Modeling and Analysis: Iteration and Time-boxing

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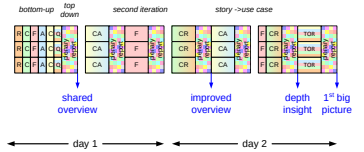
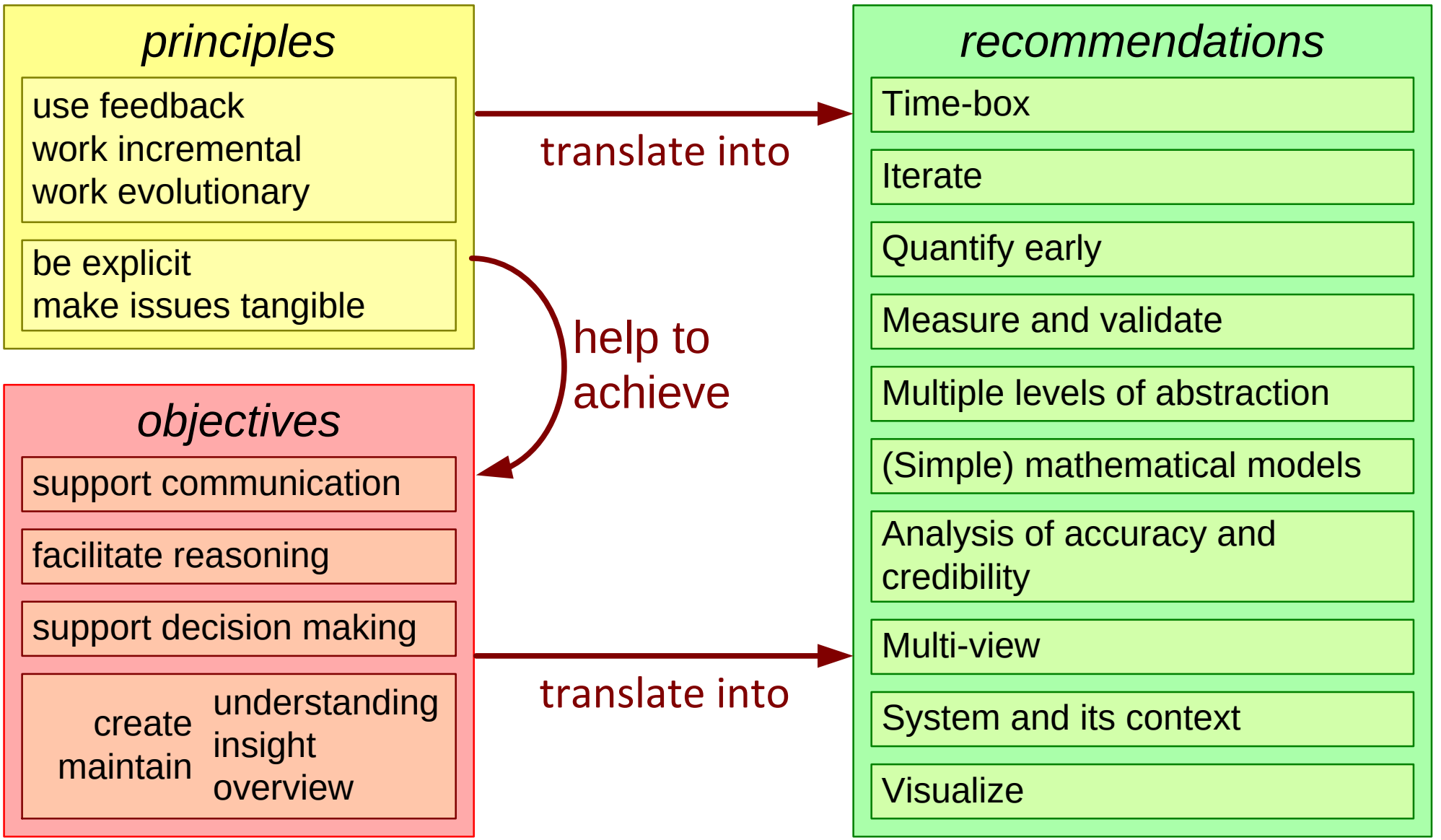
Abstract

Modeling of Systems and their context is done to support communciation with stakeholders, to facilitate reasoning about system requirements and design, to support decision making, and in general to create and maintain understanding, insight, and overview. The challenge in modeling is to find an appropriate abstraction level, and to make sufficient progress.
In this paper we discuss how time-boxing and iteration over multiple views and models helps to address both challenges. Time-boxing and iteration fit in a broader modeling method that w e will discuss briefly to provide background.

