

FIB - Disseny de Bases de Dades

Presentation and definitions slides

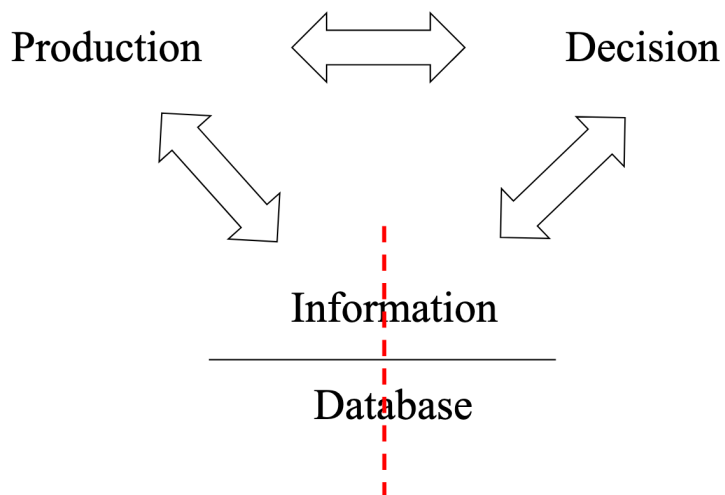
Knowledge objectives

1. Distinguish the three subsystems in every company
2. Recognize the longest stage in the waterfall lifecycle of an Information system
3. Distinguish between a data model and a database model
4. Place in a time axis the different database models
5. Enumerate the design steps of an operational database

Organization subsystems

- Production: **Perform activities** constituting the goal of the organization
- Decision: **Plan, Coordinate** and **Control** production activities
- Information: **Collect** (*input*), **Store** (*save*), **Process** (*run*) and **Distribute** (*output*) all information **relevant and needed** by the other subsystems

