

Course Objective

- **Examine databases, trends in database management systems and their application in a wide range of organizational areas.**
- **Provide an overview of database processing, both historical and discussion of recent trends in database management.**

Introduction

Database Systems and Data Models

Background: Relational Database

- **Ted Codd Mathematician paper**
- **“A relational Model of data for large shared data banks”**
- **Chamberlin inspired by Codd’s Symposium and convinced IBM to create R system group and to fund a research project to build a prototype of relational DB which leads to DB2 and SQL creations**
- **IBM focused on IMS in 1968**

Background (Continued...)

- **Based on Codd's Work two professors from university of Berkeley started a project "Ingres"**
- **Researched Competition flared between the two groups and number of the research papers are being published. IBM did not realizing the potential of the project, published these papers publicly.**

Background (Continued...)

- **Larry Ellison formed a company “System Development Labs” which recruited Employees from System R and Ingres. He started developing a system based on the research papers by the funding from CIA and NAVY.**
- **First Structured Query Language was launched in 1979.**
- **IBM came up with its version in 1983, with SQL/IDS 1980**
- **Ellison Changed the Company name to Oracle**

Chapter contents

- **Good Decision requires good information and good information is derived from raw facts called data.**
- ***Good Decision means which delivers accurate, relevant and timely information.***
- **What is DB?, What does it do? And Comparison between other Data Management Methods, Different Types of DB and Importance of DB Design.**

File System

- **Database is evolved from the File Systems.**
- **Understand the characteristics of the file system.**
- **Data management limitations by File system.**
- **Eliminations of the short comings of the file system by DBMS.**

Basic Definitions

- **Data: raw facts**
 - **Not processed yet to reveal their meaning**
 - **Constitute building blocks of information**
 - **For Examples:**
 - **Online Surveys**
 - **Online Data Entry Forms**
 - **Excel Sheets**
 - **Reports Forms**
- **Record keeping with the raw facts**
 - **Example: Students**
 - » **Pass 90%**
 - » **Fail 10 %**
 - » **Quick Answers**

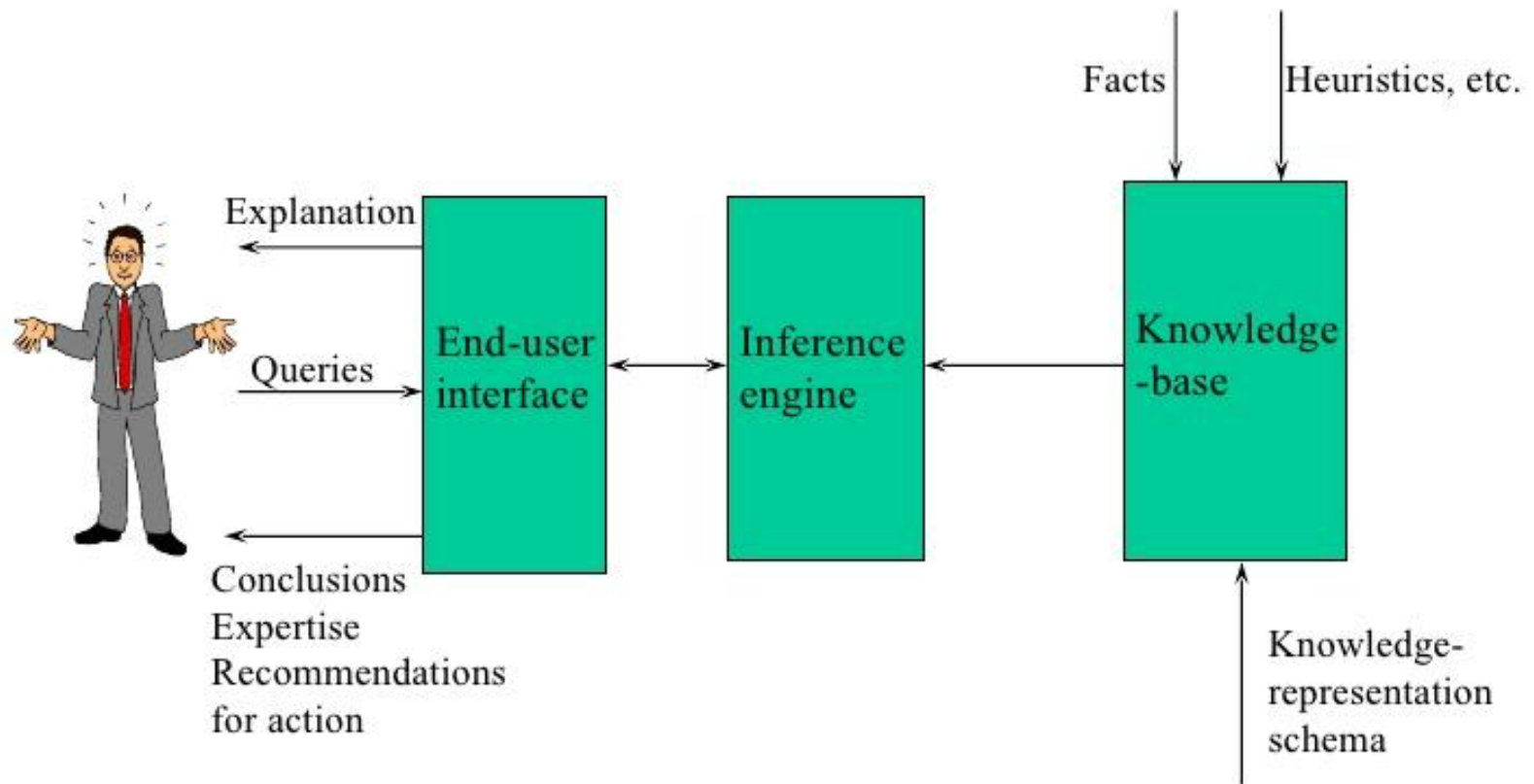
Basic Definitions (Continued...)