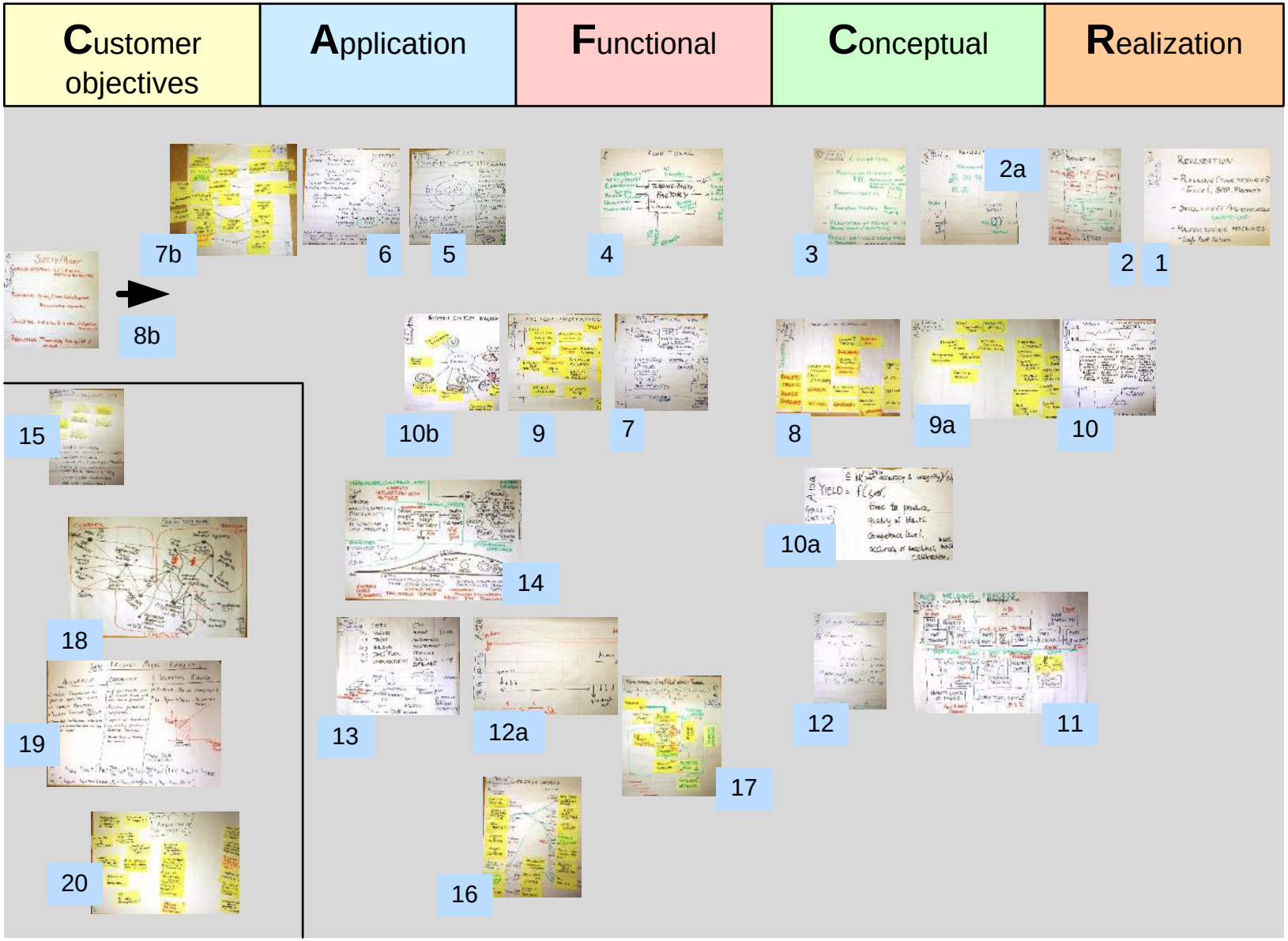
September 5, 2020
status: planned
version: 0



