Inventory Control Management Database

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Section I: Project Description

It is possible for organizations of all sizes that make and sell products to experience inventory control challenges. Common challenge areas include tracking location of raw materials and finished goods, logistics, spoilage/waste, and storage costs, all of which affect the bottom line. I would like to propose a database that takes multiple factors into account for each system transaction so as to minimize costs and losses, and improve inventory control so the business can focus on better matching supply with demand. More specifically, this database helps the company link their inventory management activities more closely to their primary business processes, such as testing, producing, stocking, selling, and delivering products.

Section II: Use Cases

I.   Buy Raw Materials

Use case title	Buy Raw Materials
Actors	Factory, Suppliers
Description	This use case begins when the **factory** buys **raw material units** of certain **types** for **production** by placing a **supply order** with the **supplier** who provides the **raw materials** to the **factory** for use in **production**.

II.   Production Batch and Storage

Use case title	Production Batch
Actors	Factory, Warehouse
Description	This use case begins when the **factory** uses **raw materials** to produce **finished product units** of certain **types** in **production batches** and then sends them to a **warehouse** for storage prior to sale.

III.   Sell Products to Customer

Use case title	Sell Products
Actors	Store, Website, Customer
Description	This use case begins when the **customer** places a **purchase order** for one or many **product units** by shopping on the company **website** or visiting a **store** in which **product units** are held. The **purchase order** is paid with **payments** of varying **type**, from **customers** which are of many **types** such as business, consumer, government, or military.

IV.   Product Delivery

Use case title	Deliver Products

Actors	Purchase Order, Customer, Logistics Provider
Description	Continuing from the previouse case, the **purchase order** allows the **customer** to request **product**(s) **delivery** ,in which a **third party logistics providers** for different **regions**, to the **customer address**.

V.   Product Development

Use case title	Product Development
Actors	Factory, Tests
Description	This use case begins when the **factory** runs **tests** to **test products** in special **test batches (iterations)** and of special **types**, that will be used to develop a **final product** for putting into actual **production**.

VI.   Returned Defective Items

Use case title	Returned Defects
Actors	Factory
Description	This use case begins when the **factory** detects **returned defective items** to detect the **defect type** and make a **decision** if it will be fixable or scrap.

VII.   Employee fullfils orders

Use case title	Employee fulfills orders
Actors	Employee, purchase order
	This use case begins when a **purchase order** is placed and an **employee** prepares the order to be handed or shipped to the **customer**. The **manager** of the **department** supervises the employee's work to make sure that the orders are well fulfilled.

Section III: Database Requirements (Business Rules)

1. Company
    a. A company shall rent at least one factory
    b. A company shall have at least one employee
    c. A company shall rent at least one warehouse

    d. A company shall rent at least one store
    e. A company shall have only one website
    f. A conpany shall have at least one department
    g. A company shall have one ID
    h. A company shall have one name
    i. A company shall have one founded date
    j. A company shall have about description

2. Employee
    a. An employee shall work in many companies
    b. An employee shal manage at most one department
    c. An employee shall be supervised by one supervisor
    d. Employee shall fulfill many purchase orders
    e. An employee shall have a unique ID
    f. An employee shall have a date of birth
    g. An employee shall have a first name
    h. An employee shall have a last name
    i. An employee shall have a salary

3. Department
    a. A department shall be managed by one employee
    b. A department shall belong to only one company
    c. A department shall have a unique ID
    d. A department shall have a name
    e. A department shall have a specific number of employees

4. Labor
    a. A labor shall have many companies
    b. A labor shall have at least one employee
    c. A labor shall have a unique ID
    d. A labor shall have a contract

5. Supplier
    a. A supplier shall fulfill many supply orders
    b. A supplier shall supply by at least one raw material unit
    c. A supplier shal have one supplier ID
    d. A supplier shall have one name
    e. A supplier shall have a description

6. SupplyItems
    a. SupplyItem can belong to at least one supplier
    b. SupplyItem shall be linked to at least one raw material unit

