Requirement Analysis Report on Harmony Apartments

1. Introduction to Harmony Access:

Harmony Apartments is an apartment complex, consisting of 13 buildings, with over 1200 apartments. They launched a mobile application to connect with their residents and streamline communication, improve management, and enhance resident experience called as Harmony Access. This application provides a platform that facilitates easy access to services and information for residents. Gradually, they added a feature where owners who wish to rent out their apartments can post the listing through application and prospective tenants can browse the available properties in the complex. This feature was designed to cater to the demand of apartment rentals, ensuring that users can find properties with ease and freeing the owners from the hassle of finding tenants on their own.

Activities of Harmony Access:

Resident Connect: The core activity of Harmony Access is to provide its residents with announcements and notices related to the society.

Requests and Complaints: Residents can raise maintenance requests for their apartments as well as society complaints and track the status of the same.

Lease Management: Tenants and Owners can view the lease details and download their Lease agreement.

Property Listings: Hosting listings of apartments available for rent. Which include information such as rental prices, description containing apartment features and amenities as well as apartment images.

Search and Filter Tools: Harmony Access offers search and filter tools that allow users to find apartments based on specific criteria such as price range, number of bedrooms, area and other preferences.

Arranging Visitations: Potential tenants can book viewings for available apartments at specific date and time.

Reasons for implementing Analytical Information System:

Implementing an analytical information system can have a positive impact on financial performance, tenant happiness, operational efficiency, and strategic planning of Harmony Access.

1. Making Decisions Based on Data

AIS can offer detailed reports on occupancy rates, rental trends, tenant demographics, and maintenance issues which will help managers in making decisions. It is also able to predict future patterns in rental demand, pricing policies, and market conditions by analysing previous data.

2. Enhanced Effectiveness of Operations

Tasks like rent collecting, lease renewals, and maintenance requests are automated which in turn lowers human effort and mistake rates.

3.Improved Client Relationship

Provide facilities and services based on tenant preferences and behaviour analysis, boosting tenant retention and satisfaction as well as ensure prompt resolution and improve tenant experience using responsive maintenance and keeping track and ranking maintenance requests.

4. Managing Risks

Credit and background checks will lower the likelihood of defaults and evictions by integrating with credit reporting organizations to conduct tenant screening. AIS can keep an eye out for relevant changes to local rules and regulations and update processes to ensure compliance.