- **Information:** is produced by processing data and reveals meaning of data
 - Good, timely, relevant information key to decision making
 - Good decision making key to organizational survival
 - Example: Informed decisions to meet student grading record
 - Raw data: Storage, Processing and presentation
- **Complex formatting:** is required when working with complex data types such as sounds, videos 'or' images.
- **For Example:** Yes/No or Y/N

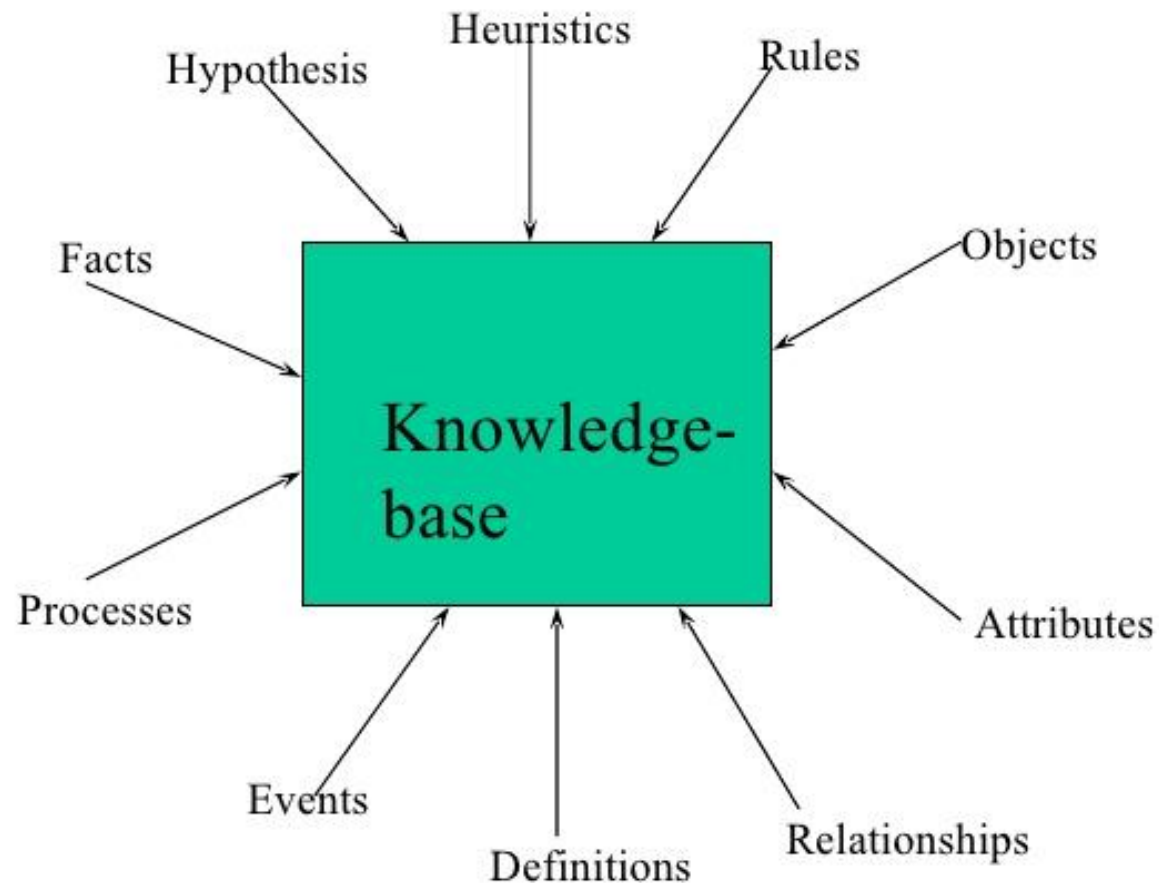
Basic Definitions (Continued...)