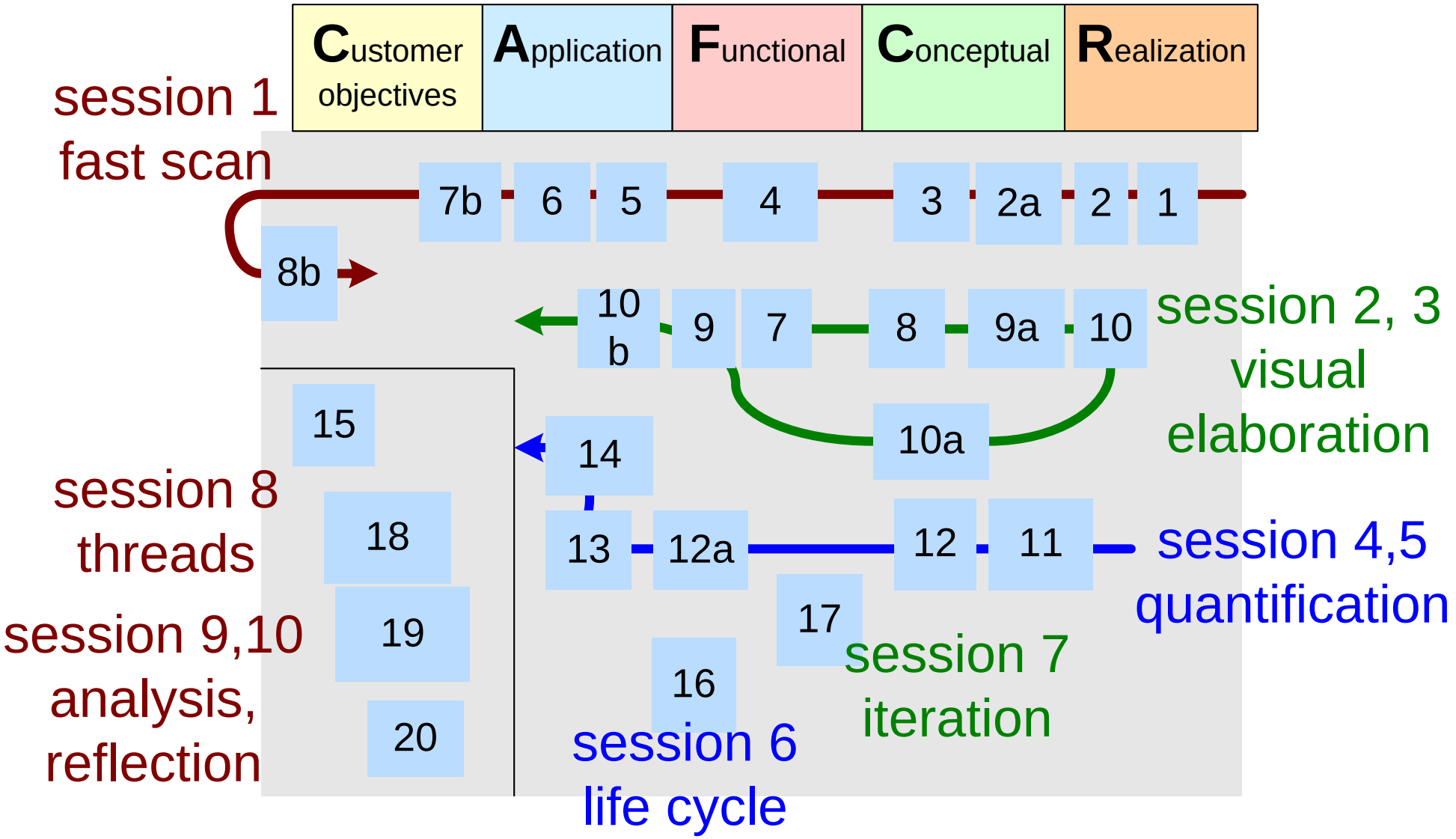
Guidelines from Modeling and Analysis Course



