Contents

Chapter 1

Introduction

Definition 1.0.1: Database

A *Database* is defined as an organised collection of data that support on carrying out specific activities

1.1 Information system

Definition 1.1.1: Information system vs IT system

A *IS* is a structured combination of technology, people, and processes that handles piaces of information

Each IS supports pontentially other *subsystems*, for this very reason it should be studied inside its operative context

1.1.1 Handling the information

Each IS handles the information within differenct aspects:

- **Gathering / Acquisition**: collecting row data from different sources
  - Gathering: collecting row data from different sources
  - Acquisition: capturing and importing data into the system
- **Storing / Preservation**: Saving datas in a secure, organised way (for instance SQL table)
- **Elaboration / Transformation / Production**: processing row data into useful information
- **Distribution / Communication / Exchange**: making the processed information available to systems

Note:

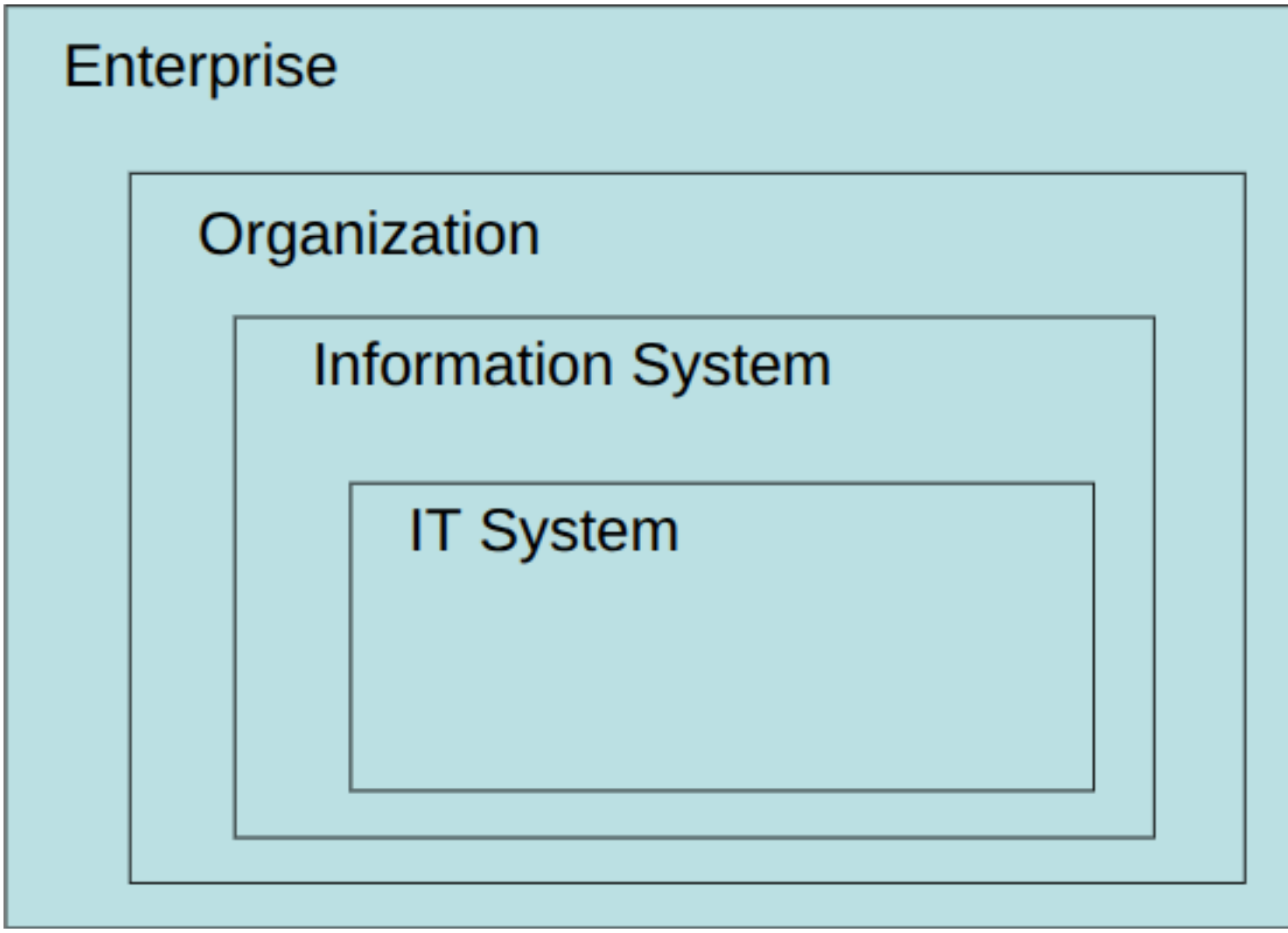
the idea of "IS" is independent from any computer automation.
"Inforamtion system vs IT system!!!!"

