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1. INTRODUCTION

1.1 TEST CASE NAME
TC-001: Personalized Search Result Optimization

1.2 TEST ITEMS
This test case focuses on validating the AI-driven personalized search results for an e-commerce platform. It ensures that search results align with user behavior, purchase history, and real-time interactions.

- **Requirements Specification:** AI search personalization module
- **Design Specification:** AI-driven search algorithm, data tracking mechanisms
- **User Guide:** Search functionality in the e-commerce platform
- **Operations Guide:** Backend AI engine operation and data management
- **Installation Guide:** AI module deployment and configuration

2. INPUT SPECIFICATIONS

- User search query input into the search bar
- User session data (clickstream, browsing history, past purchases)
- AI model analysis of user intent
- System database with product information
- New user inputs without prior data
- Anomalous search inputs (e.g., unavailable items)

3. OUTPUT SPECIFICATIONS

- Ranked and personalized search results based on user behavior
- Suggested alternatives for unavailable or irrelevant searches
- Updated user interaction data stored for future searches
- AI-generated product recommendations based on search behavior
- Search response time within an acceptable threshold (e.g., under 2 seconds)

4. ENVIRONMENTAL NEEDS

- **Hardware:**
    - High-performance servers for AI model processing
    - Cloud-based or on-premises database storage
    - User devices (PC, mobile, tablet) for testing

- **Software:**
    - AI-powered search engine integration (e.g., Elasticsearch, OpenAI models)
    - User session tracking system
    - Database management system (e.g., MongoDB, MySQL)
    - Web and mobile e-commerce platform
- **Other:**
    - Test accounts with various browsing histories
    - AI model with training data and analytics dashboard

5. SPECIAL PROCEDURAL REQUIREMENTS

- AI model should be pre-trained on user behavior data before testing
- Testing should cover both existing and new users
- Manual and automated test scenarios should be executed
- Data collection should be monitored for accuracy and performance
- A/B testing should be conducted to compare personalized vs. non-personalized search results

6. INTERCASE DEPENDENCIES

- TC-002: AI-driven Recommendation System Validation (validates AI-driven recommendations post-search interaction)
- TC-003: User Session Data Handling (validates storage and retrieval of browsing history and interactions)
- TC-004: Search Performance Testing (validates response time and accuracy of search results)

7. TEST SCRIPT

Step	Design Description	Expected Results	Actual Results	Pass/ Fail	Tester/ Date
1	User enters a search query in the search bar.	Search results should be displayed based on query relevance.			
2	AI engine processes user behavior data and refines search results.	Results should be personalized based on past searches, clicks, and purchases.			

3	User clicks on a search result and interacts with the product page.	The system should record interaction data for future search improvements.			
4	AI detects an anomaly (irrelevant or unavailable search term).	The system suggests relevant alternatives.			