Generating A Useful Theory of Software Engineering

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Theory is useful if it explains the phenomena being experienced

- Social processes are an intrinsic part of software development (socio-technical system).
- Personal values are an intrinsic part of social processes.
- Logico-deductive approaches from the “arm chair” to developing software engineering theory may lead us away from explaining what is relevant to software development practitioners.

Role of Theory In Engineering

Software Engineering Theory?

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An Opportunity to Display Leadership and Moral Courage

Theory must be useful to practitioners if its to be applied by practitioners

Are “Arm Chair” Theories Created by “Experts” Useful to Practitioners?

Another Approach to Creating Useful Theory: Why Not Involve Practitioners?

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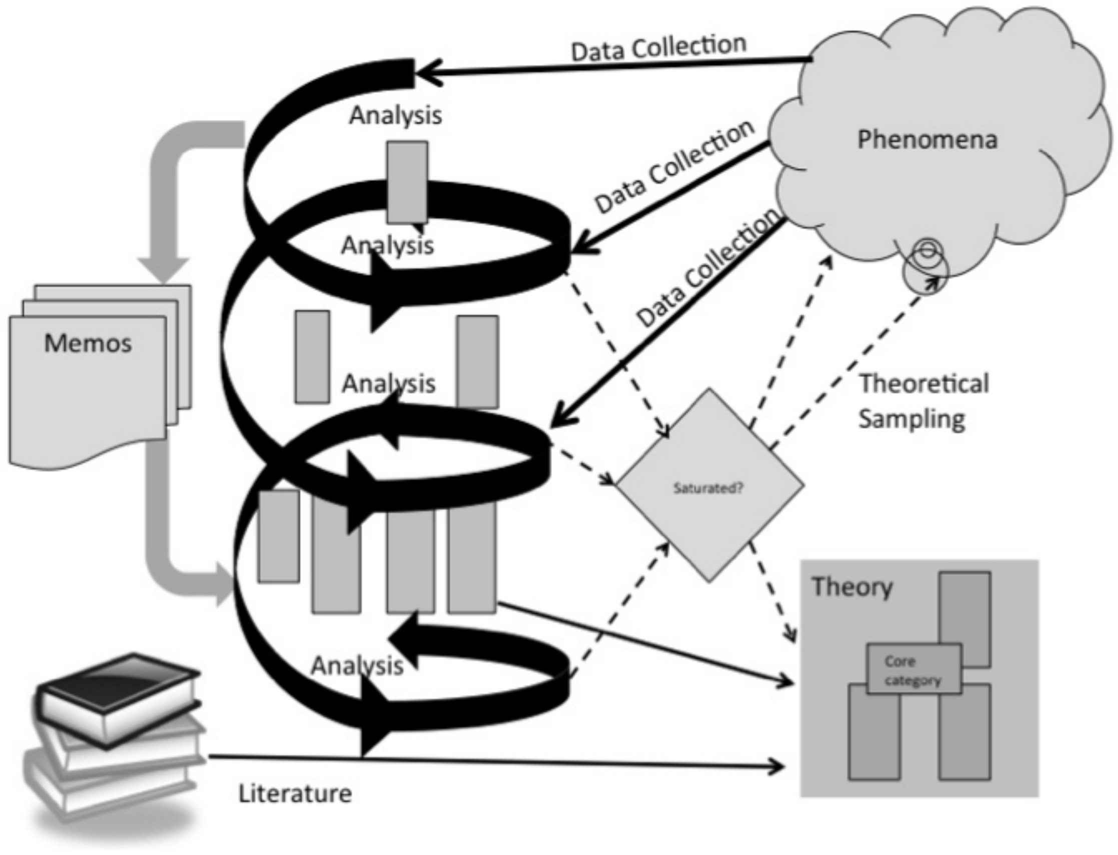
One Approach for Generating Theory By Asking Practitioners



Our Story: Why does a successful middle age practitioner go back to school?

- Software development: a 1.6 trillion industry that seems to have been in “crisis” for last 50 years.
- Lack of software engineering discipline a contributing factor.
- Foundation of good software engineering discipline and software process improvement relies on software methodologies.
- Studies demonstrate benefits from software process improvement.

Yet….

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…few practitioners use software methodologies

- Value of methodologies are questioned by both practitioners and researchers.

  "If we ever did it like that we'd never get the job done!"

