Project Report Of ROSPL Lab

Topic: Gumtrex

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1.Introduction:

Gumtrex is India’s number one consumer-to-consumer (C2C) platform, and the country’s largest marketplace for pre-owned cars and motorbikes, second-hand mobile phones, and pre-loved personal and household goods. Gumtrex pioneered the concept of C2C classifieds in India, making it the clear market leader in the space. As the market leader in India, Gumtrex has been at the forefront of building and expanding the online classifieds market in the country. The platform, which can be accessed on desktop, and mobile-web, offers a free, fast, and hyper-local way for Users to sell and buy used goods and services.Selling and buying through Gumtrex also makes the planet greener, with Gumtrex Indian transactions can be efficient to save tons of greenhouse gas emissions.

1.1 Purpose:

- Selling Used Items: Many individuals use Gumtrex to sell their used or unwanted items such as electronics, furniture, clothing, vehicles, and more. This helps them declutter their living space and make some extra money by offering items they no longer need.

- Buying Second-Hand Goods: On the other side of the equation, buyers use Gumtrex to find good deals on second-hand items. This can be a cost-effective way to acquire items that are still in good condition but at a lower price compared to buying them new.

- Local Services: Gumtrex also provides a platform for service providers to offer their services to a local audience. This includes categories like home services, repair services, event planning, and more.

- Job Listings: Some regions have job listings on Gumtrex where employers can post job openings and job seekers can find employment opportunities.

- Real Estate: Gumtrex can be used to list properties for rent or sale, connecting potential buyers or renters with property owners or real estate agents.

- Business Opportunities: Entrepreneurs might use Gumtrex to advertise their business offerings, such as franchises, partnerships, or investment opportunities.

- Promoting Small Businesses: Individuals running small businesses or startups can use Gumtrex to promote and sell their products to a broader audience.

- Vehicle Listings: People often use Gumtrex to buy or sell vehicles, including cars, motorcycles, and other modes of transportation.

1.2 Scope:

- Real-time Location Tracking (RTLS): Incorporate RTLS technology to seamlessly track the live whereabouts of retail inventory, store personnel, and customers throughout the retail space. This innovation minimizes search efforts, optimizes resource allocation, and enriches inventory management, fostering an efficient and customer-centric shopping experience.
- In-App Delivery Integration: Collaborate with third-party delivery services to offer integrated delivery options directly within the Gumtrex app. This could allow users to choose delivery during the checkout process.
- Data Analytics and Personalization: Utilizing advanced data analytics to understand user behavior, preferences, and trends can enable Gumtrex to offer personalized recommendations and targeted advertising, improving user engagement and satisfaction.
- Enhanced User Experience: Continuously improving the user interface, mobile app functionality, and overall user experience can help retain existing users and attract new ones. This could involve incorporating new features, optimizing search algorithms, and streamlining the buying and selling processes.
- Language Translation Services: Elevate the retail experience by offering robust multilingual support to both valued customers and dedicated store associates. Our cutting-edge translation services foster crystal-clear communication among diverse language speakers, fostering an inviting shopping ambiance, effortless interactions, and a truly universal retail journey.

1.3 Reason for selection of topic:

1.User Experience Enhancement: Analyzing and suggesting improvements for the Gumtrex website can contribute to enhancing the user experience. This can involve making the website more intuitive, user-friendly, and visually appealing, leading to increased user engagement and satisfaction.

2. Marketplace Optimization: Online marketplaces like Gumtrex rely on a smooth and efficient platform to facilitate transactions. Exploring ways to optimize the platform can lead to higher conversion rates, improved listings visibility, and better overall performance for both buyers and sellers.

3. Technological Innovations: The topic allows for discussions about incorporating new technologies, such as AI-powered recommendation systems, chatbots for customer support, advanced search algorithms, and secure payment gateways, to make the Gumtrex experience more advanced and convenient.

4. Environment friendly: Gumtree introduces a special "Eco-Friendly" badge for listings that meet certain criteria indicating sustainable practices. Sellers earn this badge for items that are energy-efficient, made from recycled materials, locally sourced, or otherwise contribute to eco-friendly living. Additionally, users have the option to filter their searches specifically for eco-friendly products, making it easier for environmentally conscious buyers to find and support sustainable choices.

5. Mobile Responsiveness: With the increasing use of mobile devices, optimizing the Gumtrex website for mobile responsiveness can be crucial. This could involve discussing responsive design, mobile app development, and strategies to ensure a seamless experience on smartphones and tablets.

6. Social Integration: Integrating social media features can encourage sharing, increase exposure for listings, and enhance user engagement. This might involve allowing users to share listings on their social media profiles or incorporating user reviews and ratings.

7. Localization: Adapting the Gumtrex website to cater to different languages, currencies, and local customs can improve accessibility and attract a more diverse user base.

8. Trust and Safety: Safety and trust are paramount in online transactions. Examining ways to enhance user trust through verified profiles, fraud prevention measures, and secure payment methods can be a valuable aspect of this topic.

