Understanding "Why"

in Software Process

Modelling, Analysis, and Design

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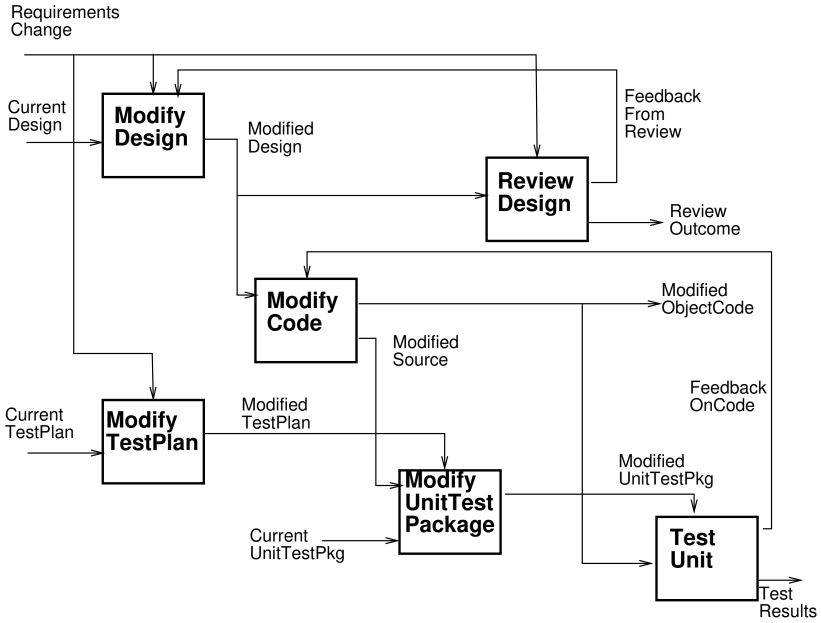
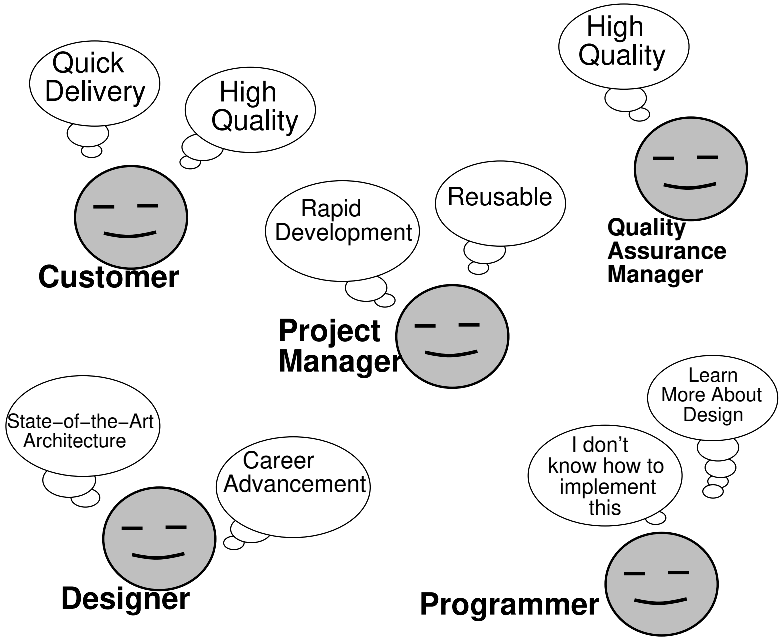
Understanding a Software Process

(from ISPW 6/7 example)



