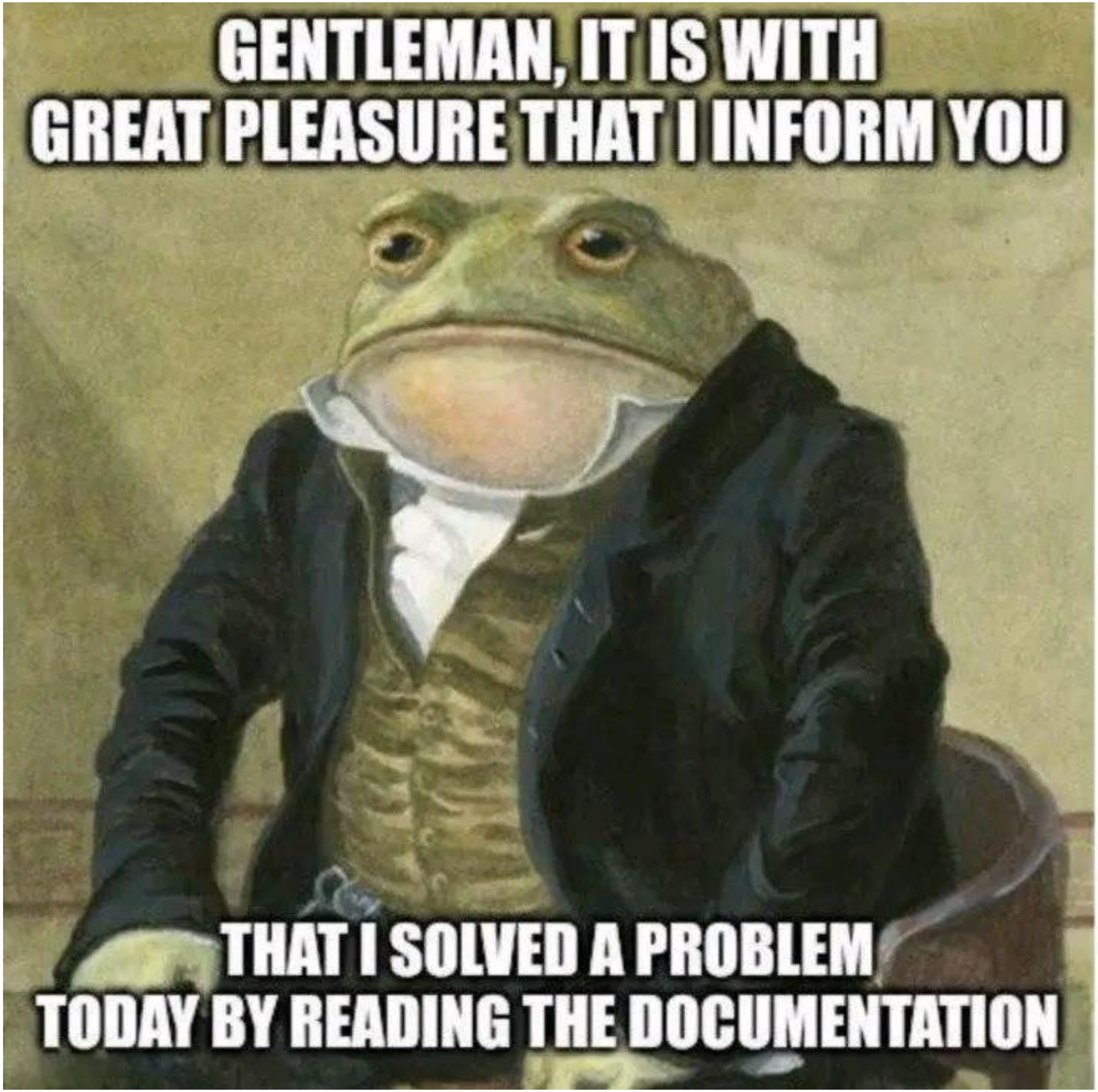
Documentation
Notations and tools

Paolo Burgio
paolo.burgio@unimore.it


GENTLEMAN, IT IS WITH
GREAT PLEASURE THAT I INFORM YOU
THAT I SOLVED A PROBLEM
TODAY BY READING THE DOCUMENTATION

Tools and diagrams

Specifications are a **contract** between us and the customer (cit.)