1.4 System Requirement Specifications (SRS) :

1.4.1: System Requirements:

=>Operating System

- Windows XP
- Windows Vista
- Windows 7
- Windows 8
- Windows 10
- Windows Server 2003
- Windows Server 2008
- Windows Server 2012

Agile.net runs on 32-bit and 64-bit versions of Microsoft Windows operating systems.

- Android 5.0 or IOS 8.0(For Implementation on user Side)

1.4.2: Hardware Requirements.

- 1 gigahertz (GHz) or faster x86-bit or x64-bit processor
- 512 MB RAM minimum
- 20 MB of hard-disk space for program installation
- A BioMetric Device (if not inbuilt in the system)

1.4.3: Software Requirements.

- Version Control and Collaboration:

1. Git and GitHub: Version control systems that allow collaborative code management, tracking changes, and enabling multiple developers to work on the same codebase concurrently.

- Communication and Collaboration:

1. Slack: A real-time messaging platform for team communication, enabling quick and efficient collaboration among team members.
2. Microsoft Teams: A collaborative communication platform that integrates chat, video conferencing, file sharing, and project discussions.

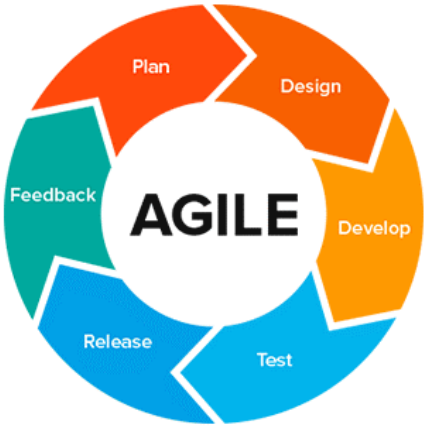
- Continuous Delivery and DevOps:

1.Kubernetes: An open-source container orchestration tool that facilitates automated deployment, scaling, and management of containerized applications.

- Agile Framework
- .Net Framework version 3.5 (Atleast)
- Php,Mysql, Java

1.5 Which SDLC model we have selected and why?

We have selected Agile Model following are the reasons:



1. Customer-Centric Approach: Agile places a strong emphasis on customer collaboration and feedback. By involving customers and stakeholders throughout

the development process, Agile ensures that the final product meets their actual needs and expectations.

2. Flexibility and Adaptability: Agile allows for continuous iteration and incremental development. This flexibility enables teams to respond quickly to changing requirements, emerging technologies, and market demands, making it well-suited for dynamic and evolving projects.

3. Early and Regular Delivery: Agile development focuses on delivering functional software in small increments during short iterations. This allows customers to see tangible progress early on and provides an opportunity for early deployment and user feedback.

4. Reduced Project Risks: By breaking the project into small, manageable iterations, Agile reduces the risk of project failure or missed deadlines. Any potential issues or roadblocks can be addressed and resolved quickly within the short time frame of a sprint.

5. Increased Collaboration and Communication: Agile promotes open communication and collaboration within the development team and between team members and stakeholders. This transparent and frequent communication fosters a better understanding of project progress and priorities.

6. Continuous Improvement: Agile methodologies, such as Scrum, include regular sprint retrospectives where the team reflects on their processes and identifies areas for improvement. This focus on continuous improvement leads to higher-quality outcomes over time.

7. Early Detection of Issues: With regular testing and frequent demos, Agile facilitates early detection and resolution of defects and issues. This leads to better software quality and overall customer satisfaction.

Agile Sprints

Sprint 1: Week 1 - Gumtrex Setup and User Management
Duration: 1 week
Day 1-2: Project Kickoff and Setup
- Kick off the Gumtrex project by setting up the project repository, development environment, and necessary tools.
- Define the overall architecture and technology stack for Gumtrex.

Day 3-4: User Registration and Authentication
- Implement user registration with email and password for Gumtrex accounts, ensuring secure data storage.
- Develop login and logout functionalities, incorporating session management and user authentication.

Day 5-7: Profile Management
- Allow Gumtrex users to edit their profiles, including profile picture, username, and contact information.
- Implement password reset functionality to enhance account security.

Sprint 2: Week 2 - Listings and Categories
Duration: 1 week
Day 1-2: Listing Categories and Filtering
- Implement product categories (e.g., electronics, fashion, real estate) with a user-friendly interface.
- Create a page where users can easily browse Gumtrex listings based on categories.

Day 3-4: Listings and Product Details
- Develop a user-friendly system for users to create, edit, and delete listings, including support for uploading images and detailed descriptions.
- Display comprehensive information for each listing, such as price, location, and contact details.

Day 5-7: Creating a Translation language services List
-Allowing User to Select their suitable Language according to their comfort of understanding.

Sprint 3: Week 3 - Messaging and Negotiation
Duration: 1 week
Day 1-2: Messaging System
- Integrate a robust messaging system to facilitate seamless communication between buyers and sellers.
- Implement features for sending and receiving messages, including message notifications.

