Principles of Software Construction: Objects, Design, and Concurrency
Part 7: Extra topics

SE: Toward People and Process

Christian Kästner **Charlie Garrod**

School of Computer Science
institute for SOFTWARE RESEARCH

Administrivia

- Homework 6 due tonight!
- Final exam Tuesday, May 5th, 1 – 4 p.m. DH 2210
  - Final exam review session Sunday, May 3rd, 4 – 6:30 p.m., Hamburg 1000

Key concepts from Tuesday

Pass, buy special tile GUI impl [ci skip]
master

fixes
master

completed Exercise class
master

Checkpoint
master

finish boom
master

GUI Finished, Test Cases Not Finised
master

new environment
master

Showing **1,862 changed files** with **0 additions** and **0 deletions**.

Sorry, we could not display the entire diff because too many files (1,862) changed.

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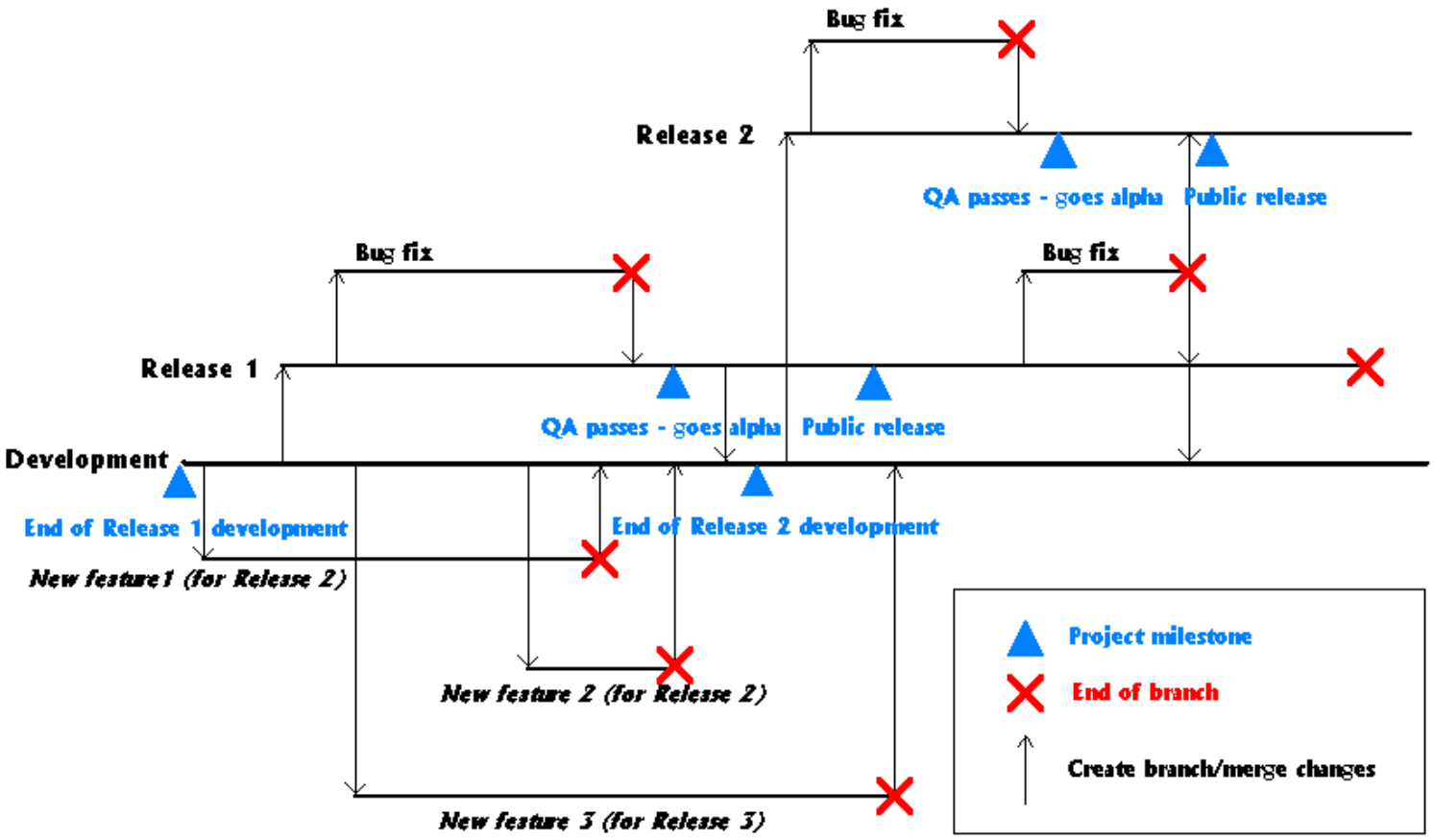
Release management with branches