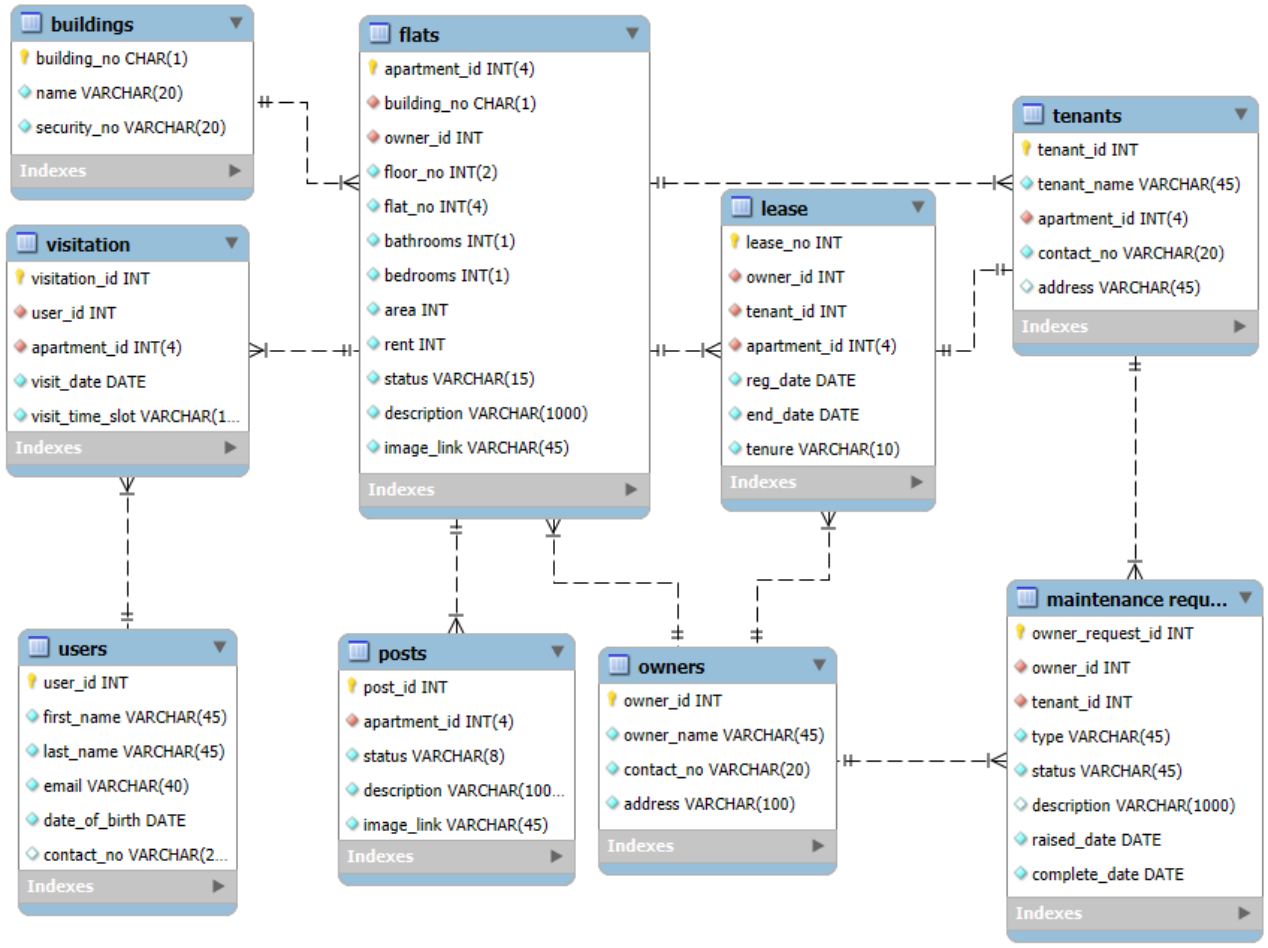
5. Tenant Retention Engagement Analytics:

The system monitors satisfaction and engagement levels of tenants by spotting possible problems before they become a reason for eviction. As well as increases lease retention rates by providing statistics on ideal renewal terms and alerting tenants when their leases are about to expire.

6. Data Security & Protection:

Guarantees that private tenant and financial information is safe by utilising cutting-edge security protocols and adherence to data protection laws. Uses anomaly detection to find and stop possible fraudulent activities.

