Project Requirements

**Project**: Disability Recognition Site

**Team**:

**Revision History**

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| **Date** | **Version** | **Description Author** |
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**Problem statement**

Our team aims to develop a web-based site for identifying people with disabilities. The site uses image recognition technology to identify external disabilities in a person. This technology aligns well with our stakeholders' needs as identified through a series of comprehensive surveys to understand their concerns and how best the site can address them. From the findings, our team came up with the following goals and objectives:

* Enhance accessibility of digital content to people with disabilities tailored to meet their needs.
* Aid in identifying the disabilities in a person for early intervention and support.
* Promote inclusivity in society by ensuring people with disabilities have access to opportunities.
* Provide valuable information to caregivers, policymakers, and other players to make informed decision-making regarding the provision of accommodation to the disabled.
* Provide data for research in public health to better understand the prevalence and impact of various disabilities.

The system will be implemented in a web-based system where users will be required to sign up and upload their images so that the system can identify their disabilities. Those authorized as admin can create, update, and delete resource materials on disability available on the landing page of the site.

**Stakeholders**

**General Public**

Accessibility Information: The public can also use this site for awareness and knowledge of different types of disability. They can share pictures with the system and analyze how the technology distinguishes between various forms of disabilities to promote empathy/understanding.

Self-Assessment: The service can help those who wish to know more about themselves with personal self-evaluation. They can share pictures with the system and analyze whether there is the existence of any disability among themselves.

**Our Team - Product owner**

* Setting Strategic Vision: Our team outlines and communicates the site's strategy. That is, how the strategy maps to the broader objectives of the project.
* Stakeholder Engagement: We are the single interface or go-to person for various players, including users, developers, government representatives, disability advocacy organizations, and others. We listen to their feedback and complaints and make sure they are incorporated into the decisions we make.
* Product Roadmap: We create and maintain a product roadmap, laying out the features of the site, what changes will occur, and at what point they will be released. The roadmap must focus on enhancements on accuracy.

**Government Agencies:**

Government agencies need to create and enforce standards and rules that cover issues including but not limited to privacy, accuracy, and compliance with disability rights law. Additionally, these entities verify the site's compliance with privacy rules and ethics codes, conducting inspections, and investigations, and promoting transparency. They can also utilize this platform's data for policy research, resource allocation, and advocacy, as well.

**Software Engineering Team**

The software engineering team is responsible for monitoring and progressing the site’s life cycle. Their responsibilities are as follows:

● Outlining the project requirements.

● Implementing the project and its features.

● Conducting software testing on the site’s APIs.

● Dividing the project into tasks and assigning these to team members.

● Resolve any issues that delay the life cycle.

**Disability Advocacy Groups**

Advocacy organizations also play an important role in ensuring the operation of the designed site is done ethically and inclusively. Besides, they are also responsible for conducting regular site audits to ensure their functionality checks and their compliance with ethical standards to guarantee accuracy about disability identification. The organizations represent the voices, needs, and aspirations of disabled people. They provide user education and support, helping people understand the results of the site, its limits, and its consequences.

**System requirements**

The disability recognition site will consist of a centralized web-based application that has a list of requirements as follows:

● The project shall use **Python** as a programming language for the model.

● The project shall use **React 17.0.2** as a Framework for the front end.

● The project shall use a **Postgres** database.

● The site shall be compatible with the most recent web browser versions.

**Feature Requirements**

**1. Functional**

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| **No.** | **User Story Name** | **Description** | **Release** |
| 1 | Registration | The system shall allow the user to register by providing his personal information (First Name, Last Name, date of birth, Phone number, and email address) and also set credentials ( password).  Upon registration, the system will associate the user credentials with the user account information that already exists. | R1 |
| 2  3 | Login  Image Upload Functionality | The user shall be able to sign in to his account by providing an email address and password.  A user should be able to upload an image for disability analysis. | R1  R1 |

