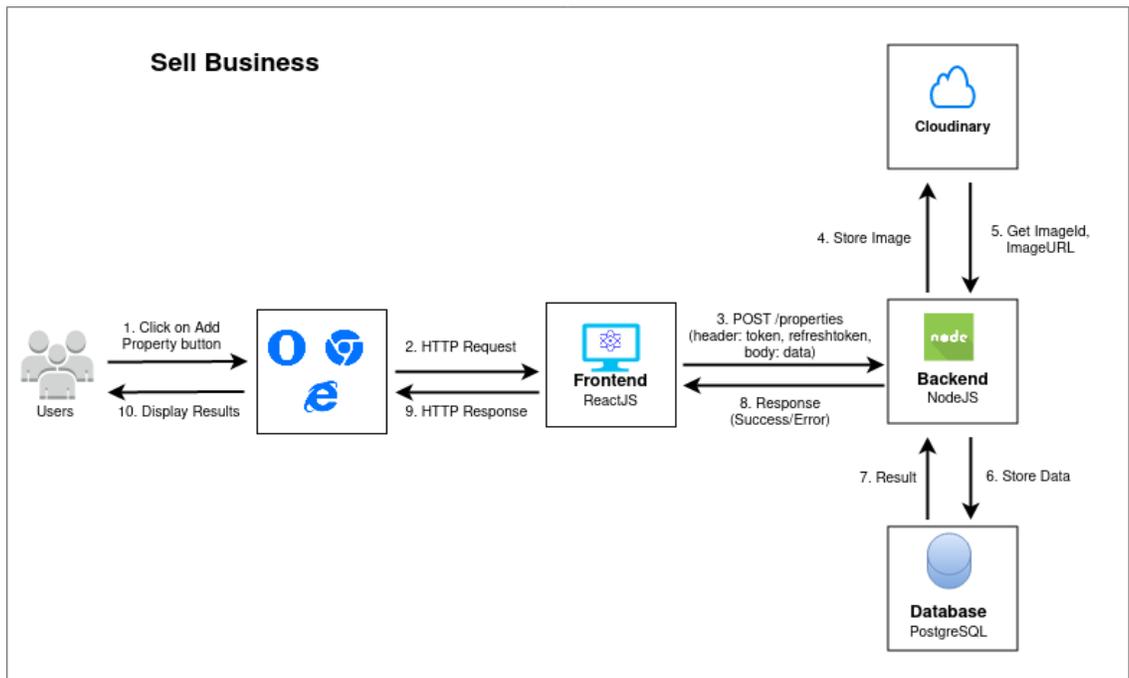
6.2. Technical Architecture