- We use well-known tools and models

We typically specify/distringuish among:

- Operational diagrams
  - Data flow, UML, models such as FSMs, and Petri Nets
- Descriptive/structural diagrams
  - Entity-Relationship (inspired by DB entities analysis and design)

UML (standard) diagrams

- Structural diagrams
  - Use-cases/scenarios
  - Notations for classes/objects/packages/components – From OOP
- Behavioral diagrams
  - Sequence diagrams
  - State diagrams
  - Activity diagrams

Sorry but… I cannot explain them in this order

We start from specifications, then system design, then implemementation

UML has dedicated slide decks

We typically specify/distringuish among:

- Operational diagrams
  - Data flow, UML, models such as FSMs, and Petri Nets
- Descriptive/structural diagrams
  - Entity-Relationship (inspired by DB entities analysis and design)

UML (standard) diagrams

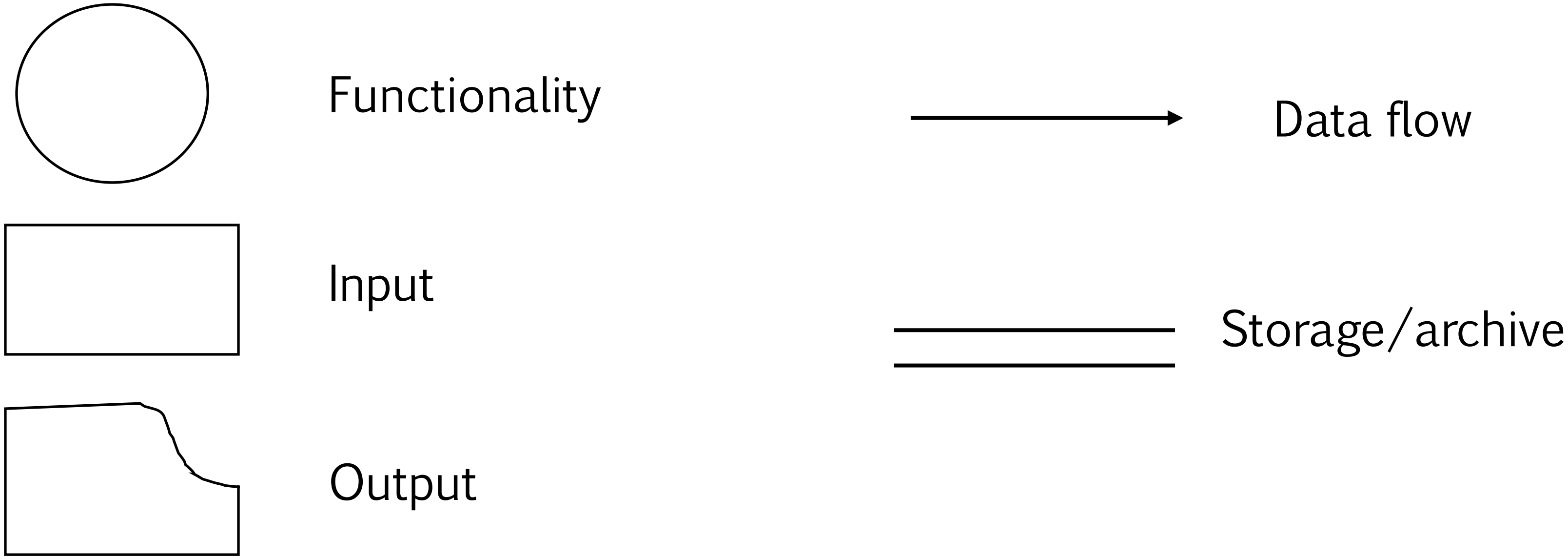
- Structural diagrams
  - Use-cases/scenarios
  - Notations for classes/objects/packages/components – From OOP
- Behavioral diagrams
  - Sequence diagrams
  - State diagrams
  - Activity diagrams

Data Flow Diagram (DFD)

Data Flow Diagrams (DFDs)

Describe functionalities (nodes) and data arcs, both input and output

- I show them in B/W, but the recommendation is “play” with shapes to be more “communicative”
- One color per functionality
- Lines can also be dotted/bold(er) etc



