



KARACHI INSTITUTE OF ECONOMICS TECHNOLOGY

College of Engineering

(Department of Software Engineering)

Human Computer Interaction

Complex Engineering Problem

Student name: Hashir Ahmed Buriro

Faculty Signature: _____

Student ID: 13948

Date: _____

CLOs		PLOs		Bloom Taxonomy	
CLO-3		PLO-2: Design and Development		C3: Apply	
SNo.	Complex Engineering Solving Attributes	Excellent (75-100%)	Average (50-75%)	Poor (<50%)	Marks
CLO-3	<u>WP1- Depth of knowledge required</u> A theory-based understanding of the natural sciences applicable to the discipline.	The student states the problem clearly and has sufficient in-depth knowledge to solve the problem.	The student inadequately defines the problem and has insufficient in-depth knowledge to solve the problem.	The student cannot define the problem and has a lack of knowledge to solve the problem.	2
CLO-3	<u>WP3 - Depth of analysis required</u> Conceptually-based mathematics, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modeling applicable to the discipline.	Identifies the correct approach for solving the problem that applies within a specific context and obtained the output as per requirement.	Identifies the improper approach for solving the problem that applies within a specific context and obtained slightly different output as per requirement.	Unable to identify the approach for solving the problem that applies within a specific context that will lead to wrong output.	2
CLO-3	<u>WP4 - Familiarity of issues</u> Involve infrequently encountered issues	Properly point-out different cases of an underlying problem that lead to exceptional results.	Do not point out all cases of an underlying problem that lead to exceptional results.	Inept to find any cases of an underlying problem that lead to exceptional results.	6
Total Marks:					10

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Submission Deadline 23rd May 2024

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Registration Number: 13948

Imagine a smart home automation system that controls various devices such as lights, thermostats, security cameras, and appliances. The system allows users to monitor and manage their home remotely through a mobile application installed on their smartphones or tablets.

Problematic Design:

The current design of the smart home application suffers from several usability issues that hinder the user experience:

1. **Lack of User-Friendliness:** The user interface (UI) is cluttered and unintuitive, making it challenging for users to find and access the controls they need. Users often struggle to navigate through multiple screens and menus to perform simple tasks like adjusting the thermostat or turning off lights.
2. **Inconsistent Behavior:** The application behaves inconsistently across different devices and platforms, leading to confusion among users. Certain features may work differently or be unavailable depending on the device or operating system version, resulting in frustration and dissatisfaction.
3. **Poor Feedback Mechanisms:** The system fails to provide adequate feedback to users when their commands are executed or when devices encounter errors. Users are left uncertain whether their actions were successful, leading to doubts and mistrust in the system's reliability.
4. **Limited Personalization Options:** The application lacks customization features that allow users to tailor the interface and settings to their preferences. Users have limited control over the appearance and layout of the UI, making it difficult to adapt the system to their unique needs and preferences.

Apply HCI concepts:

- a) How you improve design to solve problem.
- b) Sketch a design in which you will present a good design to solve these problems.
- c) Use any software for sketching design. (Balsmiq is one of the best tool for sketching design).

To Improve A Smart Home Automation:

To enhance smart home automation, key improvements can address interoperability, user interface complexity, security vulnerabilities, and energy management:

1. Interoperability:

- Use standard protocols (Zigbee, Z-Wave, and Matter).
- Develop centralized hubs for compatibility and updates.

2. User Interface:

- Create a unified app integrating all device controls.
- Implement voice and AI-driven interfaces.
- Simplify setup with guided wizards and remote support.

3. Security:

- Use strong encryption and end-to-end encryption.
- Provide regular security updates and automatic updates.
- Implement multi-factor and biometric authentication.

4. Energy Management:

- Integrate energy monitoring tools with real-time data.
- Use automated routines and AI for efficient energy use.
- Support renewable energy sources and battery storage.