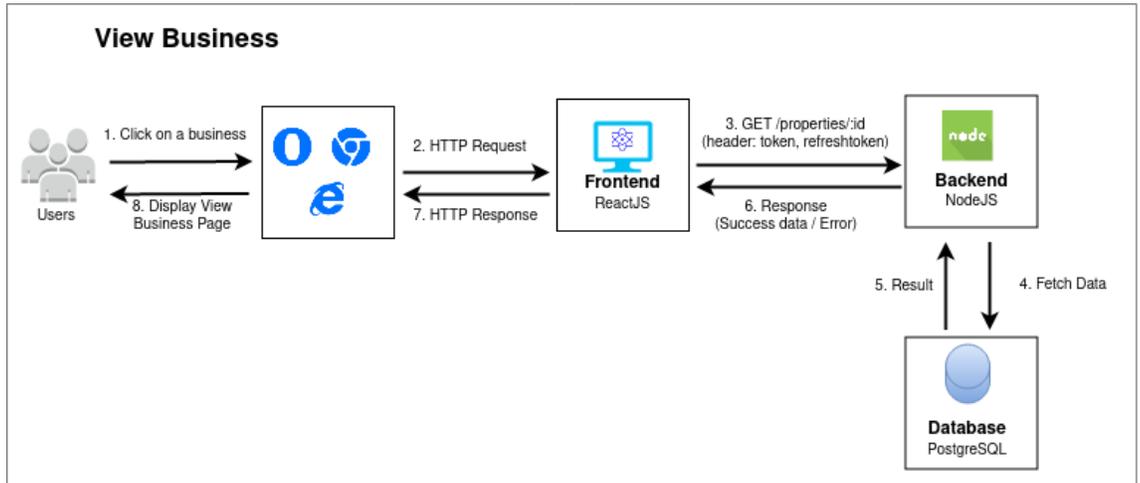
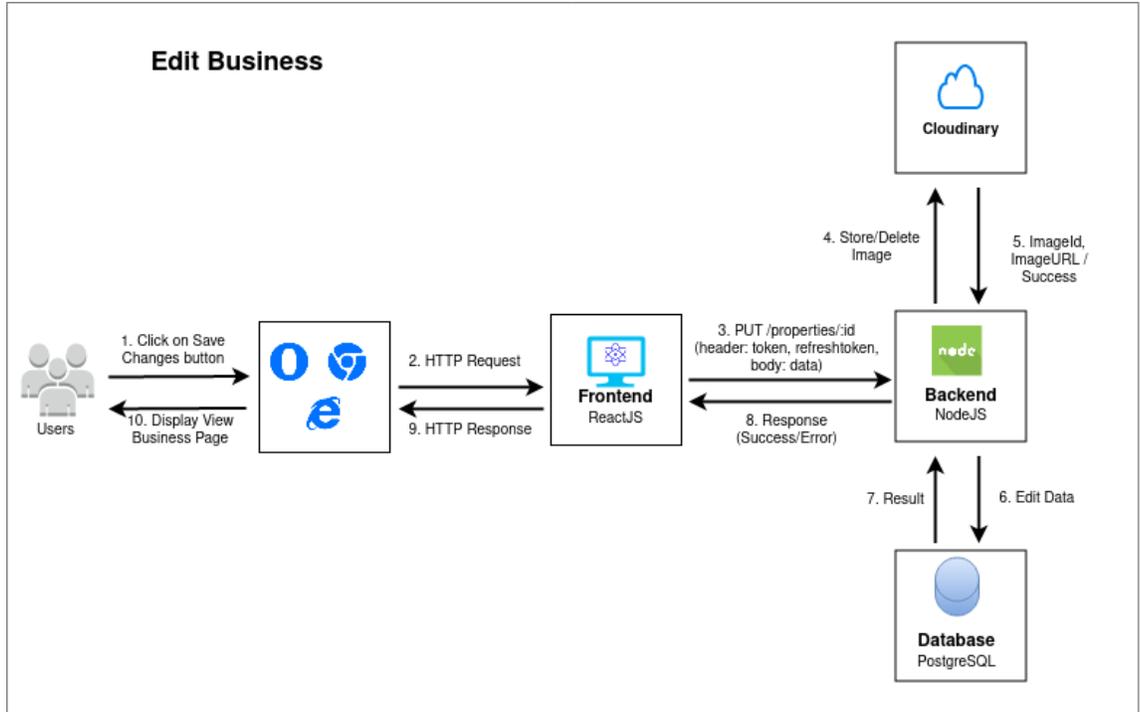


