Promoting Collaborative Systems Thinking
Aligning Culture and Standardized Process

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Research Cluster:
High-Performance Enterprises

Research Contribution:
Strategies for improving engineering processes and efficiently leveraging social assets.

Publications:
C. Lamb and D. Rhodes, *Promoting Systems Thinking Through Alignment of Culture and Process: Initial Results,* CSER Conference, March 2007

Collaborative Systems Thinking

Systems thinking: the analysis, synthesis, and understanding of interconnections, interactions, and interdependencies that are technical, social, temporal, and multi-level.

--Heidi Davidz, 2006

Collaborative systems thinking is systems thinking as a property of an engineering team or organization

How will systems thinking definition change for teams?

Groups produce products

Complimented by ideas of value and efficiency from lean thinking

How do culture and process enable collaborative systems thinking?

Standardized Process

Process: a logical sequence of tasks performed to achieve some objective. Process defines what is to be done without specifying how it is to be done.

--James Martin, 1997

Goal: Codify best practices; facilitate communication; reduce ambiguity and unpredictability.

However, process alone insufficient to guarantee success (Dougherty, 1990; Spear and Bowen, 1999)

Data Sources:

Primary Documents—specify process

Process Flow Maps

Surveys—gage familiarity with process, process artifacts

Interviews—explore how and why practice deviates from process

Culture

Components: Norms of behavior, espoused beliefs, basic underlying assumptions

Culture is difficult to change. This resistance to change is also a reason why process improvements don't succeed.

Data Sources:

Interviews—gage alignment between behaviors, beliefs (visions) and assumptions.

Focus groups—observe interactions, provide context.

Org Charts

Survey—quantify patterns of interaction, social network analysis

Culture: a dynamic phenomenon and a set of structures, routines, and norms that guide and constraint behavior.

--Edgar Schein, 2004

How do engineering processes interact with culture?

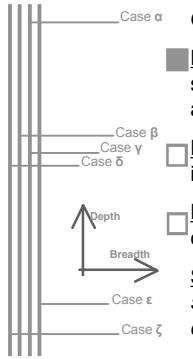
Research Timeline

Secondary Case Study Analysis	Pilot Interviews (End Phase I)	Start Main Case (Phase II)	Additional Cases (Phase III)	Finish Data Collection	Finish Thesis, Publish Results Graduate!
12-2006	2-2007	4-2007	6-2007	12-2007	6-2008

Expected Benefits to Industry

- Operational definition of collaborative systems thinking (CST)
- Identify enablers and barriers to CST
  - –Standardized process
  - –Culture
  - –Leadership
- Explain how CST develops
- Identify best practices, heuristics for aligning culture and process
  - –Ways to tailor process
  - –Feedback mechanisms
  - –Best practices

Research Methodology



Grounded Theory Method

Phase I: Literature review, secondary case study analysis, pilot interviews.

Phase II: One multi-thread in depth case study

Phase III: Several smaller case studies for breadth

Sources: *interviews, surveys, primary documents, focus groups*

Interested In Participating?

Would your organization be willing to host a case study? I am looking for organizations of varying process maturity to host small case studies analyzing interaction between process and culture.

Please contact Caroline Lamb, cmtwomey@mit.edu, for more information.

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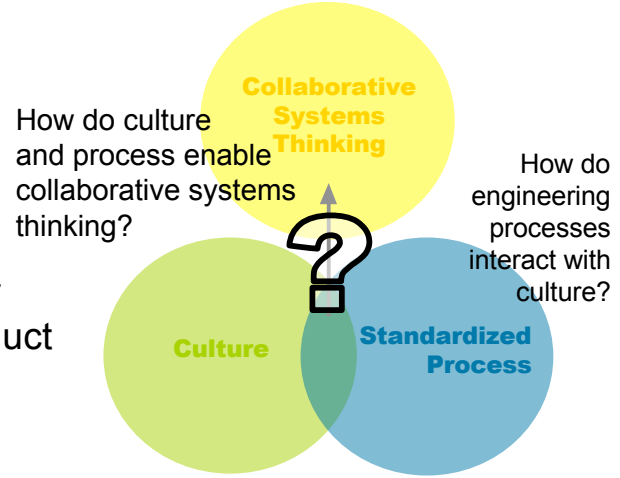
Summary Description

This study examines the development of systems thinking within teams of engineers. Emphasis is placed on the role of standard process and its interactions with organizational culture. Improved understanding into how process and culture support systems thinking development will allow for improved process engineering enabling more efficient product design.



Key Points

•Motivation: Desire to better understand systems thinking at the team level within engineering. This research focuses on the role of standardized process, its artifacts and associated tools, in enabling or promoting systems thinking with teams—termed collaborative systems thinking. Also considered is the role of culture as a context within which teams and process interact.

•Methodology: Interviews, surveys and focus groups will be used to gather data. The sample will consist of aerospace and defense companies. The unit of analysis is the team. Target teams will be selected in cooperation with participating companies. Teams with a diversity of product and process maturity are desired.

•Results: The results of this research will be directly applicable to engineering organizations and will be shared with LAI consortium member companies.

Author

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