- **We need to understand "WHY" in order to improve a process**

Understanding a Software Process



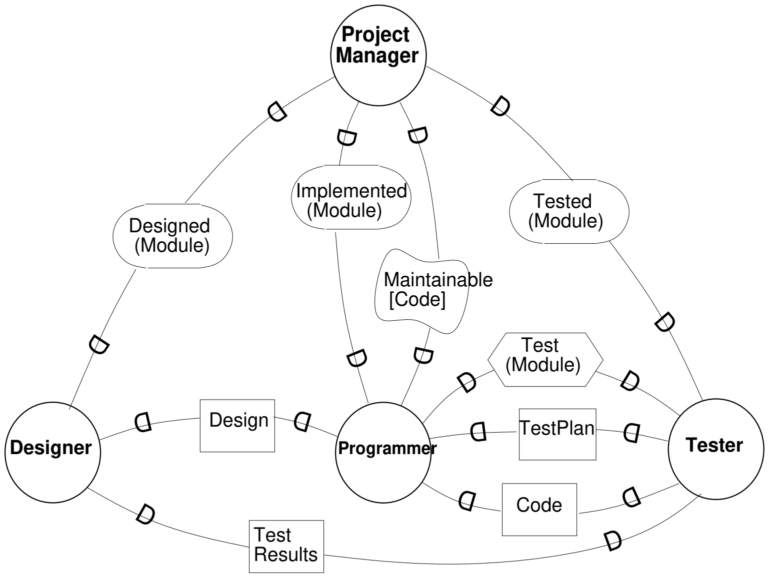
- **The "WHYs" can be traced to motivations, goals, and interests of different participants/ stakeholders in the software process.**

OUTLINE

1. **Motivation**
2. **The Actor Dependency Model** ➡
3. **Representational Framework**
4. **Process Analysis and Design**
5. **Contributions and Related Work**

