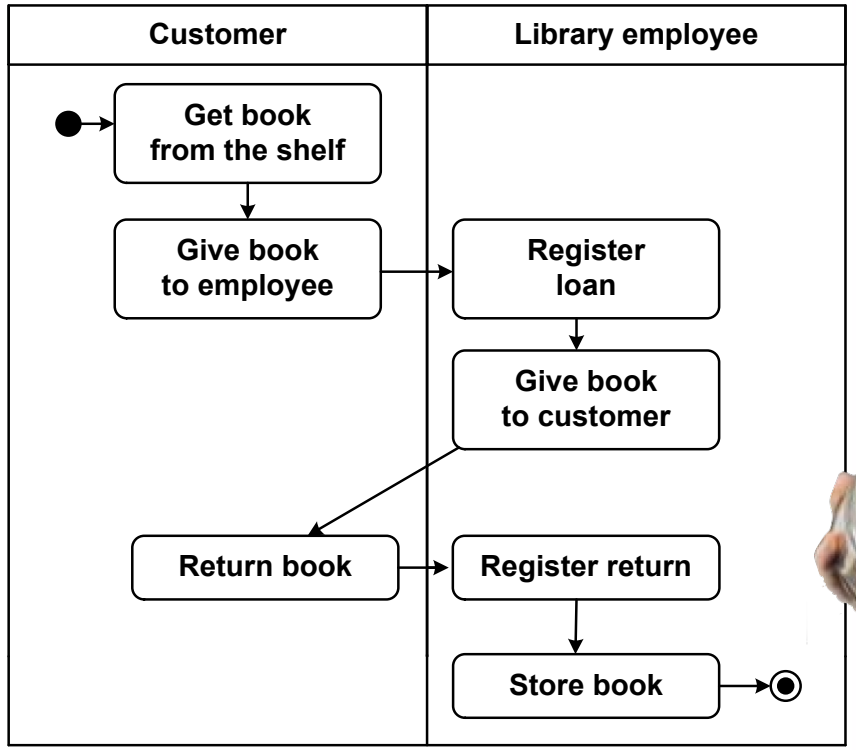
Behavioural Modelling: State Machine Diagrams

Software Systems — Design — L4T3

Dr. Vadim Zaytsev aka @grammarware, November 2020

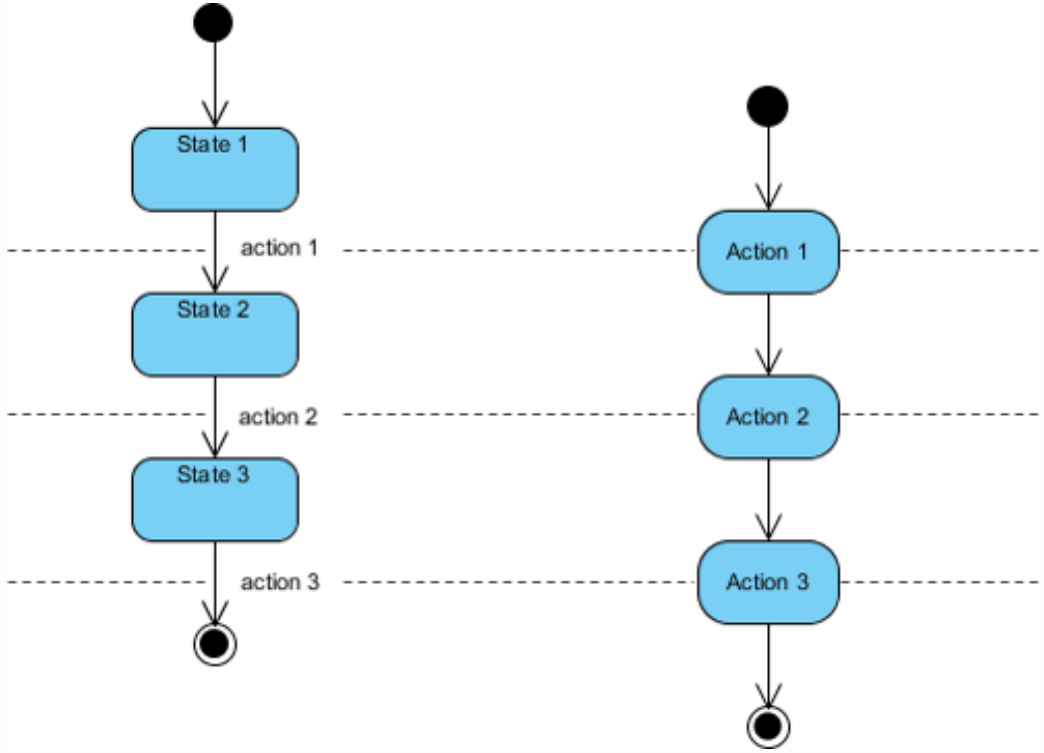
UNIVERSITY OF TWENTE. | Formal Methods & Tools

