**3. Requirements Analysis**

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

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| Date | 28 June 2025 |
| Team ID | LTVIP2025TMID35678 |
| Project Name | Pattern Sense: Classifying Fabric Patterns using Deep Learning |
| Maximum Marks | 4 Marks |

The Requirements Analysis phase identifies and documents both functional and non-functional requirements of the *Pattern Sense* project. This ensures the system meets the expectations of its users, remains technically sound, and operates efficiently.

**Functional Requirements:**

Functional requirements describe what the system should do. These include specific behaviors, processes, and features that the application must implement to fulfill its purpose.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** | **Description** |
| FR-1 | Image Upload | - Upload image from device - Drag & drop image into input area | The user should be able to select or drag and drop a fabric image to classify. |
| FR-2 | Pattern Classification | - Preprocess uploaded image - Run prediction using trained CNN model | System must preprocess the image and classify it using the trained CNN model. |
| FR-3 | Prediction Result Display | - Show predicted pattern type - Display confidence score | After processing, the system should display the predicted pattern and confidence score. |
| FR-4 | User Interaction Feedback | - Allow retry with new image - Provide feedback form or rating | Users can upload another image and optionally provide feedback on the prediction. |

**Non-functional Requirements:**

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

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| **NFR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | Usability | Interface should be intuitive and simple for users with little technical knowledge. |
| NFR-2 | Security | Uploaded images must be securely handled using HTTPS, input validation, and isolation. |
| NFR-3 | Reliability | System should consistently provide correct predictions and not crash unexpectedly. |
| NFR-4 | Performance | The model should return predictions in under 3 seconds for a smooth experience. |
| NFR-5 | Availability | The system should be available during demos and handle concurrent users smoothly. |
| NFR-6 | Scalability | Solution should allow future expansion such as more pattern classes or users. |