BLOCK 2
DESIGN INTRODUCTION

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Outline

0. Review of previously discussed

1. Design phase

2. Conceptual Design

    2.1 Basic Structures

    2.2 Properties of the links

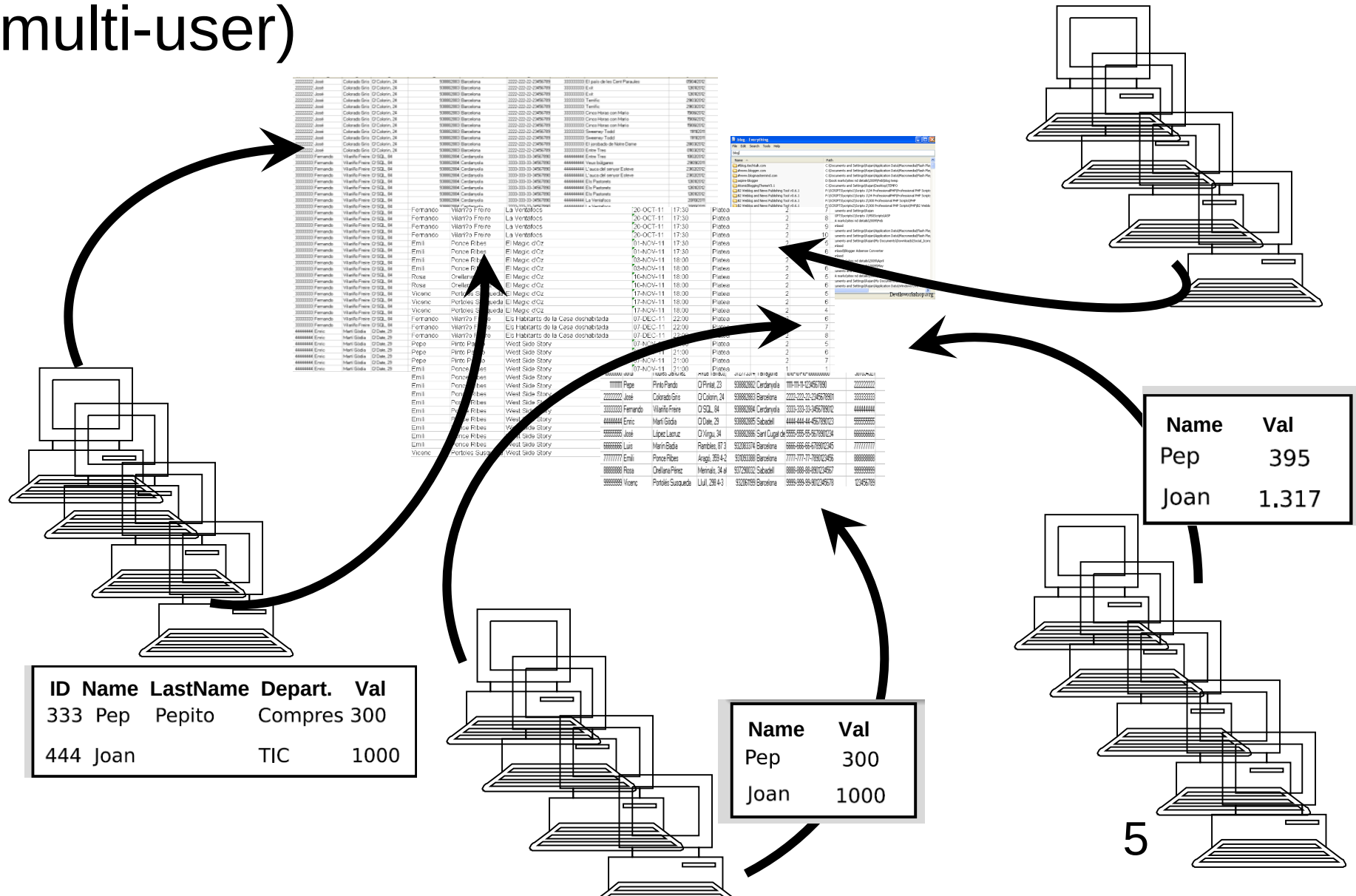
Outline

0. Review of previously discussed

1. Design phase

0. Review

Computational storage systems to manipulate volumes of related data in centralized systems (multi-user)



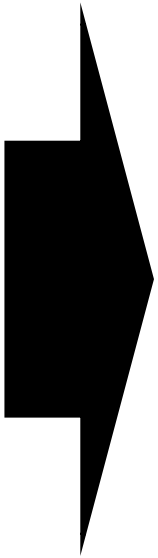
ID	Name	LastName	Depart.	Val
333	Pep	Pepito	Compres	300
444	Joan		TIC	1000

Name	Val
Pep	300
Joan	1000

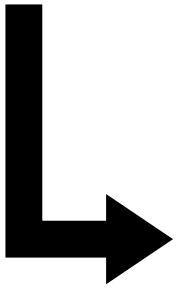
Name	Val
Pep	395
Joan	1.317

Key points of a DBS

- **Data integrity** (consistency and coherence of the content)
- **Independency** program/ format data
- **Efficient** system (access to data)



Description at Conceptual Level (Relational Model and E-R Diagram)

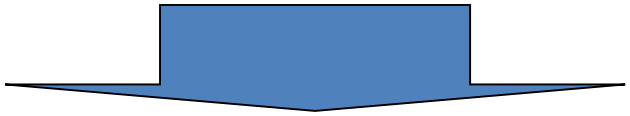


Physical Level description (file system and devices, DBM)

Data description

The DBS must satisfies the necessities of information to different users who share the data