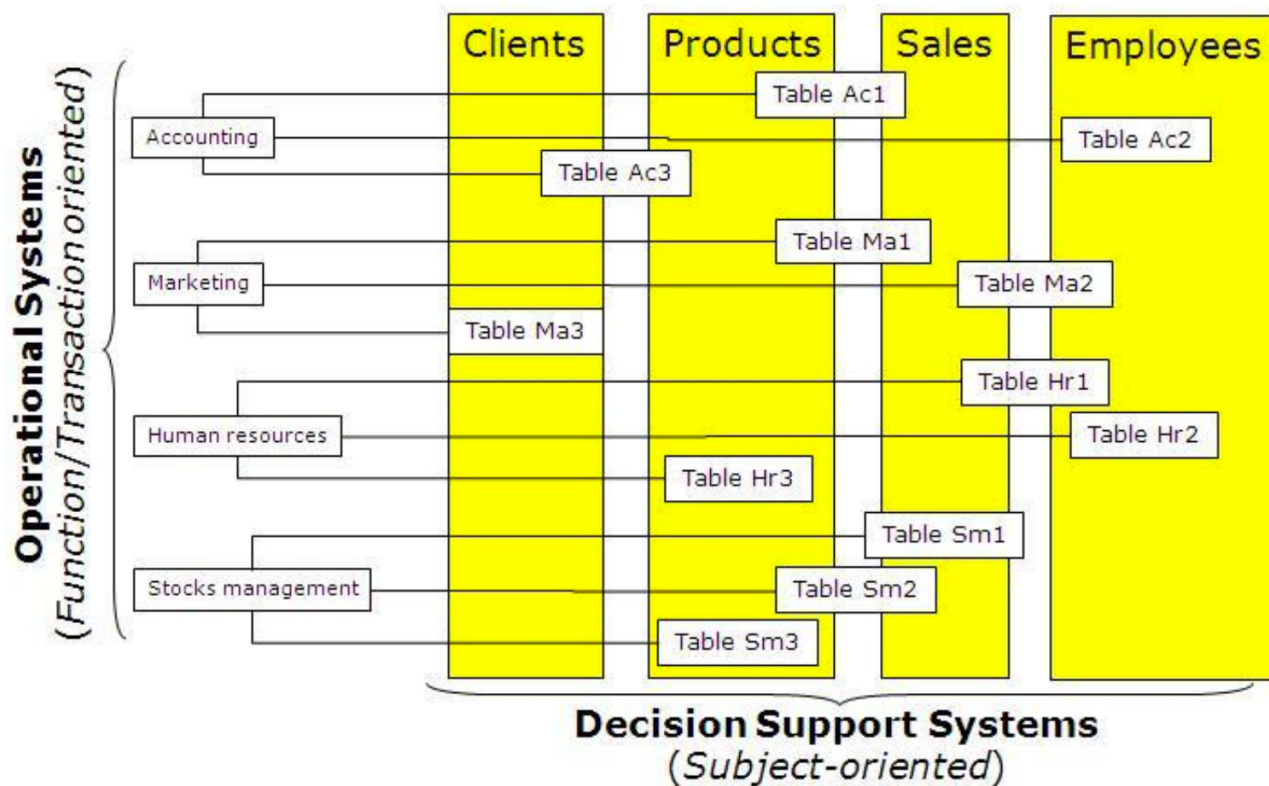
Enterprise subsystem



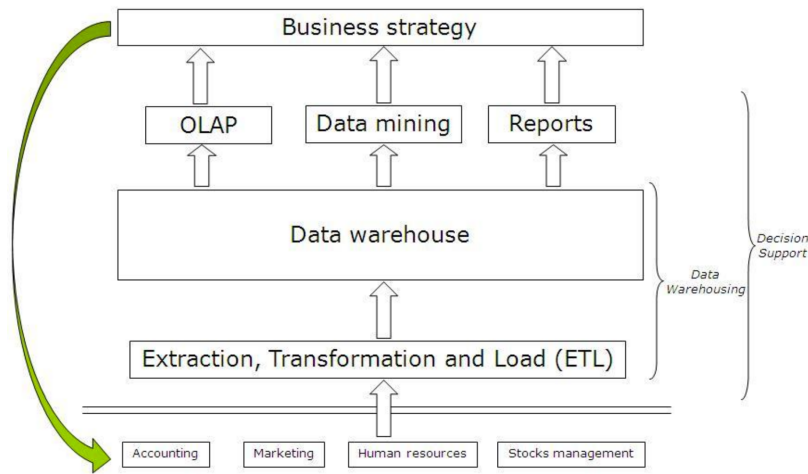
Comparison

	Operational	Decisional
Objective	Business operation	Business analysis
Main functions	Daily oper. (OLTP)	Decision Support System (OLAP)
Usage	Repetitive (predefined)	Innovative (unexpected)
Design orientation	Functionality	Subject
Kind of users	Clerks	Executives
Number of users	Thousands	Hundreds
Accessed tuples	Hundreds	Thousands
Data sources	Isolated	Integrated
Granularity	Atomic	Summarized
Time coverage	Current	Historical
Access	Read/Write	Read-only
Work units	Simple transactions	Complex queries
Requirements	Performance & consistency	Performance & precision
Size	Mega/Gigabytes	Giga/Tera/Petabytes

Subject vs Functionality



B.I. Cycle



Lifecycle of an IS

Definition: What I want to do

1. Study of opportunities
2. Requirements analysis -> DATA MODEL
3. Specification

Design: How I will do it

1. Logic (independent of tools) -> DATABASE MODEL
2. Physical (dependent on tools) -> DBMS

Construction: Coding

Execution:

1. Test
2. Open it to users

Maintaining:

1. Repair the code
2. Appearance of new functionalities

And again

Data models and Database models

- Semantic data models
 - Abrial
 - Entity-Relationship
 - Extended ER
 - RM/T
 - Unified Modeling Language
- Database models (kinds of DBMS)
 - Pre-relational (hierarchical and network)
 - Relational (SQL)

- Post-relational
 - Pure-objects
 - Object-Relationa
 - NOSQL
- Physic models (concrete DBMS)

Database design of an IS

Static facet:

- Conceptual schema
 - Intra-objects
 - Classes
 - Attributes
 - Inter-objects
 - Relationships
 - Integrity constraints

Dynamic facet (aspects that change through time):

- Use cases
- Behavior model
- State diagrams

Transactional vs Decisional