Day 3-4: Price Negotiation
- Enable users to negotiate prices effectively within the messaging system.

Day 5-7: Product Recommendations
- Create a recommendation system that suggests related products based on user preferences and browsing history.
- Implement a sophisticated recommendation algorithm to enhance the user experience.

Sprint 4: Week 4 - Notifications and Search
Duration: 1 week
Day 1-2: Notifications
- Implement a comprehensive notification system that covers new messages, listing inquiries, and updates on favorited listings.
- Provide a user-friendly notification center where users can manage and view their notifications.

Day 3-4: Search Functionality
- Develop a powerful and intuitive search bar that allows users to search for products, categories, and other users.
- Implement advanced search filters to help users find precisely what they're looking for.

Day 5-7: User Experience Enhancements
- Continuously refine user interfaces based on feedback and usability testing.
- Address any usability issues, optimize performance, and further enhance the overall user experience.

Sprint 5: Week 5 - Advanced Features and Security
Duration: 1 week
Day 1-2: Verified Sellers
- Implement a rigorous verification system for sellers to build trust among buyers, potentially incorporating identity verification and background checks.

Day 3-7: Advanced Listing Features and Security Measures
- Enhance the listing creation process with advanced features like auction-style listings, buy-now options, and featured listings.
- Implement robust security measures, including fraud detection, secure transactions, and data encryption, to ensure user safety.

Sprint 6: Week 6 - Final Polish and Deployment
Duration: 1 week
Day 1-3: Responsive Design and Compatibility
- Ensure the Gumtrex platform is fully responsive and optimized for various devices and screen sizes.
- Thoroughly test the platform on different browsers and fix any compatibility issues.

Day 4-5: Security and Deployment
- Strengthen security measures further, including regular security audits and penetration testing.
- Prepare the Gumtrex platform for a secure deployment to a production environment.

Day 6-7: Final Testing and Launch
- Conduct comprehensive final testing, including load testing and stress testing, to ensure system reliability.

- Deploy the Gumtrex platform to a production server and make it live, closely monitoring its performance post-launch and addressing any last-minute issues promptly.

1.6 Explanation of the model processes according to our topic:

The Agile model is an iterative and incremental approach to software development that emphasizes flexibility, collaboration, and customer satisfaction. It breaks down the development process into smaller cycles or iterations, allowing teams to respond to changes and deliver functional increments of a product more frequently. Here's how the Agile model's processes apply to Gumtrex :

1. Product Backlog Creation: The Agile process begins with creating a product backlog, which is a prioritized list of features, improvements, and changes that need to be implemented in the platform. For Gumtrex, this could include adding new features like improved search functionality, enhanced user profiles, or a more streamlined listing process.

2. Sprint Planning: Agile teams work in time-bound cycles called sprints, usually lasting 1 to 4 weeks. During sprint planning, the development team selects a subset of items from the product backlog to work on in the upcoming sprint. For Gumtrex, this could involve choosing specific features or enhancements to work on, such as integrating a new payment gateway or optimizing the web user interface.

3. Daily Standups: Daily standup meetings are short, daily check-ins where team members discuss their progress, challenges, and plans. For Gumtrex, the development team members would update each other on their work related to the selected sprint items, ensuring everyone is aligned and any obstacles are addressed promptly.

4. Development and Testing: During the sprint, the development team works on implementing the selected features. This involves coding, testing, and quality assurance activities. For Gumtrex, this could mean creating the necessary code changes to implement a new feature like real-time chat between buyers and sellers, followed by thorough testing to ensure it works as intended.

5. Continuous Integration and Testing: Agile places a strong emphasis on continuous integration and testing, where code changes are integrated into the main codebase frequently to prevent integration issues and catch defects early. For Gumtrex, this would involve integrating new code changes into the platform's main codebase on a regular basis and running automated tests to ensure stability.