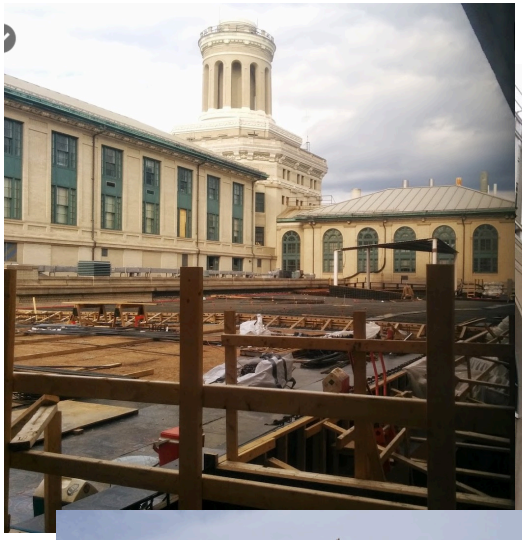


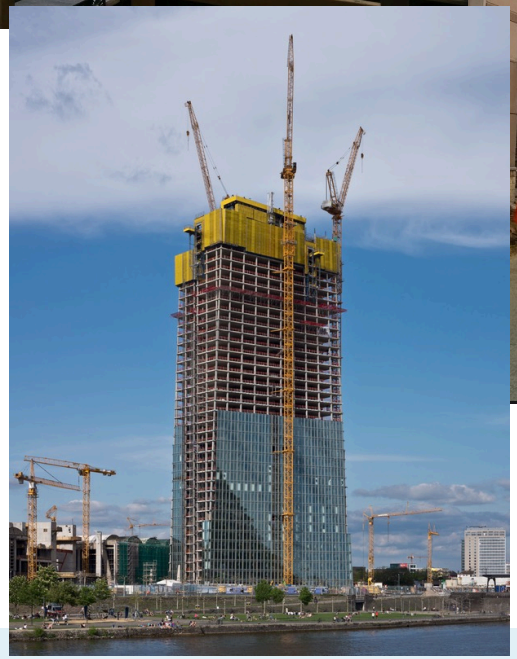
Today: First, a break to fill out FCEs

- https://cmu.smartevals.com/

Today: The next phase of SE: People and process

Compare: Software engineering to civil engineering

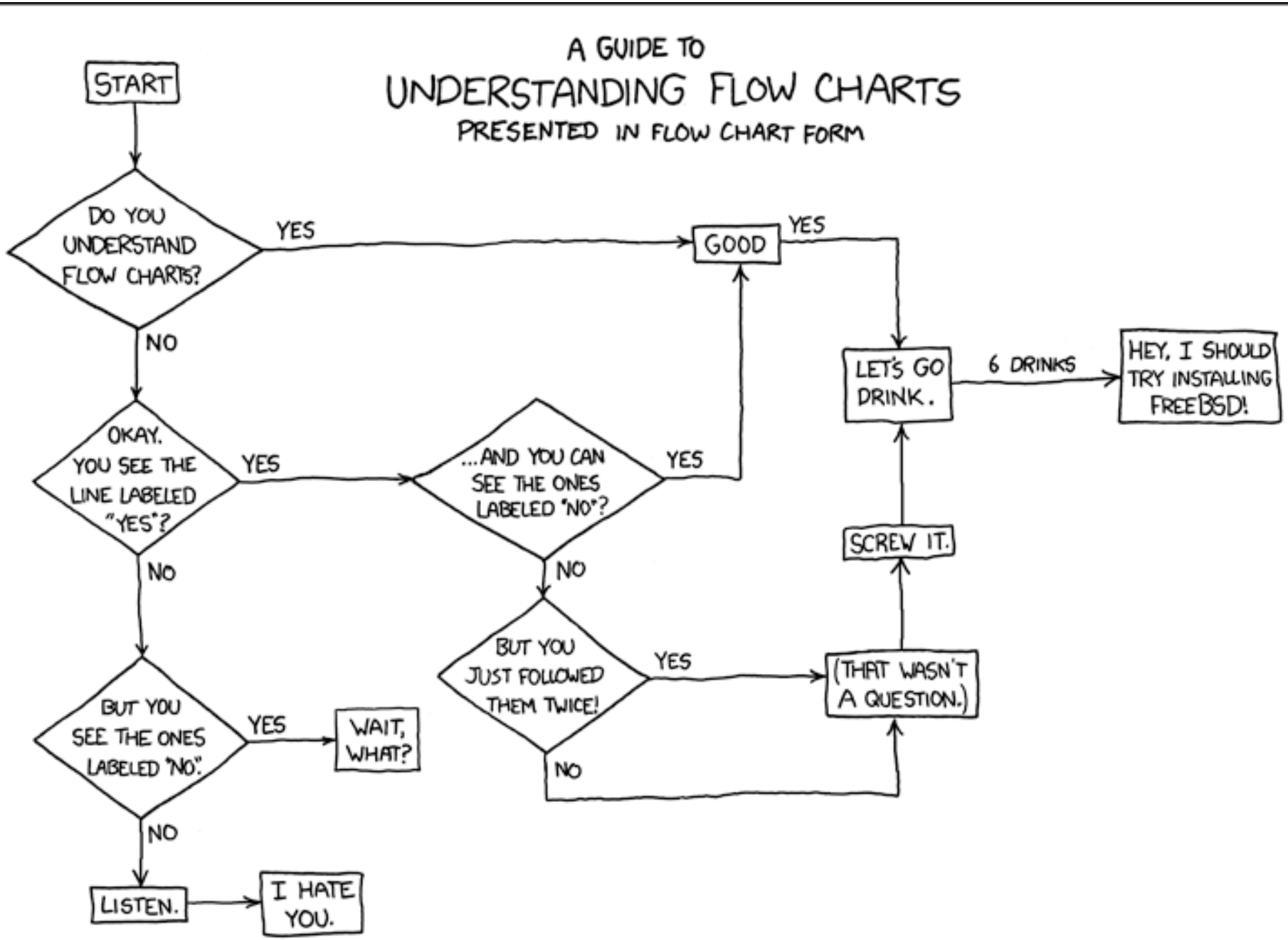




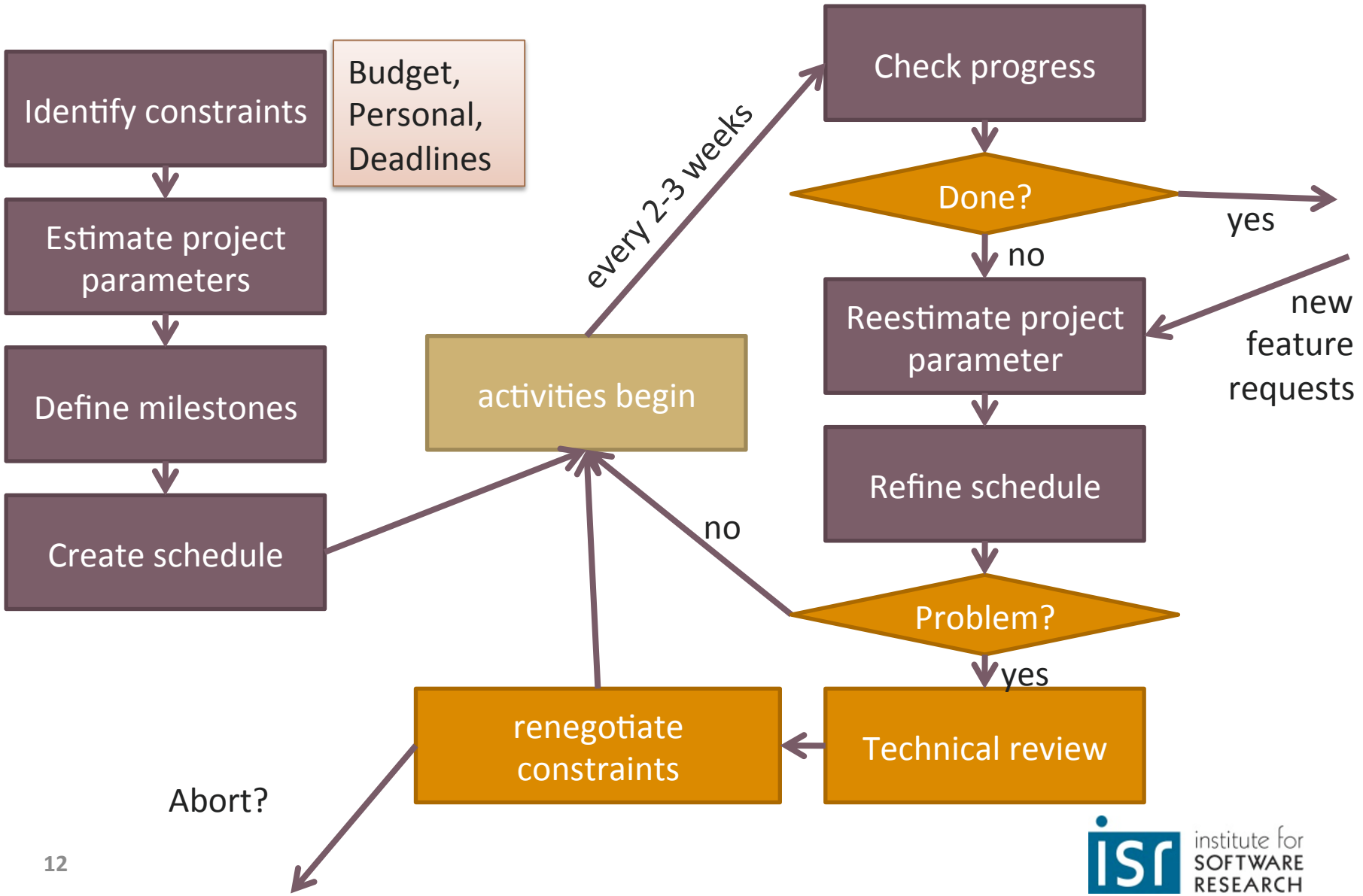
SE in 15-214

You?:

Compare: Software engineering to civil engineering


A GUIDE TO
UNDERSTANDING FLOW CHARTS
PRESENTED IN FLOW CHART FORM
START
DO YOU UNDERSTAND FLOW CHARTS?
YES
GOOD
YES
NO
LET'S GO DRINK.
6 DRINKS
HEY, I SHOULD TRY INSTALLING FREEBSD!
OKAY. YOU SEE THE LINE LABELED "YES"?
YES
...AND YOU CAN SEE THE ONES LABELED "NO"?
YES
SCREW IT.
NO
NO
BUT YOU JUST FOLLOWED THEM TWICE!
YES
(THAT WASN'T A QUESTION.)
BUT YOU SEE THE ONES LABELED "NO".
YES
WAIT, WHAT?
NO
NO
LISTEN.
I HATE YOU.