The Actor Dependency Model

a small example

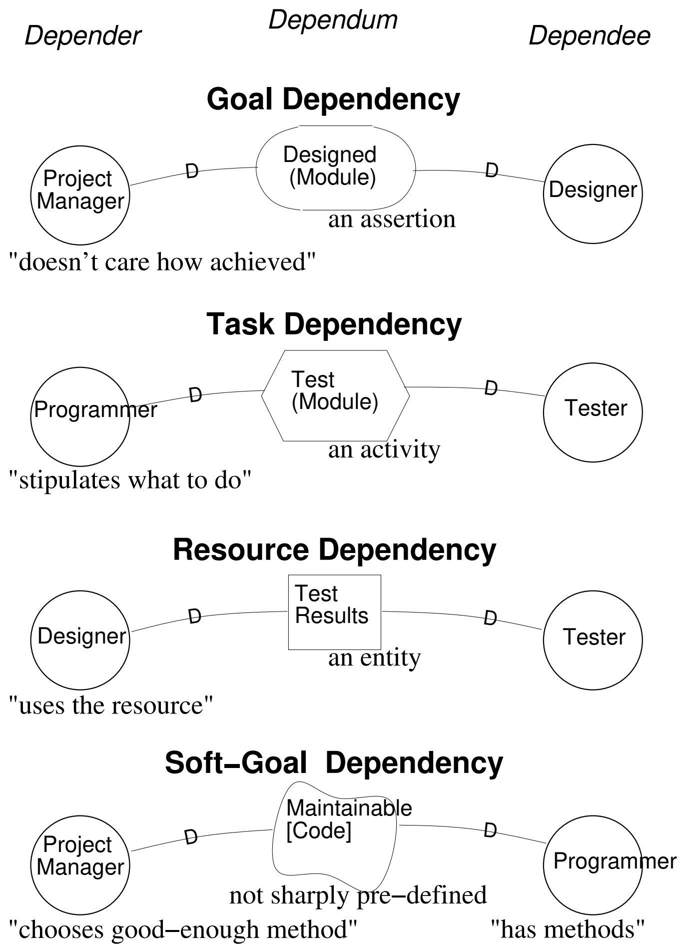


Intentional Dependency

2 aspects:
- **opportunity**
- **vulnerability**

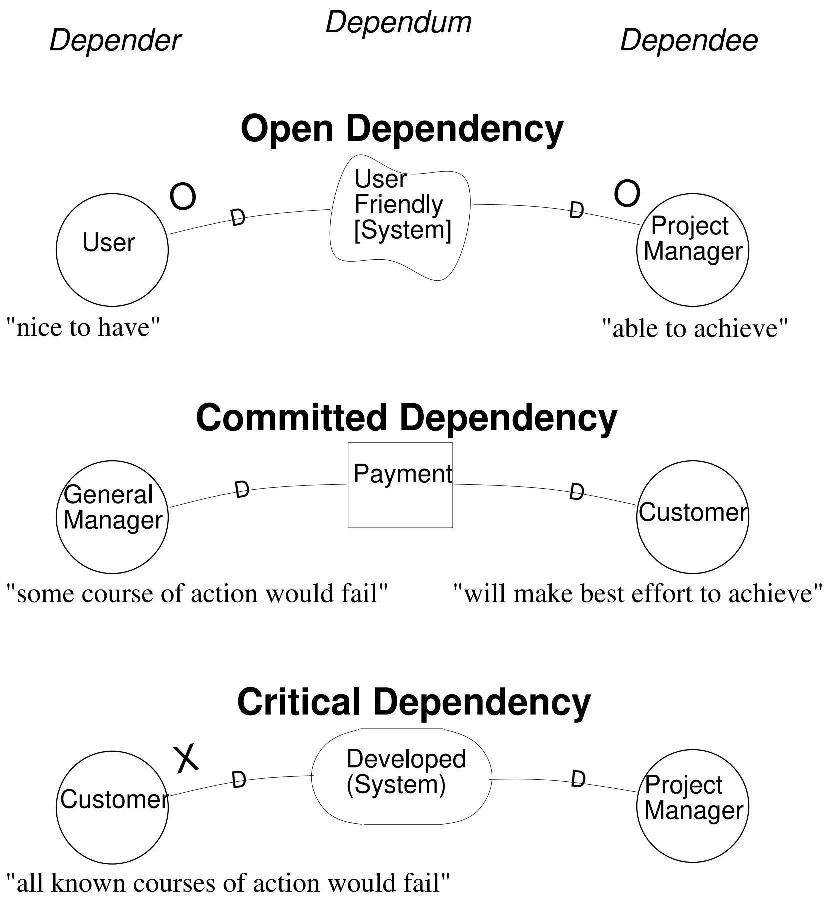
Actor Dependency Model

dependency types



Actor Dependency Model

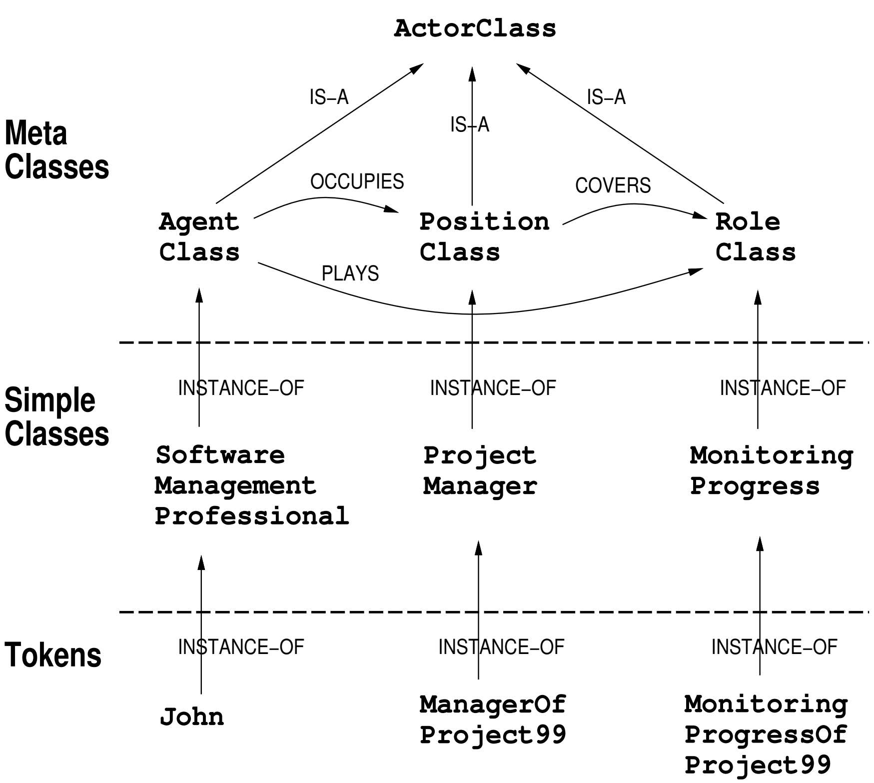
dependency strengths



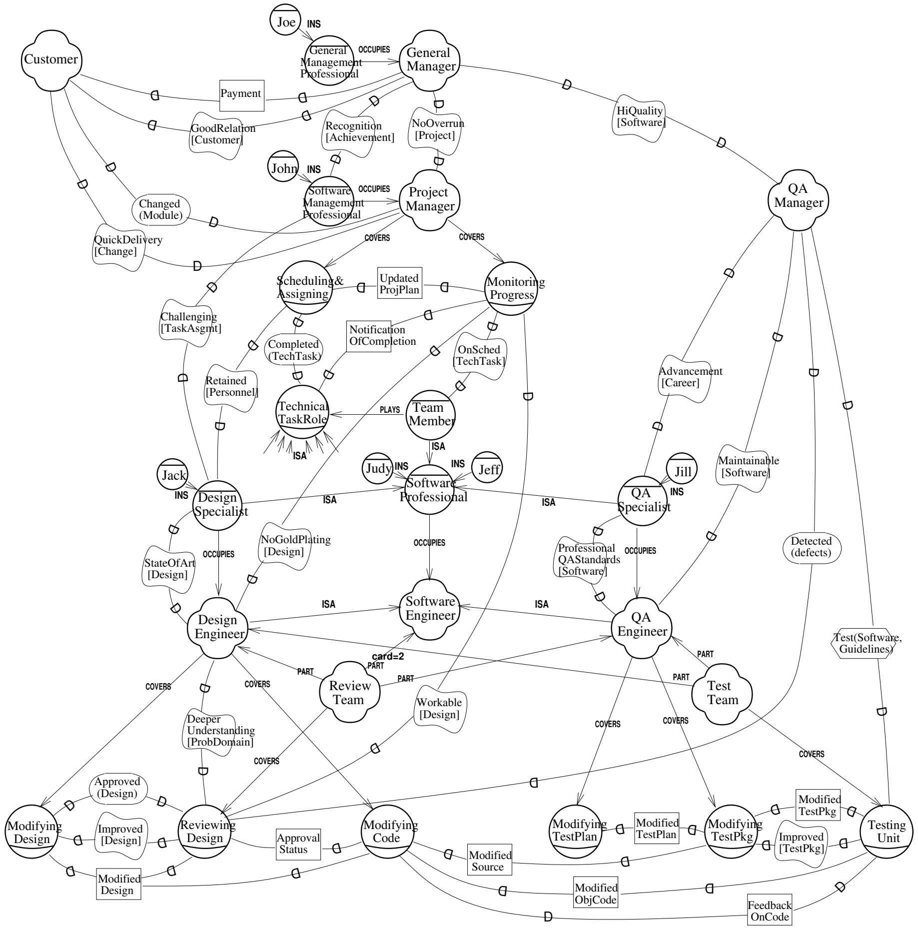
Representational Framework

