**Project design Phase-||**

**Data Flow Diagram & User Stories**

|  |  |
| --- | --- |
| Date | 27 june 2025 |
| Team ID | LTVIP2025TMID53139 |
| Project Name | House hunt: Finding your perfect rental home |
| Maximum marks | 4 marks |

**Data Flow Diagrams (DFDs): House-Hunt Application**

Data Flow Diagrams (DFDs) illustrate the flow of information through a system. We'll present them in a hierarchical manner:

**1. Context Diagram (Level 0)**

This diagram shows the system as a single process, interacting with external entities.

+----------------+ Data Flow (User Input/Requests) +----------------+

| |<--------------------------------------------->| |

| Registered | | |

| User | | |

+----------------+ | House-Hunt |

| System |

+----------------+ Data Flow (Requests/Updates) | |

| |<--------------------------------------------->| |

| Admin | | |

+----------------+ +----------------+

^ ^

| | Data Flow (Notifications, Logs)

| |

+----------------+ | | +----------------+

| | | | | |

| Unregistered |---------------------+----+------------------->| External |

| User | (Search Queries, General Browse) | Systems |

+----------------+ | (Email Service,|

| SMS Gateway, |

| Analytics) |

+----------------+

**Explanation:**

* **House-Hunt System:** The entire application being built.
* **Registered User:** A user who has signed up and logged in. They can perform all user actions.
* **Unregistered User:** A user who is Browse without an account. They can typically search and view properties.
* **Admin:** The person/team managing the property listings and potentially user accounts.
* **External Systems:** Services that the House-Hunt system interacts with but are outside its direct control (e.g., sending emails, SMS, collecting analytics).

**2. Level 1 Diagram (Core Processes)**

This diagram decomposes the "House-Hunt System" into its major high-level processes and data stores.

+---------------------+

| |

| D1: User |

| Database |

+----------+----------+

|

^ Data Flow (User Profiles, Authentication)

|

+----------------+ +----------------+ | +----------------+

| |-------->| |--------+------->| |

| Registered | User | 1. User | | 2. Property |

| User | Input | Management |<--------------->| Search & |

| |<--------| (Login, Reg, | User Data | Details |

+----------------+ Auth | Profile) | | |

Output +----------------+ +-------+--------+

^ |

| Property | Property Details

| Search | & Listings

| Results v

+----------+----------+

| |

| D2: Property |

| Database |

+----------+----------+

^ |

| Property | Inquiries

| Listings v

+----------------+ | +-------+--------+

| |-----------------------------------|-------->| |

| Unregistered | Search Query | | 3. Inquiry |

| User | | | Management |

| |-----------------------------------|-------->| |

+----------------+ | +-------+--------+

| ^

| | Inquiry Data

| |

| v

+----------+----------+

| |

| D3: Search |

| Index |

+----------+----------+

^

| (Indexed Property Data)

|

+----------------+ +----------------+ | +----------------+

| |-------->| |--------+------->| |

| Admin | Listing | 4. Listing | | 5. Notifications/ |

| | Management| Management |<--------------->| Analytics |

| |<--------| (Add, Edit, | | |

+----------------+ Output| Delete) | +--------+-------+

+----------------+ |

| (Logs, Metrics, Alerts)

v

+----------------+

| |

| External |

| Systems |

+----------------+

**Explanation of Processes & Data Stores:**

* **Processes:**
  1. **User Management:** Handles user registration, login, profile updates, and authentication.
  2. **Property Search & Details:** Manages searching for properties, filtering results, and displaying detailed property information.
  3. **Inquiry Management:** Processes user inquiries about properties and routes them.
  4. **Listing Management:** Allows admins to add, edit, and delete property listings.
  5. **Notifications/Analytics:** Handles sending notifications (emails, SMS) and collecting application analytics.
* **Data Stores:**
  1. **D1: User Database:** Stores user profiles, credentials, saved items.
  2. **D2: Property Database:** Stores all raw property listing data (descriptions, addresses, amenities).
  3. **D3: Search Index:** Optimized data store (e.g., Elasticsearch) for fast and complex property search queries.

**3. Level 2 Diagram (Example: Property Search & Details)**

Let's zoom into "2. Property Search & Details" to show more internal detail.