7. Supply Order
    a. A supply order shall contain at least one raw material unit

b. A supply order shall have at least one supply line item
c. A supply order shall be fulfilled by only one supplier
d. A supply order shall be linked to one factory
e. A supply order shall have date ordered
f. A supply order shall have instructions

8. Supply Line Item
    a. A supply line item shall refer to one raw material unit
    b. A supply line item shall be linked to one supply order
    c. A supply line item shall have a unique ID
    d. A supply line item shall specify the quantity

9. Raw Material Unit
    a. A raw material unit shall be identified by one and only one SKU
    b. A raw material unit shall be linked to at least one raw material type
    c. A raw material unit shall come from at least one supplier
    d. A raw material unit shall be linked to many supply orders
    e. A raw material unit shall be refered to by many supply line item
    f. A raw material unit shall have one name
    g. A raw material unit shall have one description
    h. A raw material unit shall have one price
    i. A raw material unit shall have one weight

10. Raw Material Associated Type

    a. Raw Material Associated Type shall be related to at least one raw material type
    b. Raw material associated type shall be linked to many raw material units

11. Raw Material Type
    a. A raw material type shall be linked to many raw material units
    b. A raw material type shall have one ID
    c. A raw material type shall have one description

12. Factory
    a. A factory shall be related to one company at a time
    b. A factory shall place many supply orders
    c. A factory shall detect many returned defective items
    d. A factory shall run many tests
    e. A factory shall make many product batch
    f. A factory shall have one ID
    g. A factory shall have one name
    h. A factory shall have one size

13. Production
    a. Production can be done by at least one factory
    b. Production can be linked to at least one Product batches

14. Product Batch
    a. A product batch shall be linked to at least one factory
    b. A product batch shall be linked to at least one product unit
    c. A product batch shall stocked in many warehouses
    d. A product batch shall have a unique ID
    e. A product batch shall have a date
    f. A product batch shall have a description

15. Product Batch Items
    a. Product batch items shall be related to at least one product batch
    b. Product batch items shall be related to at least one product unit
    c. Product batch items shall have a specific quantity

16. Product Unit
    a. A product unit shall be related to at least one product batch
    b. A product unit shall be linked to at least one product type
    c. A product unit shall be related to many returned defect items
    d. A product unit shall be listed on one website
    e. A product unit shall be related to many line items
    f. A product unit shall be related to many purchase orders
    g. A product unit shall be identified by a name
    h. A product unit shall be identified by one and only one SKU
    i. A product unit shall have a price
    j. A product unit shall have a description

17. Product Unit Associated Type
    a. Product Unit Associated Type shall be related to at least one product type
    b. Product unit associated type shall be linked to many product units

18. Product Type
    a. A product type shall be linked to many product units
    b. A product type shall have a unique ID
    c. A product type shall have a description

19. Returned Defective Item
    a. A returned defect item shall be detected by one factory
    b. A returned defect item shall be linked to one product unit
    c. A returned defect item shall have at least one defect type
    d. A returned defect item shall have a unique defect ID
    e. A returned defect item shall have a description

20. Check
    a. Check is linked to many factories
    b. Check is related to at least one returned defective item

21. Defect Level

     a. A defect level shall be related to many returned defect items

     b. A defect level shall be related to at least one defect type

     c. A defect level shall have one decision

22. Defect Type
     a. A defect type shall have many returned defect items
     b. A defect type shall have a unique code
     c. A defect type shall have a description

23. Defect Item Lot
     a. A defect item lot shall have one decision
     b. A defect item lot shall have many defect levels

24. Decision
     a. A decision shall have many defect levels
     b. A decision shall have a unique ID
     c. A decision shall have a description

25. Test
     a. A test shall be runned by one factory
     b. A test shall test many test batches
     c. A test shall have a unique ID
     d. A test shall have an instruction