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| 4 | Admin Section | The admin panel will enable all those authorized by the product owners to update any information on the site such as educational articles visible on the landing page of the site. Statistics from government agencies and disability advocacy groups will also be published on the landing page. | R2 |
| 5 | Logout Feature | Users and admin shall log in upon ending their activities while logged in. | R1 |

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| 6 | Disability Presentation | The system shall display the list of disabilities associated with the current user. | R1 |
| 7 | Disability Detection Algorithms | The system will utilize machine learning and computer vision algorithms to detect the availability of any disability in an image. | R1 |
| 8 | User Feedback | The site will allow the user to provide feedback on the accuracy of the disability detected. | R1 |
| 9 | User Consent | The site should first obtain the user's consent to process their images and provide their data to government agencies when necessary. | R1 |
| 10 | Accessibility | The site should be designed in a way that is accessible to people with disabilities. | R2 |
| 11 | Disability classification | The site will classify the type of disability present in an image. | R1 |
| 12 | Data Storage | The site should have a secure database to store the users’ credentials and analysis results. | R2 |
| 13 | Medication Advice | The site should offer advice to users based on the disability classification identified. | R2 |

**2. Non-Functional**

**2.1. Usability**

**2.1.1. User Interface**

● The system shall have a consistent theme in terms of color, texture, and text.

● The system shall have an easy-to-navigate UI.

● The system shall utilize icons.

**2.1.2. Accessibility**

● The system shall be accessed for both normal and disabled people.

● For all images, the system shall provide alt text which tells the screen reader what information the image provides. If the image is just decorative, the system shall have null alt text so that the screen reader can skip it.

**2.2. Reliability & Availability**

● The system shall handle a large number of users, especially during midnight, which is considered as the pick period without failure.

● The system shall be optimized to have a 99.9999% availability rate.

● The system shall provide database storage and backup.

**2.3. Performance**

● The system shall have a short time response even with a large load.

● The system performance shall depend on the client’s internet connection and hardware components.

**2.4. Security**

● The system shall log out all users after a period of inactivity.

● The system shall not allow unauthorized access.

* Only those authorized will have access to the admin panel

● The system database shall only be accessible to an administrator.

● The system shall not display passwords.

**Use case diagram**

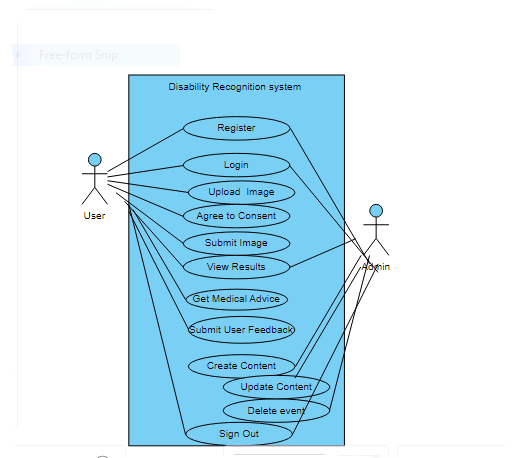


Fig1. Use case diagram

**Use case description**

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| Use Case Number | UC-01 |
| Use Case Name | **Registration** |
| Overview | The user shall enter his personal information for registration. |
| Actor(s) | Users, admin |
| Pre-condition(s) | ● The site has been set up, running, and configured.  ● Registrant has accessed the site through URL. |
| Scenario Flow | **Main (success) Flow:**  1. The user selects the option to register.  2. System requests personal information.  3. The user provides personal information.  a. First Name  b. Last Name  c. Email Address  d. Date of birth  e. Phone Number  f. Password.  4. The system verifies the required information.  a. if the provided information is invalid, the system will display an error message, and return to **Step 2**.  b. if not, the system will save the new account into the database, display a confirmation to the user, and then complete the registration. |
| Alternate Flows | The user will have the chance to cancel a registration after Step (2) by just clicking on the “Cancel” button.  The system will display the main page. |
| Post Condition | The system will not store the user information unless the user clicks on “Register” and after the system verifies the personal information provided to match the university’s data. |

