DB Module

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School of InfoComm Technology

Introduction To Databases

Databases

Day 1

Prepared by Staff of School of ICT

Objectives

- Understand and analyse data required by an organisation and to represent this information requirement using a modelling technique
- Transform data model to database tables
- To create and manipulate tables using a well accepted language, SQL

What is a database?

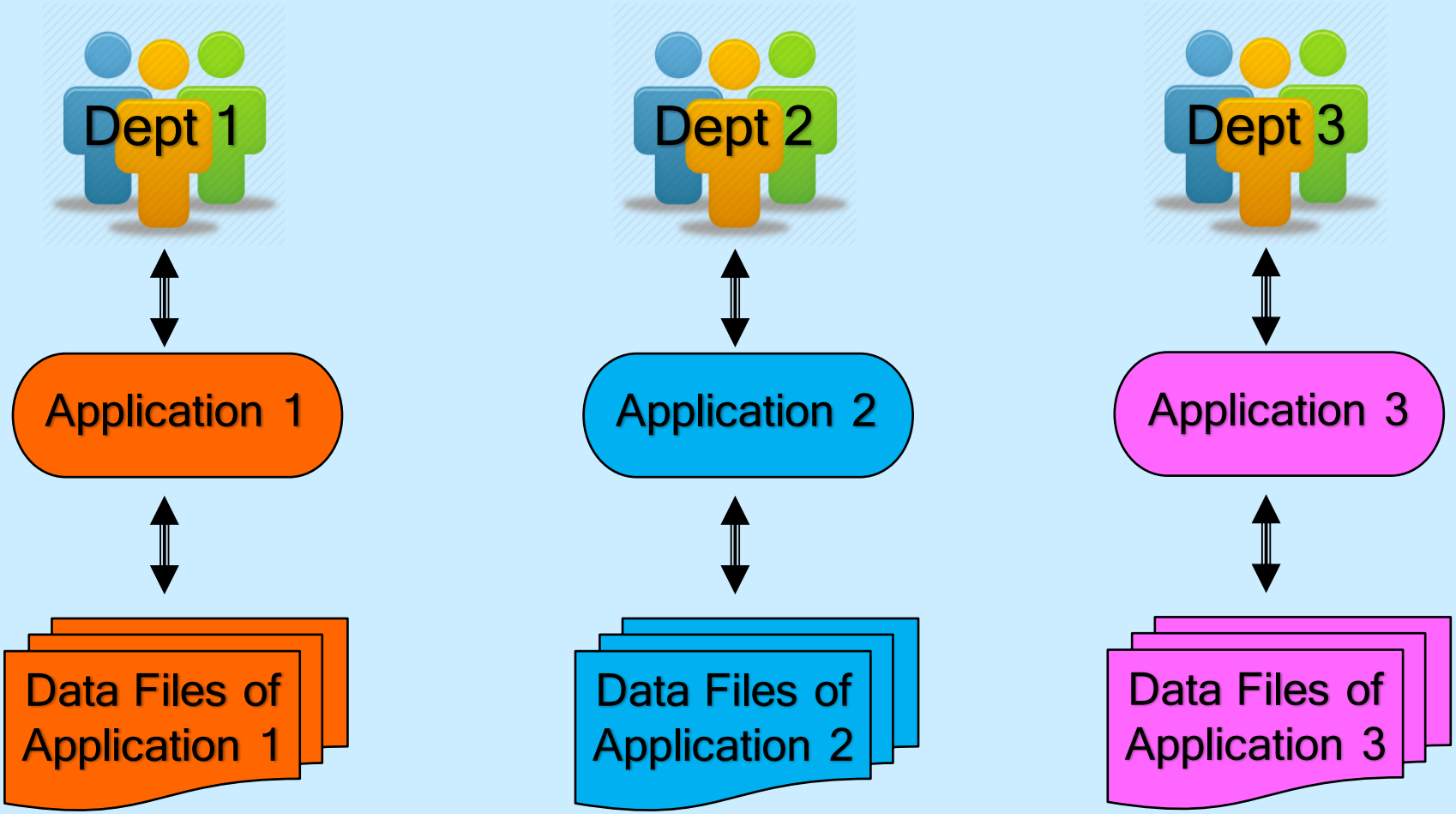
- File-Based System vs Database System

File-Based System

- A file-based system is a collection of application programs, each managing its own data.
- Each application program defines and handles its own data files independently of others.
- Sharing of data between applications is likely to be limited

File-Based System

Each department maintains its own data in its own data files.