26. TestRun
     a. Test run can be done by many factories
     b. Test run can be related to many tests

27. Product Testing
     a. Product testing shall be related to at least one test
     b. Product testing shall be related to many test batches
     c. Product testing shall have a unique ID
     d. Product testing shall have one status at a time

28. Test Batch
     a. A test batch shall be tested by at least one test
     b. A test batch shall have at least one test unit
     c. A test batch shall have a unique ID
     d. A test batch shall have a date
     e. A test batch shall have a description

29. Test Batch Reference
     a. A test batch reference shall be related to at least one test batch
     b. A test batch reference shall be related to at least one test unit

30. Test Unit
     a. A test unit shall be related to at least one test batch

b. A test unit shall have at least one test unit type
c. A test unit shall have a unique SKU
d. A test unit shall have a name
e. A test unit shall have a description

31. Test Unit Associated Type
    a. Test unit associated type shall have at least one test unit type
    b. Test unit associated type shall have many test units

32. Test Unit Type
    a. A test unit type shall have many test units
    b. A test unit type shall have a unique ID
    c. A test unit shall have a description

33. Warehouse
    a. A warehouse shall have many product batches
    b. A warehouse shall send stocks to at least one store
    c. A warehouse shall be related to one company at a time
    d. A warehouse shall have a unique ID
    e. A warehouse shall have a name
    f. A warehouse shall have a size

34. Stock
    a. A stock shall be related to many product batches
    b. A stock shall be stocked in many warehouses
    c. A stock shall have a unique ID

35. Assignement
    a. An assignement shall be done by at least one warehouse
    b. An assignement shall send to at least one store
    c. An assignement shall have a date
    d. An assignement a quantity

36. Store
    a. A store shall stock from at least one warehouse
    b. A store shall be related to one company at a time
    c. A store shall have many customers
    d. A store shall have a unique ID
    e. A store shall have a name
    f. A store shall have a description

37. Shopping
    a. Shopping can be related to many stores
    b. Shopping can be related to many customers

38. Customer

a. A customer shall have at least one address
b. A customer shall shop in many stores
c. A customer shall browse many websites
d. A customer shall place many purchase orders
e. A customer shall return many purchase orders
f. A customer shall have at least one customer type
g. A customer shall have a unique ID
h. A customer shall have a first name
i. A customer shall have a last name
j. A customer shall have a unique email

39. Customer Associated Type
    a. Customer Associated Type shall be related to at least one Customer type
    b. Customer associated type shall be linked to many Customers

40. Customer Type
    a. A customer type shall be linked to many customers
    b. A customer type shall have a unique ID
    c. A customer type shall have a description

41. Browsing
    a. A browsing shall be related to many customers
    b. A browsing shall be related to many websites
    c. A browsing shall have a date
    d. A browsing shall have a time

42. Website
    a. A website shall be related to one company
    b. A website shall lists at least one product unit
    c. A website shall be browsed by many customers
    d. A website shall have a unique URL
    e. A website shall have a domain

43. Purchase order
    a. A purchase order shall contain at least one product unit
    b. A purchase order shall contain at least one line item
    c. A purchase order shall be placed by one customer
    d. A purchase order shall be returned by one customer
    e. A purchase order shall be associated with at least one payment
    f. A purchase order shall have at most delivery request
    g. A purchase order shall be linked to many return details
    h. A purchase order shall be fulfilled by at least one employee
    i. A purchase order shall have a unique ID
    j. A purchase order shall have a date

44. OrderPreparation
    a. OrderPreparation can be linked to many employees

b. OrderPreparation can be linked to many purchase orders

45. Line Item
    a. A line item shall refer to one product unit
    b. A line item shall be linked to one purchase order
    c. A line item shall have one unique ID
    d. A line item shall have a quantity item
    e. A line item shall have a discount

46. Payment
    a. A payment shall be linked to only one purchase order
    b. A payment shall have only one payment type
    c. A payment shall have a unique ID
    d. A payment shall have an amount