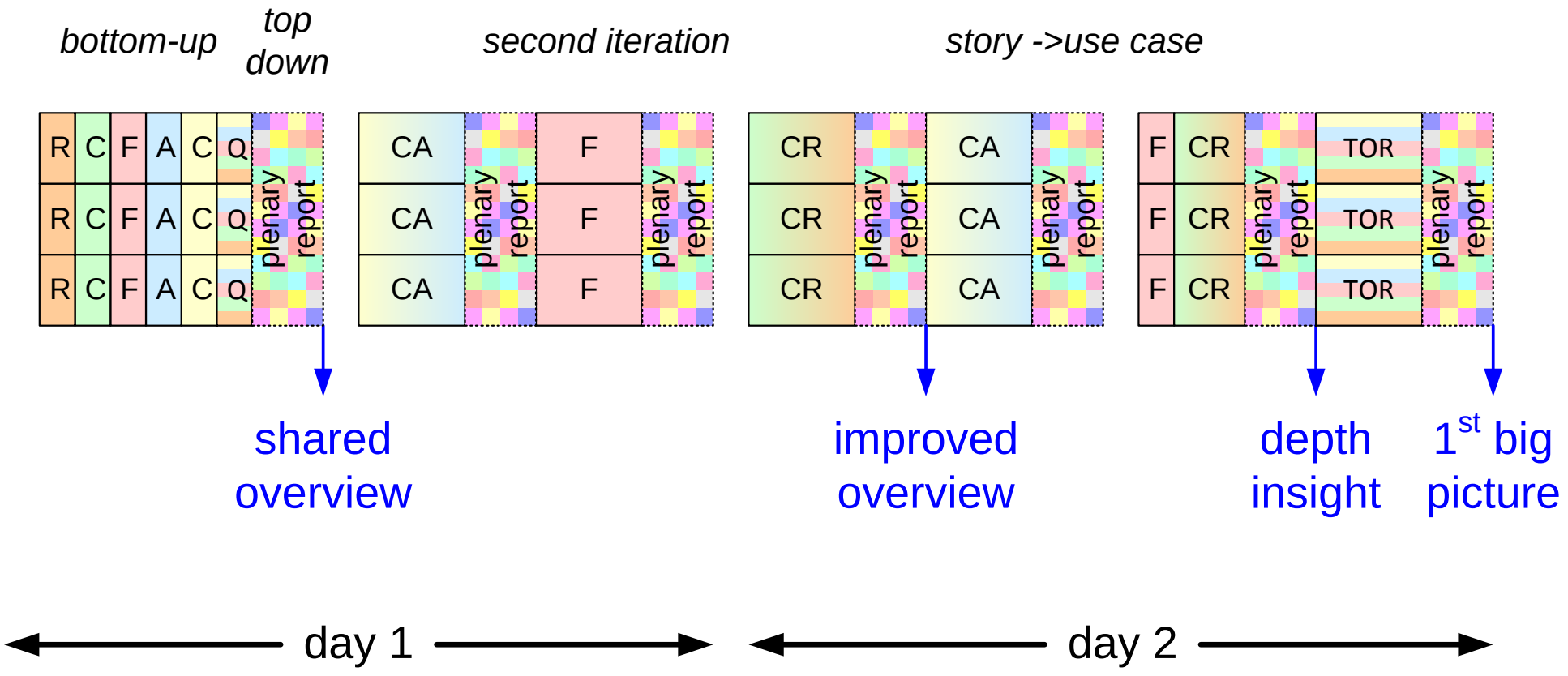
Flip-overs of one week course



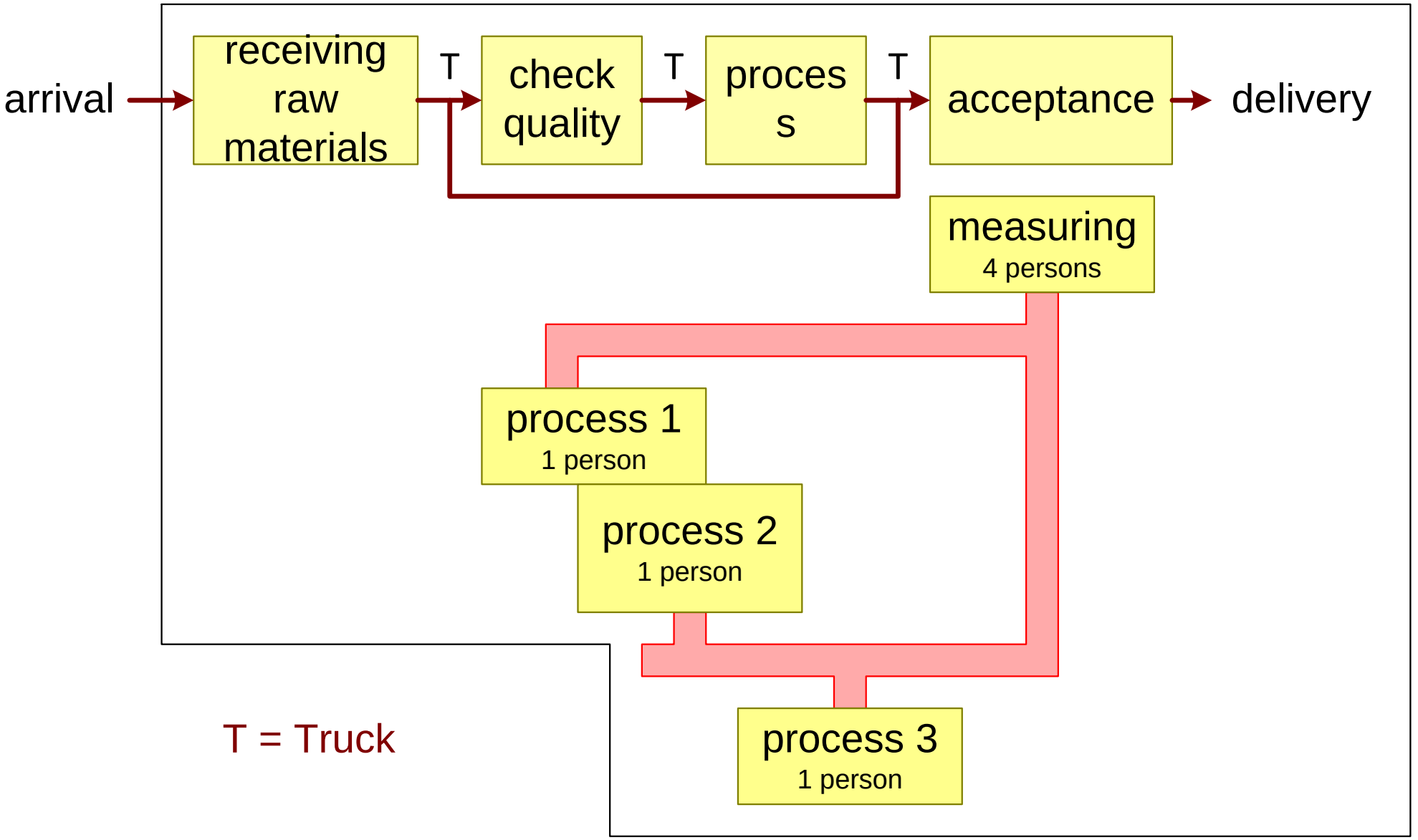
Schematic flow



Time-boxes and Iteration



Initial 2D Model



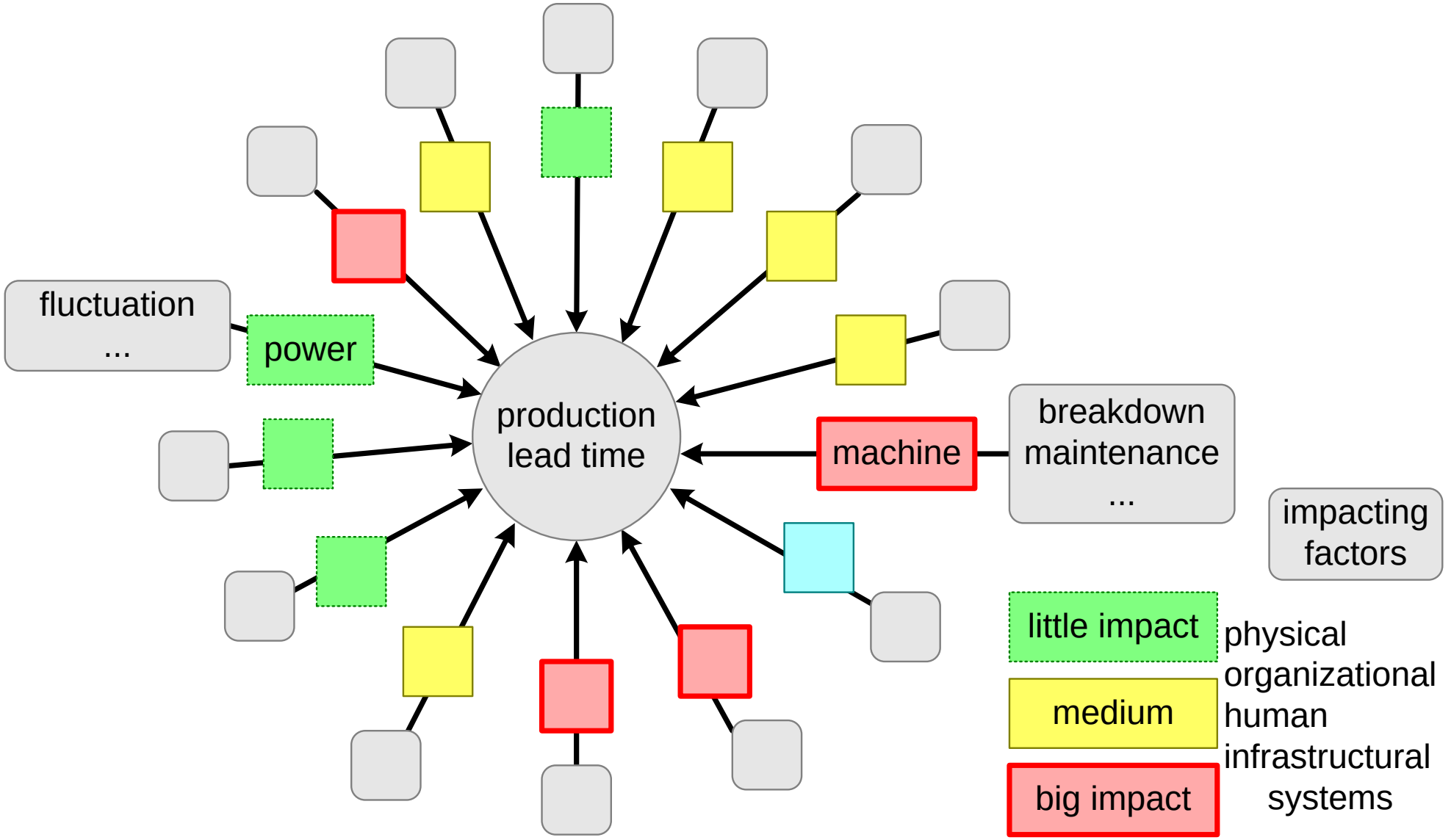
Lead-time Model

$$t_{\text{lead time}} = t_{\text{processing total}} + t_{\text{handling}}$$

$$t_{\text{processing total}} = \sum_{\text{all processes}} t_{\text{processing process}}$$

e.g. $t_{\text{drill 1..n}} + t_{\text{grind 1..m}} + \ldots$

Life Cycle Model



Models in CAFCR+

component qualities: safety, reliability, robustness, liability
factory qualities: predictable, traceable, timely

Customer objectives

factory
- lead time
- cyclic market
- ramp up new products

Application

Functional

component factory
- lead time
- input variations
- resource variations
- cost, space constraints