- **Knowledge: the body of the information and facts about a specific subjects**
- **Knowledge implies familiarity awareness and understanding of information.**
- **New Knowledge can be derived from Old Knowledge.**

3. KBS Architecture



(1) Knowledge-base



End of the Lecture

Basic Definitions (Continued...)

- **Data Management is a discipline that focuses on the proper generation, storage and retrieval of data.**
- **Efficient Data Management requires computer DB.**

Basic Definitions (Continued...)

- **Database: shared, integrated computer structure housing:**
 - **End user data**
 - **Metadata**
- **Metadata provides a description of the data characteristics and set of relationships that link the data within the Database.**
 - **Structural Metadata -> data about data**
 - **Descriptive Metadata-> Content about content**

An Example

- **Converting data to information**

Class Roster

Course: MGT 500 Semester: Spring 200X
Business Policy

Section: 2

<u>Name</u>	<u>ID</u>	<u>Major</u>	<u>GPA</u>
Baker, Kenneth D.	324917628	MGT	2.9
Doyle, Joan E.	476193248	MKT	3.4
Finkle, Clive R.	548429344	PRM	2.8
Lewis, John C.	551742186	MGT	3.7
McFerran, Debra R.	409723145	IS	2.9
Sisneros, Michael	392416582	ACCT	3.3

An Example (Cont'd)

