Let’s make abstraction engineering fun again!

Antonio Cicchetti, antonio.cicchetti@mdu.se

Mälardalen University

Main takeaway

- Abstraction engineering requires to train and mature skills for the task

- If we want a better understanding of abstraction engineering we should provide tools letting users play *transparently* with abstraction

Disclaimers

- The goal is not to make a tutorial for a tool (JJODEL)
- The observations are taken from the 1st iteration of courses using JJODEL
- JJODEL is still an academic tool

Agenda

- Cognitive science behind language workbench tools
- Lessons learnt with students (tool usage)
- Lessons learnt with researchers (tool development)

About me

- Associate Professor at MDU, Västerås, Sweden
- Co-leader of the Automated Software language and SOftware engineering research group
- Dealing with language engineering and MBSE adoption in industry since ca. 20 years ago
- Delivering MBSE-related courses for both academy and professionals since 15 years ago

On cognitive science and (modelling) tools

- Historically tools have been identified as a pain-point in MBSE

- Essential complexity vs Accidental complexity

On cognitive science and (modelling) tools

- Historically tools have been identified as a pain-point in MBSE

- Essential complexity vs Accidental complexity

- *“Go and train yourself!”*

On cognitive science and (modelling) tools

15 years later ...

On cognitive science and (modelling) tools

- We have already too many tools
- Tools are not flexible/customizable
- Modelling is a demanding activity with little RoI

On cognitive science and (modelling) tools

- Tools (or equipments) are not merely objects, but mediators that shape human interaction with the world

- A tool is ready-to-hand when it seamlessly integrates into the user’s actions as an extension of their capabilities, allowing full focus on the task without conscious thought

- For a tool to become ready-to-hand, the user must develop or adapt their cognitive schemata

Heidegger, M. (1927) Sein und Zeit. Halle: Max Niemeyer Verlag
Piaget, J. (1926). The Language and Thought of the Child. London: Routledge & Kegan Paul

Technology story line

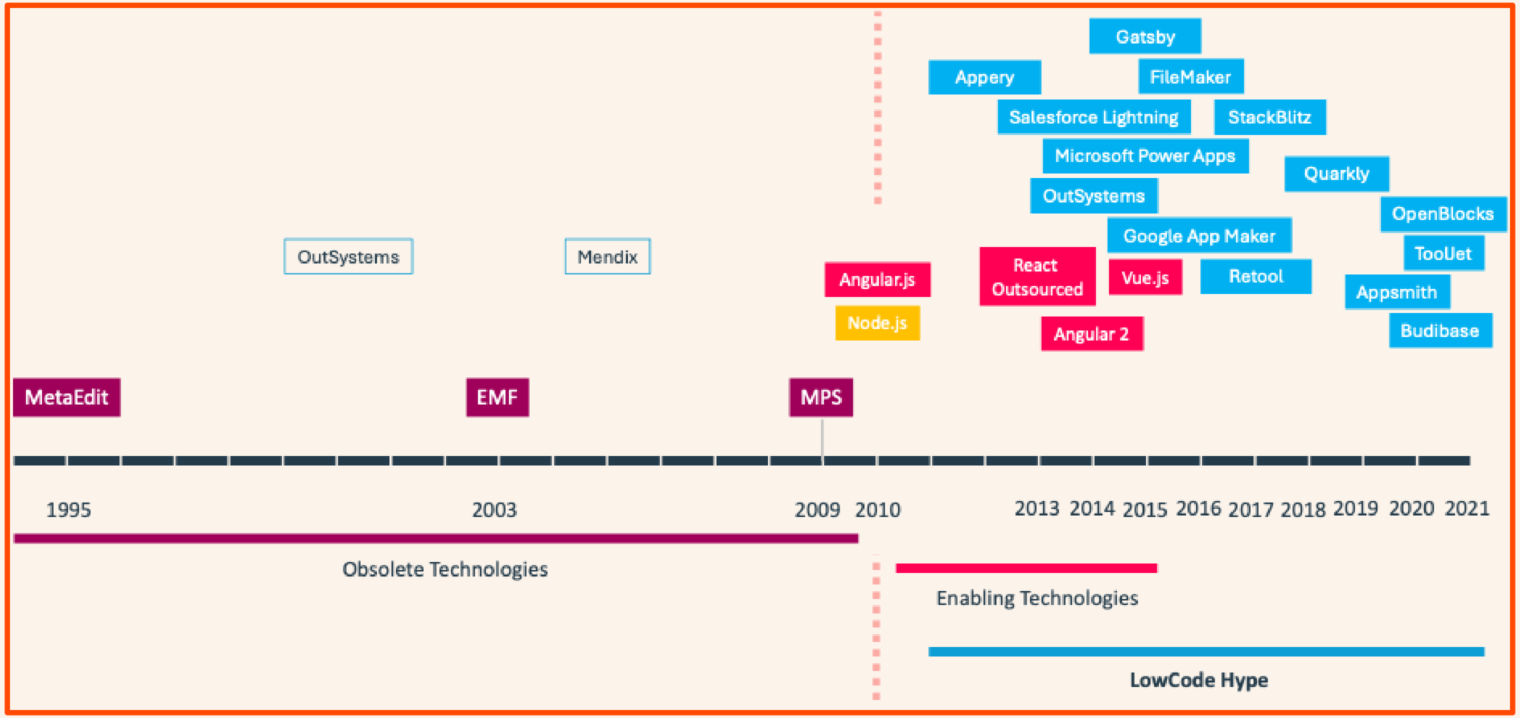

Image by Alfonso Pierantonio

Short about JJODEL

- It is a web/cloud-based language workbench
- It adopts a reflective editing approach
- Supports built-in governance including co-evolution
- Syntax beyond topological notations
- Collaborative modelling

A good point to start: https://www.jjodel.io

Lessons learnt with students

- Develop fairly complex modelling languages
- There is an interesting shift of focus to the concrete syntax
- There is a shift of focus towards language engineering tasks

Lessons learnt with researchers

- Positional semantics
- Multi-view based development
- Distributed modelling

Who should develop the tools?

- Tool providers
  - “reliable”
  - lock-ins
- Crowd-sourcing
  - reduced lock-ins
  - less “reliable” (?)
- Academia
  - innovation
  - no reward system for tool development

THANK YOU!

Antonio Cicchetti, antonio.cicchetti@mdu.se

Mälardalen University