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System Requirements Document

Stakeholders:

- End Users: Plant enthusiasts and hobbyists who want to better care for their plants.
- Plant Nurseries: Distributors who benefit from customers using the **PlantKeeper** app for better plant care and satisfaction.
- Development Team: Developers, Project Managers, and Data Scientists working to create and maintain the app.

Functional Requirements:

- User Authentication:
  - Users can create an account by registering with a unique email and password.
    - Store user's registration information.
  - Secure authentication mechanisms (e.g., hashed passwords, OAuth).
- User Account Management:
  - Stores users' personal information (e.g., username, number of plants).
  - Users can update their account.
  - Users can view account details, such as the number of plants in their collection.
  - Users can delete their account.
- Plant Identification System:
  - Users can upload a plant image using their **camera** or **photo library**.
  - The system uses a recognition model to identify the plant in the image.
  - If unidentified, the user can manually input the plant details.
- Care Instructions:
  - The system stores care guidelines (watering, sunlight, fertilizing) for each plant.
  - Users can request care instructions for identified plants or plants in their collection.
- Personal Plant Collection:
  - Each user can create their own personal plant collection.
  - Users can add, view, and edit plants in their personal collection.
  - Users can choose to add identified plants into their collection.
  - User plant collection is stored for each user.
- Plant Care Notifications:
  - Configurable alerts for care schedules (e.g., watering, fertilizing).
- Plant Journal:
  - Photo uploads, which are automatically stored, track plant growth.
  - Visual comparisons of plant growth over time.
- Plant Recommendations:
  - Suggest new plants based on the user's existing collection and preferences.
  - Provide care suggestions tailored to the user's local climate and conditions.

Non-Functional Requirements:

- Performance:
    - Fast image processing and plant identification within 5 seconds.
- Reliability:
    - Notifications delivered with up to a 30 second delay.
- Scalability:
    - Support up to 50 users, and up to 10 plants for each user.
    - **Note**: Future product and will support future growth in user base and photo uploads.
- Usability:
    - At least 90% of users should successfully complete key tasks (e.g., uploading a photo to identify a plant) within the first two attempts during usability testing.
    - Average time to complete key tasks should not exceed 2 minutes.
- Security:
    - Encryption of user photos and plant data.
    - Secure authentication for all users.
- Compatibility:
    - Support for Android devices running Android 8.0 (API level 26) or later.
- Image Storage:
    - Average size of an uploaded image up to 3 MB per image.
    - For the prototype, a total of **15 GB** image storage.
    - **Note**: Future product scalability should support **cloud-based storage** for large-scale image uploads.
- Dataset Size:
    - The plant identification dataset (e.g., images for training models) is expected to start at **3 GB** for the prototype, growing based on the number of supported plant species.
    - **Note**: Future product iterations should support an expandable dataset, hosted on a scalable cloud platform like Firebase or AWS S3.
- User Data:
    - User accounts, collections, and care schedules require minimal storage in the prototype phase, up to **1 MB** per user.
    - After account deletion, the user's data can be restored within 30 days. After this period, all data will be permanently deleted.
    - **Note**: Future product scalability needs to include database optimization.
- Plants Data:
    - Size of care details storage for each plant up to **1MB**.

Use Cases:

1. Plant Identification:
    - Actors: User, System
    - Preconditions:
        - The user has logged into the app.
        - The user has a plant photo ready or has granted camera access to take a photo instantly.
    - Basic Flow:
        - The user uploads a photo of a plant.
        - The system identifies the plant using a recognition model.
        - The system displays its name along with care recommendations (e.g., watering frequency, sunlight needs, soil type).
        - The user is given the option to add the plant to their personal collection.
    - Alternate Flow:

      If the system cannot identify the plant
        - It prompts the user to manually input the plant's name or type.
        - After manual input, the system retrieves and displays care recommendations.
        - The user is given the option to add the plant to their personal collection.

2. Receiving Care Notifications:
    - Actors: User, System
    - Preconditions:
        - The user has added plants to their collection
        - Notifications have been enabled for the app.
    - Basic Flow:
        - The system calculates care schedules based on plant requirements (e.g., watering, fertilizing).
        - Notifications are sent to the user at appropriate times.
        - The user sees the notification and acts (e.g., waters the plant).

3. Building a Journal:
    - Actors: User, System
    - Preconditions:
        - The user has added a plant to their collection.
    - Basic Flow:
        - The user uploads a photo of a plant to track its growth.
        - The system stores the photo with a timestamp and categorizes it under the specific plant.
        - The user can view a timeline or gallery of photos to see the plant's growth progress.
        - The system offers a side-by-side comparison of the plant's current state versus its previous stages.

Research and Insights

Questionnaire:

To understand user and nursery needs, as well as real life challenges, the following Google form surveys will be conducted:

End Users

- How many plants do you own?
- Name one plant you like the most.
- How often do you water your plants?
    - Once a day
    - Once a week
    - When needed (by checking the plant soil)
    - Other
- How do you remember to water your plants?
    - I set reminders on my phone
    - I water them on specific days of the week (routine)
    - I just remember it naturally
    - I use a plant care app
    - I often forget to water them
- Have you ever forgotten to water your plants?
    - Yes
    - No
- Has your plant ever gotten sick?
    - Yes
    - No
- If so, why?
    - Excess water
    - Lack of water
    - Excess sun
    - Lack of sun
    - Other
- Did you receive care instructions when buying your plants?
    - Yes
    - No
- How did you choose which plants to buy?
    - Help from nursery staff
    - Prior knowledge
    - Recommendations from friends / family
    - Online searching

- Have you ever used an app that allows you to identify plants and provide notifications and instructions for caring for them?
    - Yes
    - No
- Any other suggestions or recommendations?

Plant Nurseries

- How many plants do you sell daily?
- Do customers often ask for care advice or explanations while shopping?
    - Yes
    - Sometimes
    - No
- Do you currently offer any written or digital care guides for customers?
    - Yes
    - No
- Do customers ever struggle to locate specific plants in your nursery?
    - Yes
    - Sometimes
    - No
- What types of care information do customers usually ask about?
- Would you find it helpful if an app provided care instructions directly to your customers for plants they buy?
    - Yes
    - No