- The intentional dependency concepts are axiomatically characterized
- The concepts are embedded in the conceptual modelling language Telos
- Makes use of knowledge structuring dimensions such as
  - classification
  - generalization
  - aggregation
  - time

Schema for Roles, Agents, and Positions



Example from ISPW 6/7



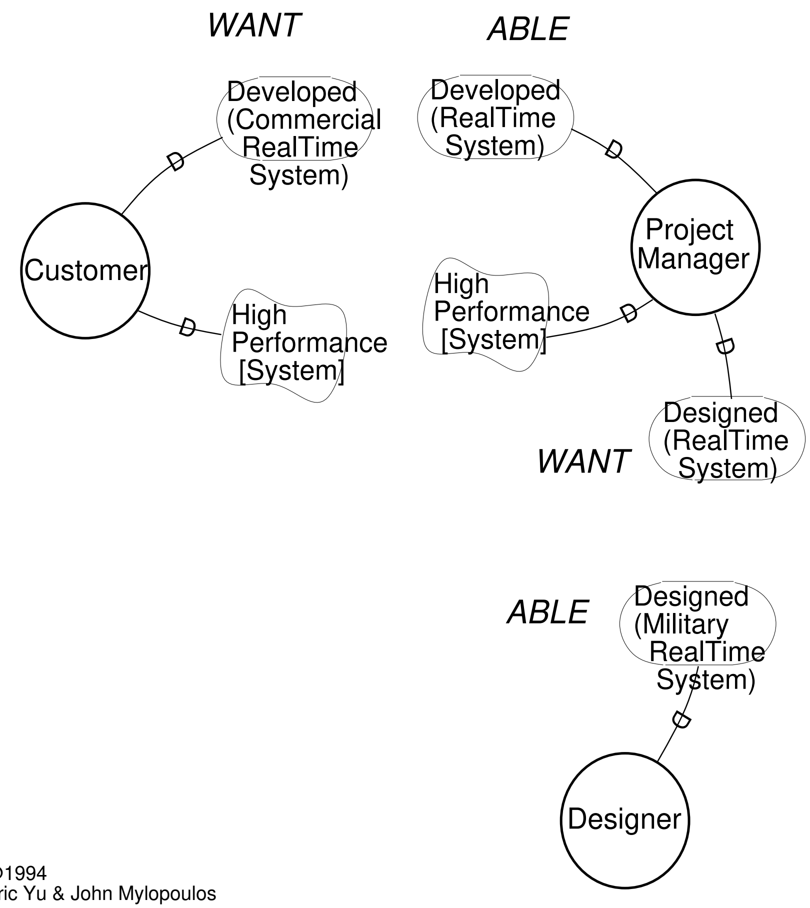
- intentional, strategic players
- understanding of “why”