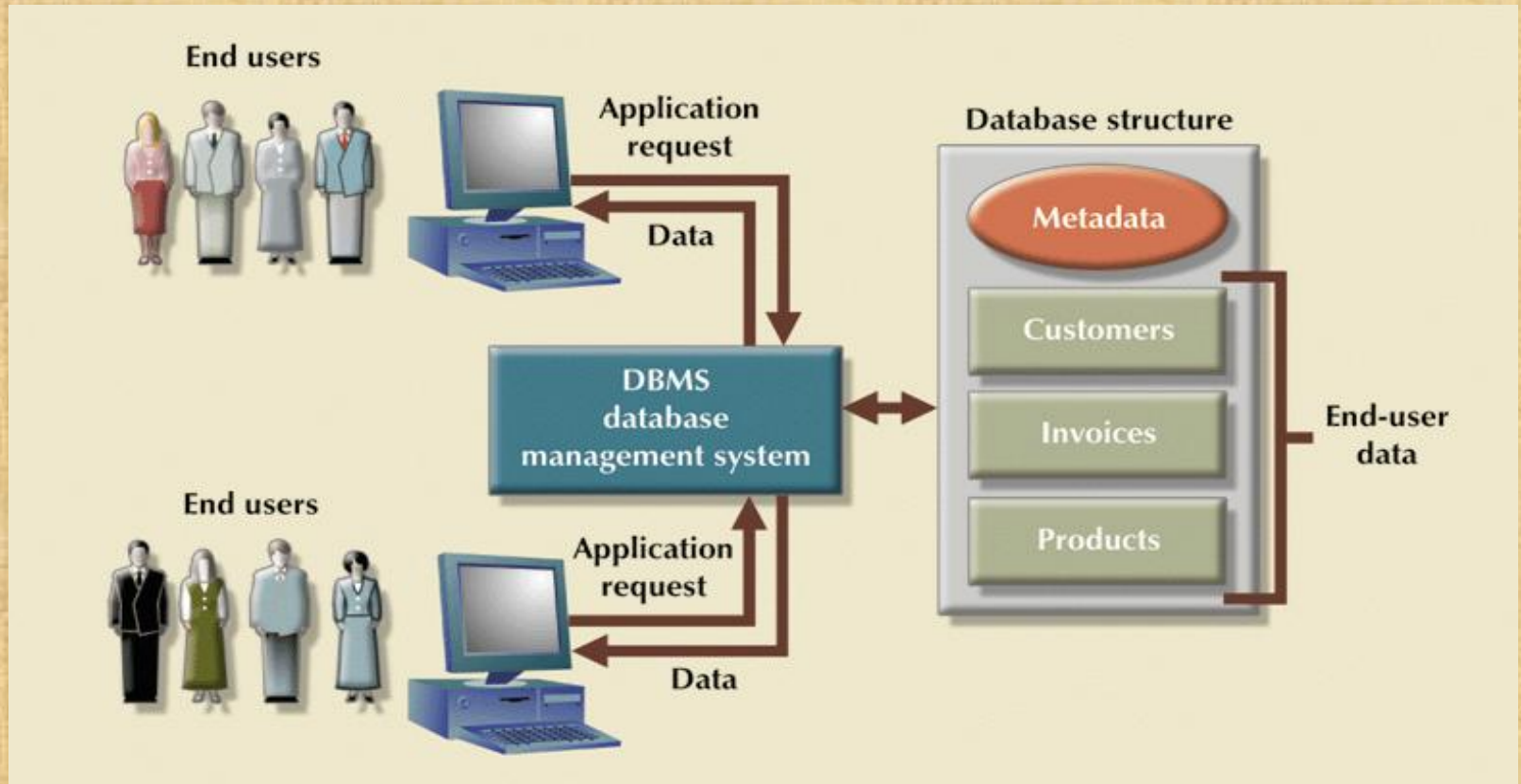
- **Metadata**

<i>Data Item</i>			<i>Value</i>		
Name	Type	Length	Min	Max	Description
Course	Alphanumeric	30			Course ID and name
Section	Integer	1	1	9	Section number
Semester	Alphanumeric	10			Semester and year
Name	Alphanumeric	30			Student name
ID	Integer	9			Student ID (SSN)
Major	Alphanumeric	4			Student major
GPA	Decimal	3	0.0	4.0	Student grade point average

What is a Database Management System (DBMS)