47. Payment type
    a. A payment type shall be used in many payments
    b. A payment type is credit card or check
    c. A payment type shall have a unique payment type ID
    d. A payment type shall have a billing address
    e. A payment type shall have one city
    f. A payment type shall have one state
    g. A payment type shall have one zip code
    h. A payment type shall have one country

48. Credit card payment type
    a. A credit card payment type shall have a unique card number
    b. A credit card payment type shall have one bank assignation code
    c. A credit card payment type shall have one expiration date
    d. A credit card payment type shall have one CVV

49. Chech payment type
    a. A check payment type shall have one unique account number
    b. A check payment type shall have one bank code
    c. A check payment type shall have one routing number

50. Delivery
    a. A delivery shall be associated with one purchase order
    b. A delivery shall be associated with one logistic provider
    c. A delivery shall have a delivery date
    d. A delivery shall have a unique ID
    e. A delivery shall have a status

51. Logistic provider
    a. A logistics provider shall have many deliveries
    b. A logistic provider shall deliver in at least one region
    c. A logistic provider shall have a unique ID

d. A logistic provider shall have a name

52. Delivery Limit
    a. A delivery limit shall be associated by many logistic providers
    b. A delivery limit shall have at least one region
    c. A delivery limit shall have a limit distance

53. Region
    a. A region shall have many logistic providers
    b. A region shall have a unique ID
    c. A region shall have a name

54. Return Details
    a. Return details shall be linked to one purchase orders
    b. Return details shall have a unique return ID
    c. Return details shall have a quantity
    d. Return details shall have have a reason

55. Address
    a. An address shall be associated with many customers
    b. An address shall have a unique address ID
    c. An address shall have a city
    d. An address shall have a state
    e. An address shall have a country
    f. An address shall have a zip code

56. Customer Address
    a. A customer address shall be associated with at least one address
    b. A customer address shall be associated with many customers

Section IV: Detailed list on Main Entities, Attributes and Keys

1. Company (Strong)
   - ❖ Company_ID: Key, numeric
   - ❖ CompanyName: multivalue, alphanumeric
   - ❖ About: alphanumeric
   - ❖ FoundedDate: composite, date

2. Labor (Weak)
   - ❖ Labor_ID: key, numeric
   - ❖ Contract: alphanumeric
   - ❖ Employee: weak key, numeric
   - ❖ Company: weak key, numeric

3. Employee (Strong)
   - ❖ Employee_ID: key, numeric
   - ❖ Employee_FirstName: multivalue, alphanumeric
   - ❖ Employee_LastName: multivalue, alphanumeric
   - ❖ DOB: composite, date
   - ❖ Salary: numeric

4. Department (weak)
   - ❖ Dept_ID: key, numeric
   - ❖ Dept_Name: multivalue, alphanumeric
   - ❖ Nb_Of_Employees: derived, numeric

5. Supplier (Strong)
   - ❖ Supplier_ID: key, numeric
   - ❖ Supplier_Name: multivalue, alphanumeric
   - ❖ Supplier_Descr: alphanumeric

6. SupplyItem (weak)
   - ❖ Supplier: weak key, numeric
   - ❖ RawMaterialUnit: weak key, numeric

7. SupplyOrder (Weak)
   - ❖ SupplyOrder_ID: key, numeric
   - ❖ SupplyOrder_Date: composite, date
   - ❖ SupplyOrder_Instr: alphanumeric
   - ❖ Supplier: weak key, numeric
   - ❖ Factory: weak key, numeric

8. SupplyLineItem (Weak)
   - ❖ SupplyLineItem_ID: key, numeric
   - ❖ SupplyLineItem_Quant: numeric
   - ❖ RawMaterial_SKU: weak key, numeric

9. RawMaterialUnit (Strong)
   - ❖ RawMaterial_SKU: key, numeric
   - ❖ RawMaterial_Name: multivalue, alphanumeric
   - ❖ RawMaterial_Descr: alphanumeric
   - ❖ RawMaterial_Price: numeric
   - ❖ RawMaterial_Weight: numeric

