CSC 430/530 : DATABASE MANAGEMENT SYSTEMS/ DATABASE THEORY

Lecture 0

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Course Information

- **Instructor:** Dr. Pradeep Chowriappa (pradeep@latech.edu)
- **Office:** Nethken Hall 235
- **Office Hours:** MWF - 9:00-10:30 am & 1:00 to 2:30 pm;
  T - 10:00 am to 11:00; H – by appointment
- **Zoom Meeting ID:** 3182574612
- **Prerequisite:**

  Passed CSC 220 (Data Structures) with a C or Better

- **Recommended/ Required Textbook(s)**

  R. Elmasri, S. B. Navathe “Fundamentals of Database Systems”, Sixth Edition, 2011. ISBN: 9780136086208

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Course Goals

- Create E/R models from application descriptions.
- Convert E/R models into relational designs.
- Identify redundancies in designs and remove them using normalization techniques.
- Create databases in an RDBMS and enforce data integrity constraints using SQL.
- Write database queries using SQL.

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Objectives

- Knowledge of various database modeling techniques;
- Understand the difference between logical and physical modeling;
- Understand and implement both Data Definition and Data Management queries;
- Understand the use of relational algebra; and writing queries
- Understand Entity Relationship Models, Design, and Functional Dependencies;
- Apply the Boyce-Codd Normalization and Multivalued dependencies;
- Differentiate between database constraints and database triggers;
- Understand indexes and its applications;
- Understand views in relational databases, view modification

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Class Policy

- **Late Assignment Submission:** Please make sure that late submission are highly discouraged.
  - If you miss the deadline, you will receive a zero for the Assessment.
  - However, if you have a genuine reason – your Assessment will be accepted with an automatic deduction of 20%.
- **Classes:** I like to start early and leave early. Please make sure you show up to class on time.
  - If you show up after the roll is called, you will be marked absent.
- **Grades assigned will be final:**
  - All grades will be set in stone and will not be changed towards the end of the quarter.
  - You will use Moodle to keep track of your performance.

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What will you learn in CSC 430

- What does it take to create structured databases?
- CSC 430 was conceptualized to be:
  - Hands on.
  - Theoretical concepts can be picked up with practical exposure.
  - Open discussions (CSC 530)
  - Outcome: creating and implementing databases.

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Final Grade Assessment

Final Grade Assessment System

Undergraduate Students	
ACTIVITY	GRADE (%)
Exercises	20
Lab Quizzes	10
Midterm	20
Final Examination	30
Final Project	20
TOTAL	**100**

Graduate Students	
ACTIVITY	GRADE (%)
Exercises	20
Lab Quizzes	10
Midterm	15
Final Examination	20
Final Paper Review	**15**
Final Project	20
TOTAL	**100**

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Course Project Overview

Project will be defined by you by the mid of Jan 2022

At the end of the quarter each group turns in a report (in the form of a presentation) to be evaluated.

2 or 3 persons per project.

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INTRODUCTION

Lecture 1

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Lecture 1: CSC430/530 - Overview

Introduction	Modeling Reality and Data Base Design
Features and Models of DBMS	Features of a DBMS Data Models
Database Schemas and Architectures	Database Schemas Three Schema Architecture
Data Base Management Systems	DBMS Languages, Interfaces, and Tools DBMS Architectures

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What is a Database?

The word **database** is commonly used to refer to any of the following:

- your personal address book in a Word document
- a collection of Word documents
- a collection of Excel Spreadsheets
- a very large flat file on which you run some statistical analysis functions
- data collected, maintained, and used in airline reservation
- data collected and used to support the launch of a space shuttle

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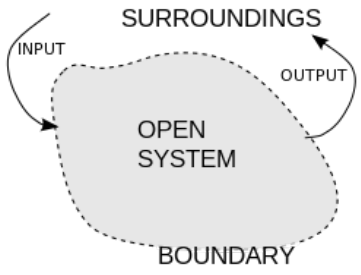
What is a "System" ?



- **A system is a group of interacting or interrelated elements that act according to a set of rules to form a unified whole.**
- **Systems Model:**
  - A system comprises multiple views.
  - **Man-made systems may have views such as concept, analysis, design, implementation, deployment, structure, behavior, input data, and output data views.**
  - A system model is required to describe and represent all these views.