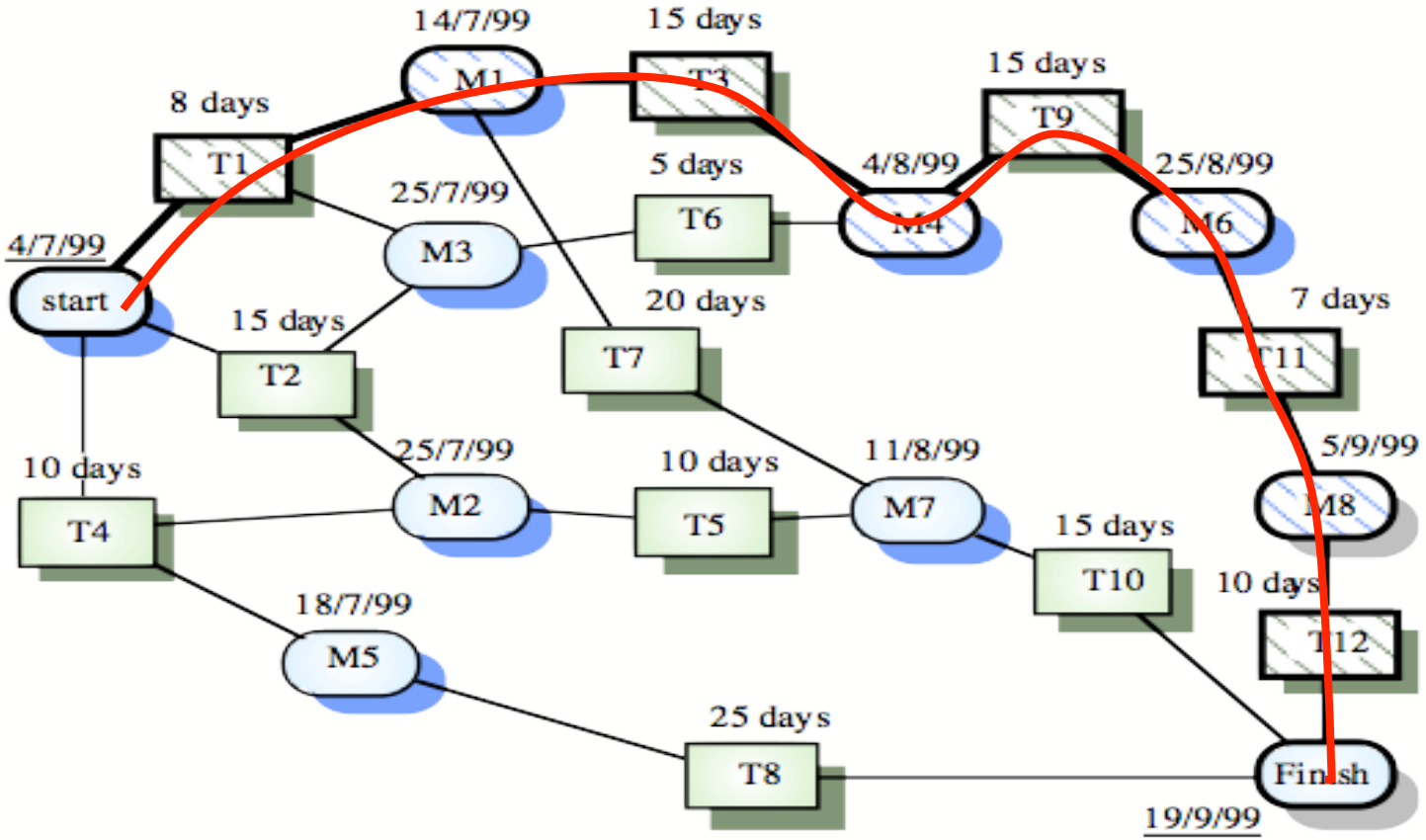
Software project planning



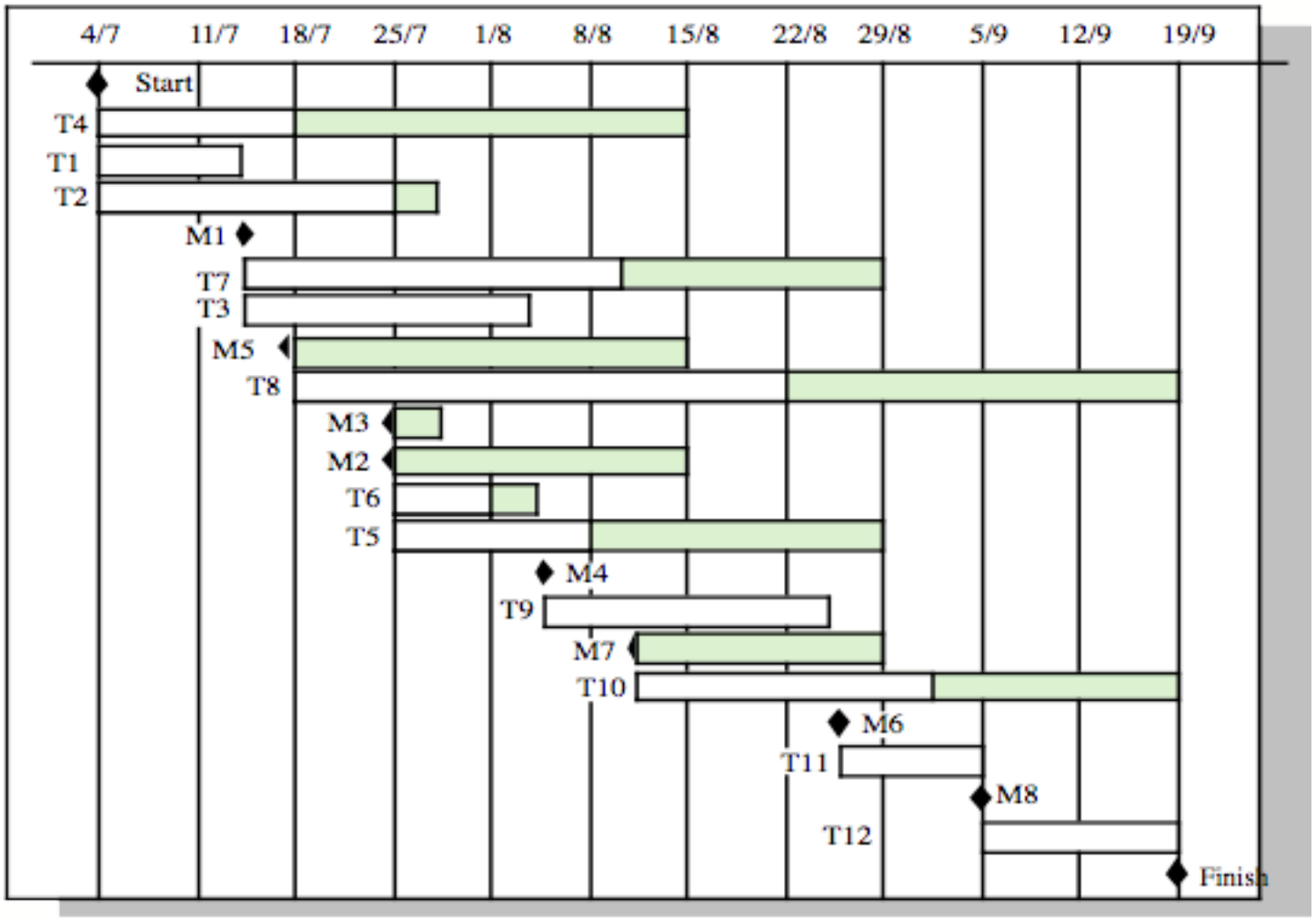
Project planning

Task	Duration (days)	Dependencies
T1	8	
T2	15	
T3	15	T1
T4	10	
T5	10	T2, T4
T6	5	T1, T2
T7	20	T1
T8	25	T4
T9	15	T3, T6
T10	15	T5, T7
T11	7	T9
T12	10	T11