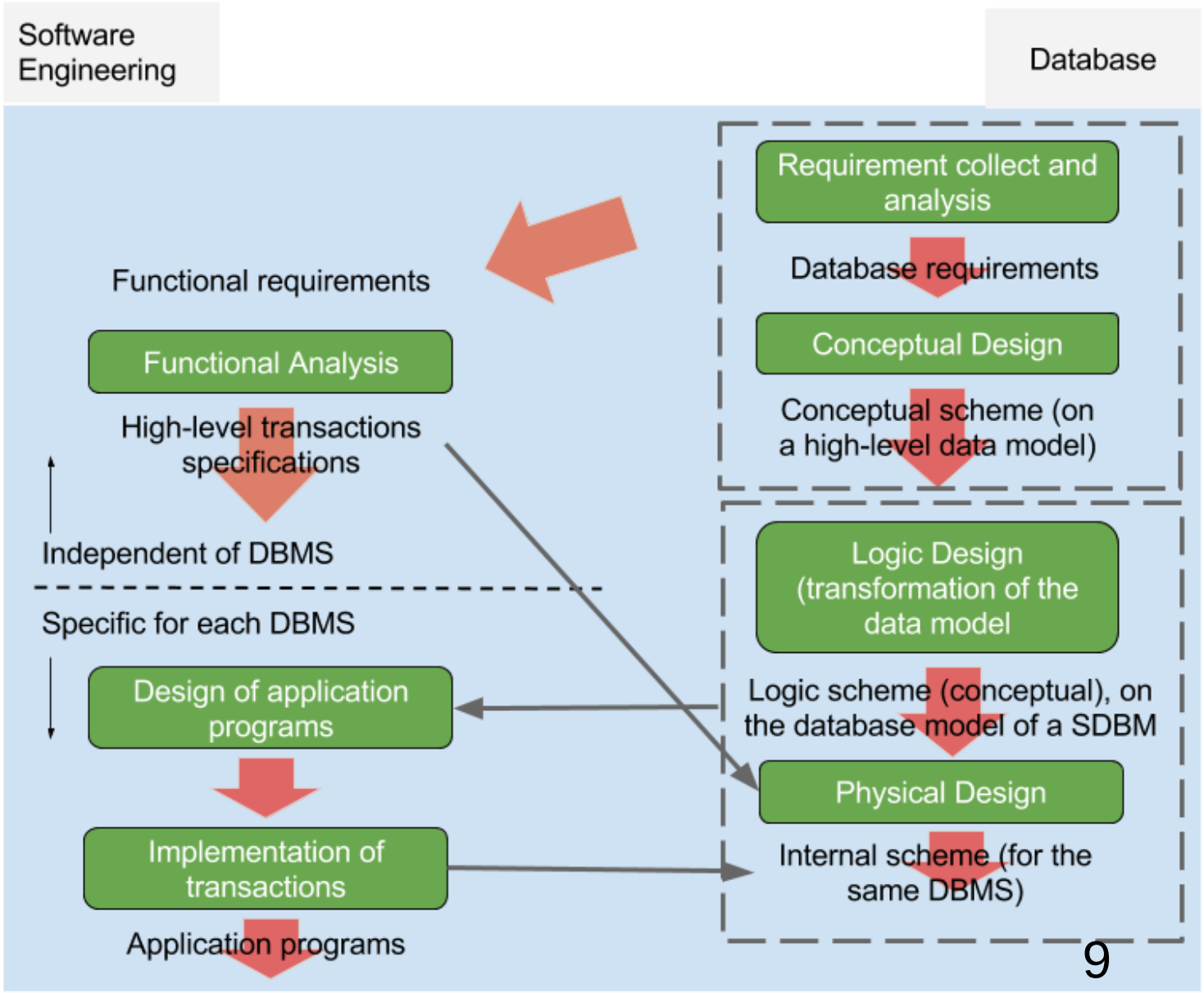
Description of the data (according to user's requirements) guaranteeing the efficiency and consistency



Design of the Database

1. Design phases

Design of an Application



Design phases of a DB

- Capture and analysis of requirements
- Conceptual design

- Logic design
- Physical design

Specific for each DBMS

Requirements

To characterize the DB user necessities, they data and they usage:

- Data requirements (what information we have): Description of data and the relationship between them

- Functional requirements (what we want to do with the data): Description of the operations (transactions) to be carried out with the data

Conceptual Design

Translation of the data requirements to the abstract model that has been chosen (conceptual scheme) :

ER Diagram
Descriptive report

It is necessary to validate its functionality according the transactions indicated in the functional requirements (set of tests)

Is an abstract description (high-level model) of independent data of the DBMS

Abstract Data Models

They allow semantically to model the data and links (relationships, inter-relations) that exist between them

Developed to increase the effectiveness and accuracy of the DB design

Existing models:

- Binary-Semantic (Abrial, 1974)
- **Entity-Relationship** (Chen, 1976)
- Semantic Data Model–SDM (Hammer-McLeod, 1981)
- Functional (Shipman, 1981)
- Object Oriented-**extended ER model**

Logical Design

Translation of conceptual design to the data model (generally relational) of the DBMS

Precise implementation depends of the DBMS of our application:

Table diagram, SQL implementation → DBM

Classes Diagram, UML implementation → Functional Analysis (Software Engineering)

Object Oriented DB (ODL,OSL) → Management and administration of a DB

Physical Design

Structure the tables/classes in files and devices.

Depends of the DBMS and the selected operating system

The device distribution must guarantee the efficiency in access and “space”.

Depends of the transactions specified in the functional requirements.