OUTLINE

1. Motivation
2. The Actor Dependency Model
3. Representational Framework
4. Process Analysis and Design
5. Contributions and Related Work

Analyzing Opportunities

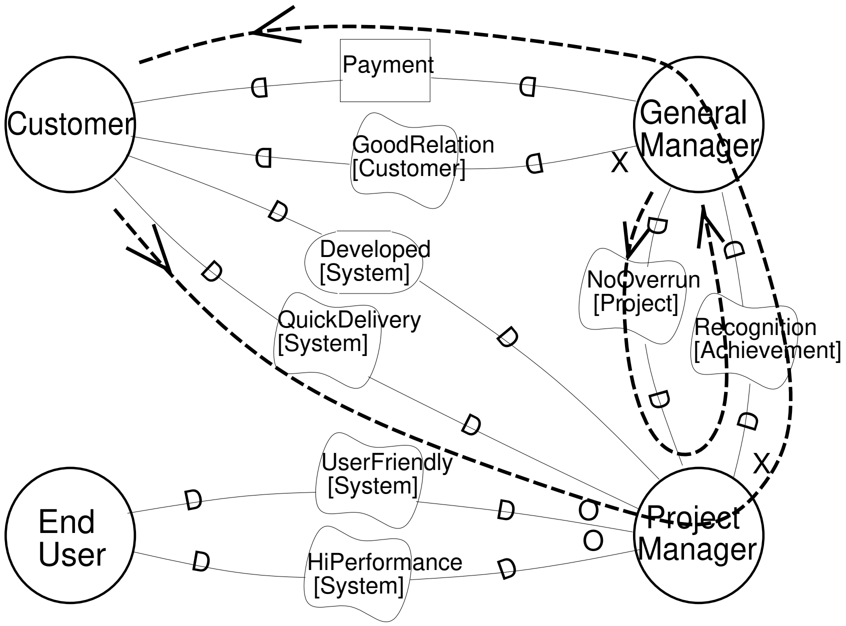
matching WANTS to ABILITIES



Analyzing Vulnerabilities

example of enforcement mechanism:
reciprocal dependency

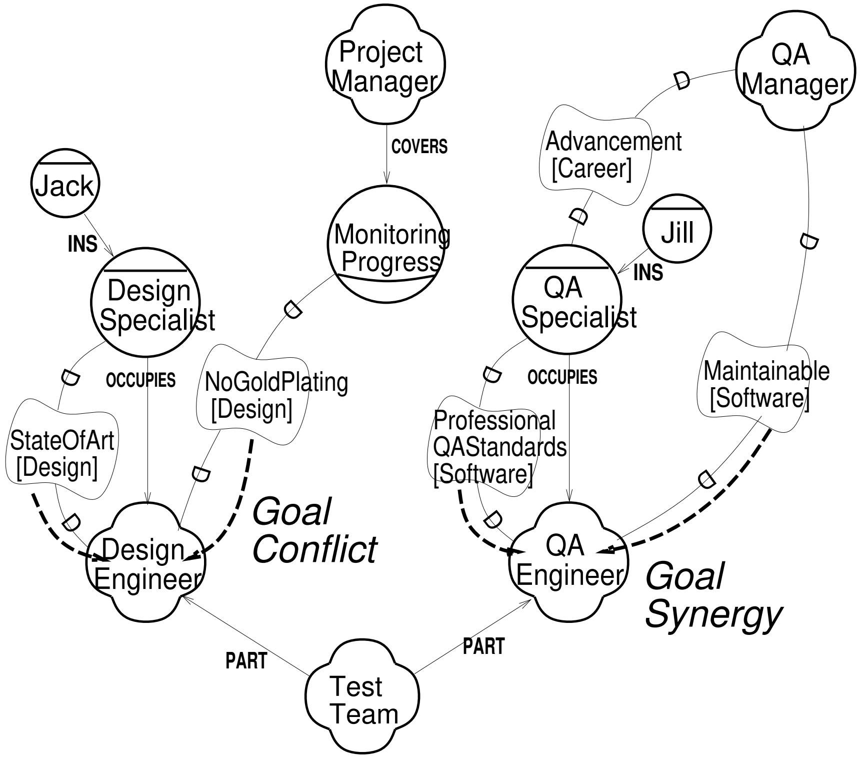
(loop analysis)



