

The background of the slide features a light gray gradient. It is decorated with several realistic water droplets of various sizes, some clustered in the top left and others in the bottom right. A faint, large circular pattern, resembling a ripple or a stylized sunburst, is centered in the upper half of the image.

RELATIONAL DATABASES

OBJECTIVES

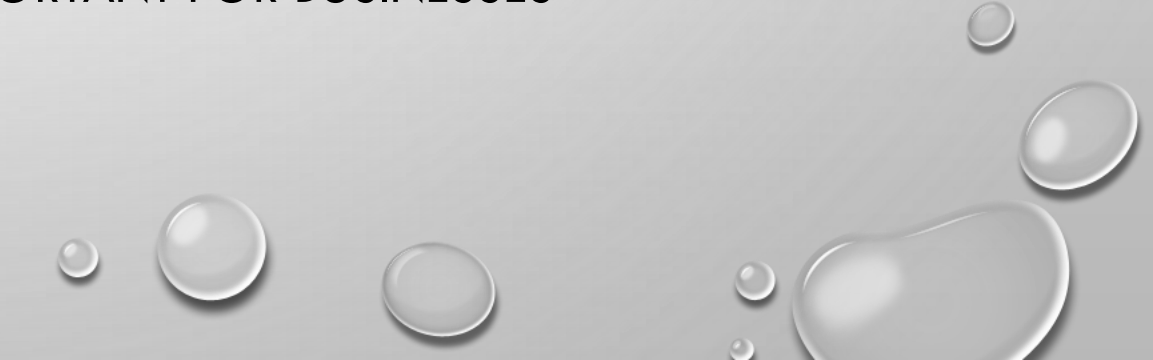
- UNDERSTAND THE USE AND MANAGEMENT OF A DATABASE
- EXPLAIN THE IMPORTANCE OF CLEARLY COMMUNICATING AND ACCURATELY CAPTURING INFORMATION REQUIREMENTS
- DISTINGUISH BETWEEN A CONCEPTUAL MODEL AND ITS PHYSICAL IMPLEMENTATION
- LIST FIVE REASONS FOR BUILDING A CONCEPTUAL DATA MODEL
- GIVE EXAMPLES OF CONCEPTUAL MODELS AND PHYSICAL MODELS

PURPOSE

- WHEN YOU ARE ABLE TO RECOGNISE AND ANALYSE INFORMATION YOU CAN BETTER UNDERSTAND HOW THINGS WORK AND POTENTIALLY MAKE THEM BETTER.
- FOR EXAMPLE:
 - HOW TO MAKE A LINE AT THE FOOD COUNTER GO FASTER
 - HOW TO SUCCESSFULLY EXCHANGE AN ITEM YOU PURCHASED
 - HOW TO ORGANISE AND KEEP TRACK OF WEEKLY SCHEDULE
- ALSO, RECOGNISING AND ANALYSING INFORMATION HELPS PREVENT MISTAKES AND MISUNDERSTANDING. FOR A BUSINESS, THIS IS IMPORTANT BECAUSE IT SAVE TIME AND MONEY.



PURPOSE

- ALL SYSTEMS NOW STORE DATA
 - MANY SYSTEMS ANALYSE AND PROCESS DATA
 - ACCESS TO DATA MUST BE MANAGED
 - ACCURACY AND SECURITY OF DATA MUST BE MANAGED
-
- THE DESIGN OF THESE STORAGE AREAS IS VERY IMPORTANT FOR BUSINESSES
- 

DATABASE CONCEPTS

- A RELATIONAL DATABASE HOLDS RELATED DATA (AND A DESCRIPTION OF THE DATA) DESIGNED TO MEET THE NEEDS OF AN ORGANISATION
- DATABASE MANAGEMENT SYSTEM (DBMS) IS SOFTWARE THAT ENABLES USERS TO DEFINE, CREATE, MAINTAIN, AND CONTROL ACCESS TO THE DATABASE.
- DATA DEFINITION LANGUAGE (DDL) ALLOWS YOU TO SPECIFY DATA TYPES, STRUCTURES AND CONSTRAINTS
- DATA MANIPULATION LANGUAGE (DML) ALLOWS YOU TO QUERY THE DATABASE