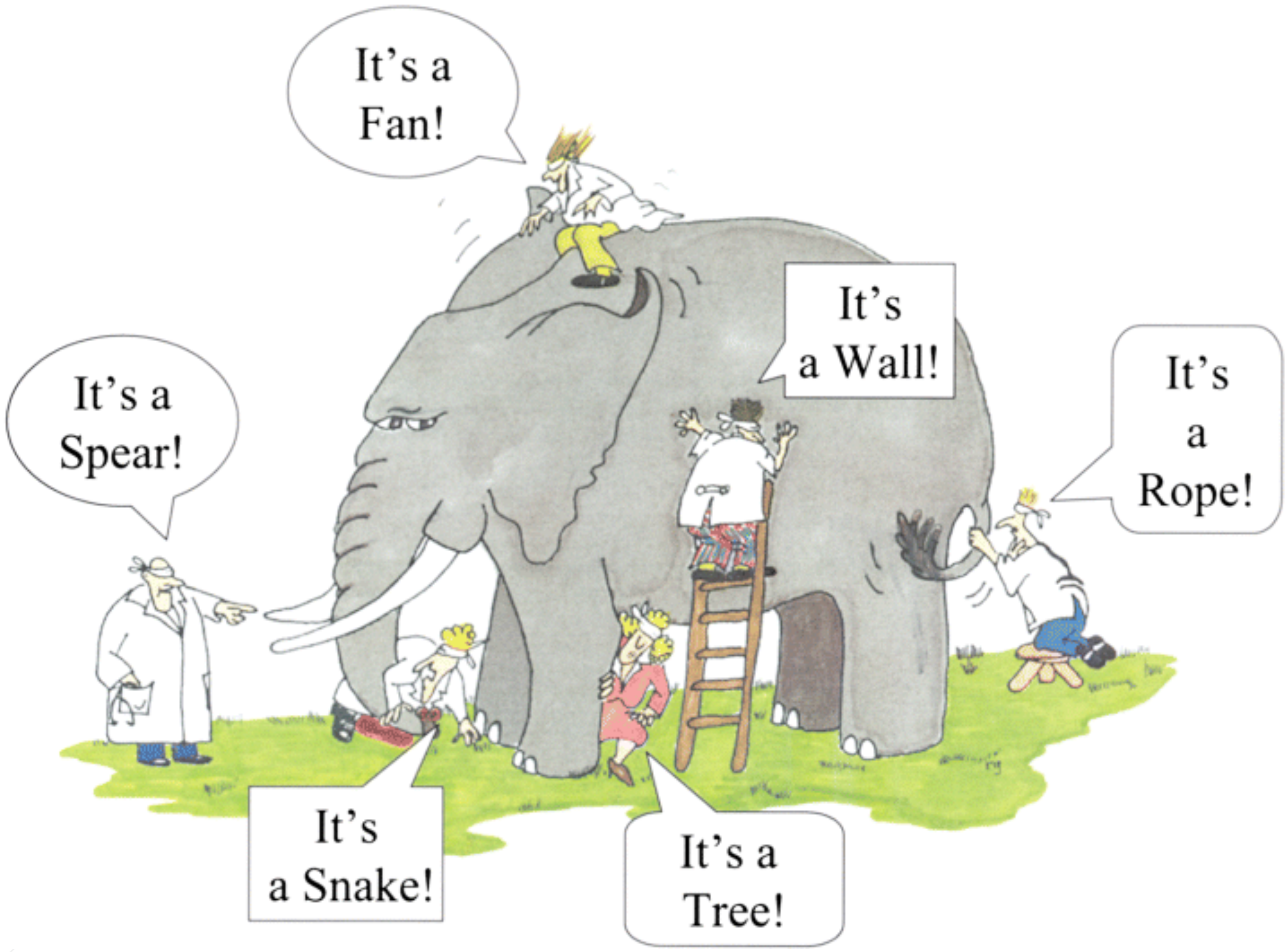
  "The use of software methods and automated development tools provide no explanation for the variance in either software product quality or team performance"' – Sawyer and Guinan 1998