note the following section:

1.1.2 IT system

Definition 1.1.2: IT sys

One of the aoutomated parts of the IS, in other words "It s the information system component that handle information using computer technologies"



1.1.3 Information vs Data

In IT sys, the *Information* is expressed as *data*. Look the differences:

Definition 1.1.3: Inforamtion

An *information* is deifined as a facts or learned about something or someone

and

Definition 1.1.4: Data

A *data* is defined pieces of information. A fixed starting point of a operation

> these definitions are incorrects
> — Danilo
>
> F
> — Il Basta

Data is simply the results of the process of orginising, coding and storing of information

Example 1.1.1 (Data vs information)

- Infromation: "Mario Rossi, born in Rome, citizen ID 12345, lives at Via Roma 10"
- Data:

Name	Surname	Tax Code	Address
Mario	Rossi	RSSMRA80A01H501X	Via Roma 10

TODO: BASTA PLEASE PROVIDE THE EXAMPLE!!!

Why Data

First of all, handling information is difficult because the nature of information is often ambiguous. On the other hand, we use data because they are more stable and structured than other representations.

1.2 Databses

New definition, morespecific for icts:

Definition 1.2.1: Database (for us)

Set of data handled by a **DBMS**

1.2.1 Database management system (DBMS)

Definition 1.2.2: DBMS

Any system handling data collections that are:

- big
- persistent
- shared: a db is an *integrated* and *shared* resources

ensuring

- privacy
- reliability
- efficiency
- effectivness

Problems

- Redundency: many repetiotions of a single data (nasty)
-

Chapter 2

Algebra and calculi

2.1 Using view

Chapter 3

Exercises

3.1 Algebra and Calculi

3.1.1 17

Trova pizzerie frequentate sia da femmine che da maschi, poi toglile dalle pizzerie totali

$$Frequents - \sigma_{\text{Gender}=F} PERSON$$

3.1.2 18

Find names of magazines that have published at least one magazine on motorcycling, and subtract it from all magazines

$$\pi_{Name} MAGAZINE - \pi_{Name}(\sigma_{\text{Topic}=\text{Motorcycling}} ARTICLE \bowtie MAGAZINE)$$

3.1.3 19

$$\begin{aligned} A \coloneqq \pi_{\text{Id,Name}} SAILOR \\ \bowtie_{\text{Id}=\text{Sailor}} \\ \text{BOOKING} \\ \bowtie_{\text{Id}=\text{Boat}} \\ \pi_{\text{Color,Id}} BOAT \end{aligned}$$

$$\pi_{Name}(\sigma_{\text{Color}=\text{red}} A) \cap \pi_{\text{Name}}(\sigma_{\text{Color}=\text{blue}} A)$$

3.1.4 20

$$\begin{aligned} A \coloneqq \pi_{\text{Id,Range}} PLANE \\ \bowtie_{\text{Id}=\text{Pid}} \\ \text{CERTIFICATE} \\ \bowtie_{\text{Id}=\text{Eid}} \\ \pi_{\text{Name,Id}} EMPLOYE \end{aligned}$$

$$\sigma_{\text{Range}>5000} A$$