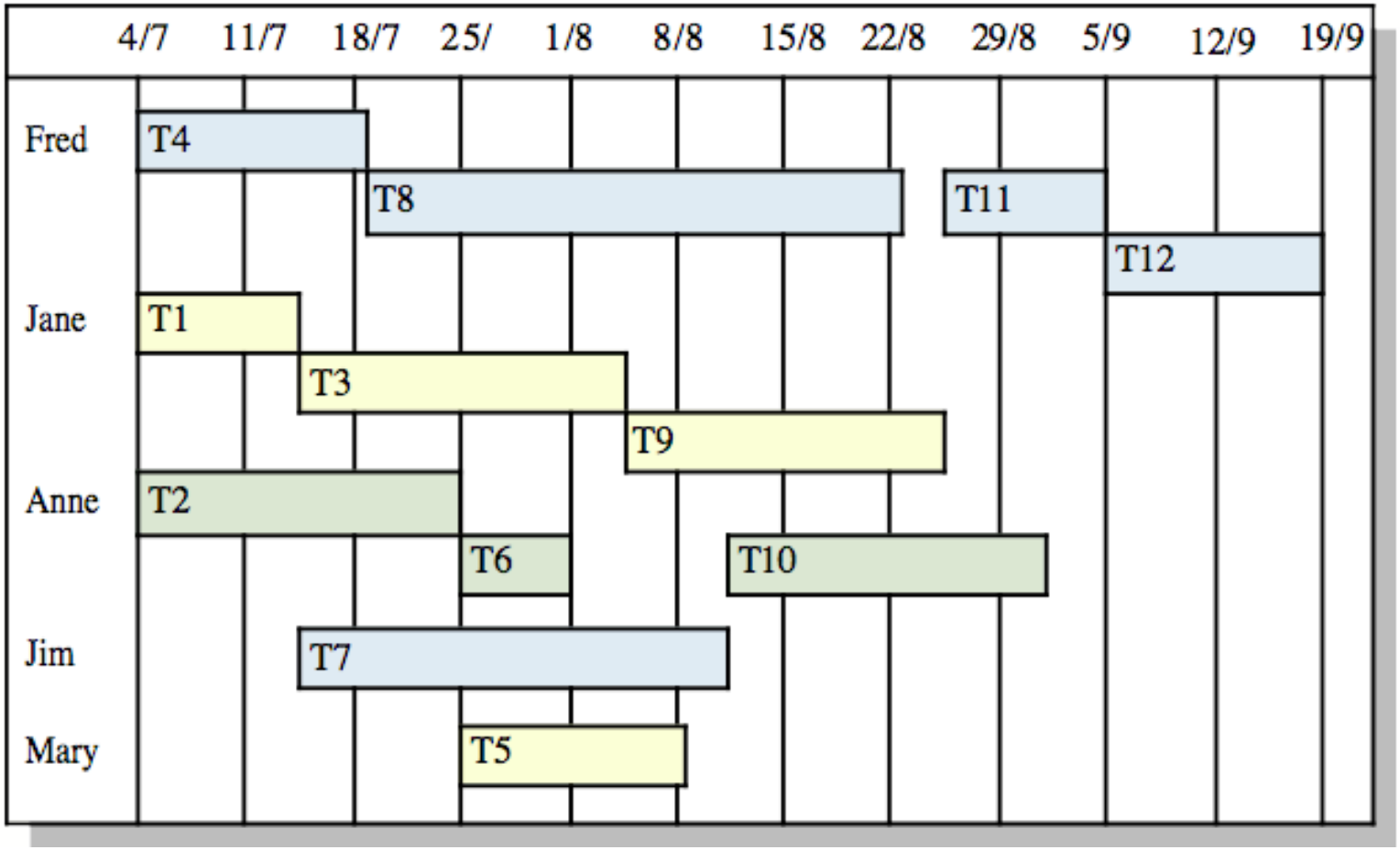
Critical paths



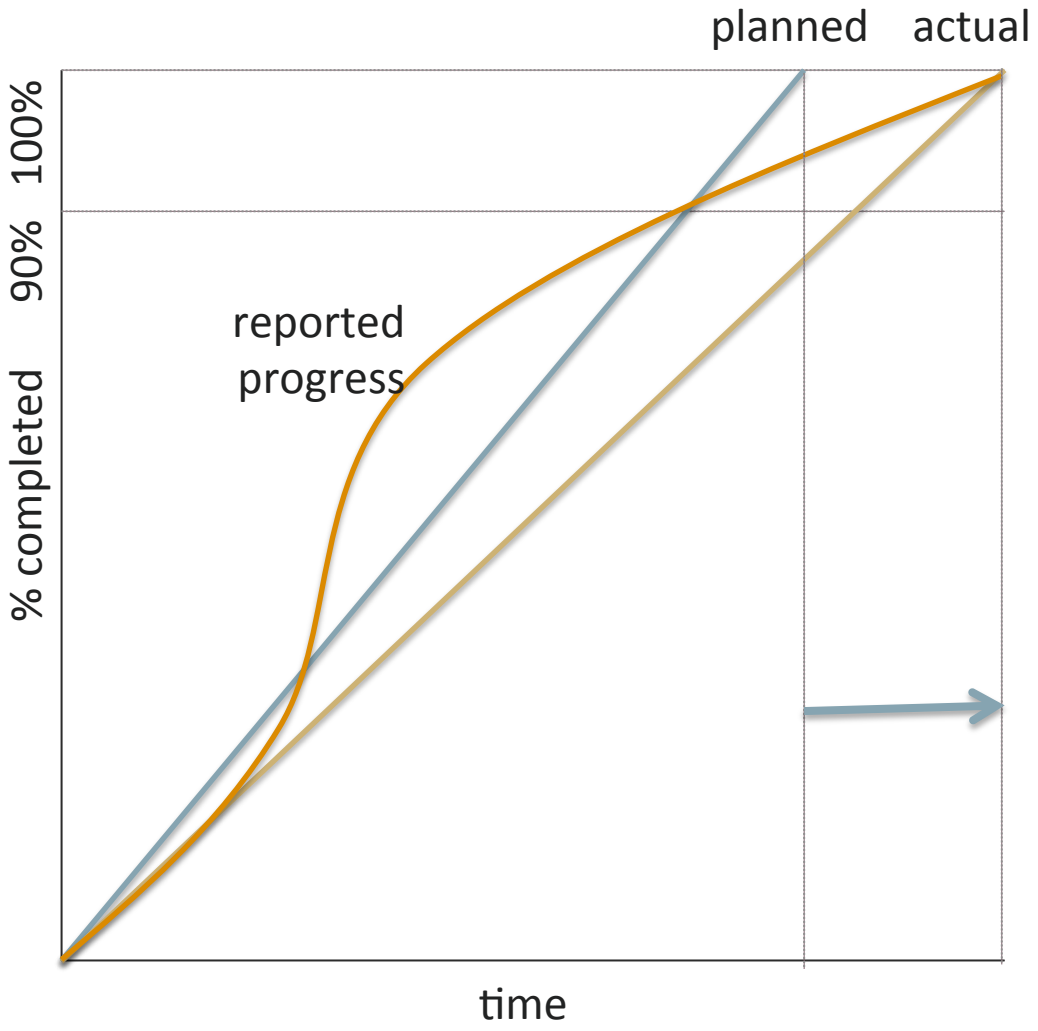
Gantt diagrams



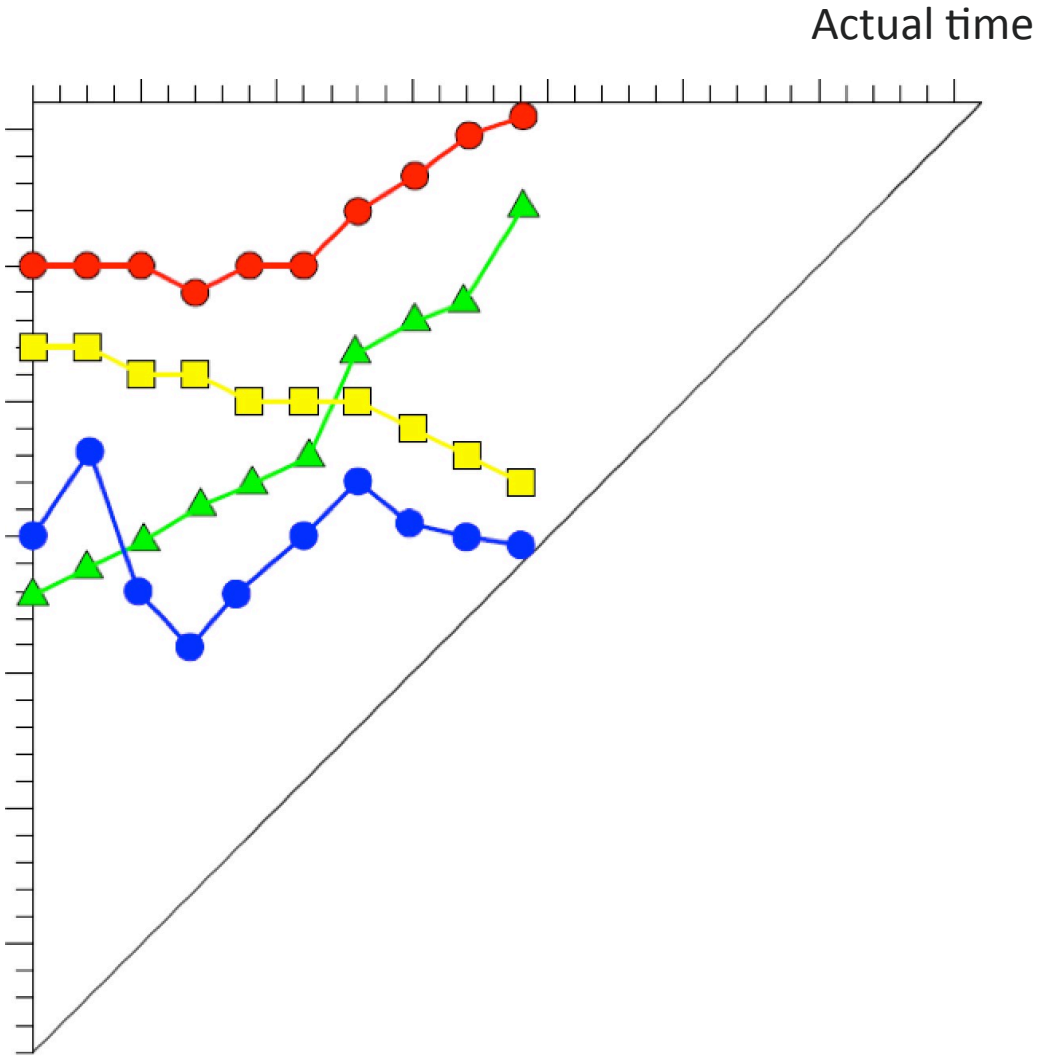
Resource planning



The "almost done" problem

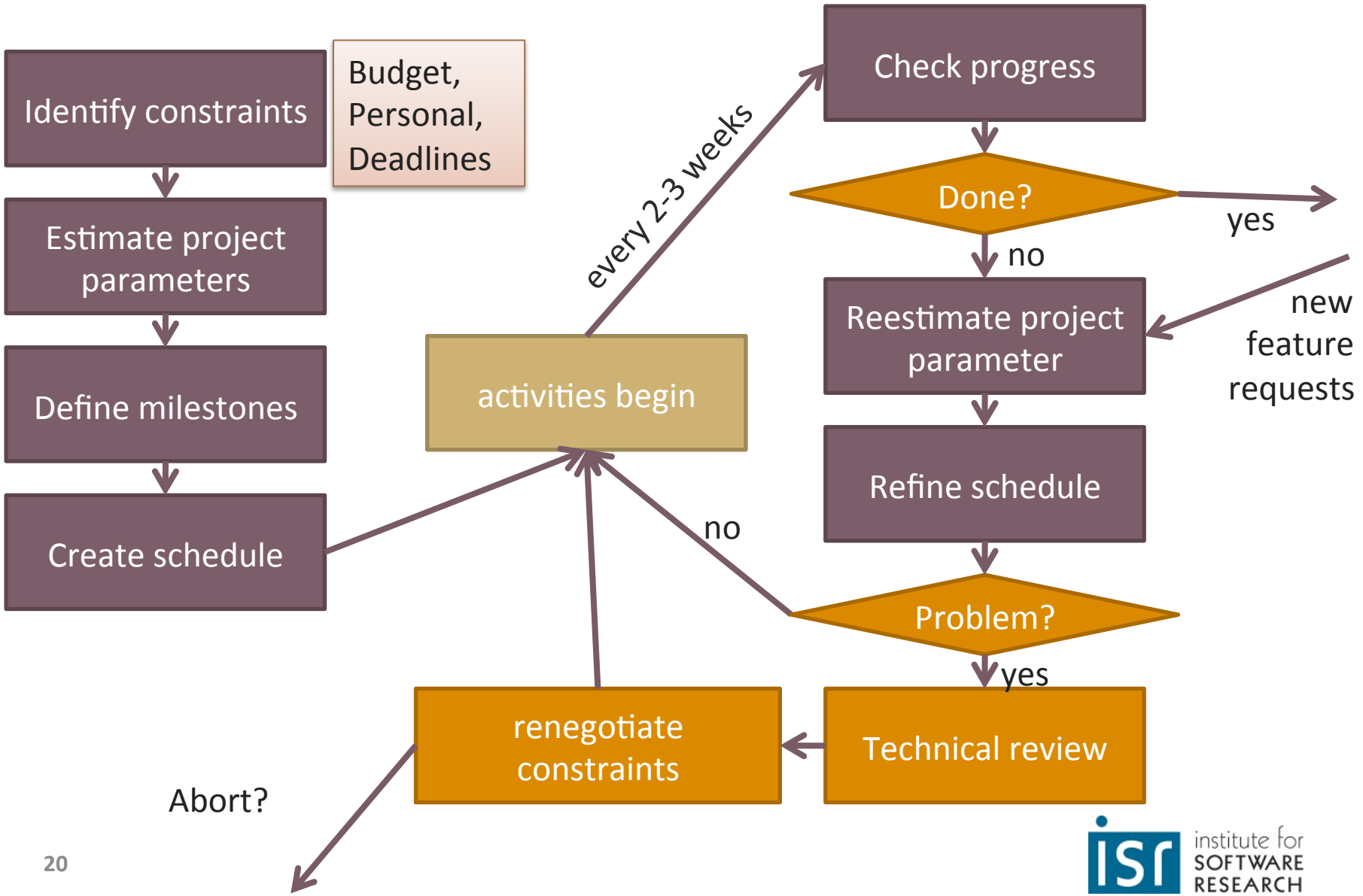


Milestone trend analysis



Risk management

Project planning



Measurement in software engineering

- Performance, memory consumption, …
- Productivity, complexity, …
- Accuracy of predictions, …
- Readability, maintainability, …
- Stability, error rate, …
- Usability, user acceptance, …

- Depending on evaluation goal