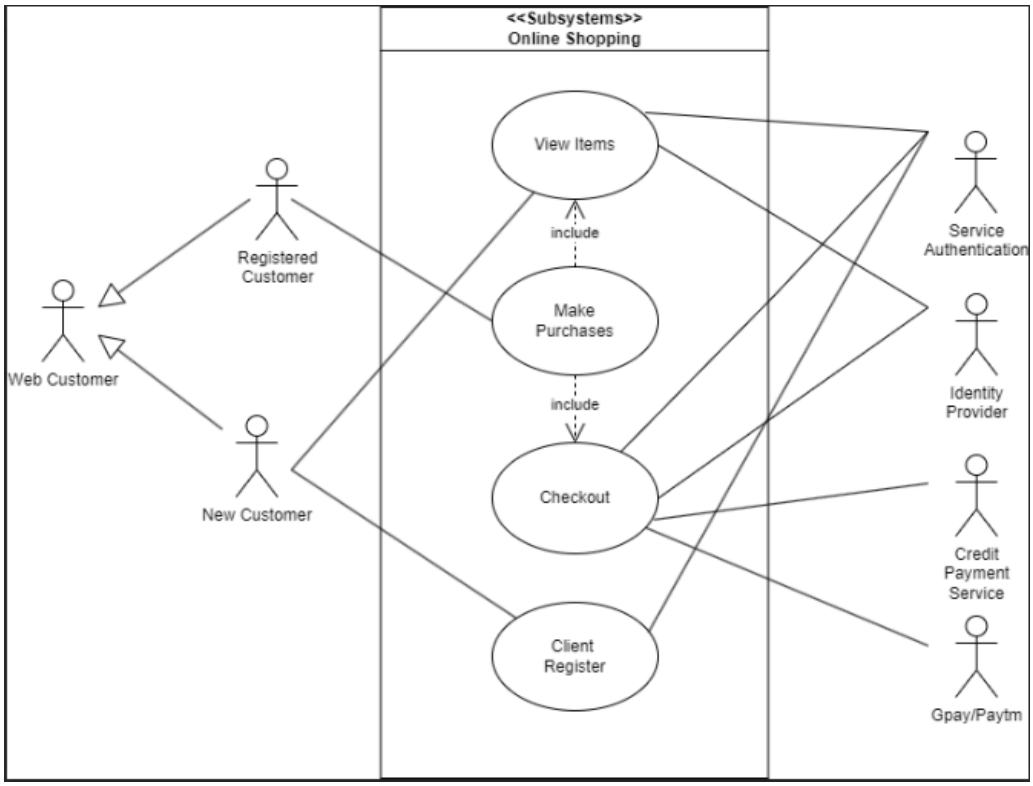
6. Sprint Review: At the end of each sprint, there's a sprint review meeting where the development team presents the completed work to stakeholders, including product owners, managers, and even users. For Gumtrex, this could involve showcasing the newly implemented features and improvements to gather feedback and make any necessary adjustments.

7. Sprint Retrospective: After the sprint review, the team holds a retrospective meeting to reflect on the sprint process and identify areas for improvement. This continuous improvement aspect is important in Agile to refine processes over time and ensure better outcomes in subsequent sprints.

8. Repeat the Cycle: After the retrospective, the team starts a new sprint and repeats the cycle, selecting new items from the product backlog and working on further improvements. This iterative approach allows Gumtrex to deliver frequent updates and improvements to its platform.

2. UML Diagrams

2.1 Use Case Diagram:



2.2 Use Case Story:

1. Use Case: User Login

Actors:

- User
- System

2.Description:

This use case portrays the steps involved in a user's successful login process, enabling them to access their account and utilize the platform's features securely.

3.Preconditions:

- The user must be registered on the system.

4.Main Scenarios:

1. The user initiates the login process by opening the platform's application or website.
2. The system presents the user with a login interface, prompting for their credentials.
3. The user enters their unique username or registered email address.
4. The user inputs their password.
5. The user clicks the "Login" button to proceed.
6. The system validates the entered credentials against the stored user data.
7. If the credentials are verified successfully:
   - The system authenticates the user's identity.
   - The system redirects the user to their personalized dashboard or homepage.
   - The user gains access to their account features, settings, and data.
   - The use case concludes on a successful note.
8. If the credentials are invalid:
   - The system displays an error message indicating a failed login attempt.
   - The user may opt to reset their password or retry entering the correct credentials.

5.Alternative Scenarios:

- If the user forgets their password:
  1. The user clicks the "Forgot Password" link provided on the login interface.
  2. The system prompts the user to provide their registered email address.
  3. The user submits their email address.
  4. The system sends a password reset link to the user's email.
  5. The user checks their email, clicks the password reset link, and follows the instructions to create a new password.
  6. The user returns to the login interface and enters the new password to successfully log in.

6.Postconditions:

- The user is granted authenticated access to the system, enabling them to utilize their account privileges.
- The user can perform various actions and interact with the platform as dictated by their account permissions.

7.Exceptions:

- If the user's account is temporarily locked due to multiple failed login attempts, the system may impose a waiting period or additional verification steps before account access is reinstated.
- If the user's account is deactivated, the system should notify the user and provide guidance for account reactivation or assistance.

2. Use Case: Add to Cart

Actors:

- Customer
- E-commerce System

Description:

This use case outlines the steps involved when a customer adds items to their shopping cart for potential purchase within an e-commerce platform.

Preconditions:

- The customer must have access to the e-commerce platform.

Basic Scenarios:

1. The customer accesses the e-commerce platform and navigates to a product listing.
2. The system displays detailed information about the selected product, including an "Add to Cart" option.
3. The customer selects the desired product quantity.
4. The customer clicks the "Add to Cart" button.
5. The system validates the product's availability and stock levels.
6. If the product is available:

- The system adds the selected product and quantity to the customer's shopping cart.
- System updates the cart's subtotal and displays a confirmation message.
- Customers can choose to continue shopping or proceed to checkout.
- The use case concludes with the product successfully added to the cart.

7. If the product is unavailable or out of stock:
   - The system displays an alert notifying the customer that the product cannot be added.
   - Customers may explore alternative products or continue shopping.