A systems architecture, using one single integrated model for the description of multiple views, is a kind of system model.

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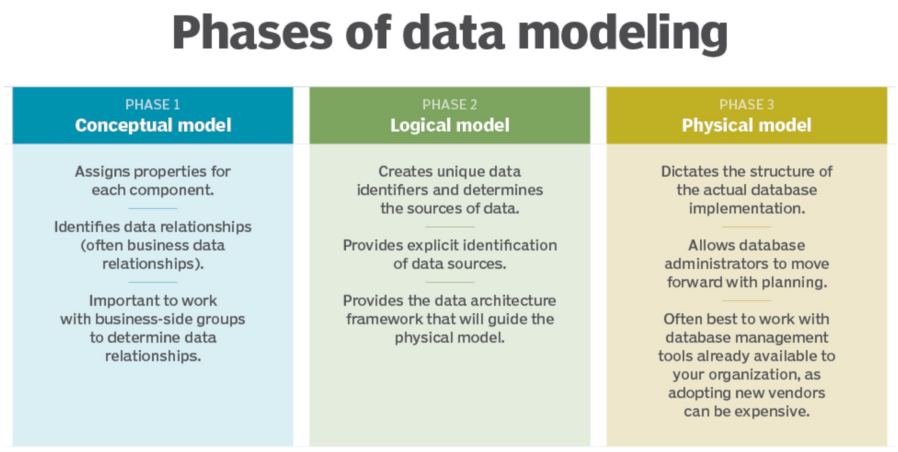
Data Modeling



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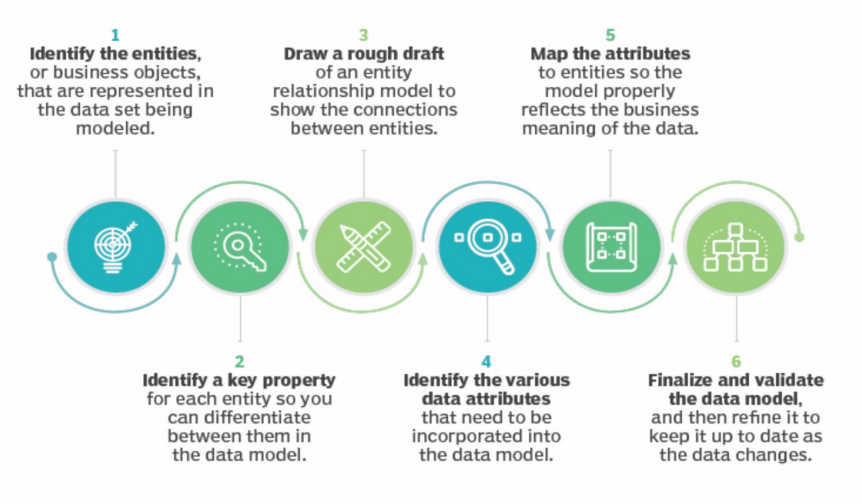
Steps of the Data Modeling Process



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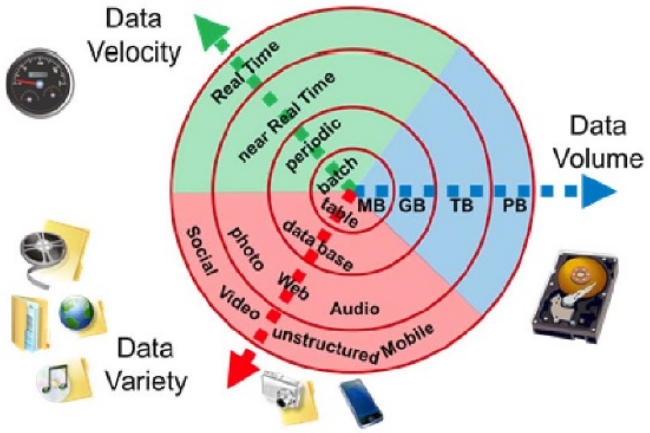
Wait a minute… Can this be used to handle today's large-scale systems?



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