Activity Diagrams



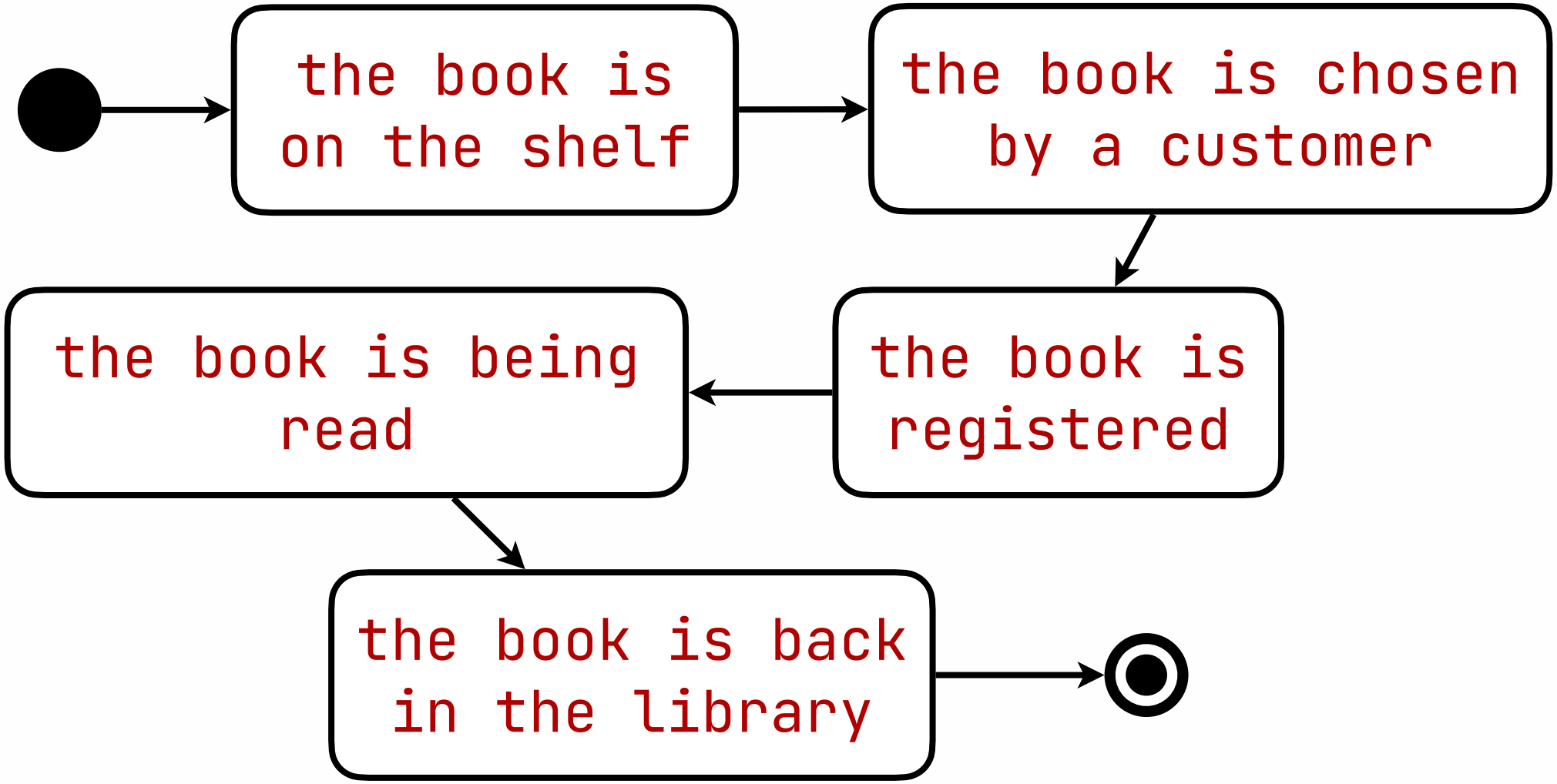
What if ...