Alternative Scenarios:

- If the customer wants to update the quantity of a product in the cart:
  1. The customer views their shopping cart.
  2. The system displays a list of products in the cart along with their quantities.
  3. The customer updates the quantity of a specific product and clicks an "Update" button.
  4. The system recalculates the cart's subtotal based on the updated quantities.
  5. The customer may continue shopping or proceed to checkout.

Postconditions:

- The customer's shopping cart is updated to include the selected product(s) and desired quantities.
- The customer can view the cart's contents, quantities, and subtotal.

Exceptions:

- If the selected product becomes unavailable after being added to the cart, the system should notify the customer and offer options to remove the item or find substitutes.
- If the customer's session expires or they log out, the cart contents may be saved temporarily, allowing retrieval upon login or for a limited time.

3. Use Case: Checkout

Actors:

- Customer
- E-commerce System

Description:

This use case describes the process that a customer goes through when completing a purchase and finalizing the order on an e-commerce platform.

Preconditions:

- The customer must have items in their shopping cart.
- The customer must have access to the checkout process.

Main Scenarios:

1. The customer proceeds to the checkout section of the e-commerce platform after adding desired items to their cart.
2. The system presents an overview of the items in the cart, including names, quantities, and prices.
3. The customer reviews the cart contents for accuracy and makes any necessary adjustments.
4. The system calculates the subtotal of the order based on the selected items and quantities.
5. The system prompts the customer to provide shipping and billing information.
6. The customer enters their shipping address, billing address, and payment details.
7. The system verifies the payment information for accuracy and security.
8. If the payment information is valid:
    - System confirms the order and generates an order summary.
    - The customer is presented with an estimated delivery date and shipping options.
    - The customer may choose a preferred shipping method.
    - The customer reviews the order summary and confirms the purchase.
    - System deducts the purchase amount from the customer's payment method.
    - The system sends an order confirmation email to the customer.
    - Use case concludes with the successful completion of the checkout process.

9. If the payment information is invalid or incomplete:
    - The system displays an error message indicating a failed payment verification.
    - The customer is prompted to correct the payment information.

Alternative Scenarios:
- If the customer has a discount code or gift card:
  1. The customer enters the discount code or gift card information during the checkout process.
  2. The system validates the code and applies the discount or deducts the gift card amount from the total.
  3. The system recalculates the subtotal and presents the updated order summary.

Postconditions:
- The customer's order is successfully placed and confirmed.
- The customer receives an order confirmation email with details of the purchase.

Exceptions:
- If the selected items in the cart are no longer available or out of stock, the system should inform the customer and allow them to update the cart.
- If there is a system error during the checkout process, the customer should be notified and prompted to try again or seek assistance.

4. Use Case: Payment

Actors:
- Customer
- Payment Gateway
- E-commerce System

Description:

This use case outlines the steps involved in processing a customer's payment for a purchase made on an e-commerce platform.

Preconditions:

- The customer must have items in their shopping cart.
- The customer must have completed the checkout process.

Main Scenarios:

1. After confirming their order, the customer proceeds to the payment section of the e-commerce platform.
2. The system displays the order summary, including the total amount to be paid.
3. The customer selects their preferred payment method (credit card, debit card, PayPal, etc.).
4. The system redirects the customer to the payment gateway's secure page.
5. The customer enters their payment details, such as card number, expiration date, CVV, and billing address.
6. The payment gateway processes the payment information and communicates with the customer's bank or financial institution for authorization.
7. If the payment is authorized:
    - The payment gateway sends a confirmation to the e-commerce system.
    - The e-commerce system updates the order status to "Payment Successful."
    - The system generates a payment receipt and displays it to the customer.
    - The customer may choose to print or save the receipt for their records.
    - The use case concludes with the successful processing of the payment.

8. If the payment is declined:
    - The payment gateway sends a decline notification to the e-commerce system.
    - The e-commerce system displays an error message indicating the payment was not successful.
    - The customer may attempt the payment again with a different payment method or seek assistance.

Alternative Scenario:

- If the customer chooses to pay using a digital wallet:
  1. The customer selects the digital wallet option during the payment process.
  2. The system redirects the customer to the digital wallet provider's authentication page.
  3. The customer logs into their digital wallet account and confirms the payment.
  4. The digital wallet provider communicates the payment confirmation to the e-commerce system.

