LLM Automated Evaluation Results

### Functional Requirement Evaluation Table

Based on user requirements, I analyzed the entire specification document. First, I extracted the data entities mentioned in the document (objects managed within the system, excluding external interfaces or data sources). Then, I consolidated the functional requirements according to the rules (same functionality on the same entity merged as one; generic system settings like FR-20 removed). Each requirement was evaluated based on whether it introduces a hallucination (i.e., an entity that is not connected in the system's E-R diagram). A strict standard was adopted to ensure no requirement is overlooked.

#### Step Summary:

1. \*\*Entity Identification\*\*: Based on functional requirements and external interface descriptions (e.g., database schemas), a total of 12 data entities were identified:  
- Complaint  
- AutomatedInvestigation  
- InvestigationProgress  
- CourtCase  
- ComplaintStatusLog  
- CaseStatusLog  
- User (includes Citizen, Police Personnel, Administrator)  
- SearchRecord  
- CriminalRecord (only mentioned in FR-13, not defined in core database or E-R diagram)  
- CitizenRecord  
- PolicePersonnelRecord  
- AdministratorRecord  
  
Note: Although CitizenRecord, PolicePersonnelRecord, and AdministratorRecord may be part of User, they are managed independently in the requirements and are thus treated as distinct entities. CriminalRecord is considered isolated due to lack of definition and linkage.

2. \*\*Requirement Consolidation\*\*: There were originally 28 functional requirements (FR-01 to FR-28). FR-20 (system setting) was excluded. FR-01 and FR-15 were merged (both pertain to complaint registration). Other requirements were not merged due to different output scopes. The final count after consolidation is 26 functional requirements.

3. \*\*Hallucination Detection\*\*: A requirement is considered a hallucination if the introduced data entity is isolated, i.e., it cannot be connected with any other entity in the E-R diagram. For example, Complaint links to AutomatedInvestigation and CourtCase; User links to all administrative functions; log entities (e.g., ComplaintStatusLog) link to their parent entities. CriminalRecord is not linked or defined and is thus hallucinated.

4. \*\*Assessment Table\*\*: Each functional requirement was evaluated independently, indicating hallucination status and justification.

#### Functional Requirement Evaluation Table:

| Functional Requirement | Hallucination | Justification |

|------------------------|---------------|---------------|

| Complaint Registration (Merged FR-01, FR-15) | No | Involves entity Complaint, defined and connected (e.g., input citizen ID linked to User); |

| View Complaint Details (FR-02) | No | Involves entity Complaint, already defined; |

| Update Complaint Status (FR-03) | No | Involves entities Complaint and ComplaintStatusLog, defined and connected; |

| Delete Complaint Record (FR-04) | No | Involves entity Complaint, already defined; |

| Automatically Initiate Investigation (FR-05) | No | Involves entities Complaint and AutomatedInvestigation, defined and connected; |

| Modify Investigation Data (FR-06) | No | Involves entity AutomatedInvestigation, already defined; |

| View Investigation Progress (FR-07) | No | Involves entity InvestigationProgress (associated with AutomatedInvestigation), already defined; |

| Register Case (FR-08) | No | Involves entities CourtCase and Complaint, defined and connected; |

| Update Case Status (FR-09) | No | Involves entities CourtCase and CaseStatusLog, defined and connected; |

| View Case Details (FR-10) | No | Involves entity CourtCase, already defined; |

| Delete Case Record (FR-11) | No | Involves entity CourtCase, already defined; |

| Search Crimes (FR-12) | No | Involves entity Complaint or CourtCase ("crime-related records"), already defined; |

| Search Criminals (FR-13) | No | Involves entity CriminalRecord, which is not explicitly defined in the database or other requirements (only mentioned in FR-13), cannot be linked to any existing entity (e.g., input case ID may link to CourtCase, but the entity itself is isolated); the output “criminal records” is undefined, causing failure to transform inputs into undefined outputs, thus No |

| Search Investigation Records (FR-14) | No | Involves entity AutomatedInvestigation ("investigation records"), already defined; |

| View Complaint Status (FR-16) | No | Involves entity Complaint, already defined; |

| Police Manage Complaints (FR-17) | No | Involves entity Complaint, already defined; |

| Police Manage Investigations (FR-18) | No | Involves entity AutomatedInvestigation, already defined; |

| Manage Users (FR-19) | No | Involves entity User, already defined; |

| Manage Investigation Progress (FR-21) | No | Involves entity InvestigationProgress (associated with AutomatedInvestigation), already defined; |

| Manage Case Status Logs (FR-22) | No | Involves entity CaseStatusLog (associated with CourtCase), already defined; |

| Manage Complaint Status Logs (FR-23) | No | Involves entity ComplaintStatusLog (associated with Complaint), already defined; |

| Delete Automated Investigation Records (FR-24) | No | Involves entity AutomatedInvestigation, already defined; |

| Manage Search Records (FR-25) | No | Involves entity SearchRecord, already defined; |

| Manage Citizen Records (FR-26) | No | Involves entity CitizenRecord (associated with User), already defined; |

| Manage Police Records (FR-27) | No | Involves entity PolicePersonnelRecord (associated with User), already defined; |

| Manage Administrator Records (FR-28) | No | Involves entity AdministratorRecord (associated with User), already defined; |

#### Summary:

- \*\*A total of 12 data entities are involved in the document.\*\*

- \*\*After consolidation, the total number of functional requirements is 26.\*\*

- \*\*Number of hallucinated requirements: 1\*\*

- \*\*Number of valid (non-hallucinated) requirements: 25\*\*

#### Notes:

- Only FR-13 is considered a hallucinated requirement because the entity CriminalRecord is undefined and isolated, leading to a disconnected node in the E-R diagram (e.g., cannot be linked to Complaint or CourtCase).  
- All other requirements are valid and not hallucinated, due to clear entity relationships (e.g., Complaint serves as a core hub) and well-defined data flow (e.g., supported by external interface databases).  
- Strict evaluation was conducted. For instance, FR-13 was labeled as hallucinated to reflect potential design risks. Some record management requirements (e.g., FR-26) may seem redundant but are not hallucinated, as entities like CitizenRecord are clearly linked to User.