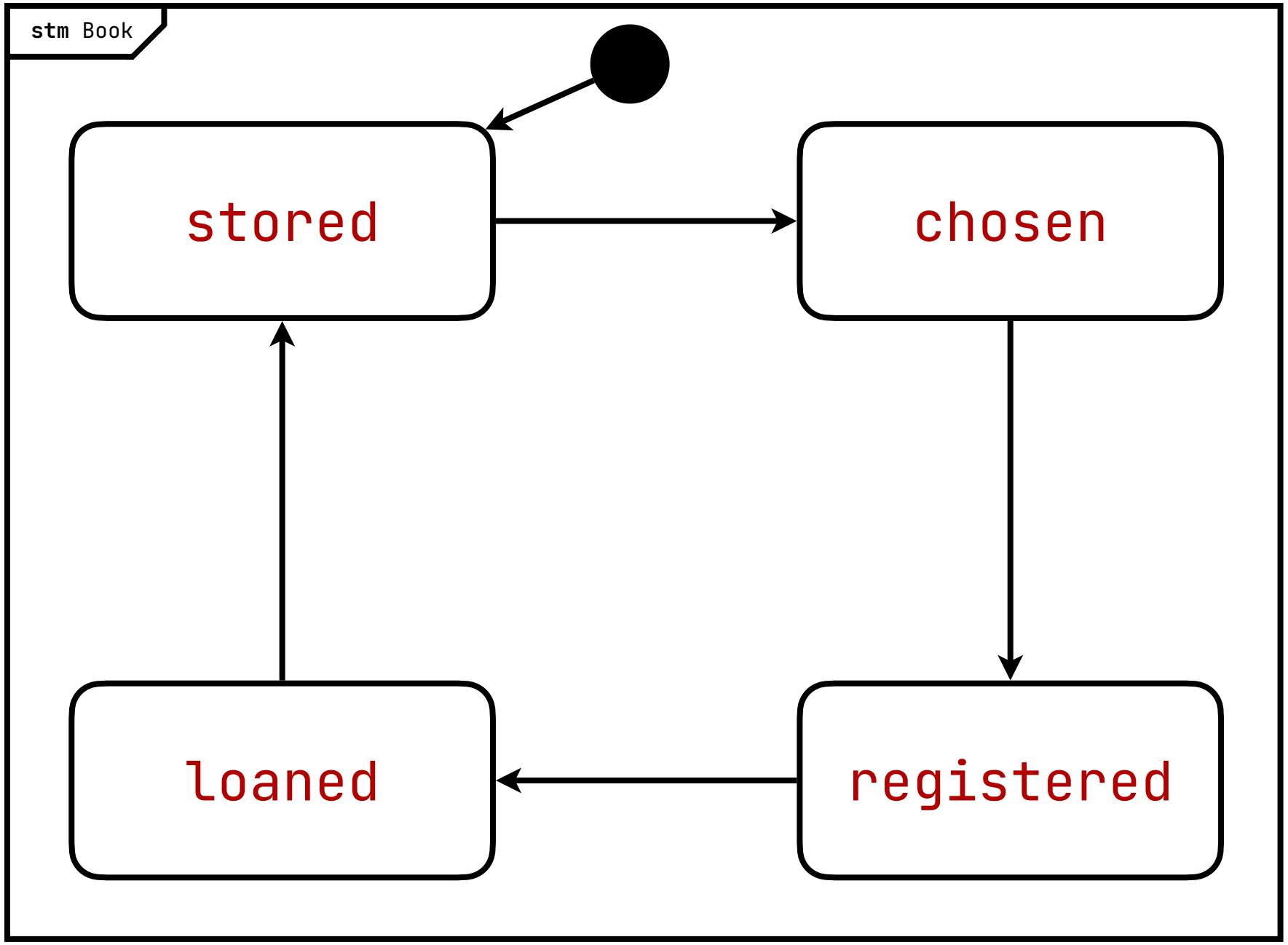
- …we focus on states instead of actions?
- …we focus on what is inside the system?

