

Information Management Systems (ECSE211L)

(Introduction of IMS)

Course Learning Outcomes:

- **CLO1:** Show the understanding of the fundamentals relational database systems.
- **CLO2:** Construct databases using DBMS products such as MySQL/Oracle/My SQL Server.
- **CLO3:** Design database systems and understand new developments and trends in databases.

Reference Books

1. **Abraham Silberschatz, Henry F. Korth, S. Sudarshan, “Database System Concepts”, 6th Edition, McGraw-Hill , 2010, ISBN:0-07-352332-1.**
2. **Elmasri, Ramez and Shamkant B. Navathe, Fundamentals of database systems, (7th Edition) Pearson, 2015. ISBN- 978-0133970777.**

Online Courses

1. Database Systems Concepts & Design by Georgia Tech

<https://www.udacity.com/course/database-systems-concepts-design--ud150>

2. Structured Database Environments by from Southern New Hampshire University. <https://www.edx.org/course/structured-database-environments-with-sql>

Evaluation Components

Components of Course Evaluation	Percentage
Mid Term Examination	20
Quiz	15
Continuous Lab Evaluation	10
Lab Exam	10
Class Participation	10
End Term Examination	35

Why Databases?

Database Management System(DBMS)

- DBMS contains information about a particular enterprise
 - Collection of Interrelated data
 - Set of programs to access the data
 - An environment that is both convenient and efficient to use
- Databases can be large
- Databases touches all aspects of our life

Which Database Have You Experienced or Interacted Today?

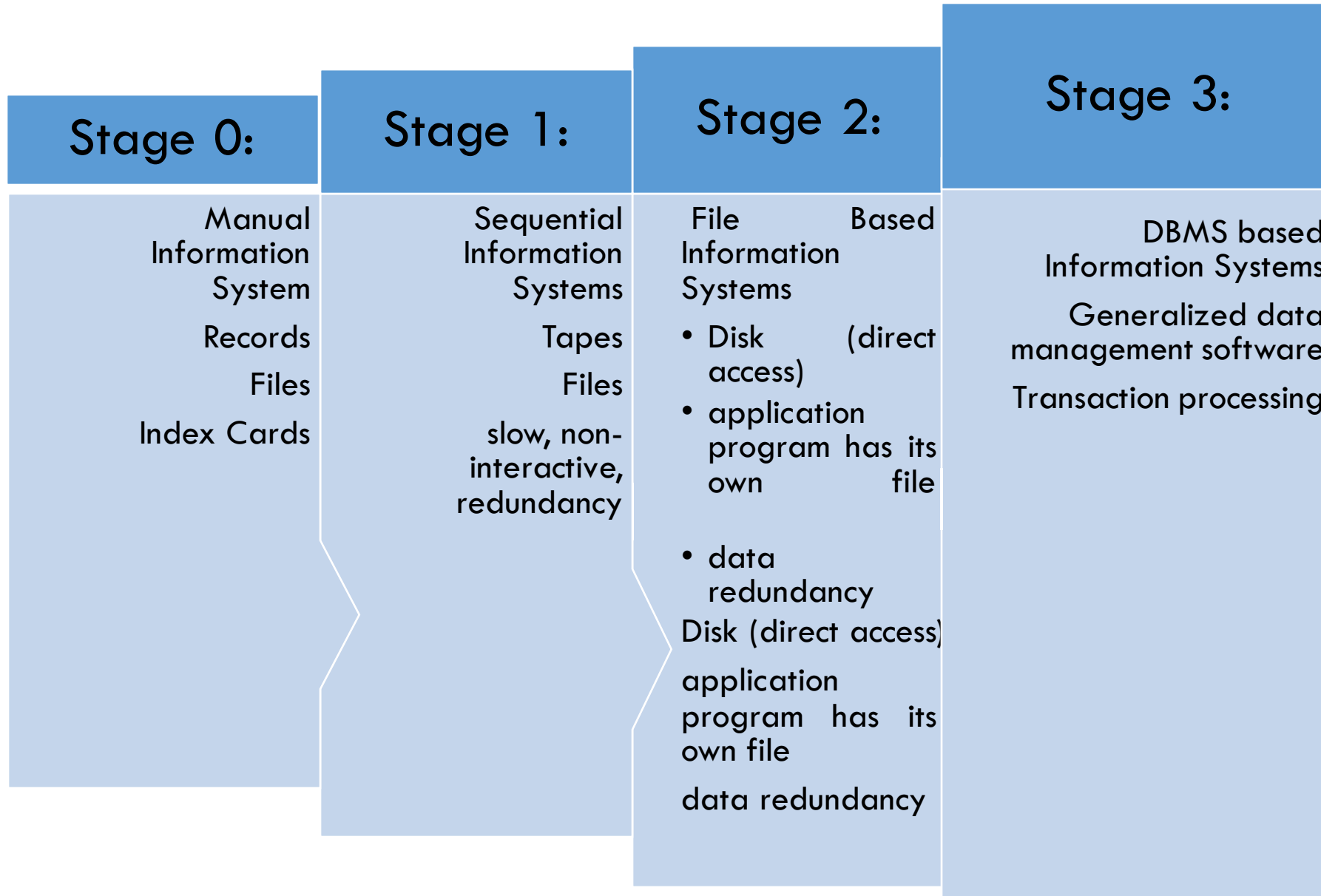
Where is Database?