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| Use Case Number | UC-02 |
| Use Case Name | **Login** |
| Overview | The user shall enter his **Email Address** and **password** to be able to log in to the site. |
| Actor(s) | Users, Admin |
| Pre-condition(s) | The user must be registered.  The user must be on the login page. |
| Scenario Flow  Alternate Flows  Post Condition | **Main(success) Flow:**  1. The user enters his credentials and clicks on **submit**  ● Email Address  ● Password  2. The system will verify the information provided by the user.  3. If the credentials are incorrect, the system will show a message and start from step (1).  4. Direct the user to the dashboard page.  The user will be able to access the dashboard. |

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| Use Case Number | UC-03 |
| Use Case Name | **Upload Image** |
| Overview | The user will upload the image to be verified. The images will be verified sequentially and the results displayed on the dashboard. |
| Actor(s) | Users |
| Pre-condition(s) | 1. The user must be logged in. 2. The user shall be on the dashboard page. |
| Scenario Flow | **Main(success) Flow:**   1. The user clicks on the **upload image** feature within the dashboard. 2. The **upload image** feature lets the user either take a camera photo or upload an image from the device storage. |
| Alternate Flows | The user will have the chance to cancel the image upload process by just clicking on the **“Cancel”** button.  The system will display the dashboard page. |
| Post Condition | The user will submit the photo and be redirected back to the dashboard. |

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| Use Case Number | UC-04 |
| Use Case Name | **User Consent agreement** |
| Overview | The user will agree to consent to have the image processed and the results stored by the site’s database. |
| Actor(s) | Users |
| Pre-condition(s) | 1. The user must be logged in. 2. The user shall have uploaded the photo but not submitted. |
| Scenario Flow | Main(success) Flow:   1. The user clicks on the upload image feature within the dashboard. 2. The upload image feature lets the user either take a camera photo or upload an image from the device storage. 3. The user agrees to consent to have the image processed by ticking on the box that has description of ”**By ticking this box you agree to give consent to have your image processed and results stored”**. |
| Alternate Flows | The user will have the chance not to agree to consent by not ticking on the box that has description of ”**By ticking this box you agree to give consent to have your image processed and results stored”**. |
| Post Condition | The user shall agree to consent before submitting the photo. |

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| Use Case Number | UC-05 |
| Use Case Name | **Submit Image** |
| Overview | The user shall submit to be verified. The images will be verified sequentially and the results displayed on the dashboard. |
| Actor(s) | Users |
| Pre-condition(s) | 1. The user must be logged in. 2. The user must have uploaded the image. 3. The user must have agreed to consent. |
| Scenario Flow | **Main(success) Flow:**   1. The user clicks on the **upload image** feature within the dashboard. 2. The **upload image** feature lets the user either take a camera photo or upload an image from the device storage. 3. The user agrees to consent. 4. The user clicks the **“Submit**” button. |
| Alternate Flows | The user may choose not to submit and will be treated as not submitted.  The system will display the dashboard page. |
| Post Condition | The user will submit the image for processing. |

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| Use Case Number | UC-06 |
| Use Case Name | **Manage Content** |
| Overview | The admin will have the ability to manage content displayed on the landing page of the site  ● Create Content  ● Update Content  ● Delete Content |
| Actor(s) | Admin |
| Pre-condition(s) | The user must have an admin role. |
| Scenario Flow | **Main(success) Flow:**  **● Create Content**  1. The user must click on “**Create Content**”.  2. The system will redirect to the “**Create Content**” page.  3. The user must fill in the content details.  i. Title  ii. Description  iii. Due Date  4. The user must click **submit** to finish content creation  **● Update Content**  1. The user must select content to update.  2. The user must select the “**Update Content**” option. 3. The system will redirect to the “**Update Content**” page.  4. The user can edit any or none of the content details.  5. The User must click submit to save changes.  **● Delete Content**  1. The user must select content to delete.  2. The user must select the “**Delete Content**” option.  3. The system will prompt if the content should be deleted.  4. The admin must select “**Yes**” or “**No**” to delete or keep the content. |
| Alternate Flow | .  The admin will have the chance to cancel any of the actions (Create, update, and Delete) content by clicking on the **“Cancel”** button. |
| Post Conditions | The admin will create, update, or delete content and the changes will be published on the landing page. |