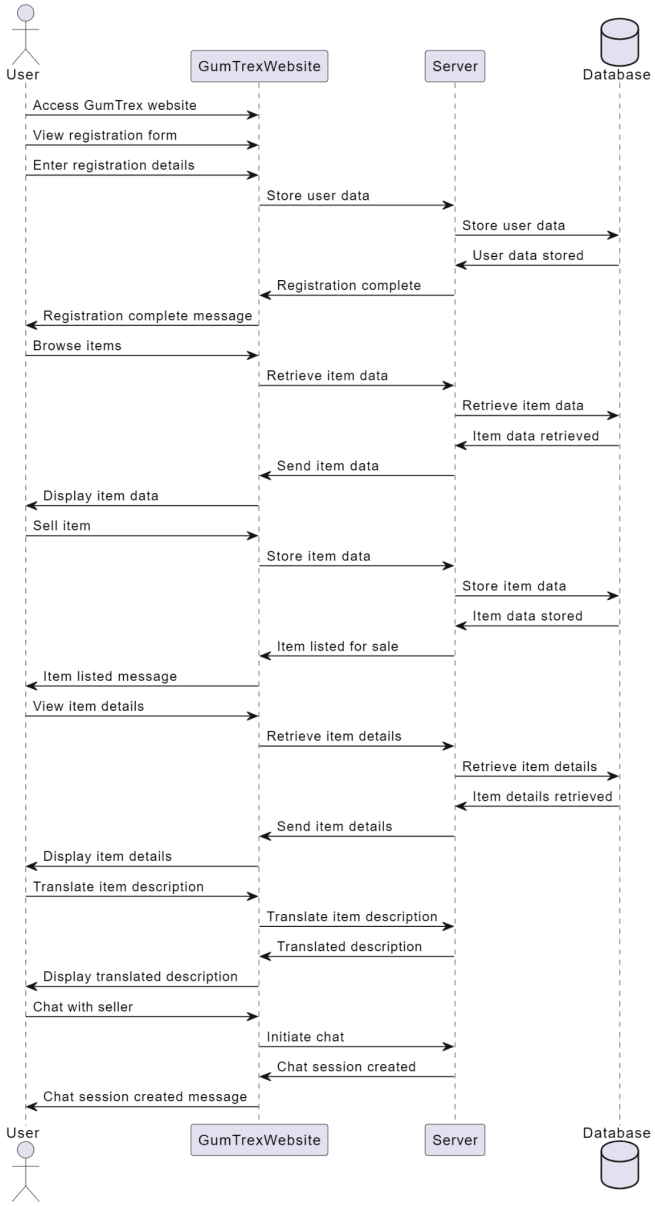
Postconditions:

- The customer's payment is successfully processed and confirmed.
- The customer receives a payment receipt and order confirmation.

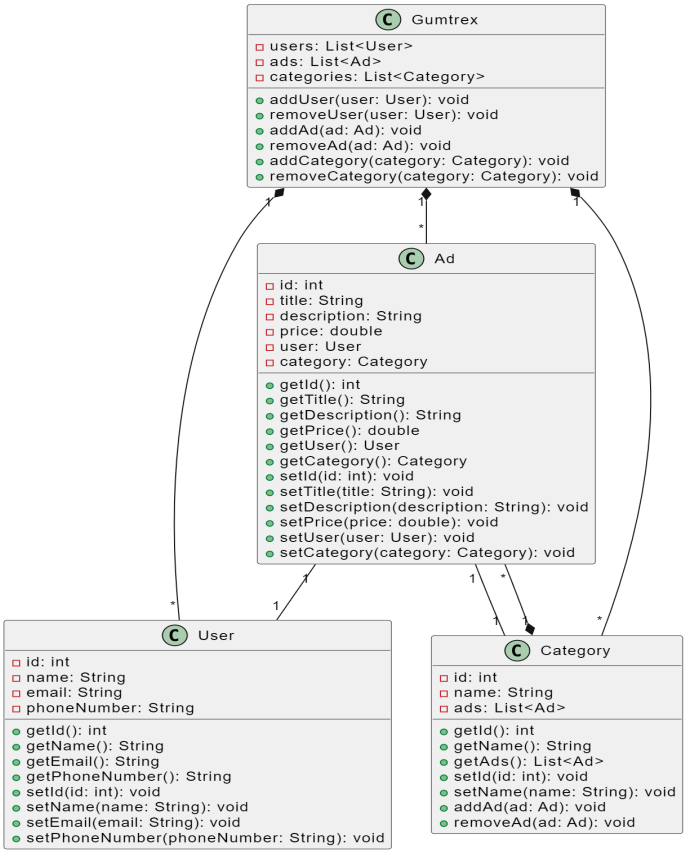
Exceptions:

- If there is a technical error during the payment process, the customer should be notified and prompted to try again or use an alternative payment method.
- If the payment is declined, the customer may need to resolve issues with their payment method or contact their bank for assistance.

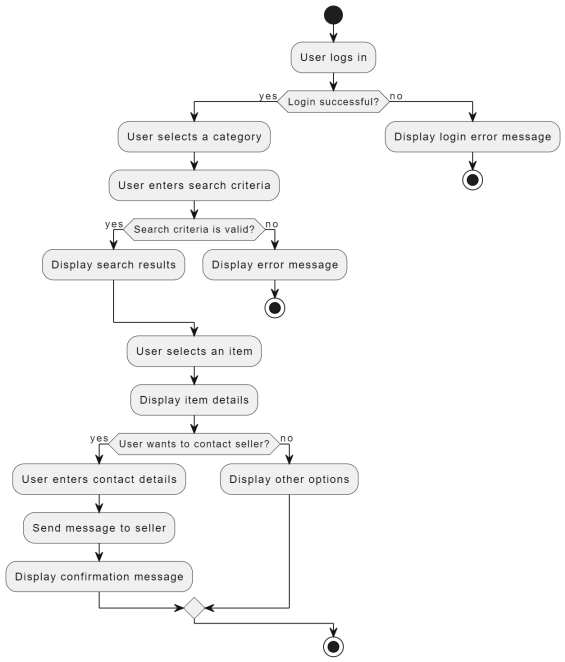
2.3) Sequence Diagram:



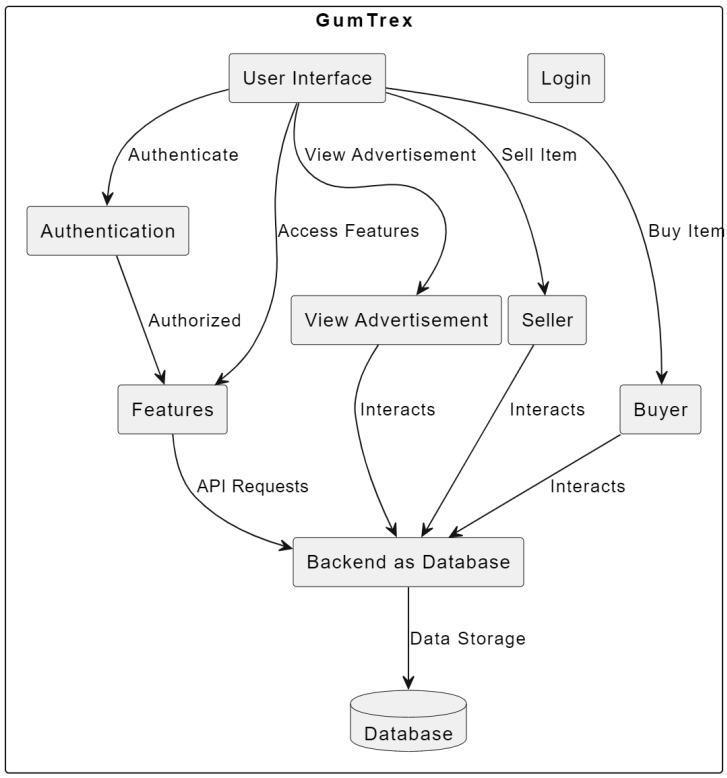
2.4) Class Diagram:



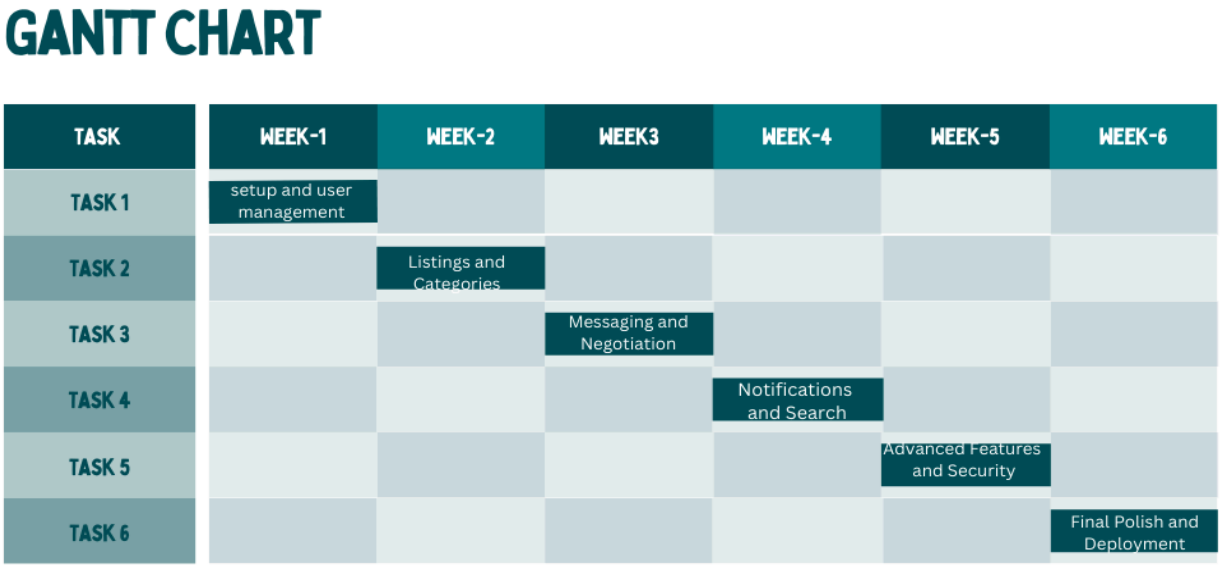
2.5) Activity Diagram:



2.6 Block Diagram



2.7 Gantt Chart



3.6.1 Risk Table

3.6.2 Risk Identification for GumTrex:

1. User Behavior Changes:
   - Probability: Medium
   - Impact: Medium
   - Description: Users' behaviors and preferences can change rapidly, affecting the popularity and success of the GumTrex platform.