10. Raw Material Associated Type (weak)
    - ❖ Raw material unit: weak key, numeric
    - ❖ Raw material type: weak key, numeric

11. RawMaterialType (Strong)
    - ❖ RawMaterialType_ID: key, numeric
    - ❖ RawMaterialType_Descr: alphanumeric

12. Factory (Strong)
    - ❖ Factory_ID: key, numeric
    - ❖ Factory_Name: multivalue, alphanumeric
    - ❖ Factory_Size: numeric

13. RentFactory (Weak)
    - ❖ RentFactory_ID: primary key, numeric
    - ❖ Company: Unique key, numeric
    - ❖ Factory: foreign key, numeric

14. Test (Strong)
    - ❖ Test_ID: key, numeric
    - ❖ Test_Instruction: alphanumeric

15. TestRun (Weak)
    - ❖ Factory: weak key, numeric
    - ❖ Test: weak key, numeric

16. ProductsTesting (Weak)
    - ❖ ProductTesting_ID: key, numeric
    - ❖ ProductTesting_Status: alphanumeric
    - ❖ Test: weak key, numeric
    - ❖ TestBatch: weak key, numeric

17. TestBatch (Strong)
    - ❖ TestBatch_ID: key, numeric
    - ❖ TestBatch_Date: composite, date
    - ❖ TestBatch_Descr: alphanumeric

18. TestBatchReference (Weak)
    - ❖ TestBatch: weak key, numeric

- ❖ TestUnit: weak key, numeric

19. TestUnit (Strong)
    - ❖ TestUnit_SKU: key, numeric
    - ❖ TestUnit_Name: multivalue,alphanumeric
    - ❖ TestUnit_Descr: alphanumeric

20. Test unit associated type (weak)
    - ❖ Test unit: weak key, numeric
    - ❖ Test unit type: weak key, numeric

21. TestUnitType (Strong)
    - ❖ TestUnitType_ID: key, numeric
    - ❖ TestUnitType_Descr: alphanumeric

22. ReturnedDefectiveItems (Strong)
    - ❖ Defect_ID: key, numeric
    - ❖ Defect_Descr: alphanumeric

23. Check (weak)
    - ❖ Factory: weak key, numeric
    - ❖ ReturnedDefectiveItems: weak key, numeric

24. DefectLevel (Weak)
    - ❖ ReturnDefect: weak key, numeric
    - ❖ DefectType: weak key, numeric

25. DefectType (Strong)
    - ❖ DefectType_Code: key, numeric
    - ❖ DefectType_Descr: alphanumeric

26. DefectItemLot (Weak)
    - ❖ ReturnDefect: weak key, numeric
    - ❖ Decision: weak key, numeric

27. Decision (Strong)
    - ❖ Decision_ID: key, numeric
    - ❖ Decision_Descr: alphanumeric

28. Production (weak)
    a. Factory: weak key, numeric
    b. ProductBatch: weak key, numeric

29. ProductBatch (Strong)
    - ❖ ProductBatch_ID: key, numeric
    - ❖ ProductBatch_Date: composite, date
    - ❖ ProductBatch_Descr: alphanumeric

30. ProductBatchItems (Weak)
    - ❖ ProductBatch: weak key, numeric
    - ❖ ProductUnit: weak key, numeric
    - ❖ Quantity: numeric

31. Product unit (Strong)
    - ❖ ProductUnit_SKU: key, numeric
    - ❖ ProductUnit_Name: multivalue, alphanumeric
    - ❖ ProductUnit_Descr: alphanumeric
    - ❖ ProductUnit_Price: numeric

32. Product unit associated type (weak)
    - ❖ Product unit: weak key, numeric
    - ❖ Product unit type: weak key, numeric

33. Product type (Strong)
    - ❖ ProductType_ID: key, numeric
    - ❖ ProductType_Descr: alphanumeric

34. Stock (Weak):
    - ❖ Stock_ID: key, numeric
    - ❖ ProductBatch: weak key, numeric
    - ❖ Warehouse: weak key, numeric