ADVANTAGES OF RELATIONAL DATABASES

- CONTROL OF DATA REDUNDANCY
 - DATA CONSISTENCY
 - SHARING OF DATA
 - IMPROVED DATA INTEGRITY
 - IMPROVED SECURITY
 - ENFORCEMENT OF STANDARDS
 - ECONOMY OF SCALE
- Improved access and response
 - Increased productivity
 - Improved maintenance through data independence
 - Increased concurrency
 - Improved backup and recovery services



DISADVANTAGES OF RELATIONAL DATABASES

- COMPLEXITY
 - SIZE
 - COST
 - PERFORMANCE
- 

DESIGNING A RELATIONAL DATABASE

- INVOLVES DATABASE DESIGNERS AND BUSINESS REPRESENTATIVES
- REQUIREMENTS NEED TO BE IDENTIFIED WITH THE BUSINESS REPS
- BUSINESS RULES THAT AFFECT THE STORAGE AND PROCESSING OF DATA NEED TO BE IDENTIFIED
- FIRST STEP IS THE CONCEPTUAL MODEL

WHAT IS A CONCEPTUAL MODEL?

A CONCEPTUAL MODEL:

- CAPTURE THE FUNCTIONAL AND INFORMATIONAL NEEDS OF A BUSINESS
- IS BASED ON CURRENT NEEDS BUT IT MAY REFLECT FUTURE NEEDS
- ADDRESSES THE NEEDS OF A BUSINESS (WHAT IS CONCEPTUALLY IDEAL), BUT DOES NOT ADDRESS ITS IMPLEMENTATION (WHAT IS PHYSICALLY POSSIBLE)

WHAT IS A CONCEPTUAL MODEL?

A CONCEPTUAL MODEL:

- IS CALLED AN “ENTITY RELATIONSHIP MODEL”
- IS ILLUSTRATED USING AN “ENTITY RELATIONSHIP DIAGRAM” (ERD)
- IS THE RESULT OF COMPLETING THE DATA MODELLING PROCESS
- BUSINESSES USE DATA TO INCREASE SALES AND/OR REDUCE COSTS
- IN ORDER TO ACCURATELY COLLECT DATA, A BUSINESS MUST CREATE A CONCEPTUAL MODEL OF THE DATA IT CONSIDERS IMPORTANT

WHAT IS A CONCEPTUAL MODEL?

A CONCEPTUAL MODEL IS IMPORTANT TO A BUSINESS BECAUSE IT:

- DESCRIBES EXACTLY THE INFORMATION NEEDS OF THE BUSINESS
- FACILITATES DISCUSSION
- PREVENTS MISTAKES AND MISUNDERSTANDINGS
- FORMS IMPORTANT “IDEAL SYSTEM” DOCUMENTATION
- FORMS A SOUND BASIS FOR PHYSICAL DATABASE DESIGN

WHAT IS A CONCEPTUAL MODEL?

A CONCEPTUAL MODEL IS IMPORTANT TO A BUSINESS BECAUSE IT:

- DOCUMENTS THE PROCESS (ALSO KNOWN AS THE “BUSINESS RULES” OF THE BUSINESS
- TAKES INTO ACCOUNT REGULATIONS AND LAWS GOVERNING THIS INDUSTRY

CONCEPTUAL AND PHYSICAL MODELS

- IT IS THE ART OF PLANNING, DEVELOPING, AND COMMUNICATING THAT ALLOWS A GROUP OF PEOPLE TO WORK TOGETHER TO ACHIEVE A DESIRED OUTCOME
- DATA MODELLING IS THE PROCESS OF CAPTURING THE IMPORTANT CONCEPTS AND RULES THAT SHAPE A BUSINESS AND DEPICTING THEM VISUALLY ON A DIAGRAM
- THIS DIAGRAM BECOMES THE BLUEPRINT FOR DESIGNING THE PHYSICAL THING
- THE CLIENT'S DREAM (CONCEPTUAL MODEL) WILL BECOME A PHYSICAL REALITY (PHYSICAL MODEL)