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| Use Case Number | UC-07 |
| Use Case Name | **View System Results** |
| Overview | All authorized users will view the results from the analysis of their uploaded and processed images.  The admin shall have access to all results from the database. |
| Actor(s) | Users, admin |
| Pre-condition(s) | The user must be logged in and should have uploaded and submitted the image for processing.  The admin must be authorized to access database data. |
| Scenario Flow | **Main(success) Flow:**  **Users**   1. The user logs in to the system. 2. The user uploads the image and agrees to the consent. 3. The system uses machine learning and image recognition algorithms to process the image. 4. The system classifies the type of disability if any. 5. The system returns results to the user.   **Admin**   1. The admin must be authorized to access the admin panel. 2. The admin logs in to the system. 3. The admin accesses the database. 4. The admin extracts the data from the database. |
| Alternate Flows | The users shall view the disability results while on the dashboard page.  The admin shall access the database while on the admin panel. |
| Post Conditions | The users and admin shall view the results which comprise disability classification results. |

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| Use Case Number | UC-08 |
| Use Case Name | **Get Medical Advice** |
| Overview | The users shall get medical advice that is system-generated and tailored to the user's disability. |
| Actor(s) | Users |
| Pre-condition(s) | The user must be logged in and should have uploaded and submitted the image for processing. |
| Scenario Flow | **Main(success) Flow:**  **Users**   1. The user logs in to the system. 2. The user uploads the image and agrees to the consent. 3. The system uses machine learning and image recognition algorithms to process the image. 4. The system classifies the type of disability if any. 5. The system returns results to the user. 6. Based on the disability results, the site issues medical advice to users. |
| Alternate Flows | The users shall view the medical advice while on the dashboard page. |
| Post Conditions | The users get a piece of tailored medical advice depending on the disability results. |

Scenario

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| Use Case Number | UC-09 |
| Use Case Name | **Submit user’s feedback** |
| Overview | The users shall have an opportunity to submit their feedback on whether the site accurately identified their disability. |
| Actor(s) | Users |
| Pre-condition(s) | The user must be logged in and should have uploaded, submitted the image for processing, and gotten the disability results. |
| Scenario Flow | **Main(success) Flow:**  **Users**   1. The user logs in to the system. 2. The user uploads the image and agrees to the consent. 3. The system uses machine learning and image recognition algorithms to process the image. 4. The system classifies the type of disability if any. 5. The system returns results to the user. 6. Based on the disability results, the site issues medical advice to users. 7. Upon receiving results and advice, a dialog box shall appear with the following questions:  * **Did we correctly identify the disability? (Yes/No).** * **If not, what is the correct disability?** * **What was your overall experience using our system?**  1. The users will then submit their feedback regarding the accuracy of the site and overall experience with the site upon clicking the **“Submit Feedback”** button. 2. A submission success message shall pop up. |
| Alternate Flows | The users shall submit the feedback while on the dashboard page. |
| Post Conditions | The users shall have their feedback submitted with a success message pop. |

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| Use Case Number | UC-10 |
| Use Case Name | **User/Admin Logout** |
| Overview | The users and the admin shall end their sessions with the system by logging out. |
| Actor(s) | Users, Admin |
| Pre-condition(s) | The user/admin must be logged in. |
| Scenario Flow | **Main(success) Flow:**  **Users**   1. The user logs in to the system. 2. The user is directed to the dashboard page. 3. On the dashboard page, there is a “**Sign Out**” button. 4. The user shall sign out and be redirected to the login page.   **Admin**   1. The admin logs in to the admin panel side of the system. 2. The admin is directed to the dashboard page. 3. On the dashboard page, there is a “Sign Out” button.   4. The admin shall sign out, end the session, and be redirected to the login page. |
| Alternate Flows | The users/admin shall log out while on the dashboard page. |
| Post Conditions | The user/admin shall terminate all active sessions and be redirected to their login pages. |

References

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