

University of Texas at Dallas

Phase 1: Project Requirements Elicitation

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Project Statement: Design and implement an innovative smart home system for non co-located rental properties.

Budget: Request for proposal.

Functional Requirements:

1. Smart Home Appearance

- The software should enhance the appearance of the home
- “Smart home but better”
 - 1. Incorporate cutting edge technology to amplify the aesthetic appeal
- The home should be Internet-connected
- There must be a “monitor” feature to safeguard young users
 - 1. Example: avoiding inappropriate sites for kids

2. Security

- The system should provide secure access control.
 - 1. Every access request must be authenticated, authorized, and encrypted prior to the access being granted.
- The system should record video and audio as needed for security purposes.
 - 1. Team discretion on how much privacy a guest will need
 - 2. Should not be invasive.
 - 3. Potential idea: cameras should only be in entry points of home for security reasons
- Only authorized people should be able to come in and out of the property
 - 1. Guests and home pets

3. Pet & Kid Friendly Features

- The system should prevent unauthorized access through pet doors.
- Home should not allow kids to make unnecessary requests
 - 1. Example: children booking flights

4. Personalization

- The software should aim to provide a highly personalized experience.
- It should allow customization to make different guests feel comfortable in their home.
 - 1. Examples include respecting dietary restrictions for others
- Customer trend analysis:
 - 1. Features like reminders, calendar integration, and trend analysis should be incorporated.
 - 2. Temperature control when guest comes home
 - 3. Stereo control based on environment
- Ensure that amenities are used only when someone is present.
 - 1. Downtime is only acceptable if the system is not being used
 - 2. Potentially be scheduled

5. Voice Command and Preferences

- The system should be able to interpret and act upon voice commands related to user preferences.

- User preferences should be updated on a regular cycle
- The level of privacy regarding voice commands should be configurable by the user.
 1. Privacy can be team discretion
- 6. **Automation**
 - Automatic repair to system
 - The system should automate routine tasks without requiring explicit programming.
 1. Adjusting lights
 2. Automatic pet feeding
- 7. **Alerts for Residents**
 - The system should provide context-sensitive alerts to residents, e.g., for property rental appointments.
 1. Owner should have as little responsibility as possible
 - Consider integrating scheduling capabilities for this purpose.
- 8. **Consistent Home Layouts**
 - The software should support consistent home layouts across multiple houses.
 - Consider scalability and expansion requirements for future homes.

Non-Functional Requirements:

1. **Budget**
 - The project should aim to accomplish more with less budget.
2. **Privacy and Security**
 - Security should be robust to prevent unauthorized access and key duplication.
 1. Potential idea: facial recognition or software-based key for enhanced security
 2. Asymmetric encryption can be used where a public key can encrypt data and that data can only be decrypted with a private key.
 3. Key escrow can be used as a key backup mechanism for encrypted keys.
 - Privacy considerations should be implemented as needed.
 - Consider how much privacy users would expect in various interactions.
 - Consider audio and visual surveillance and take certain rooms into context
3. **Performance**
 - The system should respond promptly to user commands and automate tasks efficiently.
4. **Scalability**
 - Ensure that the system can accommodate expansion to multiple houses with consistent layouts.
5. **Reliability**
 - The system should reliably perform tasks and alerts
6. **User Experience**
 - Prioritize a seamless and pleasant user experience.

- The smart home should not only be functional but also aesthetically pleasing.
- The software should be designed with an intuitive interface to reduce the need for explicit programming.
- Guests should not have to program certain situations into their home