Entity-Relationship Model – Part 1

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SUCCESSFUL	29%	27%	31%	28%	29%

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IT Projects[1]

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- There can be many reasons, including:
  - Customers were not sure about what they wanted,
  - Requirements were not properly documented,
  - Improper development methodology was used,
  - Resources were not sufficient,
  - There were communication issues,
  - …

[1] CHAOS report by Standish Group, 2015

The Tyre Swing Project

As proposed by the project sponsor

As specified in the project request

As designed by the senior analyst

As produced by the programmers

As installed at the user's site

Database Design – Four Phases

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2. **Conceptual Design**

3. **Logical Design**

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4. **Physical Design**

Phase 1: Requirements Collection and Analysis

- **Requirements collection and analysis** is the process of collecting and analyzing data requirements of the organization so as to provide database so

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  - a description of data used or generated;

  - details of how data is to be used/generated

  - any additional requirements for new data

  - …

Phase 2: Conceptual Design

- **Conceptual design** is the process of constructing a conceptual data model that is

  - used to communicate the requirements of nontechnical users.

- A conceptual data model is built using the information requirements specification.

Note: The conceptual design is based on **the entity-relationship model** in this course.

Phase 3: Logical Design

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- **Logical design** is the process of constructing a logical data model (e.g. relational or object-oriented).

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  - **From:** An ER model

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  - **To:** Relations with their primary and forei
    to deal with retrieving, updating and deletion.

Note: The logical design is based on **the relational data model** in this course.

Phase 4: Physical Design

- Physical design is the process of implementing the logical data model in a specific database management system (DBMS).

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  p

  - Deciding which indexes should be used to a

  - Describing the integrity constraints and se

- The decisions made during the physical design phrase affect the performance and accessibility of the database.

  Note: Details of this topic are out of the scope of our course.

Database Design Process