Photo Catalog Application

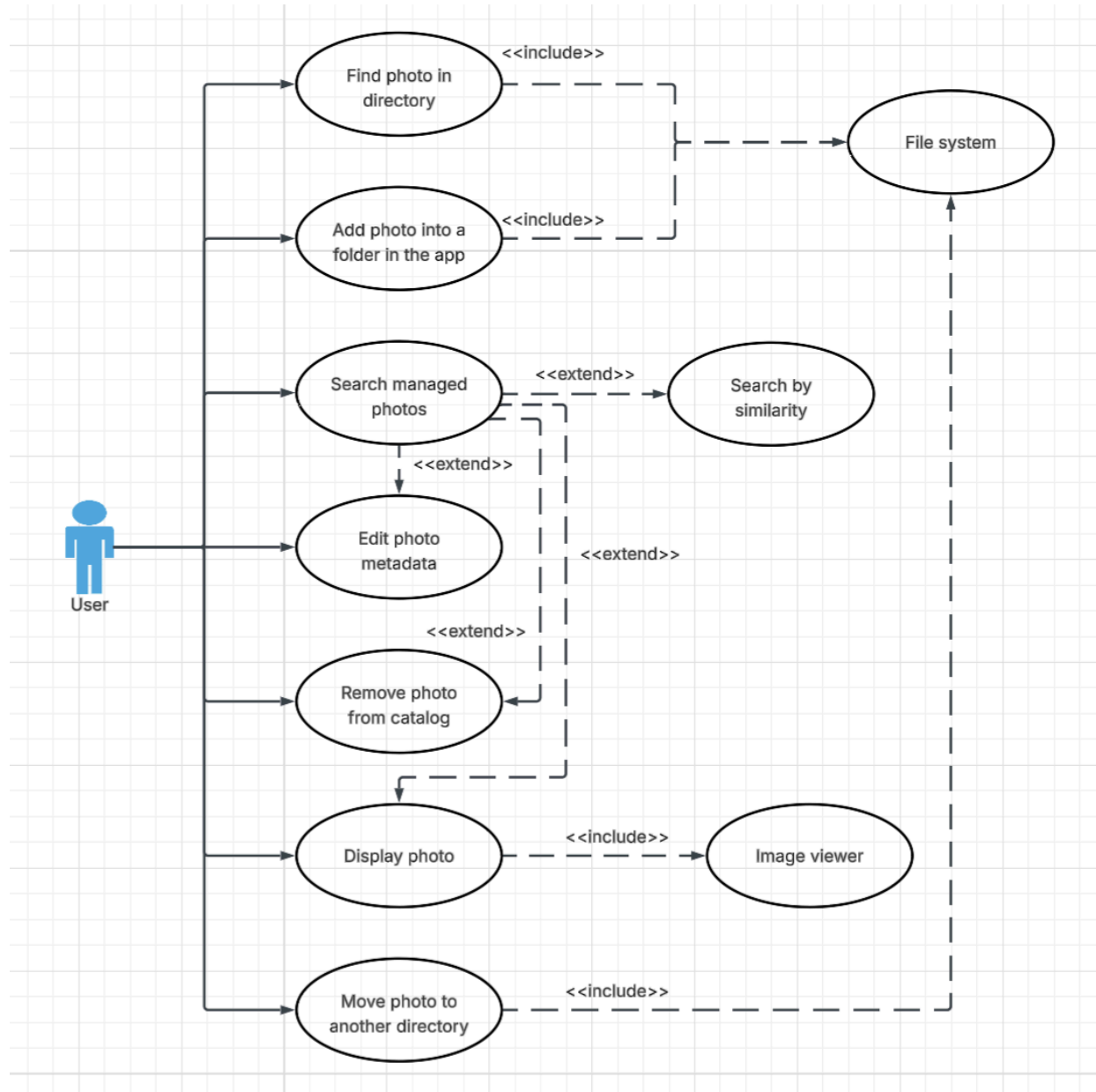Satwik, Oasis, Luka, Grace (Kanyanat)

1/9/2025

Problem/Pain Point: People often have many different photos and images scattered around on the hard disks of their desktop or laptop computer. This makes it difficult to find an image you're looking for. Also, when you see an image file sitting in some directory, you may have no idea of what it represents. This application is intended to help you organize and manage the images on your computer.

Capabilities <mark style="background-color:#00FF00">Must have</mark>, <mark style="background-color:#FFFF00">Nice to have</mark>, <mark style="background-color:#00FFFF">Blue sky (Unconstrained/Impractical)</mark>

- Find photos stored on disk: Scan the computer and locate image files (.jpg, .png), then display the file name and location, to allow further actions(allow them to select which subdirectories).
- Add new photos to the catalog: Choose an image to manage, either from a list created by a scan or directly by browsing, and insert it into the catalog. As part of this process, enter a title, a description and one or more tags to associate with the image. The catalog will also remember the location on the disk where the image is stored.
- Search managed photos: Search the photos in the catalog by title and/or tags, with partial matching. The application will show a list of matched images, then allow further actions.
- Search by similarity: Given a selected image, find other images with similar tags.
- Edit managed photos: Select an image that is managed within the catalog and modify its title, description and/or tags. Note that the selection will usually be based on a search.
- Remove photos from catalog: Usually selected based on search.
- Display a selected photo/image on the screen: You may use a third-party software module for this, or a web browser.
- Move images on disk: Given one or more images in a particular location (a specific subdirectory), move them to a new subdirectory and update the catalog information accordingly. This function should be able to create new subdirectories.

