LLM Automated Evaluation Results

**Functional Requirements Evaluation Table**

The following evaluation is based on the provided GAMMA-J Web Store system requirement document (functional requirements and external interface sections). The evaluation rules are as follows:

* **Data Entity Statistics**:  
  Only data entities mentioned in the functional requirements that need to be managed by the system are counted (excluding external data sources or formats mentioned in external interfaces). A total of 14 data entities were identified:  
  Personal Information, Contact Information, Product, Category, Inventory, Shopping Cart, CartItem, Order, OrderItem, Payment, EmailRecord, Plugin, Purchase History, User Interface Specification.
* **Functional Requirement Consolidation**:  
  According to the user’s rule, functionally similar operations on the same entity are merged into a single requirement (e.g., FR-04 and FR-31 are merged into “Manage Personal Information Function”). System-level configuration requirements (like preference settings, multilingual support) are excluded (none found in the document). Over-merging was avoided; only highly similar functions were merged. After merging, the original 33 functional requirements were reduced to 29 (see below for details).
* **Hallucinated Requirement Judgment**:  
  Based on structural criteria: a requirement is considered hallucinated if it introduces operations unrelated to any existing system entity, causing the E-R diagram to no longer be weakly connected.  
  All 14 entities in the E-R diagram are interconnected (e.g., the Purchase History entity logs actions across operations; the Plugin entity interacts with the system), so there are no hallucinated requirements.
* **Evaluation Table Explanation**:
  + Merged functional requirement IDs and simplified descriptions are used (e.g., FR-13 and FR-21 were merged).
  + The “Hallucinated” column marks all as “No” (no disconnected entities).
  + The “Evaluation Reason” column provides brief justifications based on entity relationships.
  + All functional requirements are independently evaluated. Some requirements (e.g., FR-18) are judged slightly strictly in terms of testability.

Functional Requirement ID | Function Name | Hallucinated | Evaluation Reason  
FR-01 | Customer Registration Function | No | Entities (Personal Information, Contact Information) are connected to the system; inputs (name, email, etc.) and outputs (account creation, email sent) are defined in the document.  
FR-02 | Customer Login Function | No | Entity (Purchase History) is connected to the system; inputs (email, password) and outputs (authentication, redirection) are defined.  
FR-03 | Customer Logout Function | No | Entity (Purchase History) is connected to the system; input (logout button click) and output (session termination, redirection) are defined.  
FR-04/31 | Manage Personal Information Function (merged FR-04 and FR-31) | No | Entity (Personal Information) is connected; inputs (update fields) and outputs (storage update, email sent) are defined.  
FR-05/32 | Manage Contact Information Function (merged FR-05 and FR-32) | No | Entity (Contact Information) is connected; inputs (update fields) and outputs (stored updates) are defined.  
FR-06 | Purchase History Viewing Function | No | Entity (Purchase History) is connected; inputs (navigation actions) and outputs (history display) are defined.  
FR-07 | Product Addition Function | No | Entities (Product, Inventory) are connected; inputs (product details) and outputs (product saved, inventory updated) are defined.  
FR-08 | Product Removal Function | No | Entities (Product, Inventory) are connected; inputs (product selection) and outputs (removal, inventory update) are defined.  
FR-09 | Product Information Update Function | No | Entity (Product) is connected; inputs (update fields) and outputs (info saved) are defined.  
FR-10 | Product Categorization Function | No | Entity (Category) is connected; inputs (product, category selection) and outputs (category assignment) are defined.  
FR-11 | Inventory Management Function | No | Entity (Inventory) is connected; inputs (stock number) and outputs (inventory update) are defined.  
FR-12 | Shopping Cart Creation Function | No | Entities (Shopping Cart, Inventory) are connected; inputs (product selection) and outputs (cart add, inventory update) are defined.  
FR-13/21 | Shopping Cart Modification Function (merged FR-13 and FR-21) | No | Entities (CartItem, Inventory) are connected; inputs (item selection, quantity change) and outputs (cart update, inventory change) are defined.  
FR-14 | Shopping Cart Viewing Function | No | Entity (Shopping Cart) is connected; input (navigation) and output (cart display) are defined.  
FR-15 | Checkout Function | No | Entities (Order, Payment, Inventory) are connected; inputs (cart items, address, payment method) and outputs (order created, payment processed) are defined.  
FR-16 | Order Confirmation Email Sending Function | No | Entity (EmailRecord) is connected; input (order details) and output (email sent) are defined.  
FR-17 | Payment Processing Function | No | Entity (Payment) is connected; inputs (method, details) and outputs (payment record) are defined.  
FR-18 | Plugin Development Function | No | Entity (Plugin) is connected; input (plugin details) and output (activation) are defined. However, “development” operation is vague, input undefined, output unclear.  
FR-19 | Plugin Configuration Function | No | Entity (Plugin) is connected; inputs (config settings) and outputs (config applied) are defined.  
FR-20 | User Interface Specification Compliance Checking Function | No | Entity (User Interface Specification) is connected; input (check start) and output (compliance report) are defined.  
FR-22 | Manage OrderItem Function | No | Entities (OrderItem, Inventory) are connected; input (order item selection) and output (item update, inventory update) are defined.  
FR-23/24 | Manage EmailRecord Function (merged FR-23 and FR-24) | No | Entity (EmailRecord) is connected; inputs (record selection, action) and outputs (record operations) are defined.  
FR-25 | View CartItem Function | No | Entity (CartItem) is connected; input (item selection) and output (item detail display) are defined.  
FR-26 | View Payment Function | No | Entity (Payment) is connected; input (payment record selection) and output (payment details display) are defined.  
FR-27 | Manage Administrator Function | No | Entities (Personal Information, Contact Information) are connected; inputs (admin account operation) and outputs (account updates) are defined.  
FR-28 | Manage Customer Function | No | Entities (Personal Information, Contact Information) are connected; inputs (customer account operations) and outputs (account updates) are defined.  
FR-29 | Manage Category Function | No | Entity (Category) is connected; input (category operations) and output (category update) are defined.  
FR-30 | Manage User Interface Specification Function | No | Entity (User Interface Specification) is connected; input (UI spec updates) and output (spec applied) are defined.  
FR-33 | Order Cancellation Function | No | Entities (Order, Inventory) are connected; input (order selection) and output (order cancel, inventory update) are defined.

**Summary**

* **Total Data Entities Identified**: 14  
  Personal Information, Contact Information, Product, Category, Inventory, Shopping Cart, CartItem, Order, OrderItem, Payment, EmailRecord, Plugin, Purchase History, User Interface Specification
* **Total Functional Requirements After Merging**: 29 (original 33, with FR-04/31, FR-05/32, FR-13/21, FR-23/24 merged; no generic system requirements)
* **Hallucinated Requirements**: 0 (all functions involve connected system entities, E-R diagram remains weakly connected)
* **Non-Hallucinated Requirements**: 29

Evaluation Notes: The overall document quality is high. Functional requirements are clearly described, and entity coverage is complete. All evaluations are based on the document content, and all requirements meet the defined criteria.