File-Based System – Real Estate Company

Each department maintains its own data in its own data files.

Sales Dept

Rental Property File

PropertyID	Address	District	Type	No of Rooms	Rent	OwnerID

Owner File

OwnerID	Name	Address	Office No	Mobile No	Email

Renter File

CustomerID	Name	Contact No	Email	Preferred Type	Budget

Operations Dept

Rental Property File

PropertyID	Address	District	Type	No of Rooms	Rent	OwnerID

Owner File

OwnerID	Name	Address	Office No	Mobile No	Email

Renter File

CustomerID	Name	Contact No	Email

Contract File

ContractID	Property ID	CustomerID	Deposit	Rent	Payment Mode	Start Date	End Date

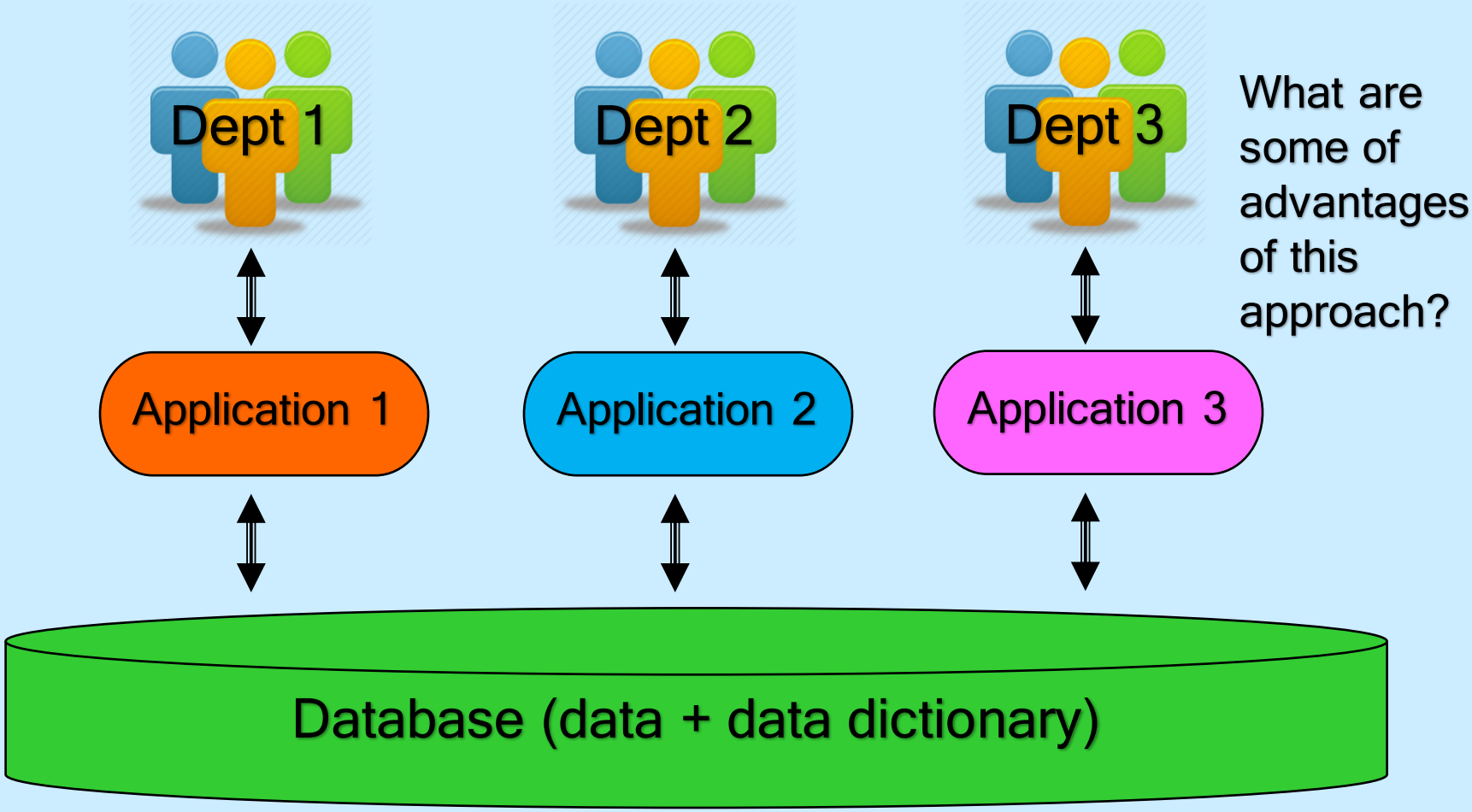
What are some of drawbacks of this approach?