35. Warehouse (Strong)
    - ❖ Warehouse_ID: key, numeric
    - ❖ Warehouse_Name: multivalue, alphanumeric
    - ❖ Warehouse_Size: numeric

36. RentWarehouse (weak)
    - ❖ RentWarehouse_ID: primary key, numeric
    - ❖ Company: Unique key, numeric
    - ❖ Warehouse: foreign key, numeric

37. Assignment (Weak)
    - ❖ Warehouse: weak key, numeric
    - ❖ Store: weak key, numeric
    - ❖ Assignement_Date: composite, date
    - ❖ Assignment_QT: numeric

38. Store (Strong)
    - ❖ Store_ID: key, numeric
    - ❖ Store_Name: multivalue, alphanumeric
    - ❖ Store_Descr: alphanumeric

39. RentStore (weak)

- ❖ RentStore_ID: primary key, numeric
- ❖ Company: Unique key, numeric
- ❖ Store: foreign key, numeric

40. Website (weak)
- ❖ Website_URL: key, numeric
- ❖ Domain: alphanumeric
- ❖ Company: weak key, numeric

41. Browsing (Weak)
- ❖ Website: weak key, numeric
- ❖ Customer: weak key, numeric
- ❖ Browsing_Date: composite, date
- ❖ Browsing_Time: composite, time

42. Customer (Strong)
- ❖ Customer_ID: key, numeric
- ❖ Customer_FirstName: multivalue, alphanumeric
- ❖ Customer_LastName: multivalue, alphanumeric
- ❖ Email: key, alphanumeric

43. Customer associated type (weak)
- ❖ Customer: weak key, numeric
- ❖ Customer type: weak key, numeric

44. Customer Type (Strong)
- ❖ CustomerType_ID: key, numeric
- ❖ CustomerType_Descr: alphanumeric

45. Shopping (Weak)
- ❖ Store: weak key, numeric
- ❖ Customer: weak key, numeric

46. Purchase order (Weak)
- ❖ PurchaseOrder_ID: key, numeric
- ❖ PurchaseOrder_Date: composite, date
- ❖ Customer: weak key, numeric

47. LineItem (Weak):
- ❖ LineItem: key, numeric
- ❖ ProductUnit: weak key, numeric
- ❖ QT_item: numeric
- ❖ Discount: numeric

48. Payment (Weak)
- ❖ Payment_ID: key, numeric
- ❖ Amount: numeric

- ❖ PaymentType: weak key, numeric
- ❖ PurchaseOrder: weak key, numeric

49. Payment type (Strong)
- ❖ PaymentType_ID: key, numeric
- ❖ BillingAddress: alphanumeric
- ❖ City: alphanumeric
- ❖ State: alphanumeric
- ❖ Country: alphanumeric
- ❖ Zipcode: numeric

50. Credit Card (Weak)
- ❖ Card_Number: key, numeric
- ❖ Bank: alphanumeric
- ❖ Expiration_Date: composite, date
- ❖ CVV: numeric
- ❖ PymentType_ID: weak key, numeric

51. Check (Weak)
- ❖ Account_Number: key, numeric
- ❖ Bank: alphanumeric
- ❖ Routing: numeric
- ❖ PaymentType_ID: weak key, numeric

52. Delivery (Weak)
- ❖ Delivery_ID: key, numeric
- ❖ Delivery_Status: alphanumeric
- ❖ Delivery_Date: composite, date
- ❖ LogisticProvider: weak key, numeric
- ❖ PurchaseOrder_ID: weak key, numeric

53. LogisticProvider (Strong)
- ❖ LogisticProvider_ID: key, numeric
- ❖ LogisticProvider_Name: multivalue, alphanumeric

54. DeliveryLimit (Weak)
- ❖ LogisticProvider: weak key, numeric
- ❖ Region: weak key, numeric
- ❖ Distance: numeric

55. Region (Strong)
- ❖ Region_ID: key, numeric
- ❖ Region_Name: multivalue, alphanumeric

56. Address (Strong)
- ❖ Address_ID: key, numeric
- ❖ AddressDescr: alphanumeric

- ❖ City: alphanumeric
- ❖ State: alphanumeric
- ❖ Country: alphanumeric
- ❖ ZipCode: numeric