Conceptual

Realization

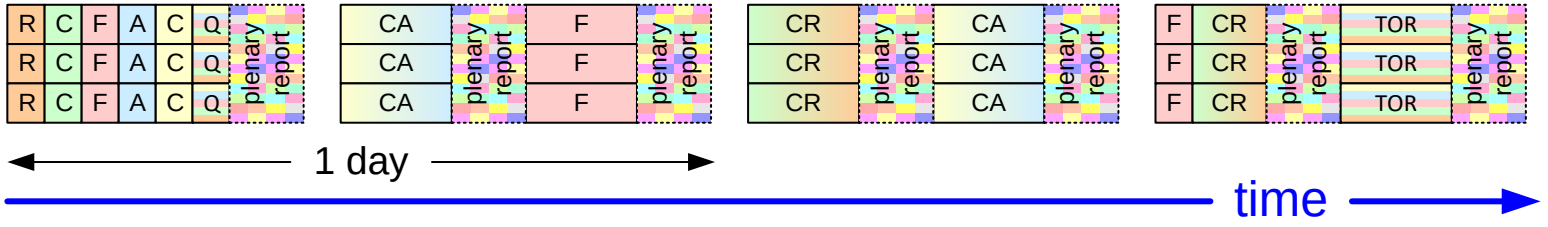
machines
storage
transport
measurements
operators
supervisors
planners
ERP
PDM
CAD-M

Life cycle

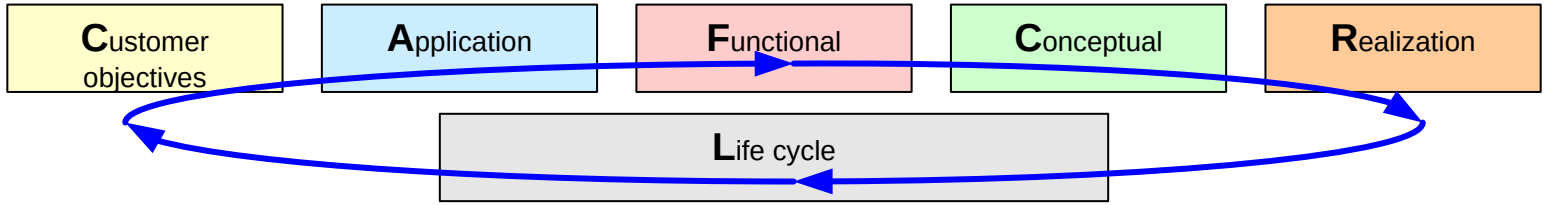
evolution
- process
- people
- infrastructure

finance

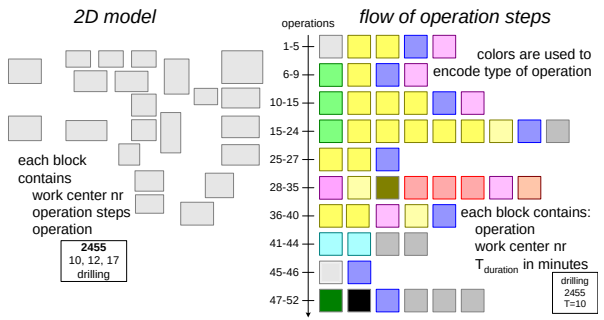
Summary

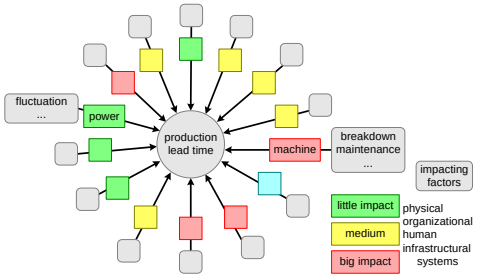


time box



iterate





$t_{lead\ time} = t_{processing\ total} + t_{handling}$

$t_{processing\ total} = \sum_{all\ processes} t_{processing\ process}$

e.g. $t_{drill\ 1..n} + t_{grind\ 1..m} + \ldots$

visualize

be specific

quantify

validate