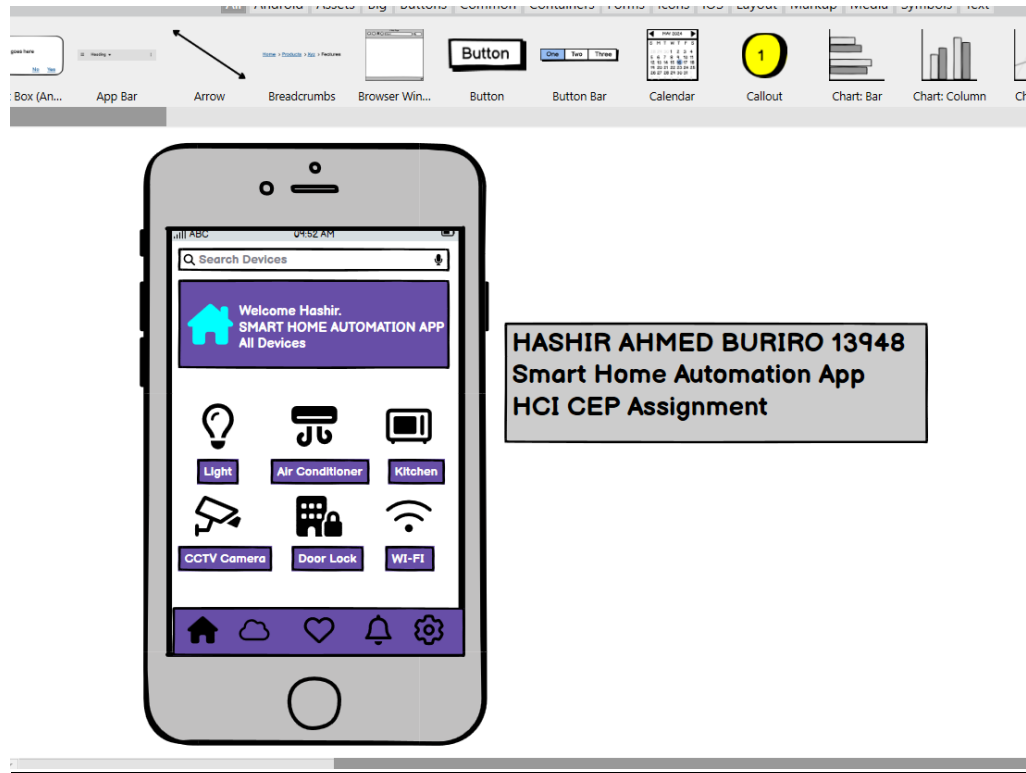
These improvements make smart home systems more user-friendly, secure, and energy-efficient.

Introduction:

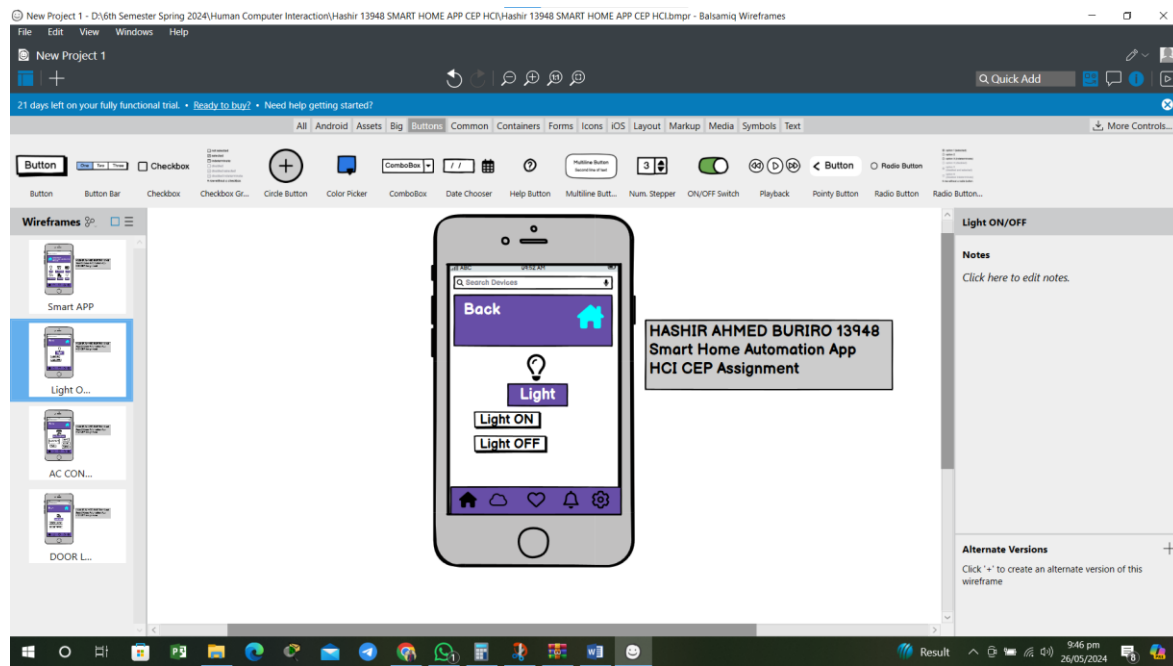
Smart home automation refers to the use of internet-connected devices to manage and control various home systems, such as lighting, heating, security, and entertainment. This technology aims to increase convenience, improve energy efficiency, enhance security, and provide personalized living experiences. Through the integration of sensors, actuators, and intelligent software, smart homes can respond to the needs and preferences of their occupants, creating an adaptive and efficient living environment.