57. CustomerAddress (Weak)
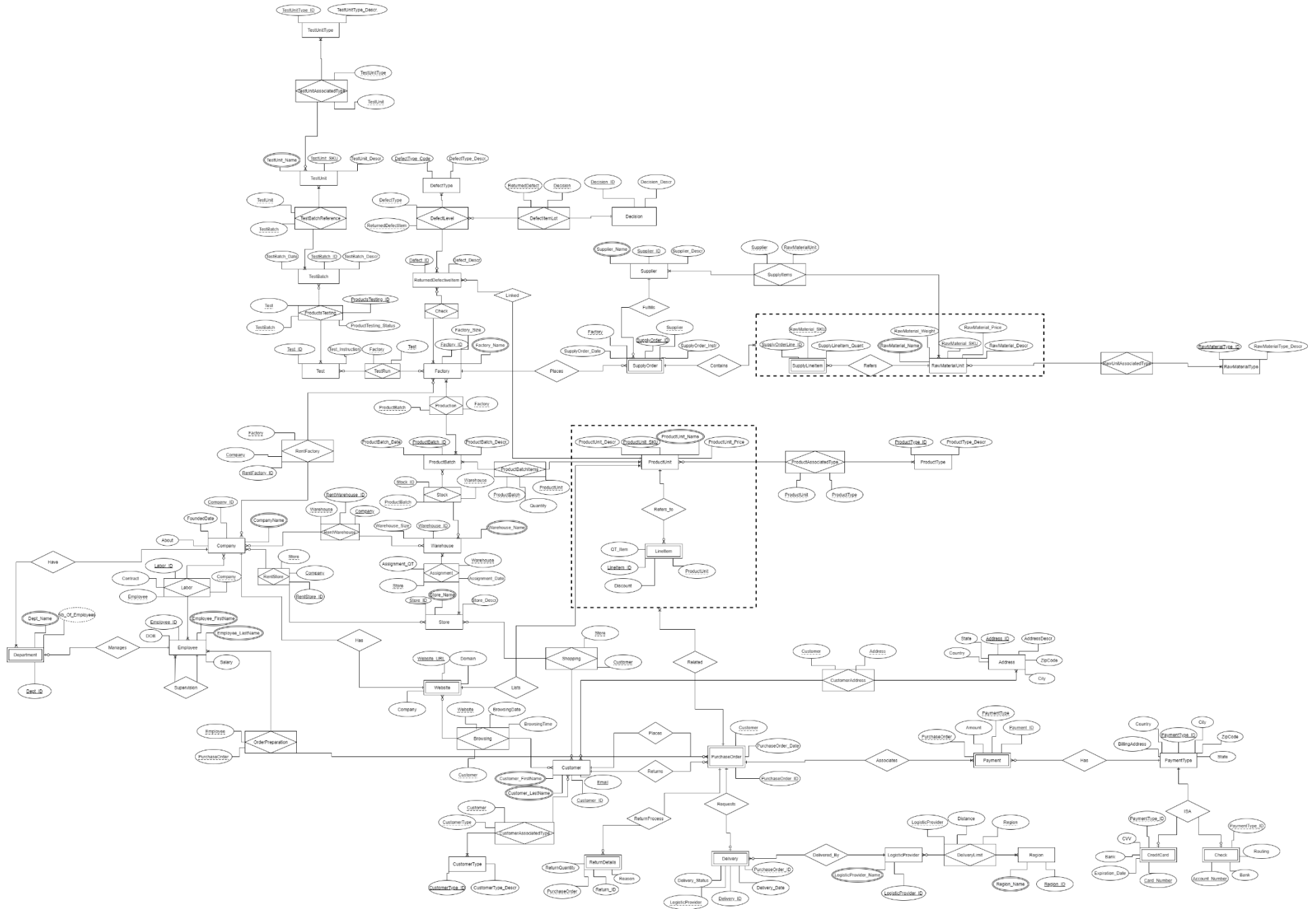- ❖ Customer: weak key, numeric
- ❖ Address: weak key, numeric

