

FH Vorarlberg - University of Applied Sciences

Web Applications (wap/INF)
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Lexi

Object Recognition Assistant (ORA)
A Modern AR-Based Language Learning Application

Project Documentation

Group DEF

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1 Project Idea and Task Description

1.1 Task Selection

For this project, we selected the task "*Irgendwas mit AR*" (Something with AR) from the available options in the Web Applications course. This decision was driven by our team's interest in emerging technologies and the potential to create a meaningful solution that addresses real-world challenges faced by the FH Vorarlberg community.

The AR task provided creative freedom to define our own use case while emphasizing client-side web development, which aligns perfectly with the course objectives of building responsive, browser-based applications using modern web APIs.

1.2 Project Concept: Object Recognition Assistant

Lexi - Object Recognition Assistant is a client-side web application designed to help international students at FH Vorarlberg overcome language barriers through technology. The application combines object recognition with language learning to provide an interactive, context-based vocabulary acquisition tool.

Core Idea:

- Users scan real-world objects using their device camera
- The application identifies the object and provides its name in German
- Additional information includes pronunciation guides, definitions, and example sentences
- Scanned objects are saved to a personal collection for later review
- A friendly mascot "Lexi" guides users through the learning experience

Slogan: "*Learn with Lexi*"

1.3 Target Audience and Use Case

Primary Users:

- International students at FH Vorarlberg (A1-B2 German proficiency)
- Exchange students on short-term programs
- Incoming students in preparatory language courses

Use Case:

International students often encounter everyday objects on campus or in daily life for which they don't know the German name. Traditional dictionaries require typing, which is slow and interrupts the learning moment. **Lexi** enables immediate vocabulary acquisition by simply pointing the camera at an object.

For example:

- A student sees an unfamiliar item in the cafeteria → scans it → learns it's a "Brezel"

- In class, a student scans classroom objects to build vocabulary
- Before an exam, a student reviews their collection of scanned objects

Integration with FHV:

The application can be integrated into German as a Foreign Language (DaF) courses at FHV as a supplementary learning tool. FHV serves as a test institution for potential expansion to other educational settings.

1.4 Project Goals

Primary Objectives:

1. Enable instant object identification and translation through camera-based scanning
2. Provide context-based vocabulary learning in real-world situations
3. Create an intuitive, mobile-first interface requiring minimal technical expertise
4. Use gamification (Lexi mascot) to encourage regular use and engagement
5. Support smoother integration of international students into the FHV community

2 Mock-Up Presentation

2.1 Design Approach

The Lexi interface follows a mobile-first design philosophy with emphasis on:

Simplicity:

- Clean, focused screens with single primary actions
- Minimal cognitive load for users with varying German proficiency
- Clear visual hierarchy guiding users to next steps

Accessibility:

- High contrast colors (WCAG AA compliant)
- Large touch targets (minimum 44x44px)
- Simple language avoiding complex vocabulary
- Icon + text combinations for clarity

Engagement:

- Lexi mascot provides personality and encouragement
- Positive reinforcement after successful scans
- Collection feature motivates continued use

2.2 Visual Design System

2.2.1 Color Palette

Color	Hex Code	Purpose
Primary Blue	#4A90E2	Buttons, headers, trust/learning
Secondary Orange	#F5A623	Call-to-actions, highlights
Background White	#FFFFFF	Main backgrounds
Light Gray	#F7F7F7	Secondary backgrounds
Dark Gray	#333333	Text

Table 1: Application color palette

2.2.2 Typography

- **Headings:** Montserrat Bold (24-32px)
- **Body Text:** Open Sans Regular (16-18px minimum)
- **Focus:** Readability and modern aesthetics

2.2.3 Lexi Mascot

The mascot "Lexi" serves as the application's friendly guide:

- Simple, modern illustration style (80-100px height)
- Gender-neutral appearance for inclusivity
- Expressive features showing different emotions (welcoming, encouraging, celebrating)
- Appears on all screens with contextual messages

2.2.4 Lexi Mascot Illustrations

Lexi appears throughout the application in various poses, each conveying a specific emotional state or activity to provide contextual guidance and encouragement to users.

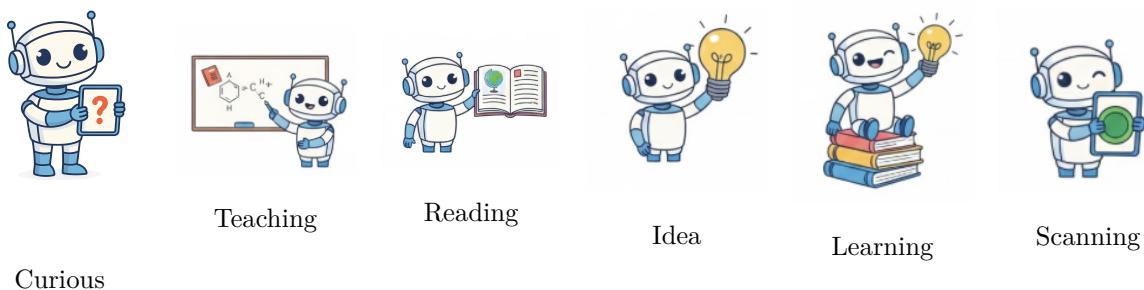


Figure 1: Lexi mascot character variations showing different emotional states and activities

Character Usage:

- *Curious*: Used on help screens and when prompting user questions
- *Teaching*: Appears during tutorials and explanatory content
- *Reading*: Shown in collection/review modes to encourage studying
- *Idea*: Displayed when providing tips or suggesting features
- *Learning*: Used to motivate continued vocabulary building
- *Scanning*: Appears during camera/object recognition activities

2.3 Core Screens

2.3.1 Welcome Screen

Purpose: Entry point and language selection

Key Components:

- Lexi mascot with welcoming animation
- Application name and tagline: "Learn with Lexi"
- Language selector (German/English)
- "Start Scanning" button (primary action)
- "View Collection" link

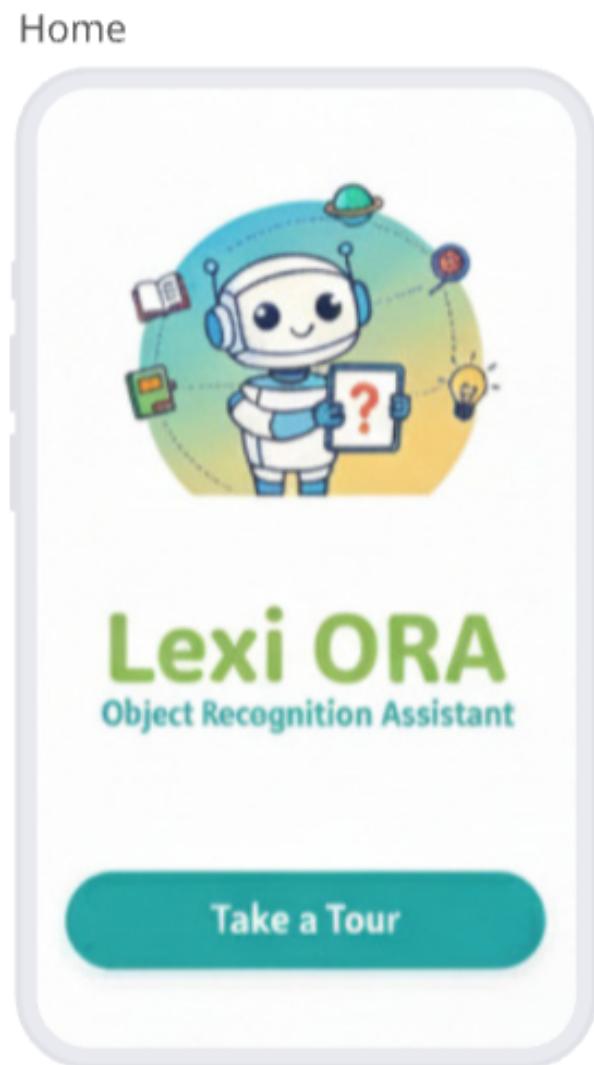


Figure 2: Welcome Screen with Lexi and language selection

2.3.2 Explorer Mode

Purpose: Camera permission handling and user guidance

Key Components:

- Lexi mascot with speech bubble
- Camera permission request message: "Please give access to the camera"
- Clear visual indication of camera requirement
- Bottom navigation bar (Settings, Camera, Collection)
- Friendly, non-threatening permission prompt

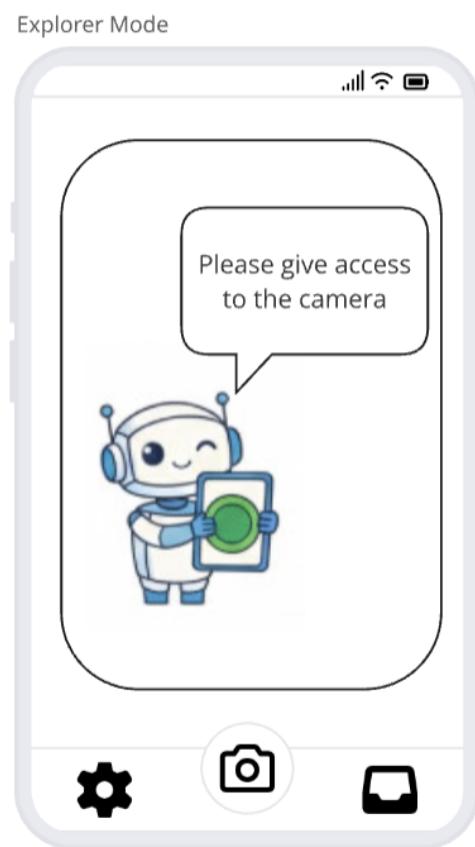


Figure 3: Explorer Mode - Camera permission request with Lexi guidance

2.3.3 Camera Screen

Purpose: Capture images of real-world objects

Key Components:

- Live camera feed (full screen)
- AR viewfinder overlay (frame for object)
- Large capture button (bottom center)
- Lexi avatar with tips: "Center the object in the frame"
- Flash and camera switch controls
- Back button

Camera Access

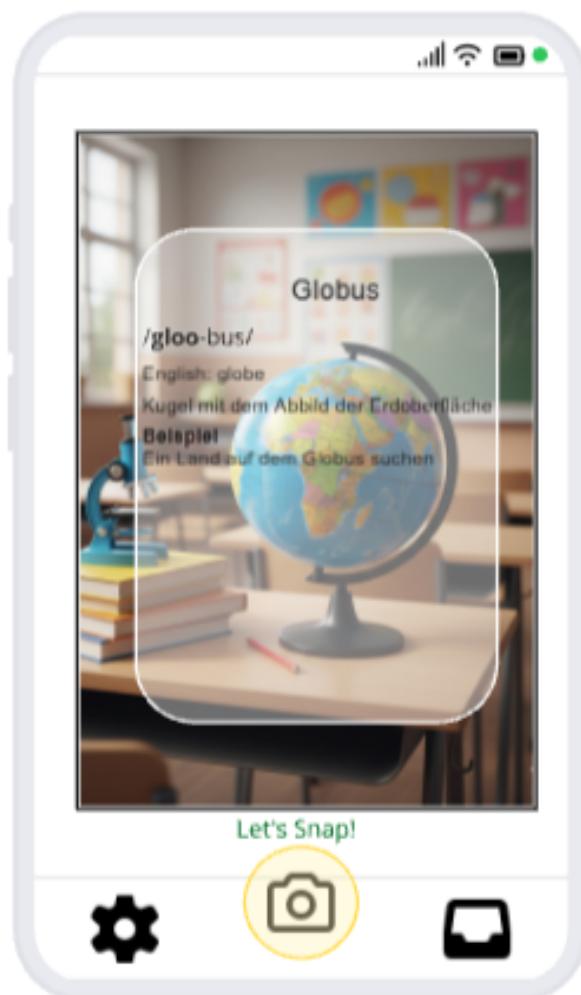


Figure 4: Camera Screen with AR overlay

2.3.4 Success Snapshot

Purpose: Confirmation of successful object recognition and save

Key Components:

- Success banner: "Added to My Index Cards" in turquoise
- Captured object image with AR overlay effect
- Object information display (name, pronunciation, definition, example)
- Bottom navigation bar with highlighted camera icon
- Visual feedback confirming action completion
- Option to capture another object immediately

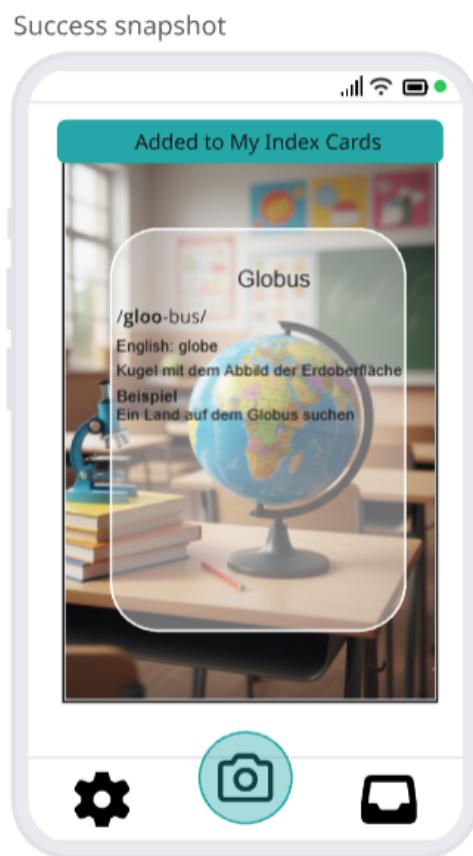


Figure 5: Success Snapshot - Confirmation of saved vocabulary card

2.3.5 Collection Screen

Purpose: Browse and review saved objects

Key Components:

- "My Collection" header
- Search bar
- Grid view (2 columns on mobile)
- Each card shows: thumbnail, object name, date
- Filter/sort controls
- Empty state: "Start scanning to build your collection!"

Index Card Overview

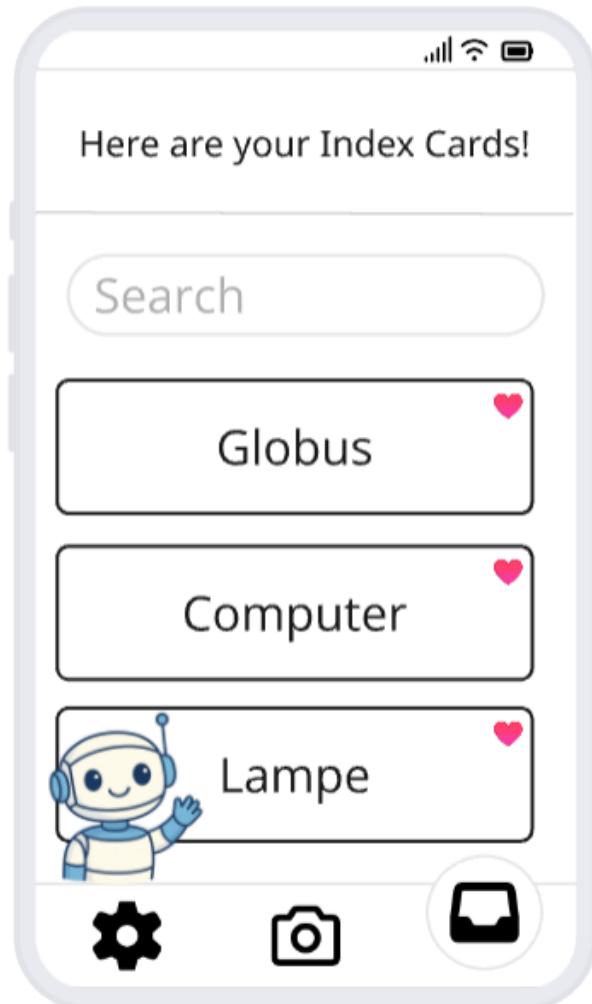


Figure 6: Collection Screen - Personal library

2.3.6 Result Screen

Purpose: Display recognized object information

Key Components:

- Captured image (top 40% of screen)
- Object name in German (large, bold)
- Pronunciation guide (phonetic)
- Brief definition
- Example usage sentence
- "Save to Collection" button
- "Scan Another" button
- Celebrating Lexi animation

Index Card Details



Figure 7: Result Screen with translations and information

2.3.7 Settings Screen

Purpose: Application configuration and user preferences

Key Components:

- Lexi mascot avatar in center
- Language Settings option with globe icon
- My Account option with crown icon
- Contact us! option with envelope icon
- Bottom navigation bar for quick access
- Clean, minimalist design with clear hierarchy

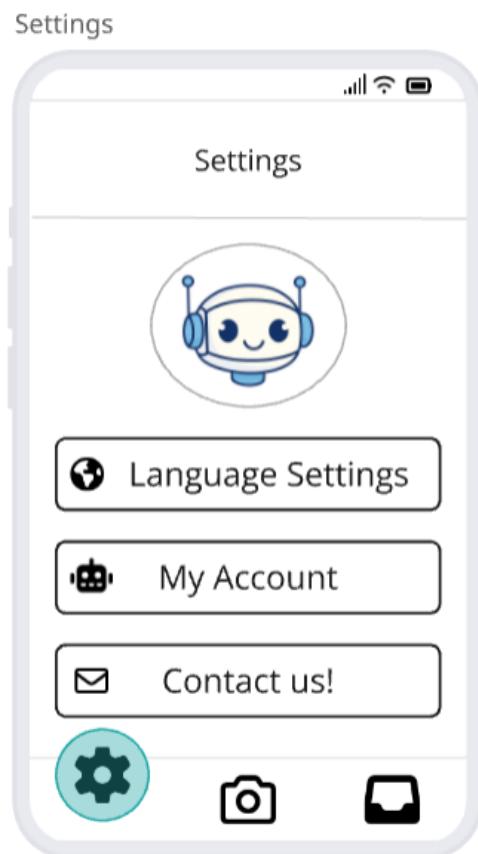


Figure 8: Settings Screen with configuration options

2.4 User Flow

Primary Flow:

1. Open app → Welcome screen with Lexi
2. Select language → Tap "Start Scanning"
3. Camera opens → Aim at object → Capture
4. Processing (3-5 seconds with loading indicator)
5. Result screen displays → Read information
6. Save to collection OR scan another object
7. Access collection anytime to review