Interface of Smart Home Automation App:

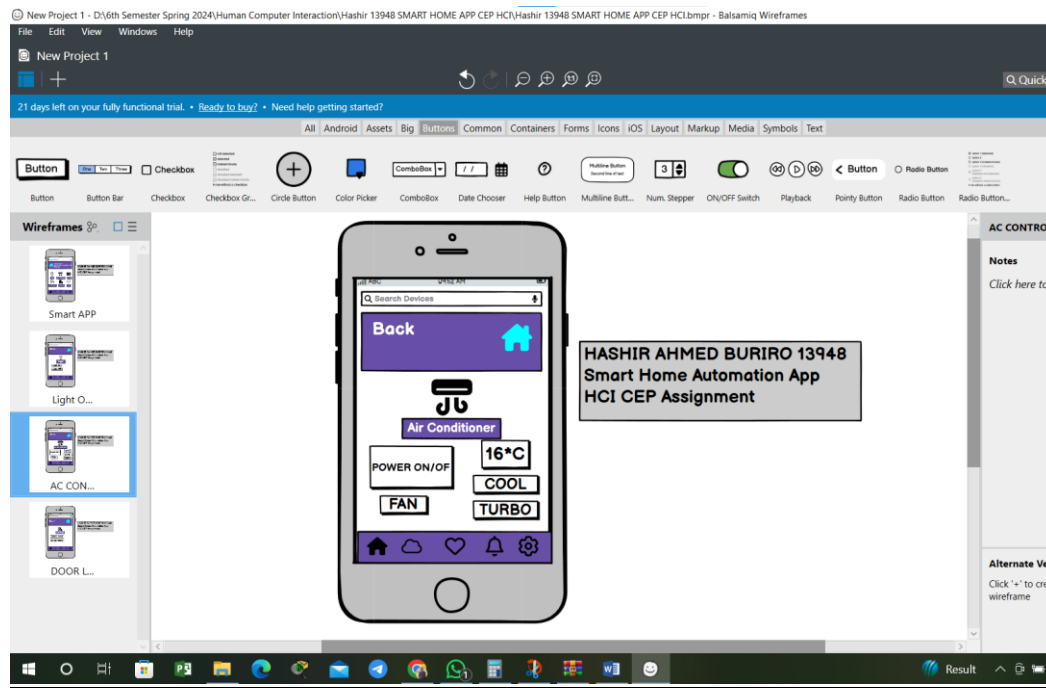
SCREEN 1:



SCREEN 2 LIGHT ON/OFF:



SCREEN 3 AC CONTROLLER:



SCREEN 4 DOOR SECURITY:

