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Group: 2

Introduction

BirdQuest is an innovative birdwatching app designed to enhance the experience of bird enthusiasts, from beginners to seasoned ornithologists. The app combines cutting-edge technology with user-friendly features to create a comprehensive tool for bird identification, tracking, and community engagement.

App Icon

Innovative Features

- **Augmented Reality (AR) Bird Identification:** Users can identify birds in real-time by simply pointing their camera at them, with the app instantly providing detailed information about the species.
- **Birding Challenges & Gamification:** BirdQuest encourages users to participate in birdwatching challenges, earning badges and climbing leaderboards as they log sightings and explore new locations.
- **Personalized Birdwatching Hotspots:** The app uses GPS to recommend nearby birdwatching spots tailored to user preferences, recent sightings, and current location.

- **Community Contributions & Social Sharing:** BirdQuest fosters a vibrant community by allowing users to share sightings, comment on others' posts, and follow fellow birders for a shared birdwatching experience.
- **Offline Mode:** Users can download bird guides, maps, and relevant data to ensure the app remains fully functional even in remote areas with no internet access.

Detailed List of Requirements

1. **Birdwatching Hotspots Finder**
    - **Functionality:** The app must allow users to find nearby birdwatching hotspots, with directions provided through an integrated map. The hotspots should be filtered based on user preferences (e.g., specific bird species, difficulty of access, etc.).
    - **Elaboration:** The feature should pull data from both community contributions and existing databases to provide real-time updates on bird activity at each hotspot. The app will integrate with Google Maps API for route guidance and navigation.
2. **Bird Sighting Log & Species Database**
    - **Functionality:** Users can log bird sightings, with each entry including species, location (GPS), date, time, and optional notes.
    - **Elaboration:** The species database must be extensive, covering a wide range of birds with detailed descriptions, images, and audio of bird calls. The app should also support user-contributed data, allowing users to add new species to their personal logs.
3. **Augmented Reality Bird Identification**
    - **Functionality:** The app should include an AR feature that identifies birds in real-time when a user points their camera at them.
    - **Elaboration:** The AR tool will leverage machine learning algorithms trained on a vast dataset of bird images. It should provide instant identification, along with details about the bird’s habitat, behavior, and sounds.

4. **Social and Community Features**
    - **Functionality:** Users can connect with other birdwatchers, share their sightings, and participate in community discussions.
    - **Elaboration:** The app will include a feed where users can post their sightings with photos, comment on others' posts, and follow friends or influential birdwatchers. Privacy settings will allow users to control who sees their posts.
5. **Gamification and Challenges**
    - **Functionality:** Users will be encouraged to participate in challenges, such as spotting a certain number of species within a timeframe.
    - **Elaboration:** The app will offer daily, weekly, and monthly challenges with badges and points that users can earn. A leaderboard will show top users based on their birding activities.
6. **Offline Mode**
    - **Functionality:** Users can download bird guides, maps, and relevant information for offline use.
    - **Elaboration:** The app will allow users to select regions or specific bird species to download for offline access. This ensures functionality in areas with limited or no internet connectivity.
7. **User Preferences and Customization**
    - **Functionality:** Users should be able to customize their app experience, from notification settings to the types of birds they are interested in.
    - **Elaboration:** Preferences will include setting favorite bird species, opting in or out of community sharing, and customizing the app's color scheme. These settings should be stored locally on the device and synced with the cloud.
8. **Data Privacy and Security**
    - **Functionality:** Ensure the safety and privacy of user data.
    - **Elaboration:** All user data must be encrypted, and the app must comply with data protection regulations like GDPR. Users should have control over their data, with the option to delete their account and all associated data at any time.

User Interface Design

- **Home Screen**
  - **Description:** The home screen serves as the central hub for accessing all major features: Hotspots, Sighting Logs, AR Bird Identification, and Challenges.
  - **Navigation:** Users can tap on icons or use a bottom navigation bar to access different sections of the app.

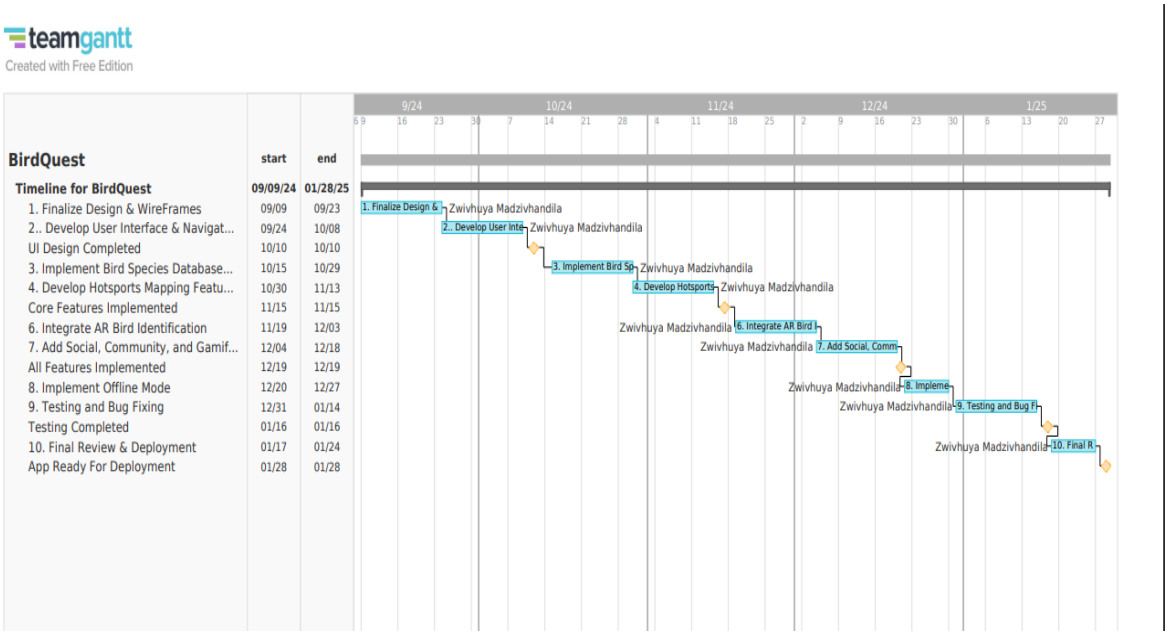
- **Hotspots Map Screen**
    - **Description:** Displays a map with nearby birdwatching hotspots marked. Users can tap on a hotspot to see details and get directions.
    - **Navigation:** From the map, users can go back to the home screen or tap on a hotspot to access more detailed information.
- **Sighting Log Screen**
    - **Description:** A list of all bird sightings logged by the user, with the option to add new sightings, edit existing ones, or filter by species, date, or location.
    - **Navigation:** Users can tap on individual sightings to view details or edit entries.
- **AR Bird Identification Screen**
    - **Description:** Activates the camera and overlays information on birds detected in real-time.
    - **Navigation:** From this screen, users can save identified birds to their log or explore more about the species in the database.
- **Challenges & Leaderboards Screen**
    - **Description:** Displays current challenges, the user's progress, and a leaderboard of top birdwatchers.
    - **Navigation:** Users can join new challenges, view their badges, or compare their progress with others.

Data Collection and Storage

1. **User Data**
    - **Data Types:** Username (String), Email (String), Password (Hashed String), Preferences (JSON).
    - **Purpose:** To manage user accounts and personalize app experiences.

2. **Bird Sightings**
    - **Data Types:** Species (String), Location (GPS Coordinates), Date (DateTime), Notes (Text), Photo (Image File).
    - **Purpose:** To log birdwatching activities and contribute to community data.
3. **Hotspots and Maps**
    - **Data Types:** Location Name (String), GPS Coordinates (Coordinates), Bird Species Sighted (Array of Strings).
    - **Purpose:** To display and navigate to birdwatching hotspots.
4. **AR Identification Data**
    - **Data Types:** Image/Video Stream (Real-time), Identified Species (String).
    - **Purpose:** To assist in real-time bird identification.

Project Plan and Timeline



- **Week 1-2:** Finalize Design & Wireframes
- **Week 3-4:** Develop User Interface & Navigation
- **Week 5-6:** Implement Bird Species Database & Sighting Log
- **Week 7-8:** Develop Hotspots Mapping Feature
- **Week 9-10:** Integrate AR Bird Identification

- **Week 11-12:** Add Social, Community, and Gamification Features
- **Week 13:** Implement Offline Mode
- **Week 14-15:** Testing and Bug Fixing
- **Week 16:** Final Review & Deployment

Milestones

- **Week 4:** UI Design Completed
- **Week 8:** Core Features Implemented
- **Week 12:** All Features Implemented
- **Week 15:** Testing Completed
- **Week 16:** App Ready for Deployment

Conclusion

The BirdQuest app is designed to be a comprehensive tool for birdwatchers, combining ease of use with powerful features like real-time bird identification, community engagement, and offline access. By drawing on the strengths of existing apps and adding innovative features, BirdQuest aims to enhance the birdwatching experience for users of all levels.

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