Use Case Diagram

Use Case Narrative

Use Case Name	Find Photo in Directory
Actors	User
Goal	Locate photo(s) the user is searching for in the selected disk.
Preconditions	None
Main Success Scenario	1. User selects a directory to scan. 2. System scans the directory by filtering by file extensions like jpg, png, etc. 3. System shows all photos in that directory.
Postconditions	User sees a list of photos in the selected directory from the scan.
Extension A	1A. Directory does not exist.
Extension B	2B. There are no photos in the selected directory, so the system displays "No photos found".

Use Case Name	Add Photo into a Folder in the App
Actors	User
Goal	Store a photo into a folder created or managed using the app and storing the photos' information, the metadata (tags, title, description), into the catalog.
Preconditions	Photo exists in directory selected by the user when scanning.
Main Success Scenario	1. User chooses a photo to add. 2. System requests the photo's location. 3. System reads photo from file system. 4. System compares file hash to detect duplicates. 5. System stores the photo into the folder. 6. System stores the photos' metadata into the catalog. 7. System confirms addition.
Postconditions	Photo is available in the managed folder and the photos' information is available in the catalog.
Extension A	3A. Photo not found, so the system displays error.
Extension B	4B. Photo already exists in the folder, so the system warns the user but allows replacement or cancellation. 5B. Photo information already exists in catalog, so the system warns the user but allows replacement or cancellation.

Use Case Name	Search Managed Photos
Actors	User
Goal	Find photos within the catalog by criteria, like metadata.
Preconditions	Catalog contains at least one photo.
Main Success Scenario	1. User selects "Search". 2. System asks for search criteria, like title, tags, description. 3. User enters criteria. 4. System searches the catalog. 5. System displays results.
Postconditions	User sees a list of photos that matches the search, which matches partial strings.
Extension A	3A. User chooses similarity search, so the system extends functionality to "Search by similarity" which compares tags or feature vectors of images.
Extension B	5B. No results found, so the system displays "No matches found".

Use Case Name	Edit Photo Metadata
Actors	User
Goal	Modify the metadata of a photo, like title, tags, description.
Preconditions	User has selected a photo from search results. Photo exists in the catalog.
Main Success Scenario	1. User selects a photo. 2. User requests "Edit Metadata". 3. System shows current metadata. 4. User updates fields. 5. System validates entries. 6. System saves metadata.
Postconditions	Updated metadata is saved in the catalog.
Extension A	2A. User cancels edit, so the system aborts the operation.
Extension B	5A. Invalid metadata, so the system prompts the user to make corrections.

Use Case Name	Display Photo
Actors	User
Goal	Open and display a photo from the catalog.
Preconditions	Photo is selected from search results. Photo exists in the catalog or in the directory.
Main Success Scenario	1. User selects a photo. 2. System checks if the file can be opened by the image library. 3. System retrieves the photo from catalog/directory. 4. System invokes Image Viewer. 5. Photo is displayed to user.
Postconditions	User is able to see the selected photo.
Extension A	2A. Photo missing/corrupted, so the system shows an error message. 2B. Image cannot be opened, system marks the image as corrupted.

Use Case Name	Remove Photo from Catalog
Actors	User
Goal	Delete a photo from the catalog
Preconditions	Photo exists in the catalog.
Main Success Scenario	1. User selects a photo. 2. User requests removal. 3. System asks for confirmation. 4. User confirms. 5. System deletes photo from catalog. 6. System confirms removal.
Postconditions	Photo no longer exists in the catalog.
Extension A	2A. User cancels confirmation, so the system aborts the removal.

Use Case Name	Move Photo to Another Directory.
Actors	User
Goal	Move a photo file to another location.
Preconditions	Photo exists in the folder/directory.
Main Success Scenario	1. User selects a photo. 2. User chooses "Move". 3. System asks for the new location. 4. User specifies a directory. 5. System checks and updates the file path to reflect new location. 6. System moves photo via File System. 7. System confirms.
Postconditions	Photo is moved to a new location that the user selected.
Extension A	4A. Selected directory not writable, so the system shows an error message.
Extension B	5A. File with same name exists in target directory, system prompts to rename or cancel.

Use Case Name	Search by Similarity
Actors	User
Goal	Find other managed photos in the catalog that are similar to a selected photo based on tags or image features.
Preconditions	Catalog contains at least one photo. Photo is selected as the reference for similarity search.
Main Success Scenario	1. User selects a photo from search results or the catalog. 2. User chooses "Search by Similarity." 3. System retrieves metadata, such as tags, from the selected photos. 4. System compares the attribute to other photos in the catalog. 5. System ranks and displays similar photos to the user.
Postconditions	User sees a list of photos similar to the selected image.
Extension A	2A. User cancels operation, system aborts search and returns to the previous screen.
Extension B	5A. No similar photos found, system displays "No similar photos found."