58. OrderPreparation (weak)
- ❖ Employee: weak key, numeric
- ❖ purchaseOrder: weak key, numeric

59. ReturnDetails (Weak)
- ❖ Return_ID: key, numeric
- ❖ Reason: alphanumeric
- ❖ ReturnQuantity: numeric
- ❖ PurchaseOrder: weak key, numeric

Section V: Entity Relationship Diagram (ERD)

Section VI: Testing Table

Rule	Entity A	Relation	Entiti B	Cardinality	Pass/Fail	Error Description
1	Company	Labor	Employee	M-N	Pass	
2	Employee	Manages	Department	1-1	Fail	An employee can manage at most one department
3	Company	Has	Department	1-M	Fail	Relationship have doesn't exist
4	Employee	Supervises	Employee	M-1	Pass	
5	Company	Rents	Factory	M-N	Pass	
6	Company	Rents	Warehouse	M-N	Pass	
7	Company	Rents	Store	M-N	Pass	
8	Company	Has	Website	1-M	Fail	A company shall have only one website
9	Factory	Places	Supply order	M-N	Pass	A supply order can be placed by only one factory
10	Supplier	Fulfills	Supply order	1-M	Pass	
11	Supplier	Has	Raw material units	M-N	Pass	
12	Supply order	Aggregation	Supply line item and raw material unit	1-M	Pass	
13	Supply line item	Refers to	Raw material unit	M-N	Fail	A supply line item should refer to only one raw material unit
14	Raw material unit	Have	Raw material type	M-N	Pass	
15	Factory	Runs	Test	M-N	Pass	
16	Test	Tests	Test batch	M-N	Pass	
17	Test batch	Linked to	Test unit	1-M	Fail	A test unit shall be linked to more than one test batch
18	Test unit	Have	Test unit type	M-N	Pass	
19	Factory	Detects	Returned defective items	M-N	Pass	
20	Returned defective items	Have	Defect type	M-1	Fail	A returned defected item shall have at least one defect type

21	Decision	Based on	Defect level	1-M	Pass	
22	Factory	Makes	Product batch	M-N	Pass	
23	Product batch	Groups	Product unit	M-N	pass	
24	Product unit	Has	Product type	M-N	Pass	
25	Product batch	Stocked	Warehouse	M-N	Pass	
28	Warehouse	supplies	Store	M-N	Pass	
32	Customer	Located	Address	1-1	Fail	An address shall belong to many customers and a customer can have many addresses
33	Store	Has	Customer	M-N	Pass	
34	Website	Browsed	Customer	M-N	Pass	
35	Website	Lists	Product unit	M-N	Fail	Product units are listed on one website
36	Customer	Places	Purchase order	1-M	Pass	
37	Customer	Returns	Purchase order	1-M	Pass	
38	Customer	Has	Customer type	M-N	Pass	
39	Purchase order	Associated with	Payment	1-M	Pass	
40	Payment	Has	Payment type	M-1	Pass	
41	Payment type	ISA	Credit card or check	1-1	Pass	
42	Purchase order	Requests	Delivery	1-1	Pass	
43	Delivery	Delivered by	Logistic provider	M-1	Pass	
44	Logistic provider	Is limitied to	Region	M-N	Pass	
45	Purchase order	Linked to	Payment, customer, and product unit	1-M	Fail	We cannot link more than 2 entities to same relationship
46	Purchase order	Aggregation	Line item and product unit	1-M	Pass	
47	Line item	Refers to	Product unit	M-1	Pass	
48	Employee	Fulfills	Purchase order	M-N	Pass	