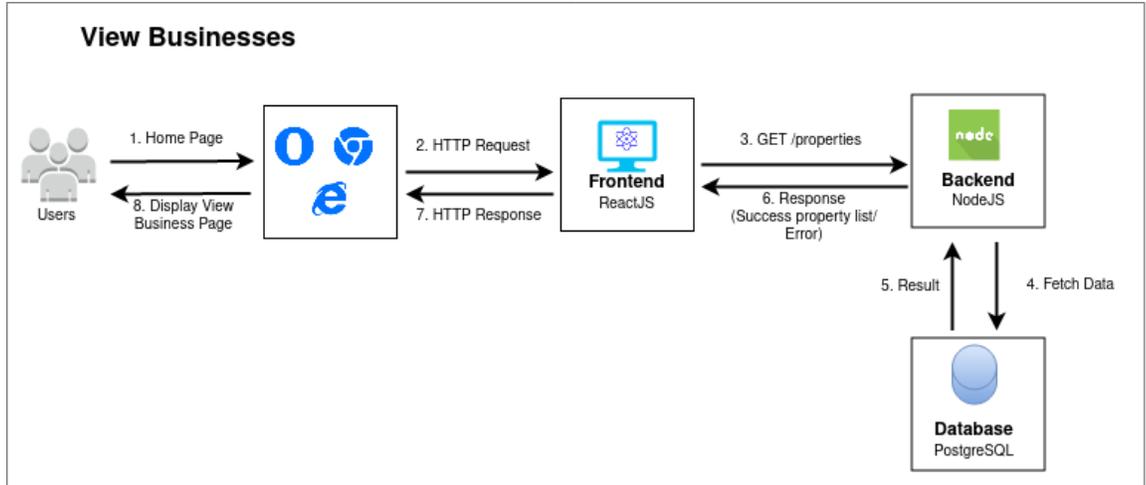


6.3. Project Modules & Interfaces

6.3.1. Project Modules







6.3.2. An API that the project connects for images:

Cloudinary: https://cloudinary.com/documentation/node_integration

6.3.3. Other required systems:

Nodemailer using SMTP server

6.3.4. Supported APIs

Route	Method	Description
/user	GET	To get the logged-in user's name.
/profile	GET	To get the user information like firstName, lastName, email, and phone
/profile	PUT	To update the user's profile information.
/changepassword	PUT	To update a logged-in user's password.
/roles	GET	To get all the user-specific roles.
/roles	POST	To add a role to a specific user
/refresh	GET	To used to refresh the JWT
/login	POST	To login to the system.
/signup	POST	To create a new user account.
/logout	GET	To log out the user from the system.
/forgotpassword	PUT	To send a change password link to the user's email.
/resetpassword	PUT	To reset the current password.

/properties	POST	Adding new business
/propertyTypes	GET	To get all the types of business like Education, Retail, etc.
/properties	GET	To get all the businesses.
/properties/mylistings	GET	To get all the businesses of a particular user.
/properties/:id	GET	To get detailed information about a particular business.
/properties/:id	PUT	To update the information of a particular business.
/contact	POST	To send the email to the Owner/Broker with the details of the user who has shown interest.
/getUserInfo	GET	To get the user's info if logged in.

6.4. Data

6.4.1. Database: PostgreSQL

6.4.2. Key Groups:

Data Group	Associated Tables
User data	users
	roles
	role_type
	role_status
Businesses data	properties
	property_types
	property_images
	property_addresses
	cities
	states
	countries

6.4.3. FlowChart with Database Schema:



6.5. User interface (UI)

1. SignUp

Sign Up

Welcome to BMA!

[Already have an account? Login](#)

2. Login

Login

Welcome to BMA!

LOGIN

[Forgot password?](#)

[Don't have an account? Sign Up](#)

3. Forgot Password

Forgot Password

Please enter your email, and instructions will be sent to the email on how to reset your password.

FORGOT PASSWORD

4. View all Businesses

BMA Sell a business

Filters Sort By: Featured

 <p>Media Buying Agency - Prime Territory Automotive & Boat Branford, Connecticut, United States \$197,000</p>	 <p>Successful National Franchise Located... Education & Children Rancho Cucamonga, California, United States \$325,000</p>	 <p>High Volume Dry Cleaning Plant with D... Dry Cleaning Service Fresno, California, United States \$1,990,000</p>	 <p>Independent pizza chain with three loc... Restaurants & Food Riverside County, California, United States \$1,200,000</p>	 <p>Cabinet Manufacturer: Commercial & R... Manufacturing Los Angeles, California, United States \$1,500,000</p>	 <p>Bridge Realty Is Please To Introduce Th... Petrol Pump San Bernardino, California, United States \$6,500,000</p>
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5. Sort By

