HYDRA: Mining Data for Evolving Organizations

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Roadmap

• Research Context
  – Research Goals
  – Questions and Methods
• Where are we now
  – (Some) Key findings so far
• Next steps
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Research Goals

Research Problem:

- Modern markets are dynamic settings in which organizations quickly network with each other

- Organizational Agility means adapting organizations while maintaining relevant KPIs

**RQ : Can we represent and adapt entire organizations using services?**
For Example: Global Software Engineering

Global Software Engineering is carried out by global communities of people... Benefits:

- Lower costs
- Cheap manpower
- Faster delivery
- Innovation
- Quality products
- ...
What is an org. Structure?

“An OSS is the set of interactions, patterned relations and social arrangements emerging between individuals part of the same endeavor” [1]
Research Goal: HYDRA

HYDRA: “Harmonizing synergies in networked organizations.”

Falsifiable Hypotheses:

1. Networked organizations can be expressed by known organizational structures from previous research.

2. Adaptation can be enacted on the Service Networks that sustain these organizational structures.
What is a Service Network?*

“A Service Network (SN) comprises [...] highly dynamic, complex end-to-end service interactions [...] that typically transcend several organizations [...] and geolocations.”

*From the S-Cube Knowledgebase
Research Goal: HYDRA

Networked Organization

Organizational Structure type 1

Supported By

Supported By

Business Service 1

Business Service "n"

Business Service "m"

Supported By

Supported By

Organizational Structure type n

Service Dependencies

SERVICE NETWORK
Research Questions and Methods

• RQ1: What types of social communities are known in literature?
  HOW → Systematic Literature Review of Organizational-Social-Structures for software engineering

• RQ2: How can one uncover an observable social community (e.g. a GSE effort) using known types?
  HOW → formulate a decision problem and solve it

• RQ3: How can one represent the resulting “socio-technical web” with services?
  HOW → Service Identification Methods to be applied on empirical data

• RQ4: How can one support the resulting “socio-technical web” with service networks?
  HOW → Organizations and Systems Theory + Social-Network Analysis
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RQ1 Key Findings: **state-of-the-art in org. structures** [1]

- **ProjectTeams**: M1.234, M4.1, M4.5b
  - Found 3 times in 3 papers
  - Found 27 times in 18 papers

- **FormalGroup**: M1.23, M1.186a-c, 252
  - Are picked from
  - Found 19 times in 16 papers

- **LearningCommunity**: M1.231
  - Found 9 times in 9 papers
  - Found 15 times in 14 papers

- **SocialNetworks**: M1.280-282
  - Found 10 times in 7 papers

- **FormalNetwork**: M1.280-282
  - Found 6 times in 6 papers

- **InformalNetwork**: M1.280
  - Found 56 times in 36 papers

- **CommunityOfPractice**: M1.277
  - NetworksOfPractice: M1.185-186, M1.287, 288
  - Found 93 times in 38 papers

- **KnowledgeCommunity**: M1.279
  - Found 10 times in 7 papers

- **ProblemSolvingCommunity**: M1.279
  - Found 9 times in 7 papers

- **WorkGroup**: M1.229
  - Found 9 times in 9 papers

- **InformalCommunity**: M1.239, 246, 250
  - Found 9 times in 9 papers

M5.38: defines the constellation concept as a sum of social networks
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RQ2 Key Finding: a decision-tree to uncover org. structure mixes for software development [2]
RQ2 Key Finding: use of the tree

The decision-tree **uncovers observable org. structures types:**

- **Adapt networks to adapt communities**
- **Monitor service networks**
- **Associate service networks**
- **Identify org. structures**
- **HYDRA Approach**

**Validating the tree:**
- Empirical Evidence
- Proof of correctness-by-construction for the decision tree
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• empirical data describing org. structures (F+NF requirements)

• Use service identification methods & org. data mining* [4]

* ServiceWave 2010
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RQ4: How can one support the resulting “socio-technical web” with service networks?

1. Analyze service network, e.g.
   1. To locate and mitigate organizational barriers
   2. To maintain socio-technical congruence [5]
   3. ...

2. Adapt service network, e.g.
   1. To support change in communities
   2. To support open-enterprises
   3. ...

But this is future work 😊
Thanks! Questions? Comments?

Oh... btw, Merry X-MAS 😊
Bibliography