- You cannot avoid it and it's everywhere!
- You can say it actually makes the current society and your life work!
- Banking/Credit card /Social Security Info...
- Airlines: reservations, schedules
- Universities: registration, grades
- Sales: customers, products, purchases
- Online retailers: order tracking, customized recommendations
- Manufacturing: production, inventory, orders, supply chain
- Human resources: employee records, salaries, tax deductions
- So many fields....

DBMS Marketplace

- **Relational DBMS companies** – Oracle, Sybase – are among the largest software companies in the world.
- **IBM offers its relational DB2 system.** With IMS, a nonrelational system, IBM is by some accounts the largest DBMS vendor in the world.
- **Microsoft offers SQL-Server,** plus Microsoft Access for the cheap
- **OpenSource:** MySQL, postgresQL

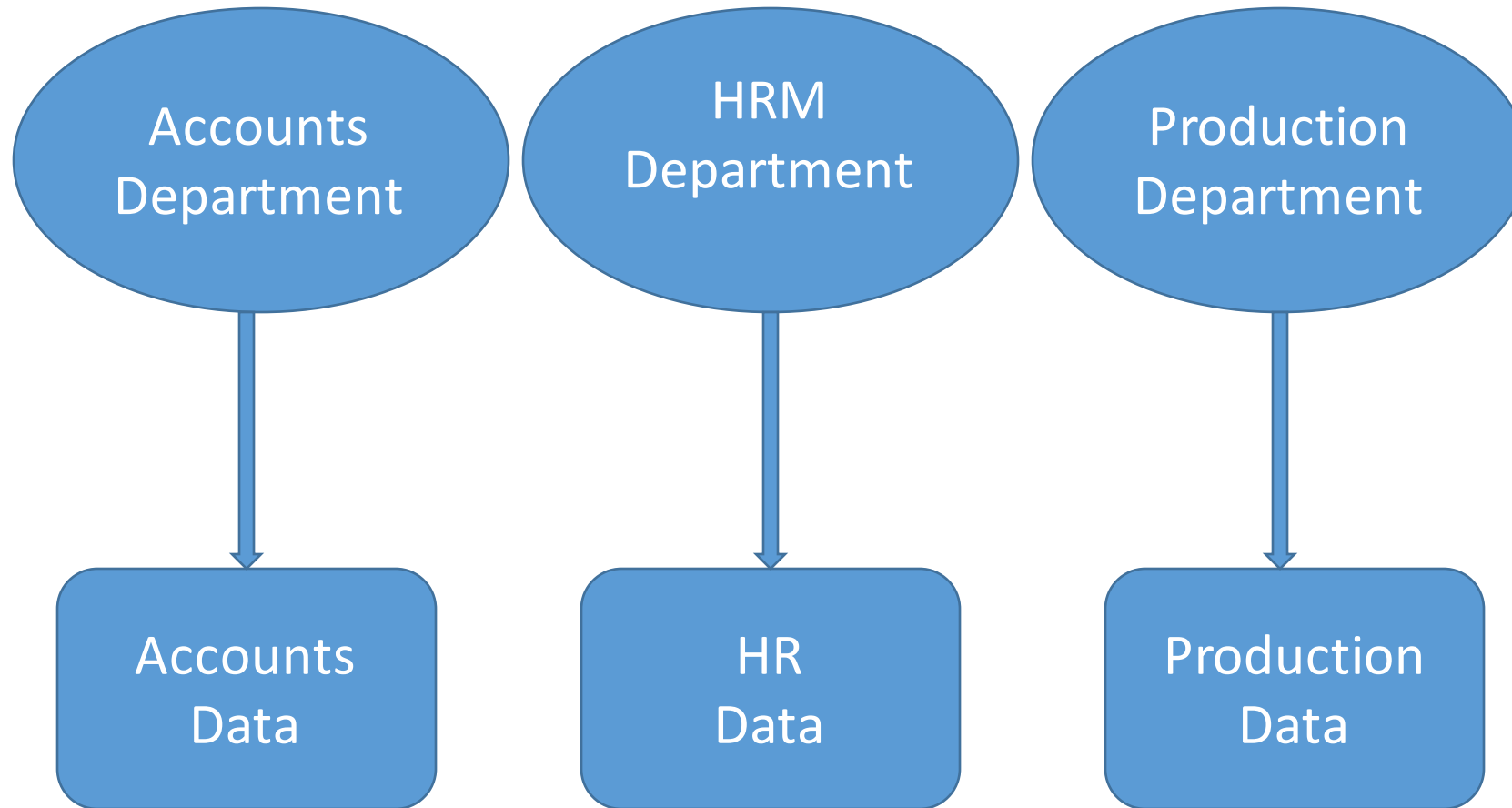
Stages of Information System



What is file based system?

- A file based system is a collection of application programs that perform services for the user.
- Each program within a file based system defines and manages its own data.

How it works?



Each department maintain their own set of data. There is no link between those data pools.

Advantages of file based system

- **No need of external storage**
- **No need of highly technical person to handle the database.**
- **Processing speed is high as compare to DBMS**
- **Low cost (ex: Equipments)**

Disadvantages of File based system

- **Data redundancy and inconsistency**
 - Multiple file formats, duplication of information in different files