Database Systems

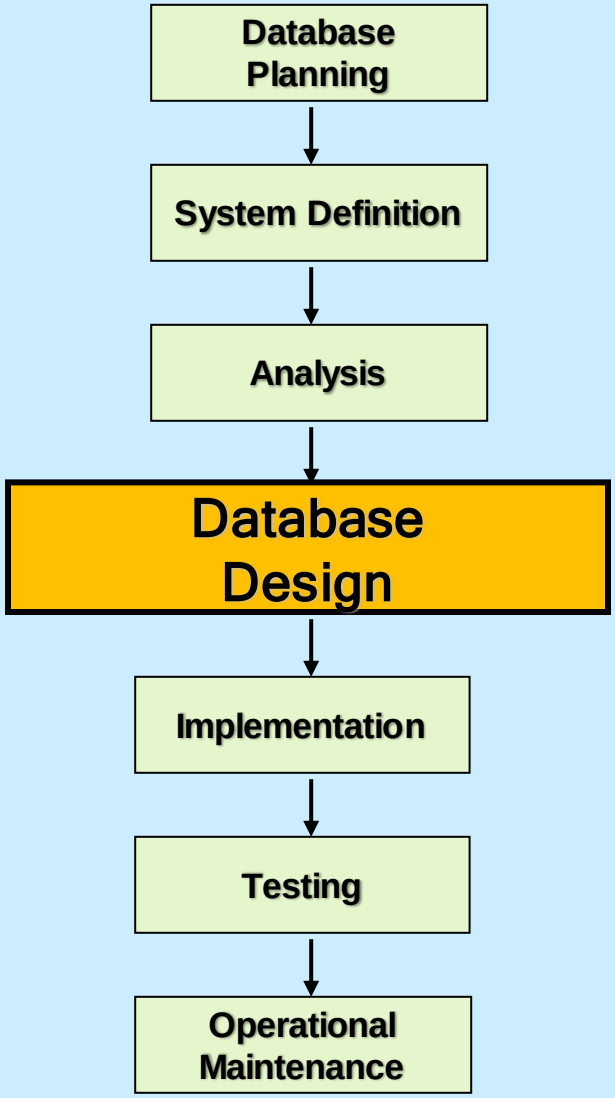
- A database is an organized collection of logically-related data (including its description) that is shared across related applications as part of the information system of an organization.

Database Systems

Different departments can share the data in the database.



Database Application Lifecycle



Define mission statement of database

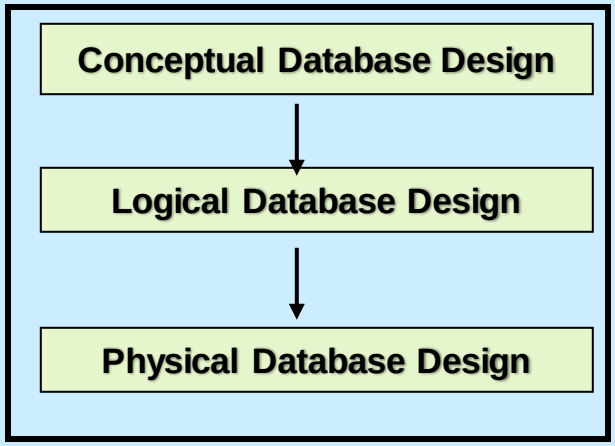
Identify system boundaries

Collecting & analyzing information

Creating a plan/model that captures the data requirements

Database Design Steps

Database design consists of 3 main phases.