+---------------------+

| |

| D3: Search |

| Index |

+----------+----------+

^

| Property Search Data

|

+----------------+ Search Query | +----------------+

| |-----------------------------------|------->| |

| Registered/ | | | 2.1 Process |

| Unregistered | | | Search |

| User |<----------------------------------|--------| Query |

| | Search Results (IDs) | | |

+----------------+ | +-------+--------+

| |

| | Property IDs

| |

+----------+----------+ v

| | +----------------+

| D2: Property | | |

| Database |<--| 2.2 Retrieve |

+----------+----------+ | Property |

^ | Details |

| Full Property| |

| Data +----------------+

| |

| | Detailed Property Info

| v

+----------+----------+

| |

| D4: Image |

| Storage |

+----------+----------+

^

| Image URLs

|

+----------+----------+

| |

| 2.3 Format |

| & Display |

| Results |

+---------------------+

^

| Displayed Properties

|

+----------------+ |

| |<----------------------------------|

| Registered/ | |

| Unregistered | |

| User | |

+----------------+

**Explanation of Sub-Processes:**

* **2.1 Process Search Query:** Receives user's search criteria, constructs a query, and sends it to the Search Index. Returns relevant property IDs.
* **2.2 Retrieve Property Details:** Takes the property IDs from the search process and fetches full details from the Property Database (D2) and image URLs from Image Storage (D4).
* **2.3 Format & Display Results:** Assembles all the retrieved data into a user-friendly format for display on the web/mobile interface.

**User Stories: House-Hunt Application (Expanded from Product Backlog)**

Here's an expanded list of user stories, categorized for clarity, following the "As a [role], I want to [goal/action], so that [benefit]" format.

**1. User Management**

* **As a new user,** I want to **register an account with my email and password,** so that I can access personalized features like saving properties.
* **As a registered user,** I want to **log in securely with my credentials,** so that I can access my profile and saved items.
* **As a registered user,** I want to be able to **reset my password** if I forget it, so that I can regain access to my account.
* **As a registered user,** I want to be able to **update my profile information** (e.g., name, phone number), so that my details are accurate.
* **As a registered user,** I want to **remain logged in across sessions** (e.g., for 7 days), so that I don't have to re-enter my credentials frequently.

**2. Property Search & Browse**

* **As a user,** I want to **search for properties by typing a location (city, neighborhood),** so that I can find properties in my desired area.
* **As a user,** I want to **filter search results by price range (min/max),** so that I only see properties within my budget.
* **As a user,** I want to **filter search results by property type** (e.g., apartment, house, villa, condo), so that I can narrow down my options.
* **As a user,** I want to **filter search results by the number of bedrooms and bathrooms,** so that I find a suitable property size.
* **As a user,** I want to **view a list of properties matching my search criteria,** with key information like a primary image, price, number of beds/baths, and location, so that I can quickly scan options.
* **As a user,** I want to **sort search results** by price (low to high, high to low), newest listings, or relevance, so that I can organize properties according to my priorities.
* **As a user,** I want to **see pagination or infinite scroll** on search results, so that I can browse through many listings efficiently.

**3. Property Details**

* **As a user,** I want to **click on a property from the search results to view its full details page,** so that I can get comprehensive information.
* **As a user,** I want to **see multiple high-resolution images/gallery of the property,** so that I can get a thorough visual understanding.
* **As a user,** I want to **read a detailed description of the property,** so that I understand its features, history, and unique selling points.
* **As a user,** I want to **see a list of amenities** (e.g., parking, gym, pool, furnished, pet-friendly), so that I can check if it meets my requirements.
* **As a user,** I want to **see the exact address or approximate location on a map,** so that I know where the property is situated.
* **As a user,** I want to **see key factual details** like property size, year built, and property ID, so that I have complete information.

**4. Saved Properties / Favorites**

* **As a registered user,** I want to **"favorite" a property** from its detail page, so that I can easily find it later without re-searching.
* **As a registered user,** I want to **view a dedicated list of all my favorited properties,** so that I can easily revisit and compare them.
* **As a registered user,** I want to **remove a property from my favorites list,** so that I can manage my selections as my preferences change.

**5. Property Inquiry**

* **As a user,** I want to **fill out a contact form on a property's detail page** with my name, email, and message, so that I can inquire about the property.
* **As a user,** I want to **receive a confirmation message** after submitting an inquiry, so that I know my message has been sent successfully.

**6. Admin Panel (Listing Management)**

* **As an admin,** I want to **log in to a secure dashboard,** so that I can manage property listings.
* **As an admin,** I want to **add a new property listing** by providing all necessary details (description, price, location, images, amenities, etc.), so that it appears on the website.
* **As an admin,** I want to **edit existing property listings,** so that I can update information (e.g., price change, status update).
* **As an admin,** I want to **delete property listings,** so that outdated or sold properties are removed from public view.
* **As an admin,** I want to **view all submitted property inquiries,** so that I can follow up with interested users.

**7. Non-Functional / Technical User Stories**

* **As a system,** I want **all user data (passwords, contact info) to be encrypted at rest and in transit,** so that user privacy is protected.
* **As a system,** I want **search queries to return results within 2 seconds,** so that users have a fast and responsive experience.
* **As a system,** I want to be able to **handle 1,000 concurrent users without performance degradation,** so that the application remains stable under load.
* **As a developer,** I want **automated deployment pipelines (CI/CD),** so that new features and bug fixes can be released quickly and reliably.
* **As an administrator,** I want **comprehensive logging and monitoring of application health,** so that I can identify and resolve issues quickly.
* **As a user,** I want the **website to be fully responsive on mobile devices,** so that I can use it comfortably on my phone or tablet.