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 - Uncontrolled concurrent accesses can lead to inconsistencies
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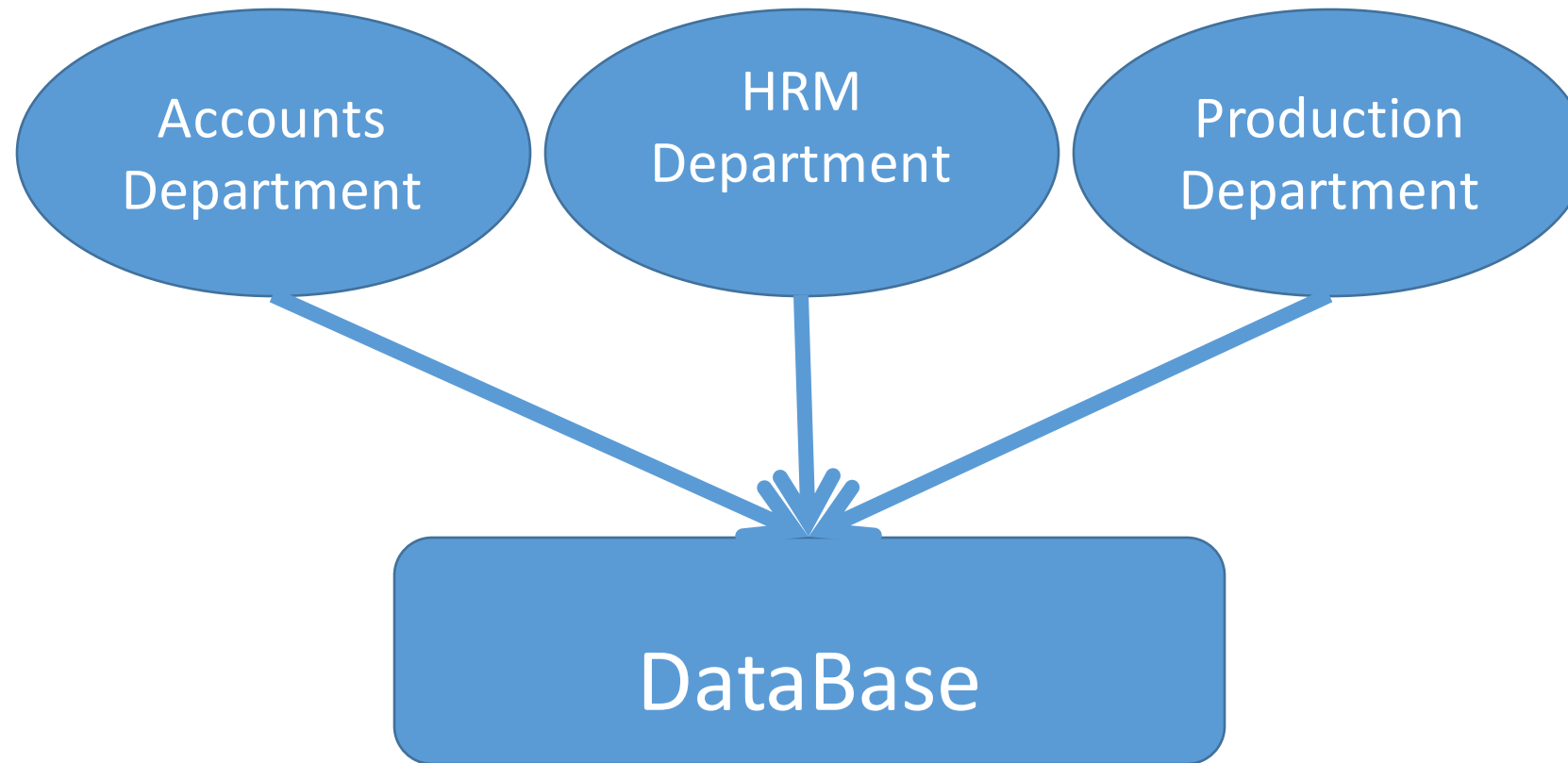