Database Design

Library :
Student loan materials

Model
Staff
Student
Loan

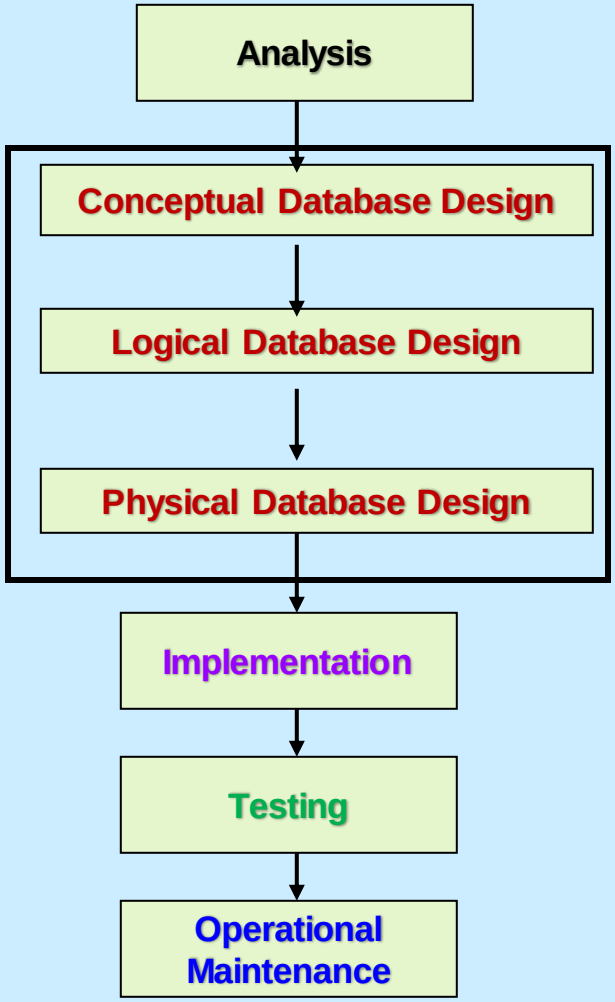
Entity mapped to relation

Relation transformed To table

Creating table Using ddl

Query language
To test the links

Go live
Maintenance



- Family of five
  - Elderly couple
  - 3 young children
- Likes to entertain

One master room
Three other bedrooms
One dining room
Three storey

Master room with walkin wardrobe
All bedrooms with attached toilet

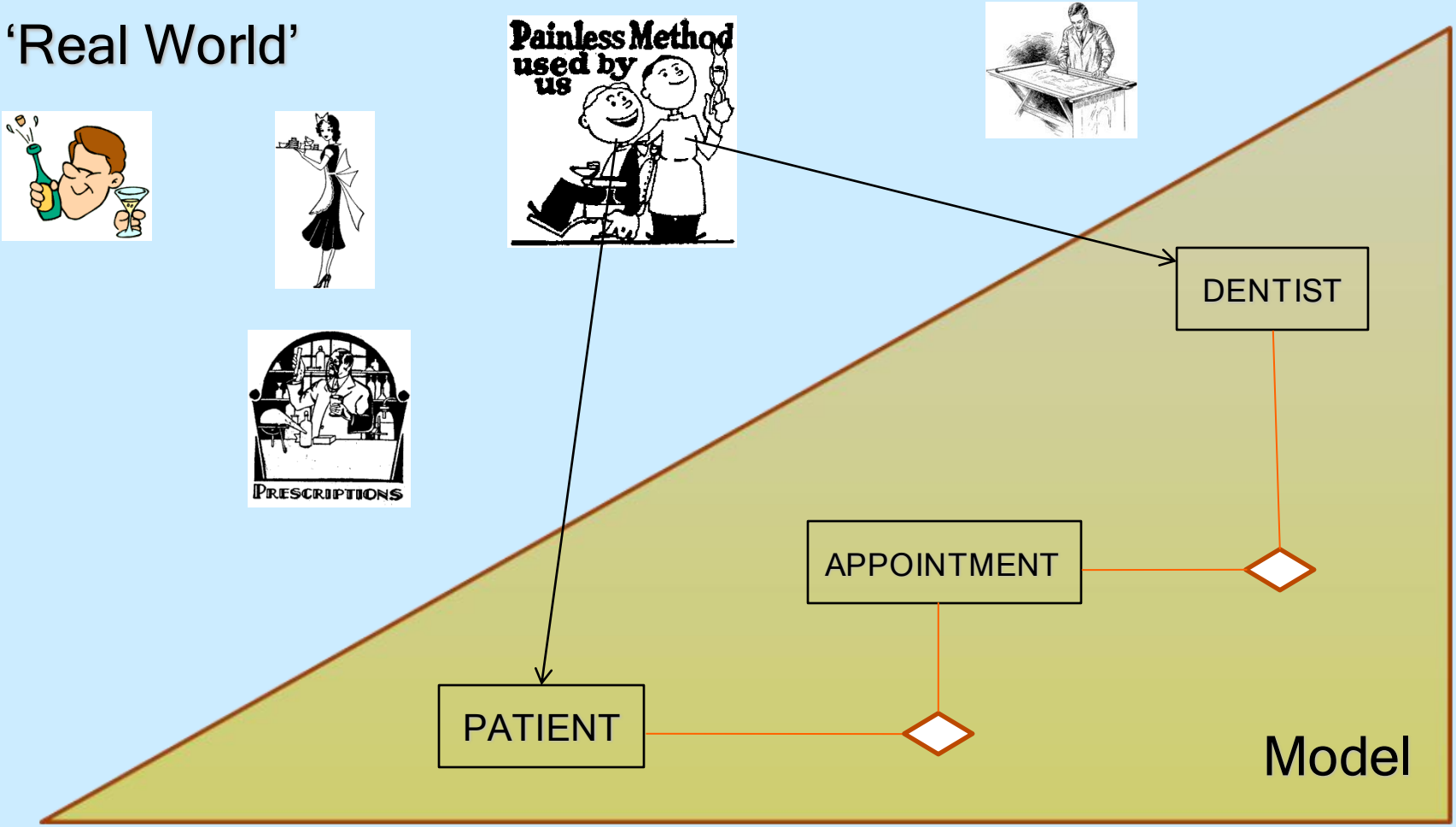
Twenty by 15 feet master
Toilet by the side

Building the foundation
Putting in the bricks
Internal works
External works

Building Inspection

Move in
List of defects

Modelling (in context)



Transforming to Relation

- Dentist (dentistID, name, gender..)
- Patient (patientID, name, gender..)
- Appointment (appointmentNo, dateofAppointment, dentistID, patientID, appointmentType ..)
  - Who – dentistID (who is attending) ,
    patientID (who is being treated)
  - When – appointmentDate
  - What – appointmentType (annual checkup, pulling of tooth, Crowning, etc)
