LLM Automated Evaluation Results

Functional Requirements Evaluation Table

The following is a comprehensive evaluation of the GAMMA-J Web Store requirement document based on the user’s instructions. The assessment strictly follows the provided rules:

• Data Entity Identification: Data entities managed internally by the system were extracted from the functional requirements, excluding external data sources or formats mentioned in interface specifications. The extracted entities include: Account, Product, Category, Order, Shopping Cart, Inventory, Payment Method. These entities are core nodes in the E-R diagram, and every functional requirement must be associated with at least one of them. If not, the requirement is considered hallucinated. The total number of entities is 7.

• Functional Requirement Merging: The original 25 functional requirements (FR-01 to FR-25) were merged to ensure consistent granularity:

• Merging Rules: Only requirements that operate on the same data entity and involve the same operation (e.g., Create, Read, Update, Delete) were merged to avoid excessive consolidation (e.g., CRUDe operations were not merged as “Manage”). General configuration-type requirements (such as multilingual support) were excluded, though none existed in this document.

• Merging Results: FR-07 (Payment Information Update) and FR-24 (Payment Information Management) both target update operations on the Payment Method entity, with similar inputs and outputs. They were thus merged into “Payment Information Management (FR-07/24).” No other requirements were merged due to involving different entities or differing operations (e.g., FR-04 and FR-23 both update Account, but refer to different attributes: FR-04 updates profile info, while FR-23 updates account settings). The total number of merged functional requirements is 24.

• Hallucinated Requirement Judgment: For the 24 merged requirements, hallucination status was assessed. Criterion: if the operation introduced in the requirement involves a data entity that cannot be connected to the existing 7 entities (resulting in a disconnected node in the E-R diagram), it is considered hallucinated. Only such structural disconnection is judged as hallucination; expanded functional descriptions are not. Excluded requirements (none in this case) are not considered in the total.

The evaluation table below lists each requirement with individual judgment to ensure completeness. The assessment is relatively strict to identify potential issues:

｜Functional Requirement｜Hallucinated Requirement｜Justification｜

｜FR-01: Account Registration｜No｜Involves the Account entity; inputs and outputs are well-defined; the operational path is connected to the system’s main flow; no isolated entities or processes.｜

｜FR-02: Account Login｜No｜Operation is based on the existing Account entity; login behavior connects user authentication to system sessions; the structure is coherent and logical.｜

｜FR-03: Account Logout｜No｜Complementary operation to login; forms a closed system state loop; no structural disconnects or omissions.｜

｜FR-04: Profile Update｜No｜Updates attributes of the existing Account entity; logic is self-consistent; the function chain is closed.｜

｜FR-05: Purchase History View (Customer)｜No｜Relies on the Order entity to build a customer history view; traceable connection to the Account entity; structurally complete.｜

｜FR-06: Order Details View｜No｜Performs queries based on the existing Order entity; no new structural components; logical path is sound.｜

｜FR-07/24: Payment Information Management (merged)｜No｜Operates on the Payment Method entity, which is a part of the system’s core module; path is reachable.｜

｜FR-08: Inventory Management｜No｜Updates Inventory entity attributes; tightly associated with Product and other core operations; system structure remains connected.｜

｜FR-09: Product Category Management｜No｜Involves the Category entity; category hierarchy built through Product associations; no isolated logic.｜

｜FR-10: Product Details Update｜No｜Modifies fields of the Product entity; data flows are clear and structurally complete.｜

｜FR-11: Sales Report Generation｜No｜Operates on Product, Order and other core entities; although output format is not specified, the data path remains intact.｜

｜FR-12: Product Addition｜No｜Adds new entries to the Product entity; conforms to the core data lifecycle; logic is closed.｜

｜FR-13: Product Removal｜No｜Removes Product entries; does not conflict with structural or data constraints; system state can maintain consistency.｜

｜FR-14: Product Search｜No｜Performs conditional queries on the Product entity; introduces no new structures; path is reasonable.｜

｜FR-15: Shopping Cart Addition｜No｜Involves interaction between Shopping Cart and Product entities; operation logic and data structure are closed.｜

｜FR-16: Shopping Cart Removal｜No｜Removes items from the cart; does not break entity connectivity; logic is clear.｜

｜FR-17: Shopping Cart Quantity Update｜No｜Updates item fields in the cart; no new structures involved; functional chain is closed.｜

｜FR-18: Cart Summary View｜No｜Aggregates data within the Shopping Cart to generate a summary view; path is traceable.｜

｜FR-19: Order Placement｜No｜Involves coordinated operations between Order and Inventory entities to complete order process; structure is consistent.｜

｜FR-20: Order Cancellation｜No｜Cancels orders and updates Inventory status; all involved entities are defined in the system; process is logical.｜

｜FR-21: Order Status View｜No｜Queries order status based on the Order entity; operational path is clear; no data structure breakage.｜

｜FR-22: Order Confirmation｜No｜Although the confirmation action is loosely defined, it is still based on the Order entity; data relationship is complete.｜

｜FR-23: Account Management｜No｜Maintains and updates Account entity; logic structure aligns with the existing system.｜

｜FR-25: Purchase History Management (Admin)｜No｜Filters Order data; implemented through existing entities for data filtering and display; structure is sound.｜

Summary

The document involves 8 data entities: Account, Product, Category, Order, Shopping Cart, Inventory, Payment Method, Purchase History.

After merging functionally identical operations, the total number of functional requirements is 24 (originally 25, with FR-07 and FR-24 merged).

There are 0 hallucinated requirements: all requirements are associated with existing entities, and the E-R diagram maintains weak connectivity (no disconnected nodes).

There are 24 non-hallucinated requirements: since no hallucinated requirements exist, all are considered valid.

Evaluation Notes:

Strict assessment: Although most requirements are compliant, FR-11 (Sales Report Generation) was previously flagged as lacking complete output definition and testability; FR-22 (Order Confirmation) lacks a clearly defined input (“Customer Confirmation”), thus was also previously marked as incomplete (though testable). This aligns with the expectation that “normally not every requirement is perfect.”

Merging rationale: FR-07 and FR-24 were merged due to operating on the same entity (Payment Method) with the same operation (managing payment information), avoiding redundancy. Other requirements like FR-04 and FR-23 were not merged because they target different attributes of the Account entity (profile vs account settings).

Hallucination analysis: All requirements are based on existing entities (e.g., Order-related operations reference the Order entity), and no new entities disconnect the E-R diagram. Therefore, no hallucinations are present.