**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 27 June 2025 |
| Team ID | LTVIP2025TMID34533 |
| Project Name | Pollen Profiling |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| --- | --- | --- |
| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | Registration through Form  Registration through Gmail  Registration through LinkedIN |
| FR-2 | User Confirmation | Confirmation via Email  Confirmation via OTP |
| FR-3 | Image Upload & Preprocessing | |  | | --- | | Upload pollen grain images (JPG/PNG format) |  |  |  |  | | --- | --- | --- | |  |  | Perform data preprocessing (resizing, normalization, augmentation) | |
| FR-4 | Automated Pollen Classification | |  | | --- | | Classify uploaded pollen images using deep learning models |  |  |  |  | | --- | --- | --- | |  |  | Display predicted pollen type along with confidence score | |
| FR-5 | Results Visualization | |  | | --- | | Provide detailed morphological analysis (shape, size, surface features) |  |  |  |  | | --- | --- | --- | |  |  | Display charts/graphs of pollen distribution | |
| FR-6 | Application Scenarios | |  | | --- | | Support environmental monitoring reports (pollen distribution over time/location) |  |  |  |  | | --- | --- | --- | |  |  | Generate allergy diagnosis reports for clinicians |  |  |  |  | | --- | --- | --- | |  |  | Enable agricultural research outputs (species/cultivar mapping) | |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | The web interface should be intuitive, easy to navigate, and responsive across devices. |
| NFR-2 | **Security** | User data (including uploaded images) must be securely stored and transmitted using HTTPS. Authentication and authorization controls should be in place. |
| NFR-3 | **Reliability** | The system should ensure consistent classification accuracy and recover gracefully from failures (e.g., invalid file uploads). |
| NFR-4 | **Performance** | The system should classify pollen images and generate reports within a reasonable time (<2 seconds for typical uploads). |
| NFR-5 | **Availability** | The system should be available >99% of the time during working hours, with minimal downtime for maintenance. |
| NFR-6 | **Scalability** | The system should support increasing numbers of users and image uploads without performance degradation. |