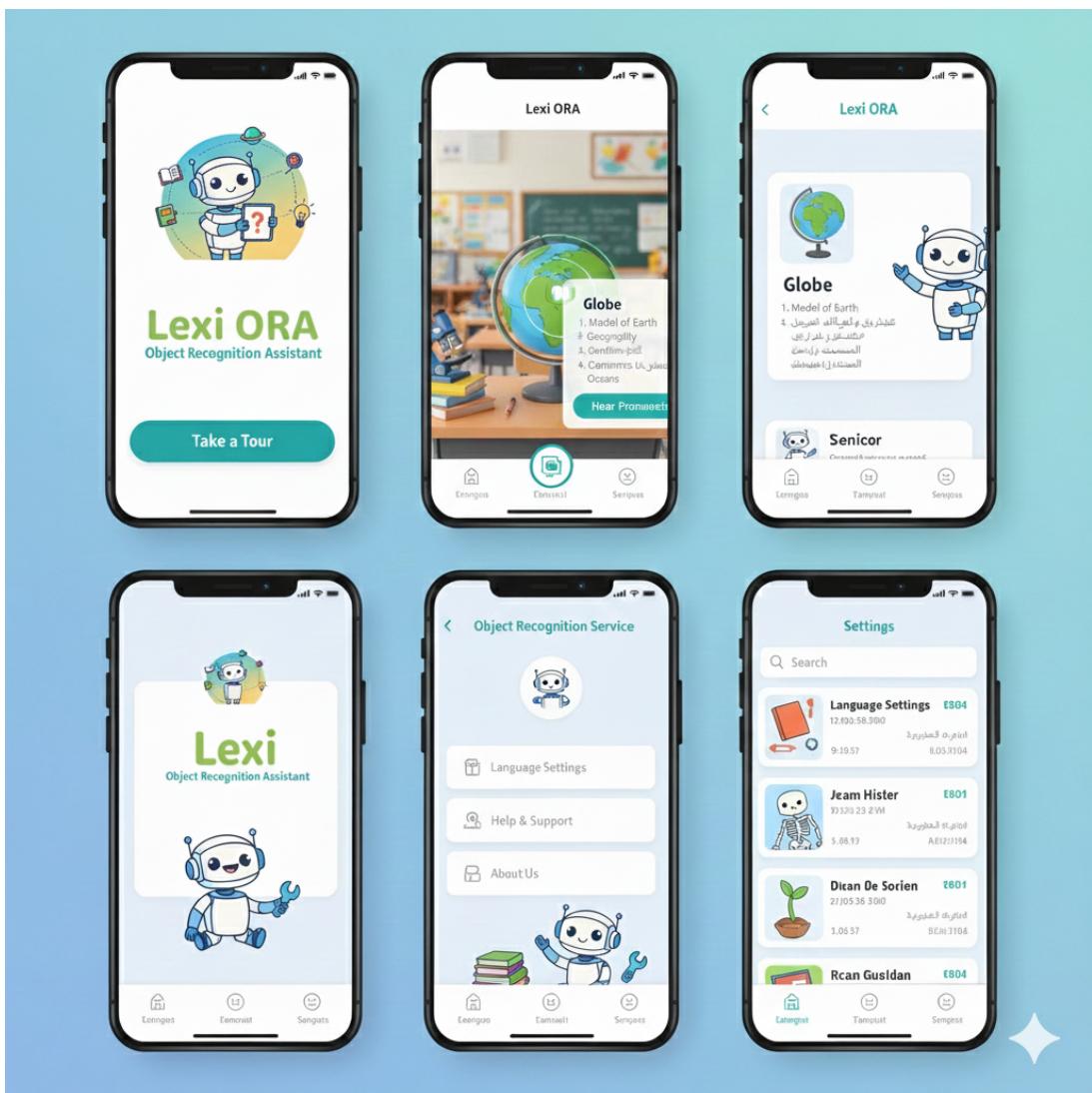


Figure 9: Complete user flow from launch to collection

3 Final Implementation

- 3.1 Goal of the Project
- 3.2 Presentation of the Final Result
- 3.3 Technologies and Tools Used
- 3.4 Challenges and Problems During Development
- 3.5 Comparison with Mock-Up
- 3.6 Evaluation and Assessment of Results

4 Conclusion

This mock-up documentation establishes the conceptual and design foundation for **Lexi**. The application concept addresses a real need among international students at FH Vorarlberg by providing an accessible, engaging tool for context-based vocabulary acquisition.

The mock-up presents:

- Clear project goals focused on language learning and student integration
- Four core screens with intuitive user flows
- Visual design system emphasizing accessibility and engagement
- Lexi mascot as a friendly guide throughout the learning experience

The next phase will focus on technical implementation, iterative testing with real users, and refinement based on feedback and technical constraints.

A Appendix A: Additional Mock-Up Materials

B Appendix B: Code Samples

C Appendix C: User Testing Materials