  - Different data collection
  - Different metrics and scales
  - Different evaluations

Requirements engineering

- Knowledge acquisition: how to capture relevant detail about a system?
- Knowledge representation: once captured, how do we express it most effectively?

Beyond functional correctness

- E.g.:
  - Availability
  - Modifiability, portability
  - Performance, scalability
  - Security
  - Testability
  - Usability
  - Cost to build, cost to operate

Software engineering risks

- Project risks
  - Projects late, buggy, cost overruns
- System risks
  - Security and safety issues
  - e.g. The Toyota case
- Engineering risks
  - Unsuitable technology choices, validation issues, usability issues, scalability issues …`

Teams

- Phases: Forming, Storming, Norming, Performing
- Problems: Groupthink, Social loafing, Communication, …

Software crises…

Healthcare.gov: Government IT Project Failure at its Finest

Posted: 10/18/2013 6:33 pm

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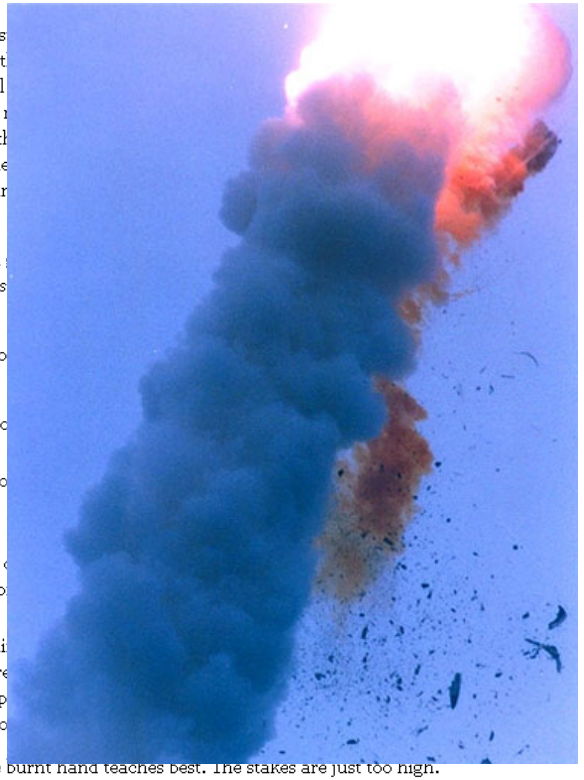

One can only hope that the burnt hand teaches best. The stakes are just too high.

Next time…