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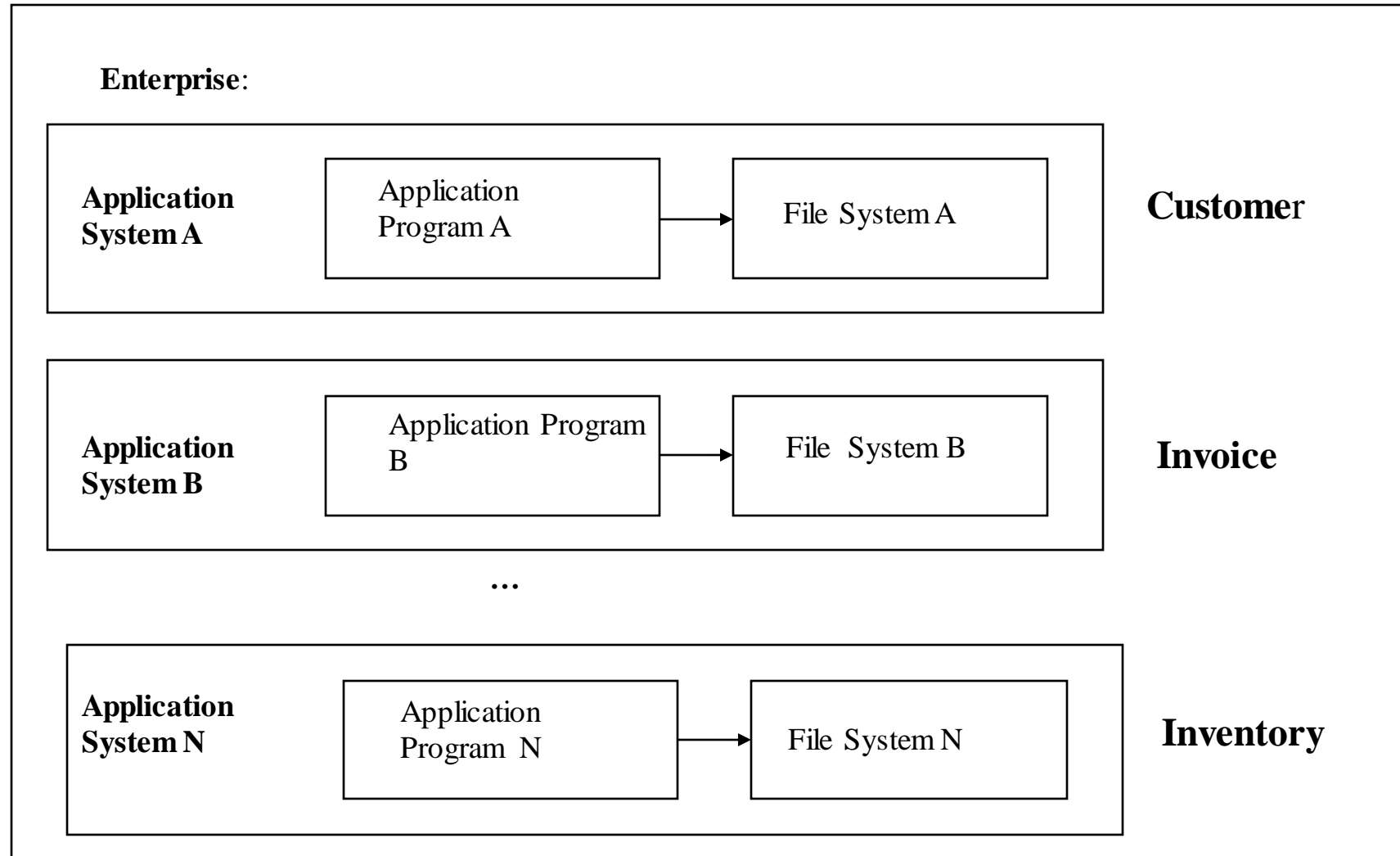
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Data based system offer solutions to all the above problems