2. Current Operational Data (ER Diagram):

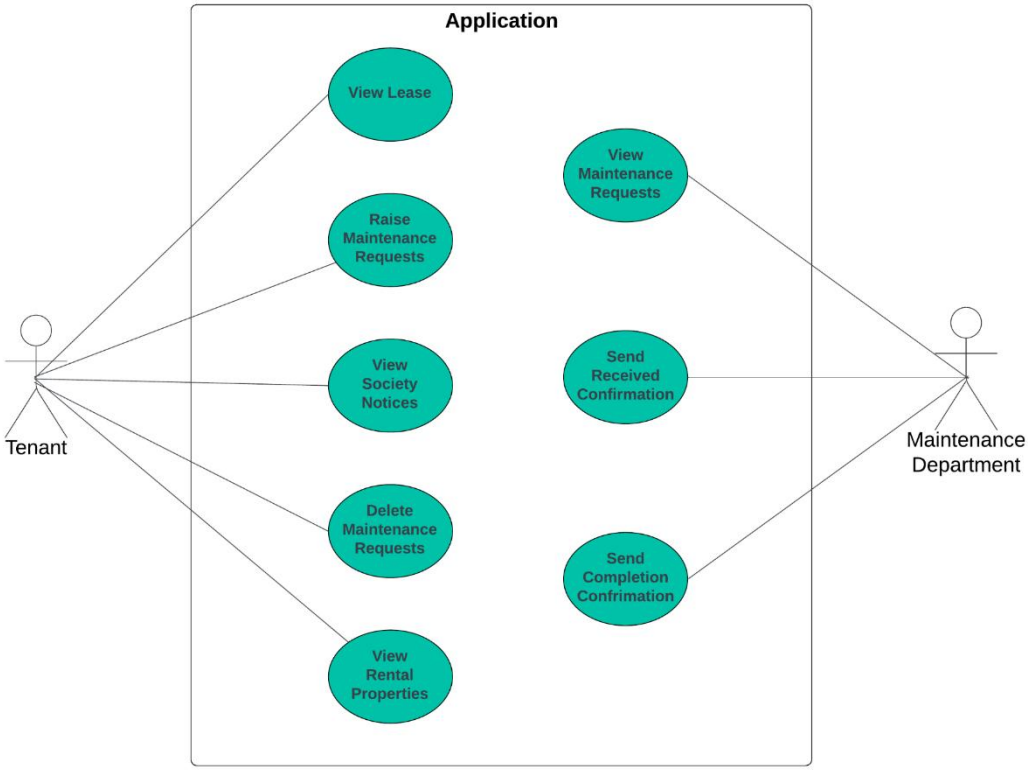


Description of ER Diagram:

The company maintains multiple databases for different departments like Maintenance, Purchase, Finance and Accounts. But we will be focusing on the application database which is the backbone of their Harmony Access application. As depicted in the above diagram, the database revolves around the apartments (flats) in the complex. The apartments are owned by the landlords(owners) and in some cases rented out to tenants with the help of a lease. The maintenance requests raised by owners and tenants are recorded for tracking. The posts contain the properties available for renting using which tenants(users) can arrange visitations.

Attributes at the top of entities are the primary keys denoted by 'golden keys' (e.g., 'apartment_id' in flats and 'lease_no' in lease table, they are the unique identifiers. Red Diagonals usually below primary keys are the foreign keys which are referring to different columns ('apartment_id' in tenants and 'user_id' in visitations). These references are denoted by one-to-one, one-to-many and many-to-many relationships. For example, flats and lease has one to many relationship as one flat can have multiple leases at different times but a particular lease will be for one flat and tenant and lease have one-to-one relationship as one lease will be on name of one tenant (primary) and one tenant can have one lease as lease no. gets updated on renewal.

3. Use Case Diagram:



Tabular Description of Maintenance Request Use Case:

Actors	Tenants, Maintenance Department.
Description	A resident with a tenant role can login into the app and Raise maintenance requests, View Status of the request and delete the requests. The requests are sent to the Maintenance Department, where they can View the requests and Give Confirmations, All the requests are recorded in the database.
Data	Request Description, Tenant & Apartment Details.
Stimulus	Tenant raising the request from application.
Response	Tenant gets confirmation from maintenance department that the request is received through the application.
Comments	The tenant and maintenance department needs to have appropriate login details.

4. Requirement Elicitation Plan to develop an Analytical Information System:

1. Objectives of the Plan:

Recognizing and understanding problems with the current system.

Compiling detailed specifications for the upcoming system.

Meeting the needs of all stakeholders.

Specifying the criteria and extent of deployment.

2. Scope of the Plan:

Functional Requirements (System's Features and Capabilities).

Non-functional Requirements (Usability, Security, and Performance, etc.)

Timeline as well as Financial & Technological constraints.