2. Cybersecurity Threats:
   - Probability: High
   - Impact: High
   - Description: GumTrex, like all online marketplaces, is vulnerable to cyberattacks, including data breaches and fraud attempts.

3. Regulatory Changes:
   - Probability: Low to Medium
   - Impact: High
   - Description: E-commerce and data protection regulations may change, impacting GumTrex's operations.

3.6.3 Risk Analysis for GumTrex:

1. User Behavior Changes:
   - Priority: Medium
   - Mitigation Strategy: Monitor user engagement, gather feedback, and stay updated with industry trends to adapt GumTrex accordingly.
   - Contingency Plan: Be ready to adjust platform features and marketing strategies based on user feedback and market dynamics.

2. Cybersecurity Threats:
- Priority: High
- Mitigation Strategy: Implement strong cybersecurity measures, including encryption, firewalls, and intrusion detection systems.
- Contingency Plan: Maintain a well-defined incident response plan to minimize damage in case of a security breach.

3. Regulatory Changes:
- Priority: Medium
- Mitigation Strategy: Stay informed about legal developments in the e-commerce sector, maintain compliance, and adapt policies and practices accordingly.
- Contingency Plan: Consult with legal experts to ensure ongoing compliance and prepare to adjust operations if regulations change.

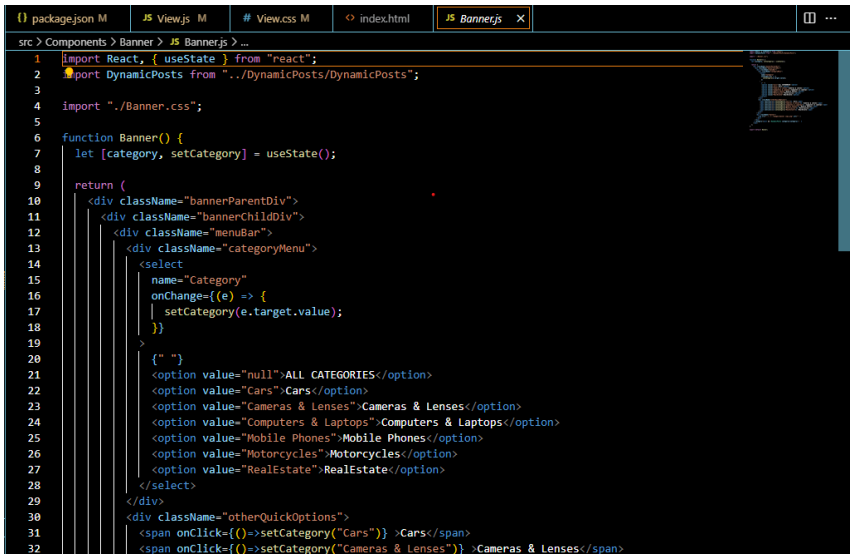
3.6.4 Risk Monitoring and Control for GumTrex:

1. User Behavior Changes:
- Regularly analyze user data, conduct user surveys, and monitor user reviews.
- Use data analytics to identify emerging trends and make necessary adjustments to GumTrex's features and marketing strategies.

2. Cybersecurity Threats:
- Implement regular security audits and penetration testing to identify vulnerabilities.
- Continuously monitor network traffic and user activities for suspicious behavior.

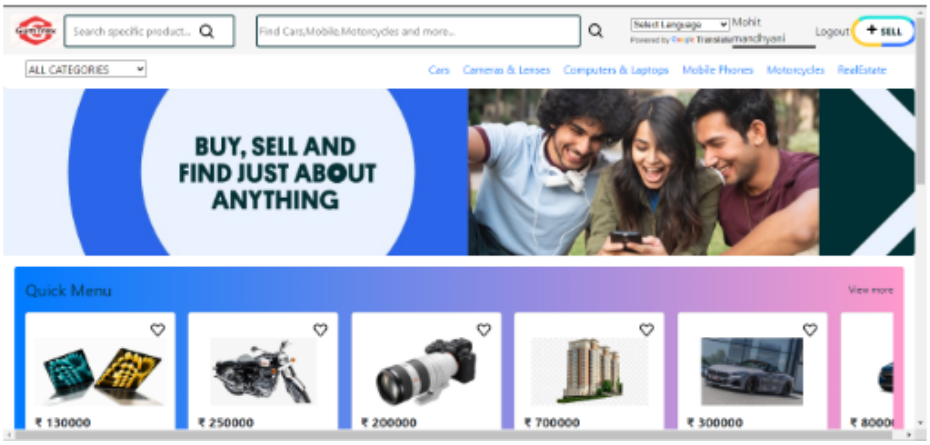
3. Regulatory Changes:
- Appoint a compliance officer or team responsible for monitoring and staying updated on evolving regulations.
- Regularly review and update platform policies and practices to align with new regulatory requirements.

4. Working Model Screenshots



Gumtrex Code

Login Page



Main Page

Services Page

Chat Page