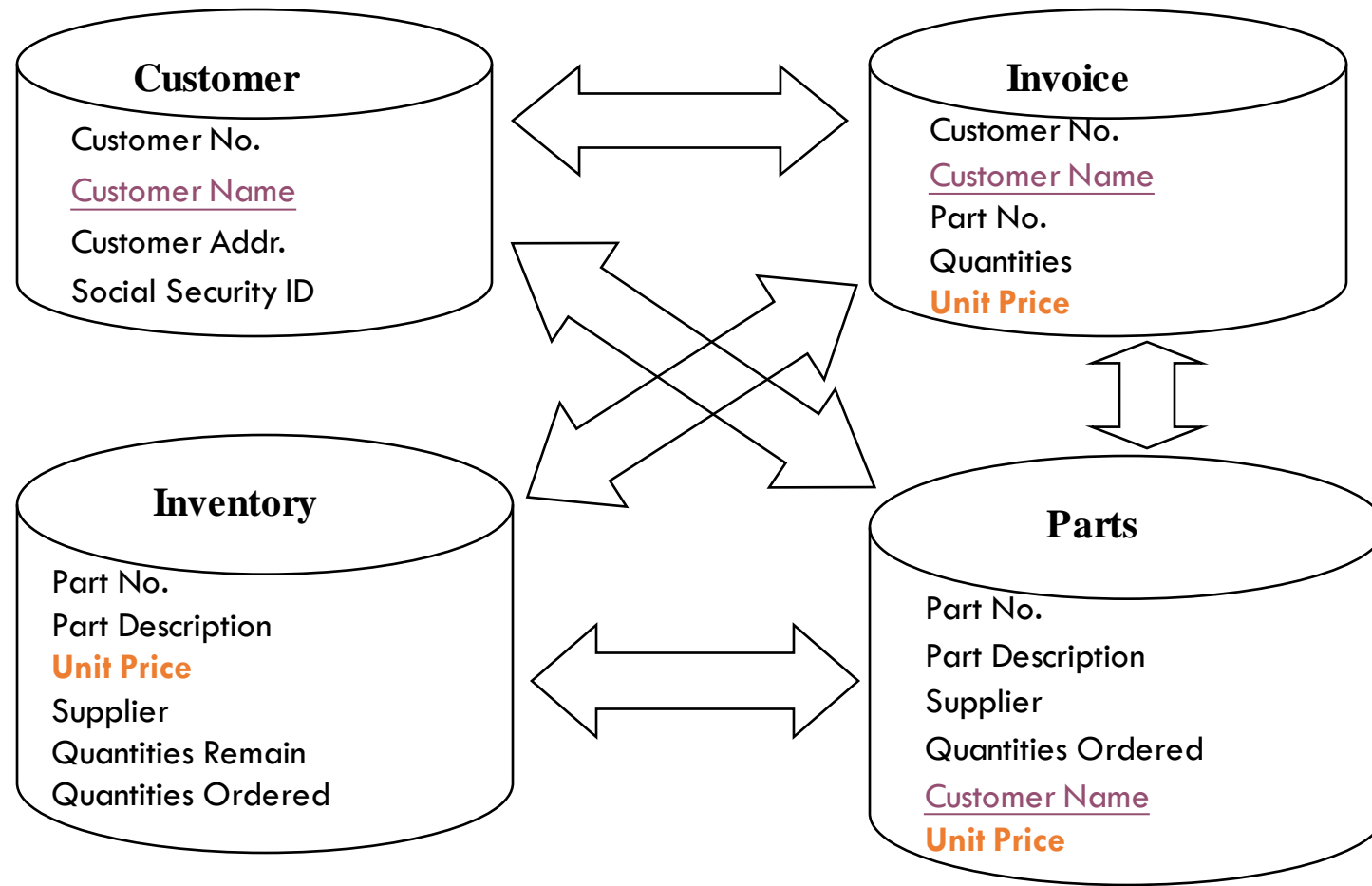
How DBMS works



File Based Information Systems : Example



File Based Information Systems (cont.)



- Data Isolation caused due to _____ in traditional file system.
 1. Duplicate Data
 2. Scattering of Data
 3. Complex Data
 4. Atomic Data

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- If person A want to transfer fund of Rs.500 to person B. If failure occurs after removing Rs.500 from Account A and before transferring to Account B then problem caused is _____.
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 2. Data Atomicity
 3. None of these
 4. Data Redundancy

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- Duplication of data at several places is called as _____.
 1. Data Inconsistency
 2. Atomicity Problem
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- If in redundant file common fields are not matching then it results in _____.
 1. Data Integrity Problem
 2. Data Isolation
 3. Data Redundancy
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- It is difficult to access conventional file system than Database System.
 1. True
 2. False

- It is difficult to access conventional file system than Database System.

1. **True**

2. False

- Suppose user have Saving Account and Current Account in the Bank. Saving Account Stores following information -

account-no
name
address
mobile

and current Account stores -

account-no
name
address
mobile

- Which of the information is not redundant. Data Inconsistency
 1. Address
 2. Name
 3. Mobile
 4. account-no

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 4. **account-no**

Case 1: Amazon Database

- Amazon uses their own proprietary NoSQL database for their humongous product and marketplace info which is scaled horizontally and renders many pages, and is dynamic.
- However, Amazon does use Relational Databases for their own human resources management. For instance, Amazon is a major Oracle client, spending some 50 million dollars on RDMS.
- The databases presented my AWS is to be used by AWS clients and is for hosting and that includes DynamoDB which is a relational database.

Case 2: Google Database

- Although Google uses BigTable for all their main applications, they also use MySQL for other (perhaps minor) apps. And it's maybe also handy to know that BigTable is not a relational database (like MySQL) but a huge (distributed) hash table which has very different characteristics.

Three Aspects to Studying DBMS

1. Modelling and design of databases.

- Allows exploration of issues before committing to an implementation.

2. Programming: queries and DB operations like update.

3. DBMS implementation.

Task for Students

- 1) Does Facebook use the RDBMS?
- 2) Does Salesforce use RDBMS?
- 3) Does Microsoft use RDBMS?
- 4) Enlist the name of anyone big IT Company which use RDBMS frequently .

Thank you