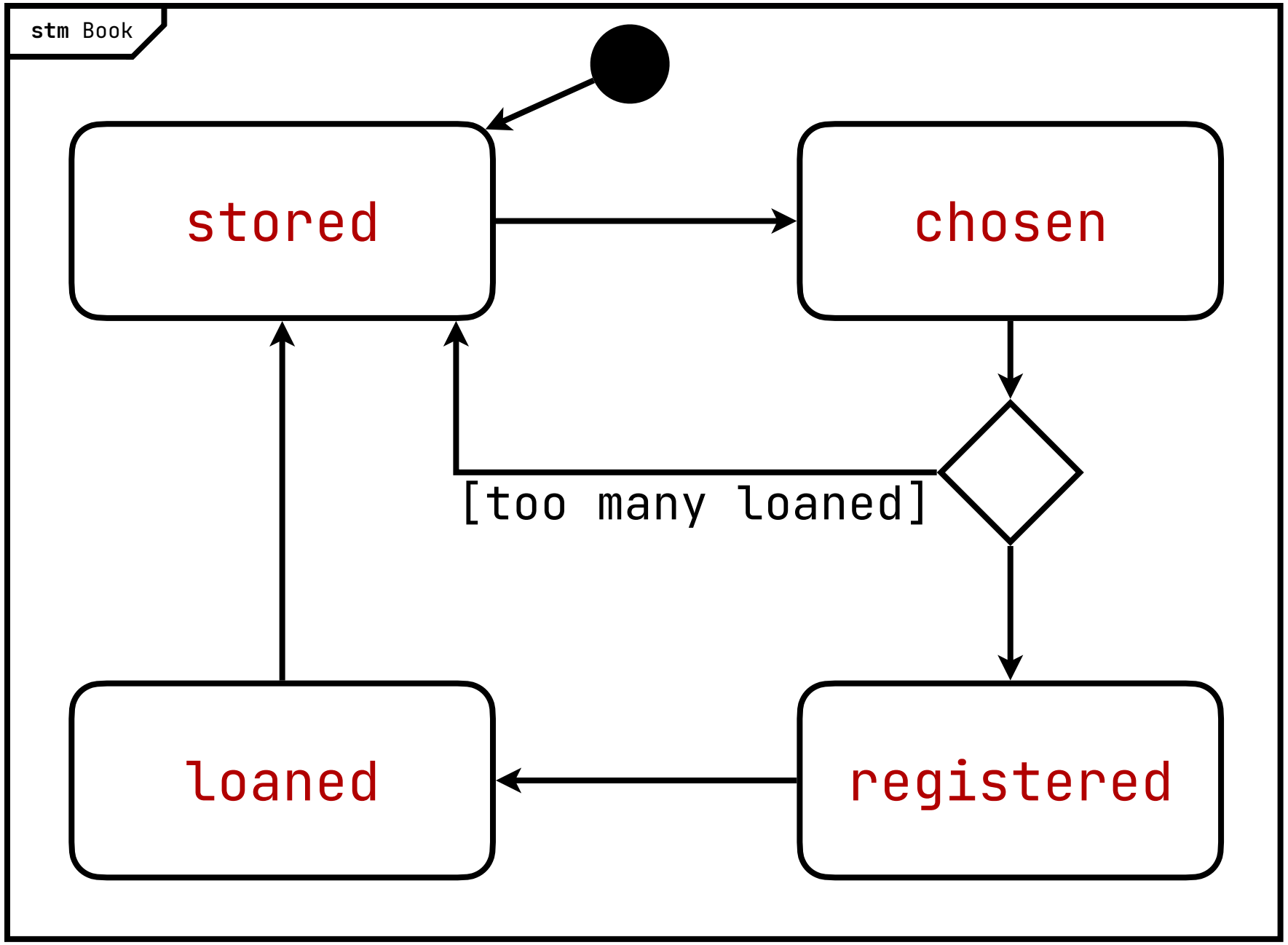


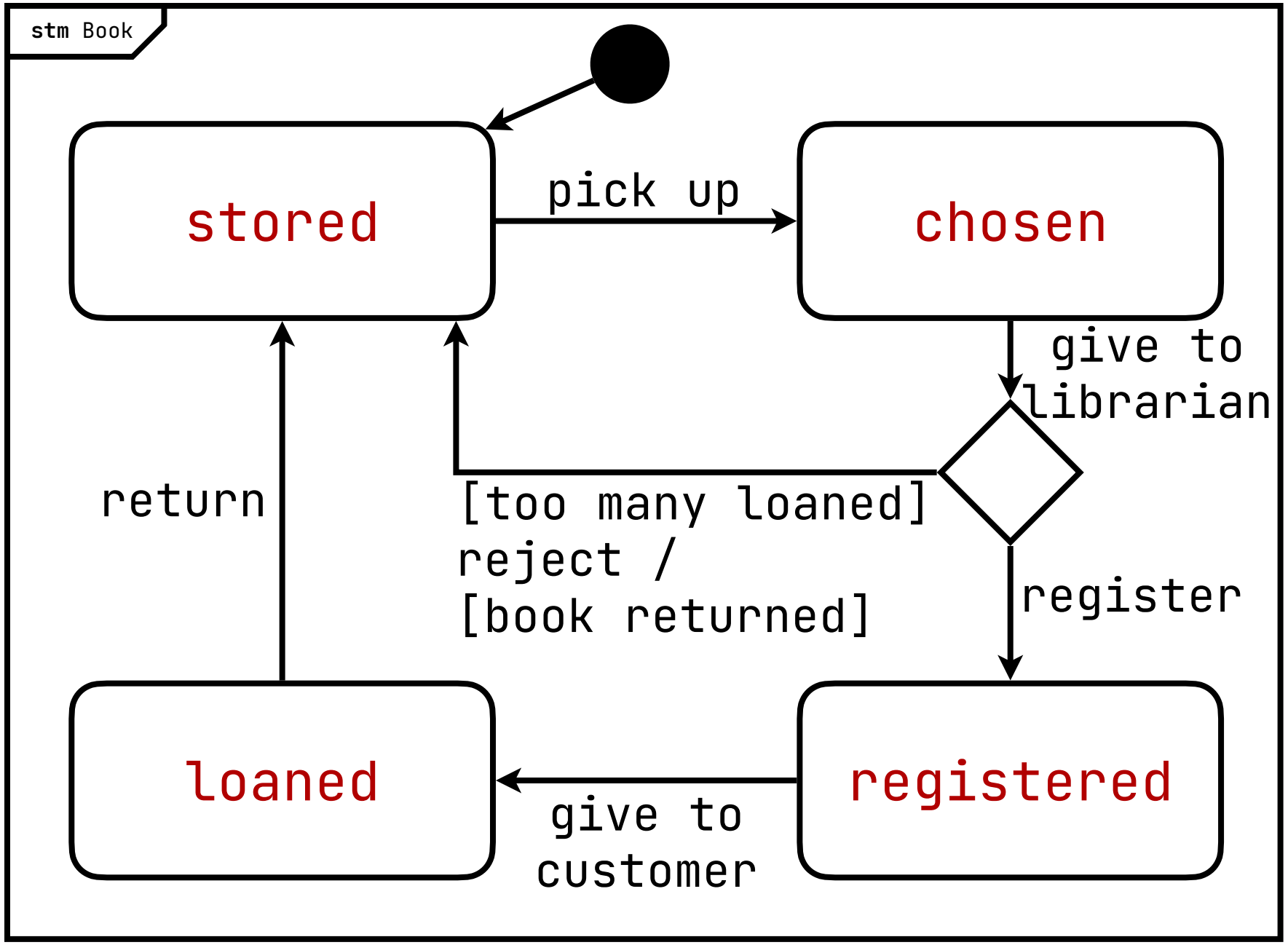
Visual Paradigm, *State Machine Diagram vs Activity Diagram*