Functionality

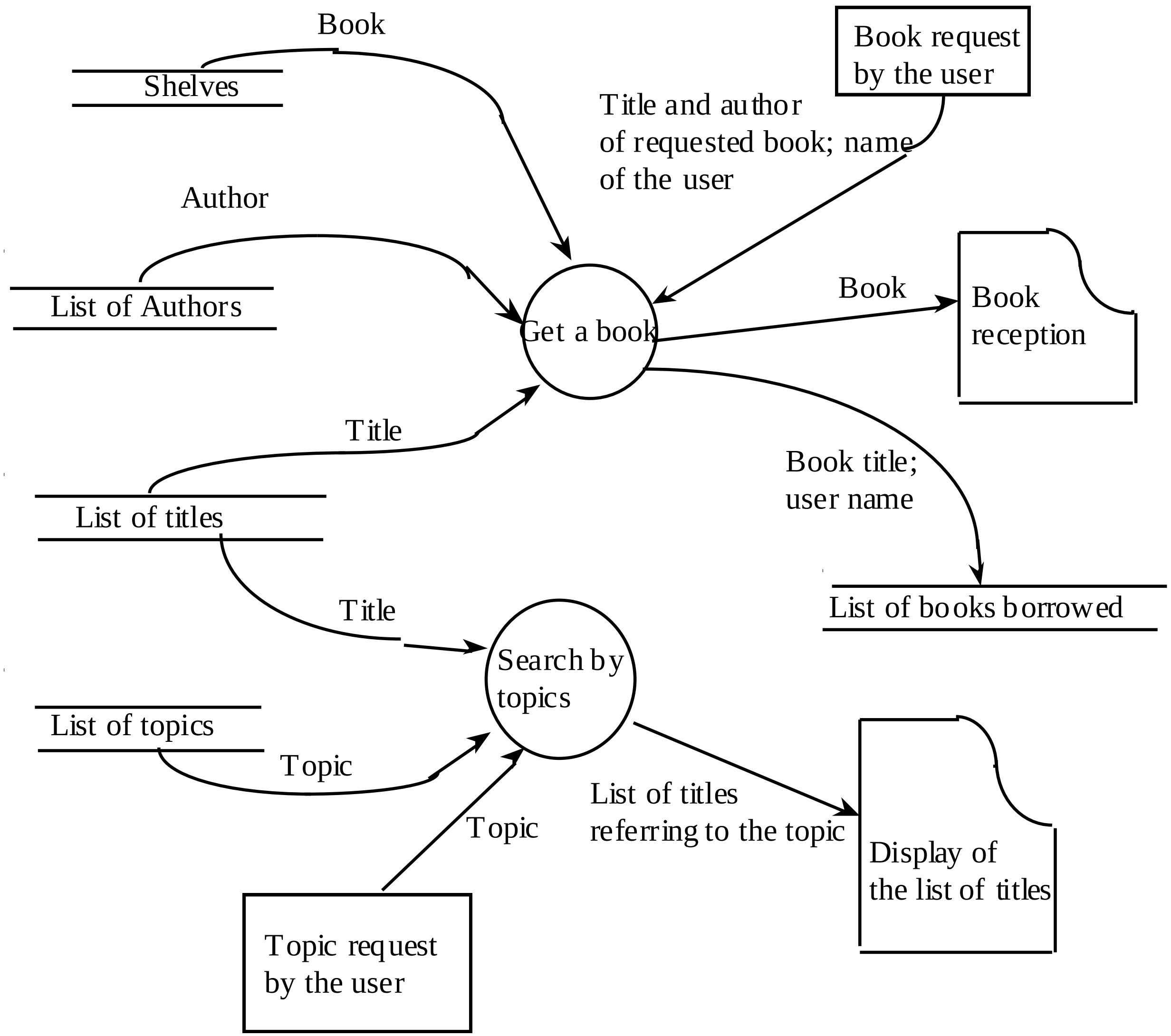
Data flow

Input

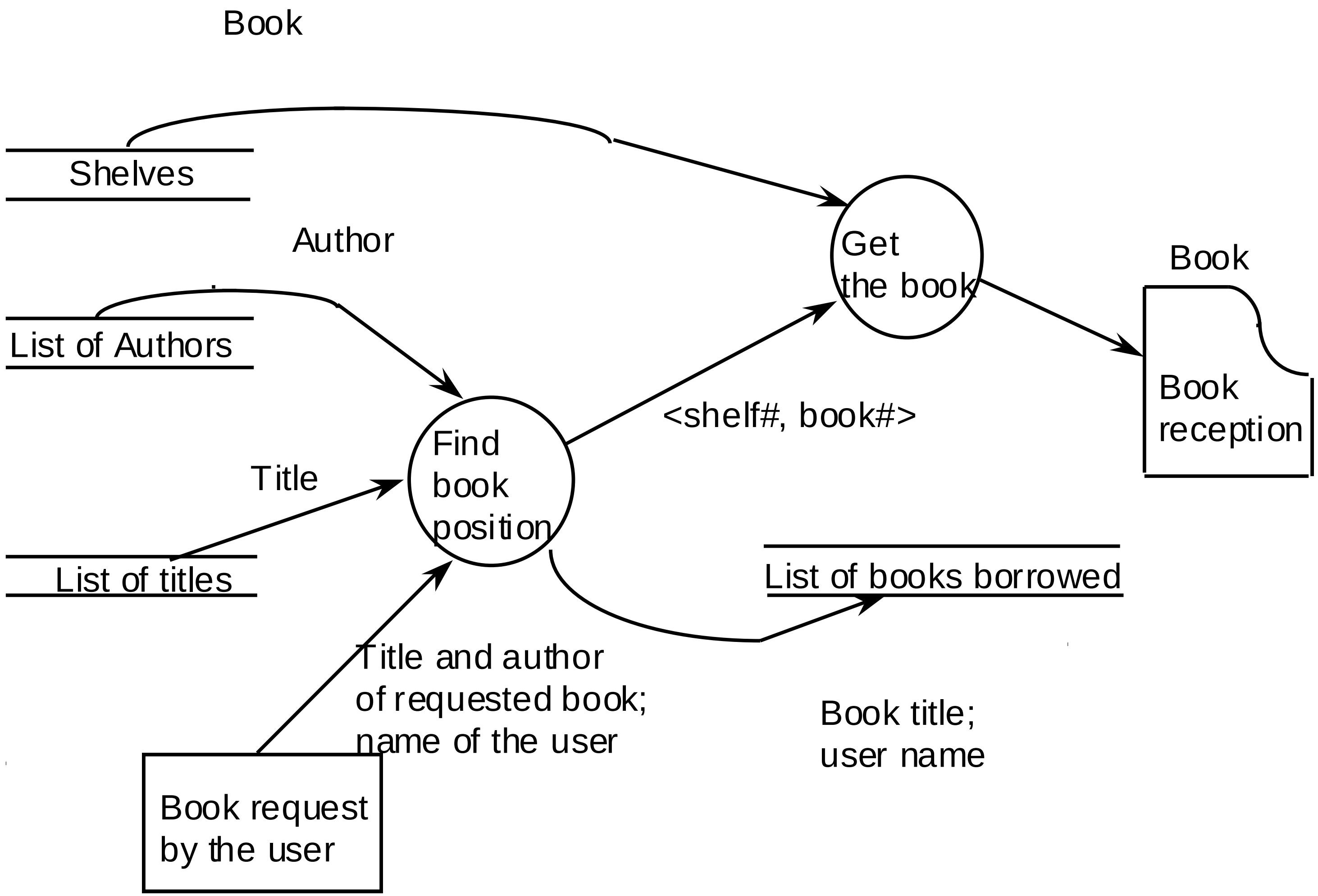
Storage/archive

Output

Example of DFD



Example of DFD (cont'd)



DFD are not standardized

Pros: they are extremely simple, and everyone uses them

Cons:

- Informal, not standardized
- I typically use a variant with additional symbols
- They are not operational: they cannot, specify “control flows (`if`, `or`, `switch`,…)

Unified Modeling Language (UML)

UML

- See the dedicated slide decks

Finite state machines

FSMs

- TODO

Petri nets

Petri nets

- TODO

References

Course website

- http://hipert.unimore.it/people/paolob/pub/ProgSW/index.html

Book

- I. Sommerville, "Introduzione all ingegneria del software moderna", Pearson
  - Chapter 3

My contacts

- paolo.burgio@unimore.it
- http://hipert.mat.unimore.it/people/paolob/
- https://github.com/pburgio