Filters Sort By: Featured

- Featured
- Price: Low To High
- Price: High To Low
- CashFlow: Low To High
- CashFlow: High To Low
- Revenue: Low To High
- Revenue: High To Low



6. Filter

Filters

Price Range:

-

Property Types:

Location:

7. View and Edit User Profile

BMA



Profile

First Name *

Last Name *

Phone Number *

Email ID

8. Change Password

BMA Sell a business



Profile

Account Security

Roles

Change Your Password

Current Password *

New Password *

Confirm New Password *

CHANGE

9. User Roles



Profile

Account Security

Roles

Roles and Permissions

Buyer

Owner **APPLY**

Broker **APPLY**

Apply to be Owner

EIN

Driving License ID

About

SUBMIT

Roles and Permissions

- Buyer
- Owner
- Broker

Applied Successfully

Roles and Permissions

- Buyer
- Owner
- Broker

10. Sell a Business

Add Property

Phone Email

Owner

Title *

Type of Business *

Address line 1 * Address line 2

Country * State *

City * ZIP code *

Asking Price * Revenue *

Cash Flow * Established

Description *

Reason for selling *

Drag and drop an image here or click

14. Contact Seller

Contact Broker

Property Name : Independent Pizza Chain With Three Locations

Broker Name : Palak Jain

Full Name 
Email ID
Phone Number
Message

SEND MESSAGE

7. Project Organization

7.1. Project Tools

7.1.1. Development methodology:

We are using Agile software development. We have divided the schedule into sprints and for each sprint - we have spring planning, detail design, development, testing, and demo.

7.1.2. Tool(s):

Purpose	Tools
Communication with the Sponsor	Google Meet
	Slack
	Email
Communication with Team members	Zoom
	WhatsApp
	Phone call
Project management or task & action tracking	GitHub
Collaboration & Document Storage	Google Drive
UI Design	Figma

7.2. Team Member Roles

All the team members worked full-stack. Divided tasks in such a way that we will work on both the front end and back end.

Sprint	Team members	Area	Task Name
Sprint 1	Nilima	Frontend	Creating Header (Not Logged in) and Footer
			Login Page
			Logout
			Apply for roles (Basic)
		Backend	Exposing an API to identify whether the user is logged in or not
			Exposing an API to get/update user details

	Palak	Frontend	Creating Signup page	
			Creating Header (Logged in)	
			Reset Password Page	
		Backend	Exposing an API to add new user	
			Exposing an API to reset password	
	Manas	Frontend	User Authentication with JWT Token	
			Edit/View Profile Page	
		Backend	User Authentication with JWT Token	
Exposing an API to accept apply role requests				
Sprint 2	Nilima	Frontend	Apply for Broker/Owner roles (Asking more details from the user)	
		Backend	Updating an API to accept more details when user applying for roles	
			Exposing an API to send all the details of a business	
	Palak	Frontend	View all the businesses with pagination	
			View all the details of a particular business	
			Refreshing JWT token using JWT Refresh token	
		Backend	Exposing an API to send all the businesses in pages	
			Refreshing JWT token using JWT Refresh token	
	Manas	Frontend	Add New Business	
			Forgot Password page	
		Backend	Exposing an API to add new business to DB	
			Send mail to the user for resetting the password and providing an API for the password change.	
	Sprint 3	Nilima	Frontend	Contact Broker/Owner By Email
			Backend	Send mail to Broker/Owner regarding the interest offered by the buyer.