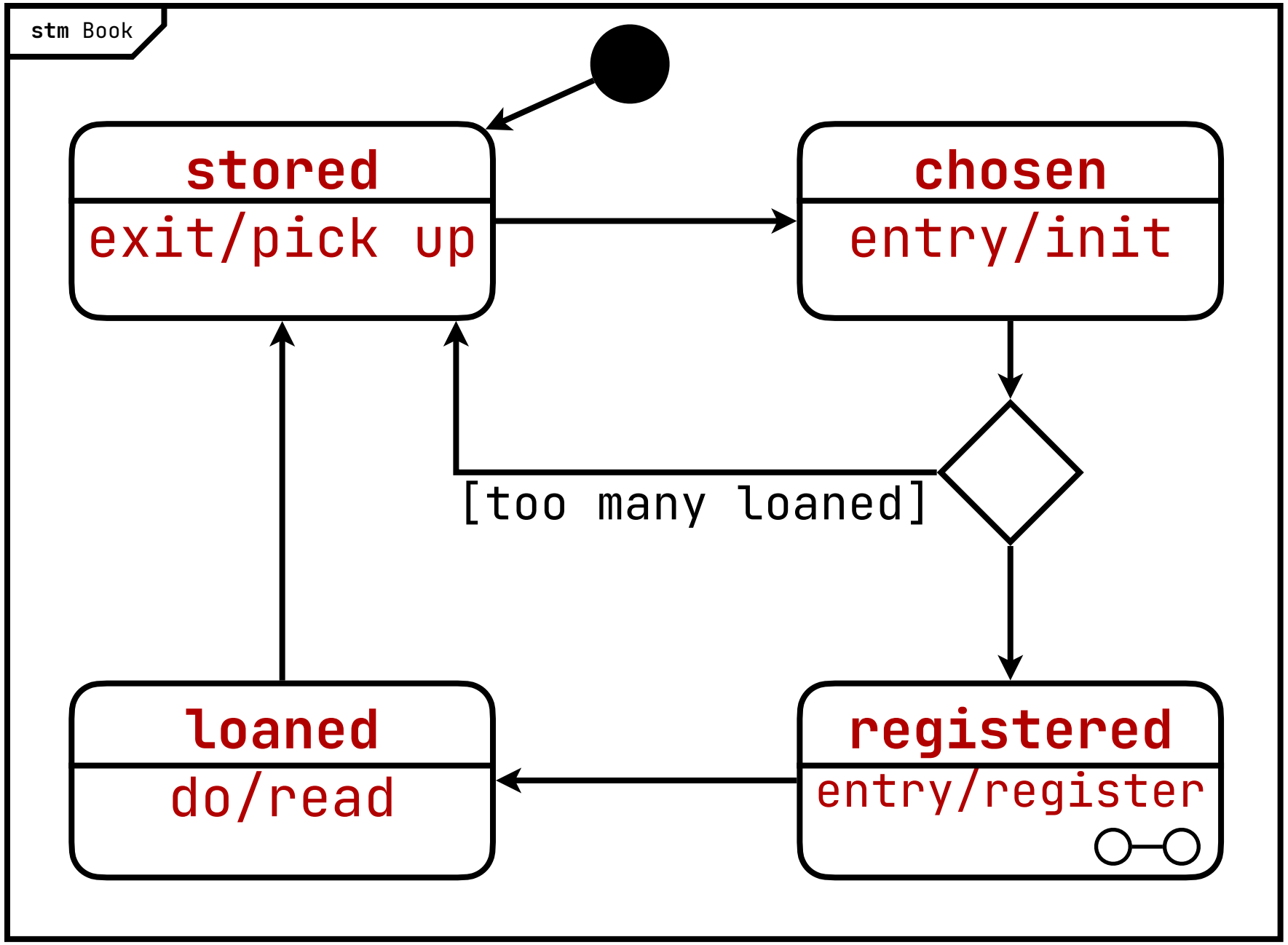
The Library Activity as a SMD

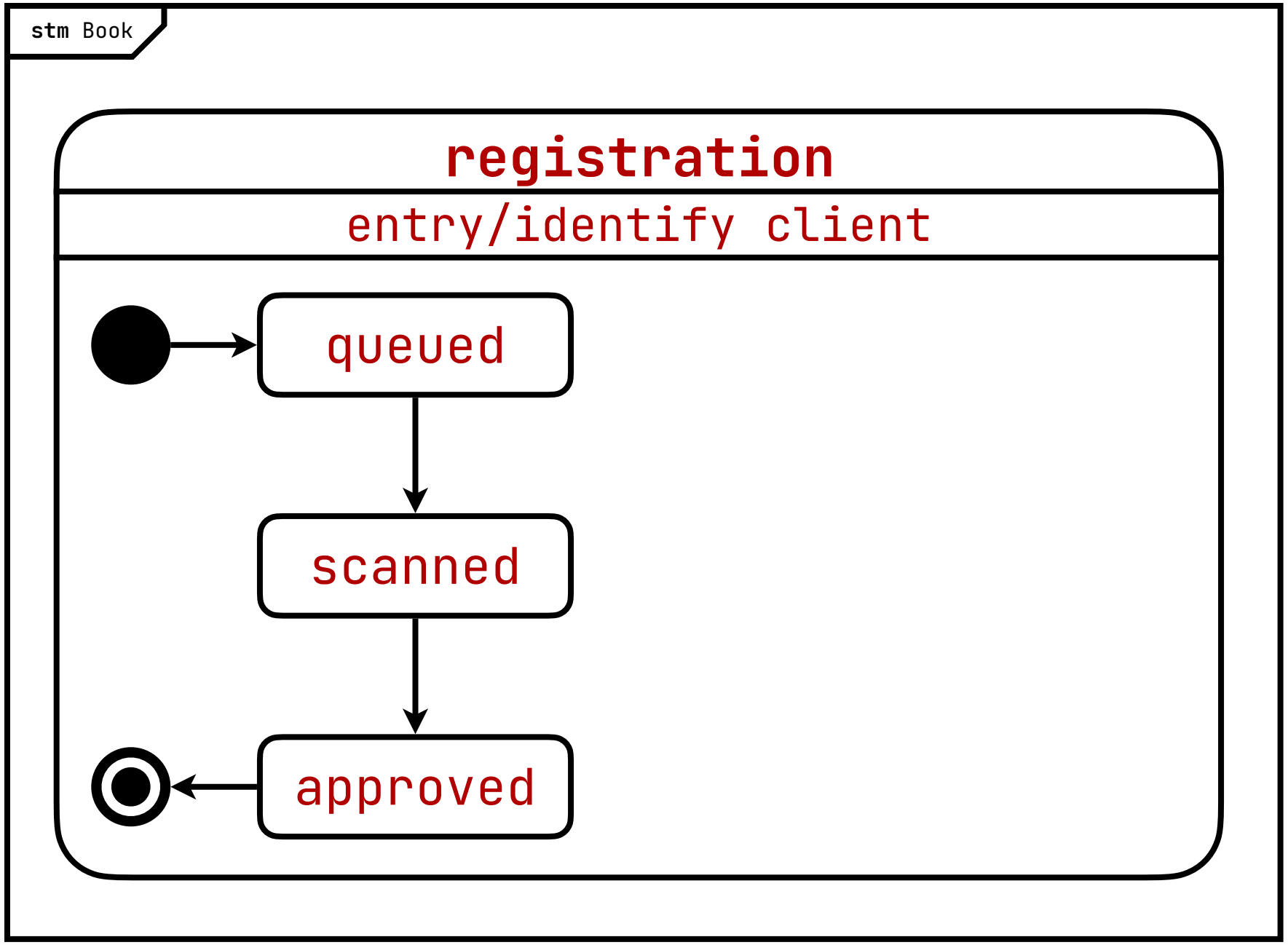


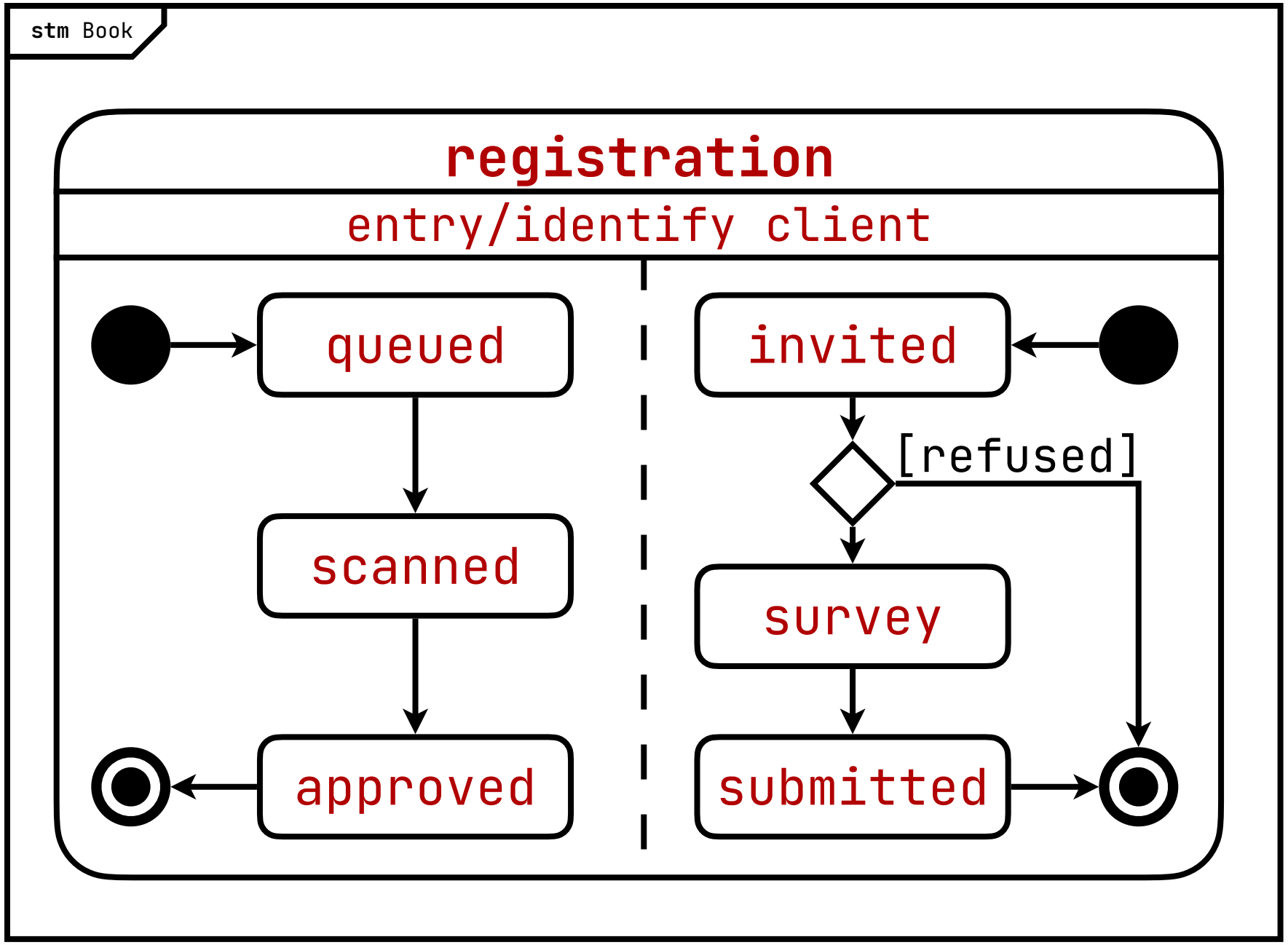

stm Book
stored
chosen
loaned
registered


stm Book
stored
chosen
[too many loaned]
loaned
registered


stm Book
stored
pick up
chosen
give to
librarian
return
[too many loaned]
reject /
[book returned]
register
loaned
give to
customer
registered


stm Book
stored
exit/pick up
chosen
entry/init
[too many loaned]
loaned
do/read
registered
entry/register


stm Book
registration
entry/identify client
queued
scanned
approved


stm Book
registration
entry/identify client
queued
scanned
approved
invited
[refused]
survey
submitted

Conclusion

- State Machine Diagram aka Statechart
- Splits the behaviour into states
  - model real world (married, unmarried, divorced, widowed)
- Transitions move from state to state
- Pseudo-states: start, stop, choice
- Internal activities: exit, enter, do
- Composite states have substates
  - can have parallel compartments

Topics/Slides Disclaimer

- Good ✅
  - watch before Q&A
  - embrace reality
  - try out at labs
  - ask for feedback
  - apply to project
  - dig deeper
  - recall from slides
- Bad ❌
  - slides over videos
  - assumptions
  - blanks
  - timing