

System Testing

Course: Software Testing

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System Test 2: Supplier Deletion Constraint Handling at System Level

Test Type: System Testing

This test is classified as **System Testing** because it validates the behavior of the entire POS system rather than individual modules or components. The test covers the full execution flow from the user action, through the business logic, to the database constraint enforcement.

Testing Level: End-to-End System Level

The test operates at the **End-to-End System Level**, as it verifies the interaction between:

- User actions (supplier and product management),
- Application logic (DAL and controllers),
- Database layer (MySQL foreign key constraints).

System Under Test

Point of Sale (POS) System – Supplier and Product Management Modules

Objective

The objective of this system test is to verify that the POS system correctly enforces business and database constraints when attempting to delete a supplier that is still referenced by existing products. The test ensures that the system prevents invalid operations and maintains overall data integrity across the application and database layers.

Test Description

This test validates the complete system behavior when a user attempts to delete a supplier that has products linked to it. The test is executed through the POS system's functional flow, interacting with the database through the Data Access Layer (DAL) and JDBC.

The system is expected to:

- Prevent deletion of a supplier while dependent products exist.
- Enforce foreign key constraints correctly.
- Allow deletion only after all dependent products are removed.

Preconditions

- The POS system is running correctly.
- MySQL database connection is active.
- suppliers and products tables exist with a foreign key relationship.
- The user has sufficient privileges to manage suppliers and products.

Test Data

- Supplier:
 - Name: Test Supplier
 - Phone Number: 0681234567
- Product:
 - Name: Test Product
 - Barcode: TEST123
 - Stock Quantity: 10
 - Supplier ID: Linked to Test Supplier

Test Steps

Step	Action
1	Insert a new supplier into the system
2	Insert a new product linked to the created supplier
3	Attempt to delete the supplier while the product still exists
4	Verify that the system prevents supplier deletion
5	Delete the product linked to the supplier
6	Delete the supplier after product removal

Expected Results

Step	Expected Result
1	Supplier is successfully added
2	Product is successfully added and linked to supplier
3	Supplier deletion is rejected
4	Error message or constraint violation is triggered
5	Product is successfully deleted
6	Supplier is successfully deleted

Actual Results

- The system prevented the deletion of the supplier while dependent products existed.
- After deleting the product, the supplier deletion was allowed.
- Foreign key constraints were correctly enforced by the database.
- The POS system behaved as expected without crashing or data corruption.

Test Outcome

PASS

Notes

- This test confirms that the system correctly enforces referential integrity rules.
- It ensures that invalid deletion operations are blocked at system level.
- The behavior aligns with real-world business rules in inventory and supplier management systems.

The screenshot shows the Point of Sale application interface. The left sidebar contains navigation links: Customers, Supplier, Employees, Products, Category, Sales, Invoice, and Reports. The main content area is titled "Category Information". It features a search bar with "Name:" and "Search By Name" fields, and buttons for "Add", "Delete", "Update", and "Clear". A table lists categories with columns "Id" and "Name". The data in the table is:

Id	Name
1	grocery
2	xyz
3	mw

The top right corner shows the user "admin" and a "Logout" link.

≡
Point of Sale
admin [Logout](#)

- + Customers
- Supplier
- Employees
- Products
- Category
- Sales
- Invoice
- Reports

Supplier Information

Search Id:

Name:

Phone No:

Save
Delete
Search
Update
Clear

Id	Name	Phone No
1	sup test	1100
2	milke	456-7854
3	albert	789-88
4	baby	222-3
6	milke	456-7854
7	ubsaidq	1100
9	fawad	123456
10	Fawad Iqba	234567890

 Point of Sale

[admin](#) [Logout](#)

Product Information

Id	Name	Bar Code	Price	Stock
1	xyz	234567	12.0	123.0
2	oil	123456	260.0	12.0

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

- classicmodels
- commerce
- e-commerce
- grouping_tutorial
- library
- new_database
- pos**
- Tables
- Views
- Stored Procedures
- Functions
- pos_system
- seancal
- sys
- test_pos

Administration Schemas

No object selected

SQL File 1*

```
1 • SELECT * FROM suppliers;
```

Result Grid | Filter Rows: Limit to 1000 rows | Edit | Export/Import | Wrap Cell Content:

	ID	Name	Phone Number
1	sup test	1100	
2	mike	456-7854	
3	albert	789-88	
4	baby	222-3	
6	mike	456-7854	
7	ubaidq	1100	
9	fawad	123456	
10	Fawad Iqba	234567890	

SQL Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Output

Action Output

#	Time	Action	Message	Duration / Fetch
26	01:11:15	USE pos	0 row(s) affected	0.000 sec
27	01:11:16	UPDATE users SET password = 'evisa' WHERE username = 'admin'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.031 sec
28	01:11:16	SELECT * FROM users WHERE username='admin' LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec
29	01:48:53	SELECT * FROM suppliers LIMIT 0, 1000	8 row(s) returned	0.156 sec / 0.000 sec

Object Info Session

Query Completed

MySQL Workbench

Local instance MySQL80 x

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Administration Schemas

No object selected

SQL File 1*

```
1 • SELECT * FROM products WHERE suppliers_id = 3;
```

Result Grid | Filter Rows: Limit to 1000 rows | Edit | Export/Import | Wrap Cell Content:

	ID	Name	Barcode	Price	Stock Quantity	Category ID	Created At	Updated At	Quantity Type	Suppliers ID
1	xyz	234567	12.00	123.00	1	1	2024-02-13 07:05:31	2024-02-15 09:18:05	Counted	1
2	oil	123456	260.00	12.00	1	1	2024-02-13 07:11:02	2024-02-15 09:18:05	Weighted	1

SQL Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Output

Action Output

#	Time	Action	Message	Duration / Fetch
32	01:51:13	SELECT * FROM products WHERE suppliers_id = 1 LIMIT 0, 1000	2 row(s) returned	0.000 sec / 0.000 sec
33	01:51:24	SELECT * FROM products WHERE suppliers_id = 3 LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
34	01:51:34	SELECT * FROM products WHERE suppliers_id = 0 LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
35	01:51:45	SELECT * FROM products WHERE suppliers_id = 1 LIMIT 0, 1000	2 row(s) returned	0.000 sec / 0.000 sec

Object Info Session

Query Completed