Addis Ababa Science and Technology University

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Software Component Design

Rapid Application Development (RAD) Model

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ARDI: Augmented Reality Museum Guide Application

Introduction

The ARDI (Augmented Reality Museum Guide Application) project is a cutting-edge initiative designed to transform the way visitors interact with museum exhibits. By utilizing augmented reality (AR) technology, ARDI delivers immersive, interactive experiences that provide detailed information, historical context, and enhanced engagement with museum displays. This project aligns with the principles of Component-Based Software Engineering (CBSE) and employs the Rapid Application Development (RAD) model for efficient and iterative development.

Project Objectives

- To provide visitors with detailed, interactive, and immersive guides to museum exhibits using AR technology.
- To create a modular, reusable design that aligns with CBSE principles.
- To demonstrate iterative prototyping and stakeholder feedback integration following the RAD model.

Components in ARDI

1. Action Bar

- **Purpose**: Provides quick access to essential actions such as navigating back, refreshing content, or initiating a scan.
- **Design**: Consistently placed across all screens for ease of access.
- **Implementation**: Created as a reusable component in the Figma prototype, with a uniform style and functionality across different modules.

2. Menu

- **Purpose**: Offers structured navigation to different sections of the app, including Home, About Us, and Exit options.
- **Design**: Designed as a sidebar or drop-down menu that can be accessed from the action bar or screen corners.
- **Implementation**: Reused across all relevant screens for consistent navigation.

3. Search Bar

- **Purpose**: Enables users to search for specific exhibits or topics.
- **Design**: Simple, intuitive input field placed prominently on the main screens.
- **Implementation**: Styled and placed using Figma templates, reflecting its standalone utility.

4. Profile Details

- **Purpose**: Allows users to view and manage their account details (if applicable in the real-world version).

- **Design**: Accessible from the menu or action bar, providing information such as account settings and activity.
- **Implementation**: Conceptualized as an independent screen or module within the Figma prototype.

Application of RAD Model

1. Phase 1: Requirements Planning

- **Stakeholder Involvement**: Requirements gathered from the instructor and team discussions.
- **Outcome**: Defined key features such as AR scanning, exhibit details, menu system, and profile management.

2. Phase 2: User Design

- **Low-Fidelity Prototyping**: Initial sketches created on paper to outline the app's structure and functionality.
- **Medium-Fidelity Prototyping**: Built in Figma, incorporating action bar, menu, search bar, and profile details as reusable components.
- **Stakeholder Feedback**: Regular feedback cycles used to refine designs and improve usability.

3. Phase 3: Construction

- While no backend development is performed, the Figma prototype simulates the app's functionality through interactive designs.

4. Phase 4: Cutover

- The final Figma prototype is presented as the deliverable, showcasing all app features and their interactions.

Component-Based Software Engineering Alignment

1. **Modular Design**
    - Each feature (e.g., action bar, menu, search bar, profile details) is treated as an independent module.
2. **Reusability**
    - Components like the menu and action bar are reused across multiple screens, demonstrating CBSE principles.
3. **Stakeholder Feedback**
    - Iterative refinements align with CBSE’s focus on incremental and modular improvements.

Conclusion

The ARDI project demonstrates the integration of RAD model principles and CBSE concepts to create an innovative, interactive museum guide application. With reusable components and iterative prototyping in Figma, ARDI exemplifies efficient, stakeholder-focused design and development. The final deliverable showcases a comprehensive, modular, and user-centric solution for museum visitors.