3. Stakeholder Identification (Participants):

Primary Stakeholders:

Property Managers

Landlords (Owners)

Maintenance Staff

Secondary Stakeholders:

Tenants

Users (Prospective Tenants)

IT Staff

Financial, Legal and Compliance teams

4. Methods of Elicitation

Interviews (One-on-one or Group Interviews)

To gather information about stakeholders' analytical needs and expectations.

Participants: Managers, Maintenance Staff, IT Staff

Surveys/Questionnaires (Online or Paper-based Surveys)

To collect quantitative data on analytical requirements from a broader group.

Participants: Landlords (Owners), Tenants, Users

c. Focus Groups (In-person or virtual focus groups)

To gather diverse perspectives on analytical needs.

Participants: Representatives from user, tenant groups

d. Observation (On-site visits)

To understand the context in which data is collected and used.

Participants: Managers, Maintenance Staff

e. Document Analysis

To review existing documents and systems for insights into current data usage.

Participants: Property Managers, IT Support Staff

5. Elicitation Schedule

- **Week 1-2**: Plan stakeholder identification and interviews.
- **Week 3-4**: Distribute and collect surveys.
- **Week 5**: Conduct interviews.
- **Week 6**: Study survey results and conduct focus groups.
- **Week 7**: Complete on-site observations.
- **Week 8**: Analyze data and review documents.

6. Conclusion

On completion of the plan, it was observed that residents were facing delays in getting their maintenance request resolved. On consultation with maintenance department, manual assignment of tasks was cited as one the possible reasons. Further management and concerned departments were approached for viable solutions to be implemented.

5. Requirements Gathering:

Functional Requirements:

1. Tenant Portal

   Using the application tenants should be able to make maintenance requests monitor the progress of their repair requests. As well as Request updates, planned maintenance, and completion should be sent to tenants. Tenants should also be able to offer input regarding the maintenance services they have received.

2. Maintenance Management

   When a maintenance request is submitted, the system should automatically log it. Requests should be divided into groups according to their nature (e.g., plumbing, electrical, HVAC) and the system should automatically designate tasks to the relevant maintenance personnel. Maintenance personnel should be able to instantly update the state of their tasks.

3. Property Management

   Key information, like occupancy rates, maintenance statistics, and financial data, should be available to property managers via a dashboard. The system should keep track of rental histories, leases, and tenant information.

4. Communication Tools

   System should be able to inform employees and renters on the status of requests, upcoming maintenance, and lease renewals. Application should facilitate direct communication between renters and property management.

5. Integration

   Integration with credit, background, and payment processing with third-party services. Connectivity to IoT devices to provide predictive maintenance and real-time monitoring of vital systems (such as elevators and HVAC systems).

Non-Functional Requirements

1. Performance

   The system must be able to accommodate an increasing number of users and properties, without sacrificing performance. The system needs to react to user input in less than two seconds, for most processes.

2. Reliability

   The system needs to maintain a 99.9% uptime, to provide high availability. It is also needed to deliver informative error warnings and treat mistakes with grace.

3. Security

   Safe access controls and encryption should be in place to protect tenant and financial data. Role-based access restriction and strong authentication procedures should be put in place. And compliance with all applicable data protection laws (such as the CCPA and GDPR) should be met.

4. Usability

   The user interface of the system should be simple to use and intuitive. And to cater to a variety of user demographics, application should support several languages.

6. Compatibility

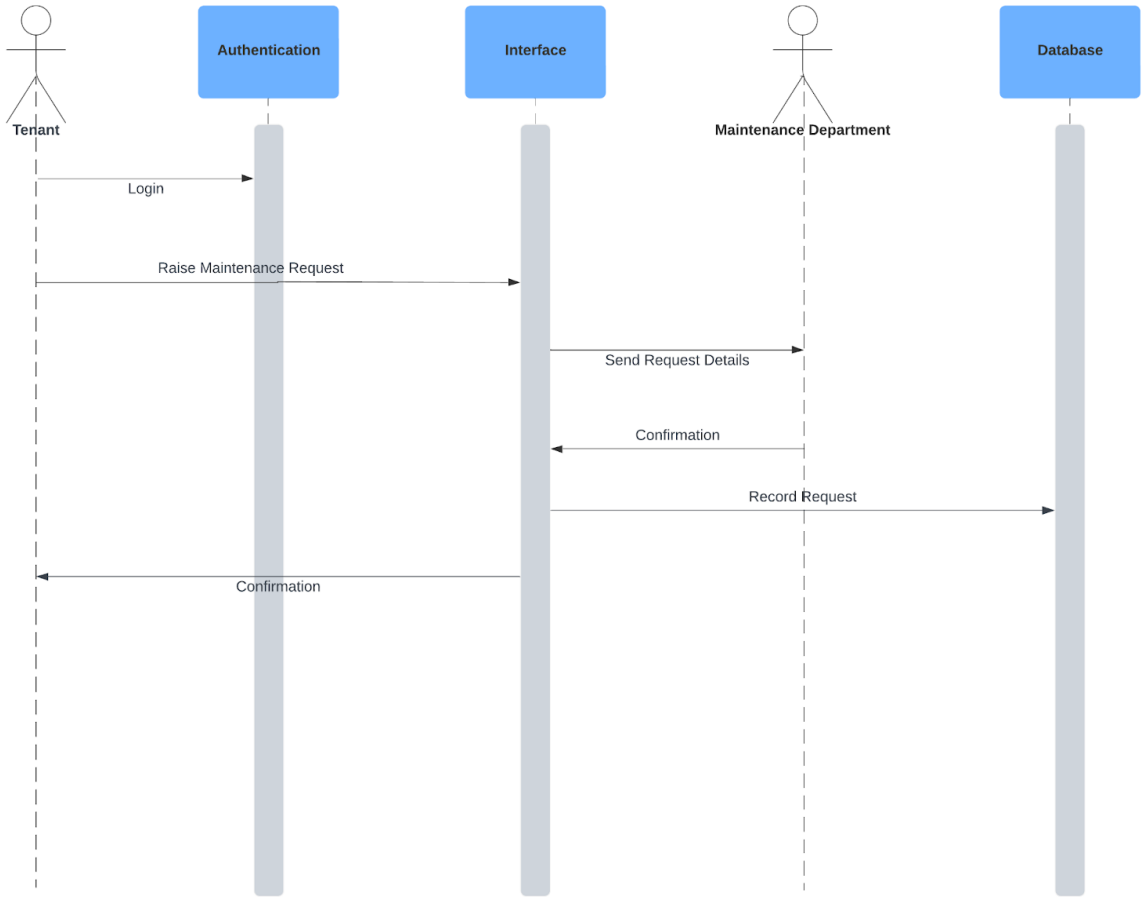
   The system should be accessible on both tablets and smartphones. As well as major operating systems should be supported.

8. Backup and Recovery

   Performing regular data backup operations to avoid data loss. Restore system operation in the event of a significant breakdown, create a disaster recovery plan.

6. Sequence Diagrams:

Before Enhancements:



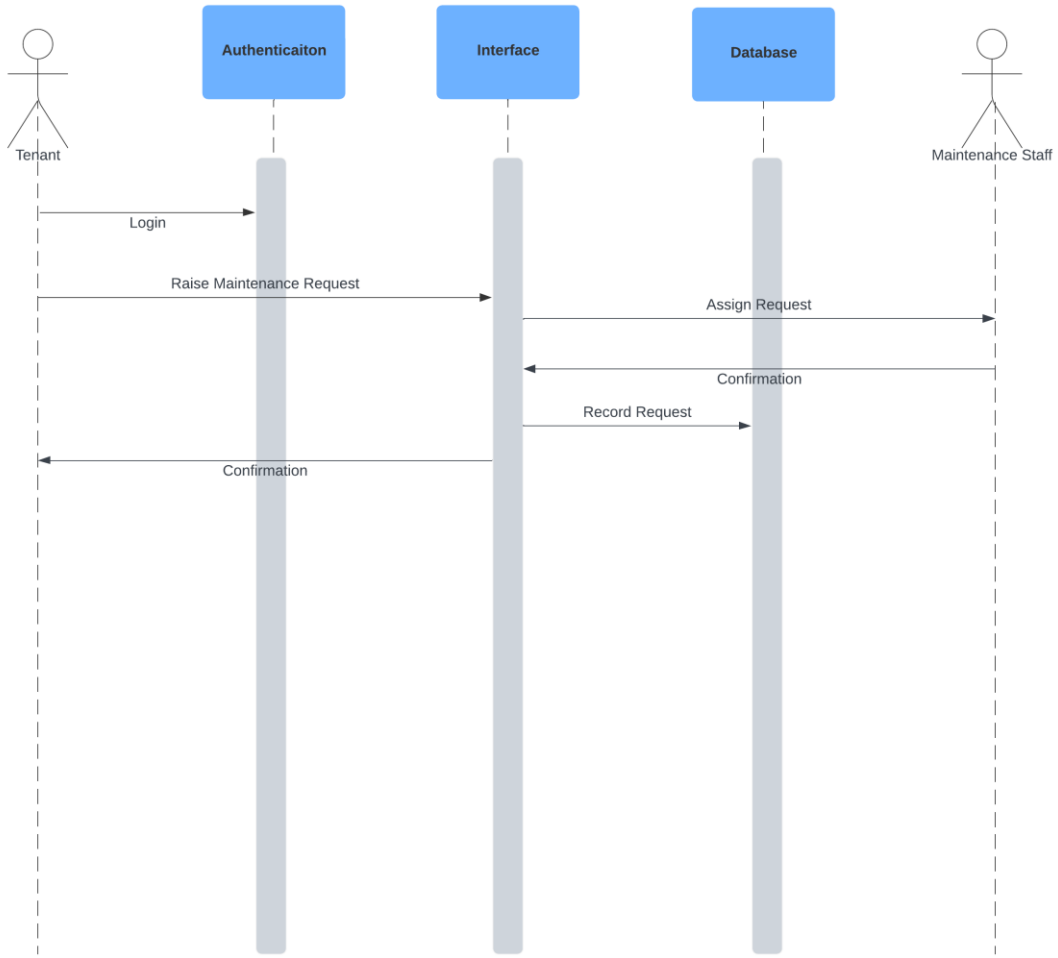
Description:

The image represents a sequence diagram which explains the process of a Maintenance Request function in the application. We will focus on how the function worked for tenants before implementation of Analytical Information System. A tenant logs in to the application and Authenticator provides access based on predefined roles. Once tenant is logged in with a tenant role, he/she can Raise Maintenance Request by entering description of the issue. The application then sends the request to maintenance department representative. After the confirmation from representative, the application records the request in database and subsequently sends the confirmation to the tenant.

Implications:

The Maintenance Department representative receives the request through application. After which, he/she assigns tasks to the Maintenance Staff based on description of request. This process results in delays if the head is not available for some reason. As well as overall duration of request handling is longer due to manual interference.

After Enhancements:



Description:

After implementation of Analytical Information System, the login and authentication process remain same but when tenant Raises Maintenance Request. They get new option to select specify type of request as well as add description as earlier. The application then analyses the type and priority of request and directly assigns it to the maintenance staff based on their role. After the confirmation from staff, the application records the request in database and subsequently sends the confirmation to the tenant.

Implications:

The system will automatically assign the tasks to maintenance staff instead of sending to maintenance head. This action will reduce instances of delays. As well as overall time it takes for request to reach from tenant to maintenance staff. The system can also prioritize tasks based on seriousness and assign critical tasks prior to the less critical tasks. Automated notifications sent by the system will help both tenants and maintenance staff.