Analyzing Vulnerabilities

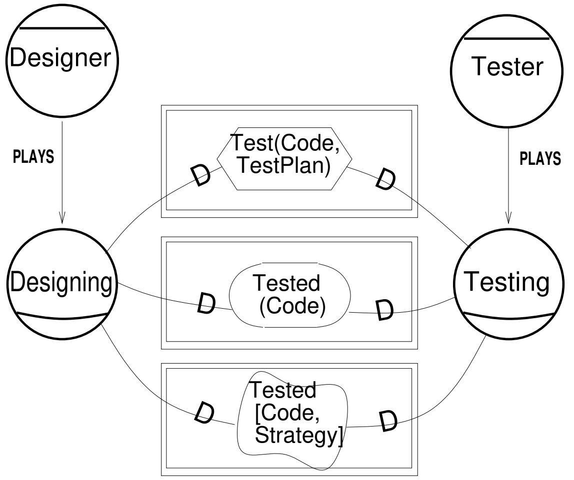
example of assurance mechanism:
goal synergy or conflict

(node analysis)



Towards Systematic Design of Software Processes

Intentional model offers richer distinctions among process design alternatives



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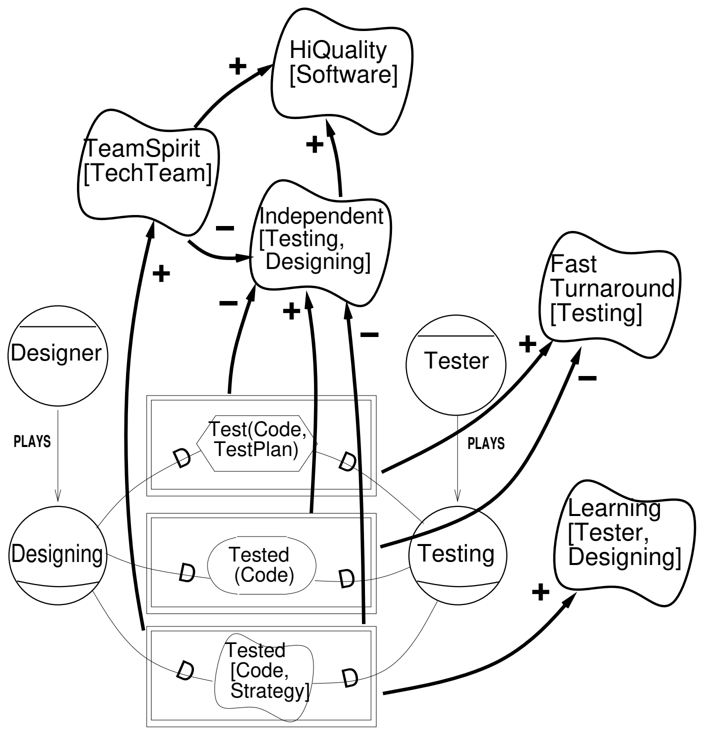
Towards Systematic Design of Software Processes

A design rationale framework is used to support:

- qualitative assessment of alternatives
- design decisions



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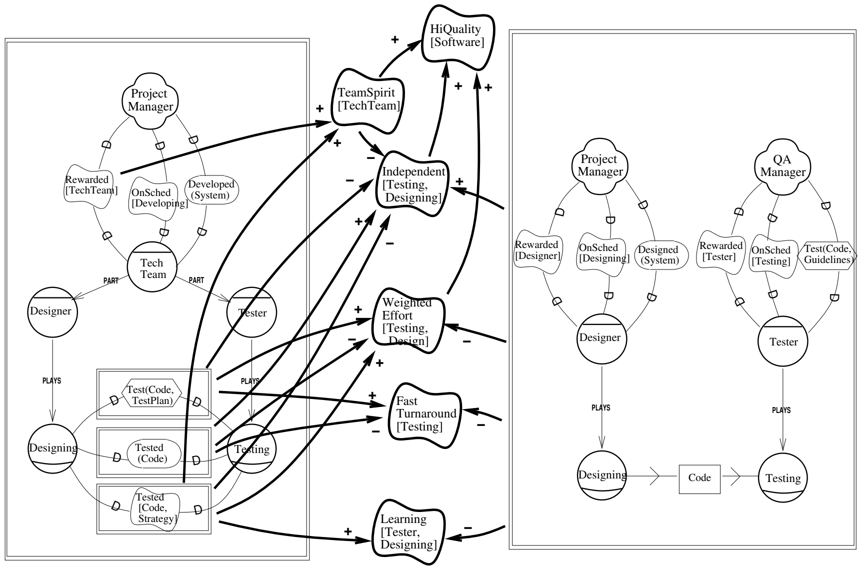
Towards Systematic Design of Software Processes

- **Means–ends reasoning is used to help generate and explore the space of process design alternatives systematically**



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Contributions

A software process model that

- **incorporates the intentional dimension for deeper understanding**
  – process participants have goals, abilities, commitment.
- **supports analysis and design of software processes**
- **is embedded in a conceptual modelling framework**
- **complements enaction models by potentially serving as ‘‘requirements level’’ model**

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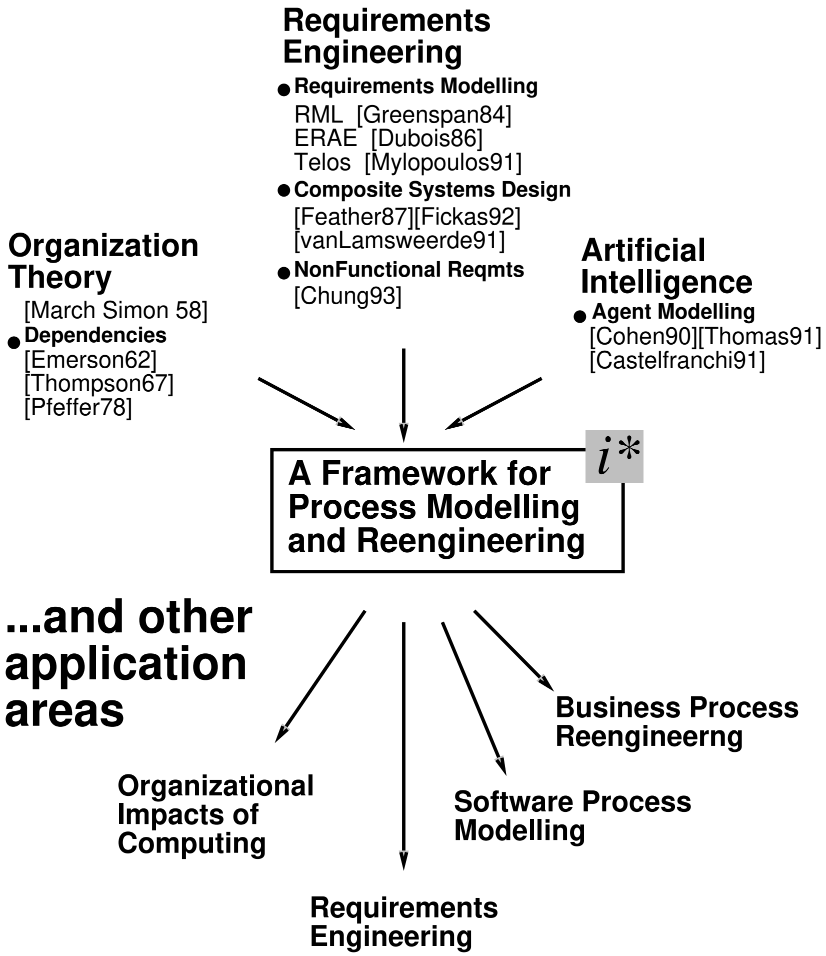
Future Work

- **Refine and test modelling concepts**
- **Implement tools and integrate with Telos support environment**
- **Identify and codify process analysis and design methods**
- **Link to other software process models**
- **Work towards a framework (and tools) to support continuous process improvement (process re/engineering)**
- **Link process re/engineering to the development & evolution of software engineering environments**

Related Work...



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