  - Where – at clinic (Is there a need to capture? Why?)

Transforming to Tables

Dentist

DentistID	Name	Gender
D001	Ng Aik Kiat	Male
D002	Sharon Au	Female

Patient

PatientID	Name	Gender
P001	Sng Liau Kar	Male
P003	Wong Sau Chee	Female

Appointment

Appointment No	AppointmentDate	DentistNo	PatientNo
AP01	24/04/2009	D001	P003

Why are we doing this?

To be able to answer queries such as:

Who are the dentists I can consult?
When is the appointment of patient P003?
How many dentists are there?

>>> Information is kept for a purpose

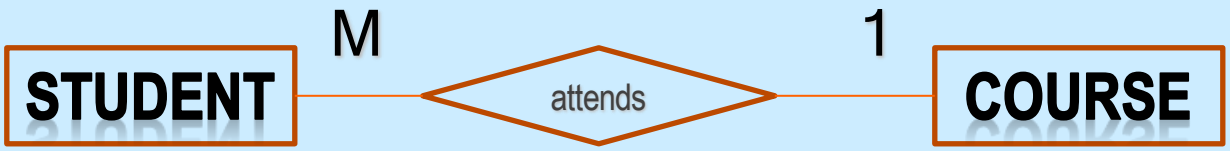
If there is no relation between dentist and patient, some important queries will not be answered.

Example : If there is no appointment relation, we would not be able to tell which dentist attends to which patient?

>>> A well designed database is a foundation to a good information system.

At the End of this Module

1. You must know what this means



2. Transform the above into two tables
3. Retrieve information from the tables to meet users' queries (requirements)