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|  | 2814ICT – Data Management  7003ICT – Database Design  School of Information & Communication Technology  Trimester 1, 2021  **Assignment Part 1:**  **Designing a Database for BigM** |

**ASSIGNMENT TITLE: Logical Database model for BigM**

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| **Course Code: 2814ICT** | | **Workshop/Lab day & time: Friday / 9am-10:45am** |
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# **Acknowledgements:**

1. **Emon Kumar Dey**

# **Entity Relationship Diagram**

Diagram

Description automatically generated

Figure1: Entity Relationship Diagram

# **Assumptions**

• Store Managers manage all supervisors in the store.

• One employee can only work in one department.

• Customers can only pick up orders as a whole, not as individual products.

• Every order has a unique order number assigned to it which is the primary key.

• When an order is taken, date identifying when the order will arrive at the store will be noted under the name orderArrivalDate.

• Similarly, date identifying when the order is ready to be picked up by the customer at the store is noted under pickUpDate.

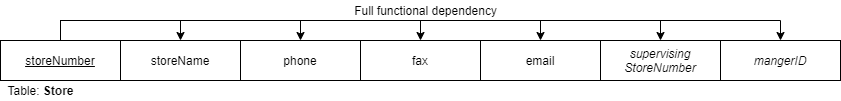
• Big M does not make any deliveries.

# 

# **Normalisation**

1. Relation Schema
2. PRODUCT (productNumber, productName, productDescription, productSize, productPrice, productArrivalDate)
3. PRODUCT ORDER (productNumber, orderNumber, qtyOrdered)
4. ORDER (orderNumber, *customerNumber*, pickUpDate, *storeNumber*)
5. CUSTOMER (customerNumber, customerFirstName, customerLastName)
6. STORE PRODUCT (*storeNumber*, *productNumber*, productQty)
7. STORE (storeNumber, storeName, phone, fax, email, *supervisingStoreNumber*, *managerID*)
8. STORE DEPARTMENT (*departmentID*, *storeNumber*, numberOfDepartment)
9. DEPARTMENT (departmentID, departmentName, phone, email, *supervisorID*)
10. EMPLOYEE (employeeID, firstName, lastName, phone, dateOfBirth, startDateOfWork, hourlyRate, annualSalary, taxFileNumber, *departmentID*, *supervisorID*, *managerID*)
11. Normalisation

### **Store**



This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** storeNumber → storeName, phone, fax, email, *supervisingStoreNumber*, *managerID*

### **Store Department**

Table

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** *departmentID*, *storeNumber* → numberOfDepartment

### **Department**

Diagram

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** departmentID → departmentName, phone, email, *supervisorID*

### **Product**

Table

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** productNumber → productName, productDescription, productSize, productPrice, productArrivalDate

### **Product Order**

Table

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** *productNumber*, *orderNumber* → qtyOrdered

### **Customer**

Table

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** customerNumber → customerFirstName, customerLastName

### **Store Product**

Table

Description automatically generated

This table is in 3NF because it has full dependency without any transitive and partial dependencies.

* **Full Dependency:** *storeNumber*, *productNumber* → productQty

### **Order**

Diagram, table

Description automatically generated

This table is in a 2NF because it has a transitive dependency, but no partial dependency.

* **Full Dependency:** orderNumber → *customerNumber*, pickUpDate, *storeNumber*
* **Transitive Dependency:** {*customerNumber*} → pickUpDate

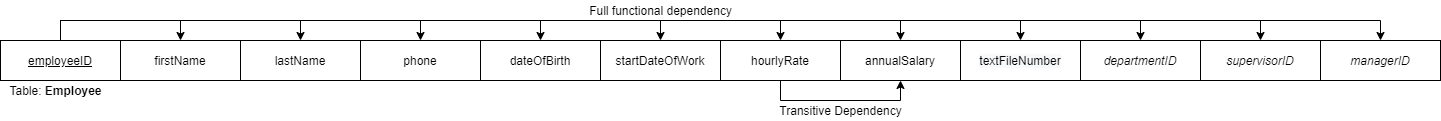
There is transition dependency among orderNumber, customerNumber and pickUpDate.

orderNumber -> *customerNumber*

{*customerNumber*} -> pickUpDate

However, there is no need to decompose this table into two because pickUpDate doesn’t introduce big redundancy.

### **Employee**



This table is in a 2NF because it has a transitive dependency, but no partial dependency.

* **Full Dependency:** employeeID → firstName, lastName, phone, dateOfBirth, startDateOfWork, hourlyRate, annualSalary, taxFileNumber, *departmentID*, *supervisorID*, *managerID*
* **Transitive Dependency:** {hourlyRate} -> annualSalary

There is transition dependency among employeeID, hourlyRate and annualSalary.

employeeID -> hourlyRate

{hourlyRate} -> annualSalary

However, there is no need to decompose this table into two because annualSalary doesn’t introduce big redundancy

# **Appendices**

# **Bibliography**