	Palak	Frontend	Updating an API to get businesses based on the filters, search, and sort applied by the user
			Edit the business
		Search/Filter/Sort Options	
	Backend	Exposing an API to update business details	
	Manas	Frontend	Allowing users to view all the businesses listed by them in one place
			Axios interceptor, success and error handling
Backend		Updating an API to return the businesses listed by particular user	
Sprint 4	Nilima, Palak, Manas	Frontend	Mark the business as favorite
			Save Searches
			Change Email Address
		Backend	Exposing an API to save the business as a favorite for a user
			Set up email notifications for saved searches
			Expose an API to let the user change the email address

7.3. Sponsor-meetings

Date	Meeting purpose
09/15/2022	First Meeting and getting Project User Discussions
09/22/2022	Backend TODO Assignment Demo
09/29/2022	Front end TODO Assignment Demo and Future sprint discussion
10/14/2022	Sprint 1 Demo
10/28/2022	Sprint 2 Demo
11/1/2022	Sprint 3 Design/Requirement Discussion
11/11/2022	Sprint 3 Demo
11/23/2022	Sprint 4 Demo

8. Goals and Milestones

8.1. Project Goals

- Users can sign up for the portal using a username and password.
- Users can log in using their email and password.
- Allow users to view and edit the user profile where they can edit username, phone number, and email address.
- Allow users to reset passwords or create a new password
- By default, users have a buyer role. They can apply to be an owner or broker to allow them to add properties to the platform.
- Brokers or business owners can post their businesses for sale. Sellers will provide information like title, city, state, asking price, revenue, cash flow, description, the reason for selling, type of business, and established year while posting new property.
- Sellers can provide images and documents for the properties while posting.
- Currently, sellers can post new properties but will not be able to remove them.
- Users will be able to see the dashboard, where they can see all the properties listed. They can filter, search by title and sort the properties.
- Users can see all the properties listed by them in one place.
- Sellers can edit the details of properties.
- Verified users can contact the seller of the property via email.
- Users can favorite/unfavorite properties.
- Users can set up email notifications based on specific searches.

8.2. Project Milestones

Start Date	End Date	Milestones
9/08/2022	9/15/2022	Learning Technologies
9/16/2022	9/22/2022	Node.js Assignment POST: Create a TodoList GET: Get all of the TodoLists POST: Create a TodoItem for a specific list GET: Get all the TodoItem's in the TodoList PUT: Update a TodoItem and mark it as done DELETE: Delete a TodoListItem DELETE: Delete a TodoList
9/22/2022	9/29/2022	Frontend Assignment: Create the UI for the TodoList project you made last week
9/30/2022	10/14/2022	[Sprint 1] Create Accounts <ul style="list-style-type: none">• Sign up and log in• Email and password required Dashboard

		<ul style="list-style-type: none"> ● Edit profile <ul style="list-style-type: none"> ○ First and last name ● Settings <ul style="list-style-type: none"> ○ Business Owner, Buyer, Broker ● Log out <ul style="list-style-type: none"> ○ Reset password and update email address
10/14/2022	10/14/2022	Midterm
10/14/2022	10/27/2022	[Sprint 2] Brokers or business owners can post their businesses for sell <ul style="list-style-type: none"> ● Title, city, state, asking price, revenue, cash flow, description ● Reason for selling ● Type of business: restaurant, cleaning, health, software, etc. ● Franchise or not, FBA approved or not, Seller financing available or not View a dashboard of all of their businesses <ul style="list-style-type: none"> ● Edit their business
10/28/2022	11/10/2022	[Sprint 3] Buyers/regular users will see a dashboard where they will be able to search by text, filter using any of the following [type of business, location, absentee, price min, price max], and sort using any of the following [asking price, revenue, cash flow] Users will able to see all the listings which they posted Users can tap on the listing to see the details of the listing Users will be able to contact the seller via email
11/02/2022	11/11/2022	Product Specification Document submission
11/11/2022	11/24/2022	[Sprint 4] Users can favorite/unfavorite listings Users can setup email notifications based on specific searchers
11/25/2022	12/8/2022	Final Paper If papers are not required, then a reference document outlining a summary of the app A detailed README file outlining how to run and make changes to the app Fix remaining bugs + improve the UI
12/8/2022	12/8/2022	CS Night