MAKING MEANS-END-MAPS WORKABLE
FOR RECOMMENDING TEACHING METHODS

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Outline

- Motivation

- Means-End-Maps

    - Short Overview

    - Modifications

- Summary and Future Work

Motivation (1)

Hmm, what can I do to foster SE-related competencies of students effectively and efficiently?

How can I benefit of others' experiences (and let others take advantage of mine)?

Motivation (2)

I need a way to describe learning settings…

Goals

Target competencies

Constraints / Restrictions

Course settings

Methods / Tasks

Didactical methods

Experiences made

Outcomes

Motivation (3)

+ Modeling must be

  + quick and easy

  + distributed, i.e. shareable with colleagues

  + basis for recommendations

➡ Goal-oriented modeling

Motivation (4)

- i*
  - doable,
  - but …
    - no perfect match to the modeling problem
    - complex models [Koch / Landes 2014]

➡️ Means-End-Maps [Wang et al. 2014] ?
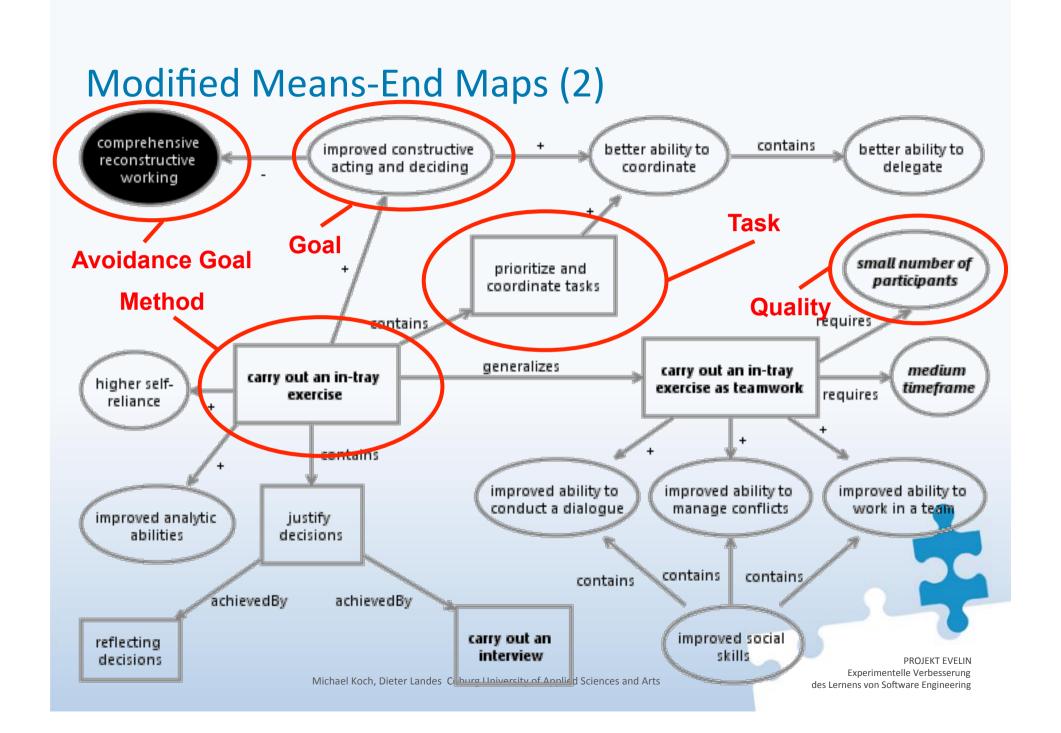
Reich's Pool of Constructivist Methods as a trial

Means-End Maps

Element	Know-how mapping based on i*[1]	Know-how mapping based on the ME-map
Node	*Goal* (usually, plays the role of a problem)	*Task* (unifies both problem and solution perspectives)
	Task (usually, plays the role of a solution)	
	Softgoal	*Quality*
Link	*means-ends* link	*achieved-by* link
	decomposition link (refers to softgoals or tasks)	*consists-of* link (refers to tasks)
		association link (refers to qualities)
	contribution links (make, some+, help, unknown, break, some-, hurt)	*contribution* links (+, -)
Attribute	[not exist]	*Context* (can be assigned to nodes and links) is applicable condition
	[not exist]	*Reference* (can be assigned to nodes and links)

[Wang et al. 2014]

Modified Means-End Maps (1)

Element	Means-End Maps	Modified Means-End Maps
Node	Task	Task (what needs to be done)
		Method (how something needs to be done)
	Quality	Soft Goal (intended outcome or avoidance goal)
		Quality (constraint, prerequisite)
Link		generalizes (subsumption)
	consists-of	consistsOf (complete aggregation)
		contains (incomplete aggregation)
	achieved-by	achievedBy
	association	requires (prerequisite)
	+, -	+, - (positive, negative contributions)

Modified Means-End Maps (2)

comprehensive reconstructive working

improved constructive acting and deciding

better ability to coordinate

— contains → better ability to delegate

Avoidance Goal

Goal

Method

Task

prioritize and coordinate tasks

Quality

small number of participants

requires

higher self-reliance

carry out an in-tray exercise

— generalizes → carry out an in-tray exercise as teamwork

requires

medium timeframe

contains

improved analytic abilities

justify decisions

improved ability to conduct a dialogue

improved ability to manage conflicts

improved ability to work in a team

contains

contains

contains

achievedBy

achievedBy

reflecting decisions

carry out an interview

improved social skills

Summary

- **Adaptation of Means-End Maps, driven by**

  - specific modeling problem, i.e. documentation of learning settings

  - specific domain, i.e. software engineering education

  - distinguish

    - tasks and methods

    - goals and qualities

    - incomplete and comprehensive aggregations

Summary

- **Compromise between simplicity and expressive power**
  - leaner than i*, yet not so lean as Means-End Maps
  - potentially generalizable to other domains

Future Work

╫ Development of a graphical editor for Modified
Means-End Maps

╫ Goal models as a basis for an automated
recommendation engine

╫ "With similar goals as you have, others tried…"

Thank you for your attention!

Questions?