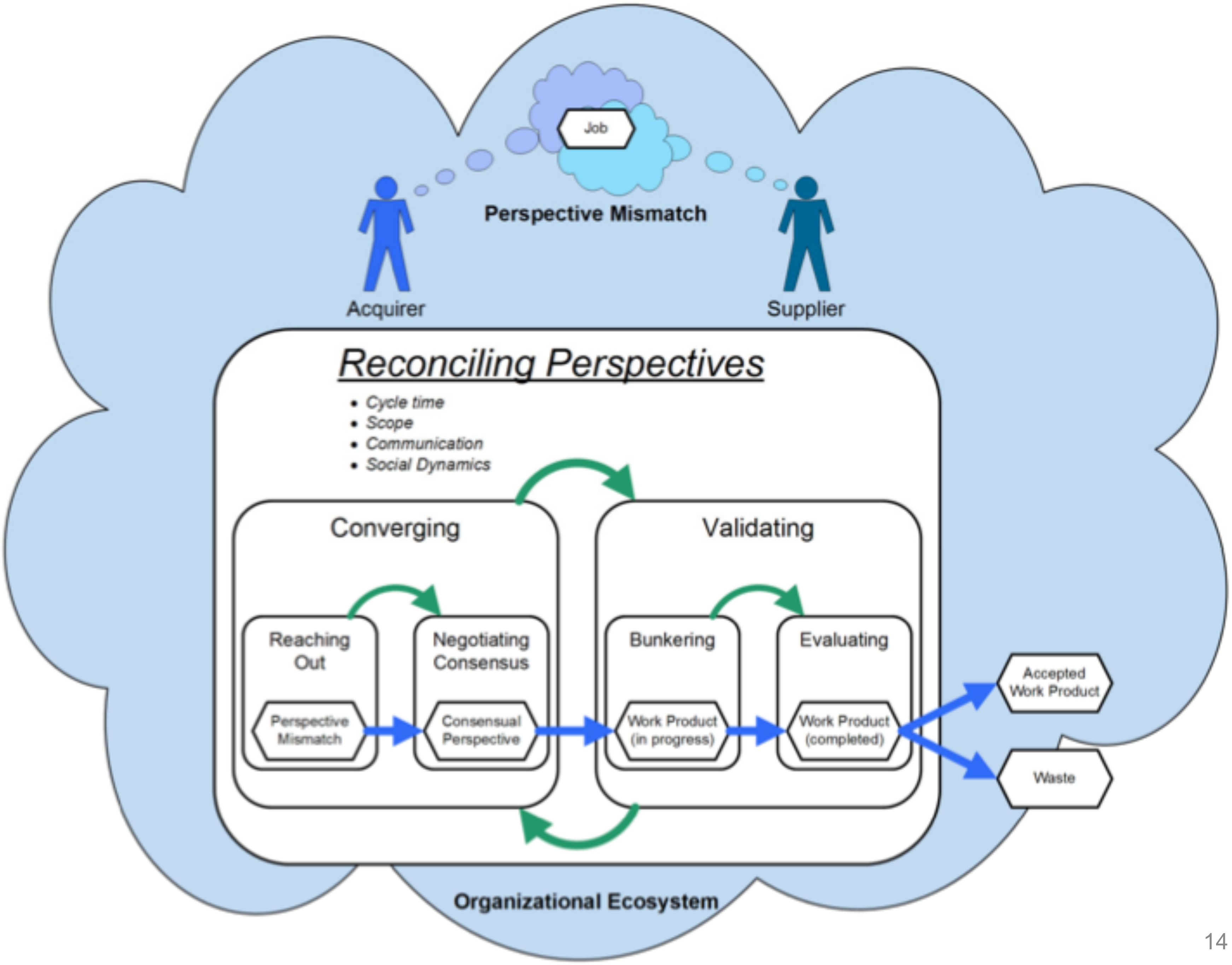
- What is going on here?

Our Approach

- Field Study – go and ask practitioners
- Grounded Theory – analyze data, steer the study and generate a “mid-level” theory
- Use resulting theory to inform the design of software methodologies

Our Results




Job
Perspective Mismatch
Acquirer
Supplier
Reconciling Perspectives
• Cycle time
• Scope
• Communication
• Social Dynamics
Converging
Validating
Reaching Out
Negotiating Consensus
Bunkering
Evaluating
Perspective Mismatch
Consensual Perspective
Work Product (in progress)
Work Product (completed)
Accepted Work Product
Waste
Organizational Ecosystem

Nothing new? Consider…

- *Reconciling Perspectives* is our participant's story
  - Theory emerged from our participant’s stories and our observations of their day-to-day routines
  - Practitioners view software development as a social process
  - Has “grab” - is relevant to software practitioners and make extant theory relevant to practitioners

- *Reconciling Perspectives* is about *Getting the Job Done*
  - not enough to just *Converge*, also need to *Validate* to *Get the Job Done*
  - *Reconciling Perspectives* explains how the *job gets done* (end to end*)*

- *Reconciling Perspectives* as a theory provides an overarching framework for understanding:
  - Connects theories into a process that explains how people manage the process of software development.
  - highlights the communications tension and the need for managed communications.

Is this Useful?
“Yeah, that’s my life!”

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Software Development is a Social Process

- When asked or observed practitioners described software development as a social process.
- *Reconciling Perspectives* is a social process.

"*The design focus of software methodologies should be away from production-centered practices and toward socially-centered methodologies*"

– Sawyer & Guinan 1998

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Thank you: Now on with the quest for the Grail!

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