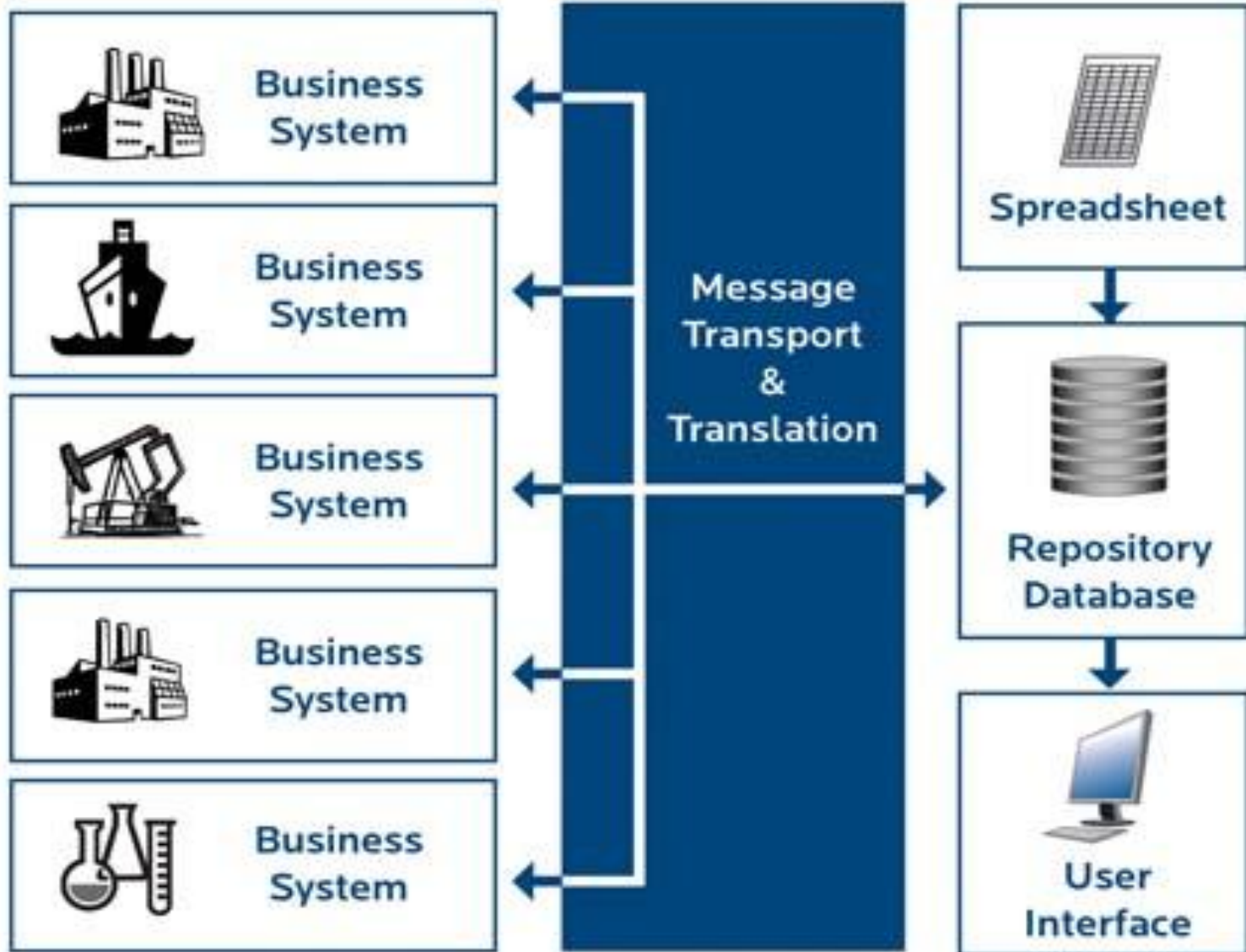
- **A collection of programs that manages the database structure and controls access to the data stored in the database**
 - **Possible to share data among multiple applications or users**
 - **Example: bank and its ATM machines**
 - **Makes data management more efficient and effective**
 - **End users have better access to more and better-managed data**
- **DBMS hides much of the database's internal complexity from application program and End user**

DBMS Manages Interaction



Advantages of the DBMS

- **Improved data sharing**
 - **Shared among users and applications**
- **Better Data Integration**
 - **Different User's views into single data Repository**
 - **Repository: can be a place where multiple DBs or files are located for distribution over the network.**
- **Minimized Data inconsistency**
 - **Different versions of the same data.**
 - **Example: Product ID and Product Number in different departments**



Advantages of the DBMS

- **Improved Data access**
 - Quick answers to the ad hoc queries
 - Query is a complete question: a specific request for data manipulation (read or update data)
 - DBMS sends back an Answer (Query result set) to the application
- **Improved Decision Making**
 - Better managed data and improved data access ->to better quality information ->better decisions
- **Increased End User Productivity**

End of the Lecture