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

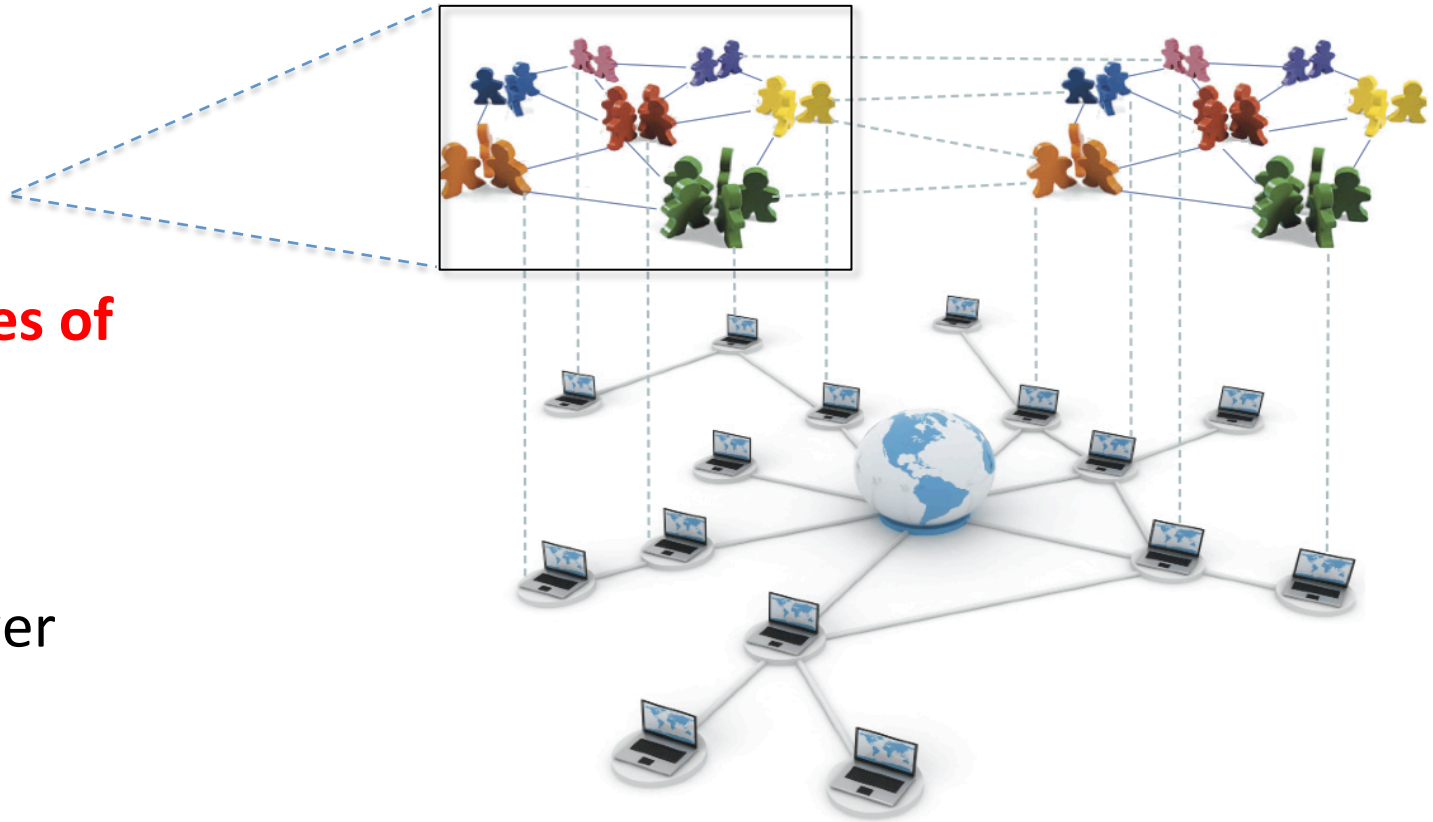
→ Organizational Agility means adapting organizations while maintaining relevant KPIs

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
- …

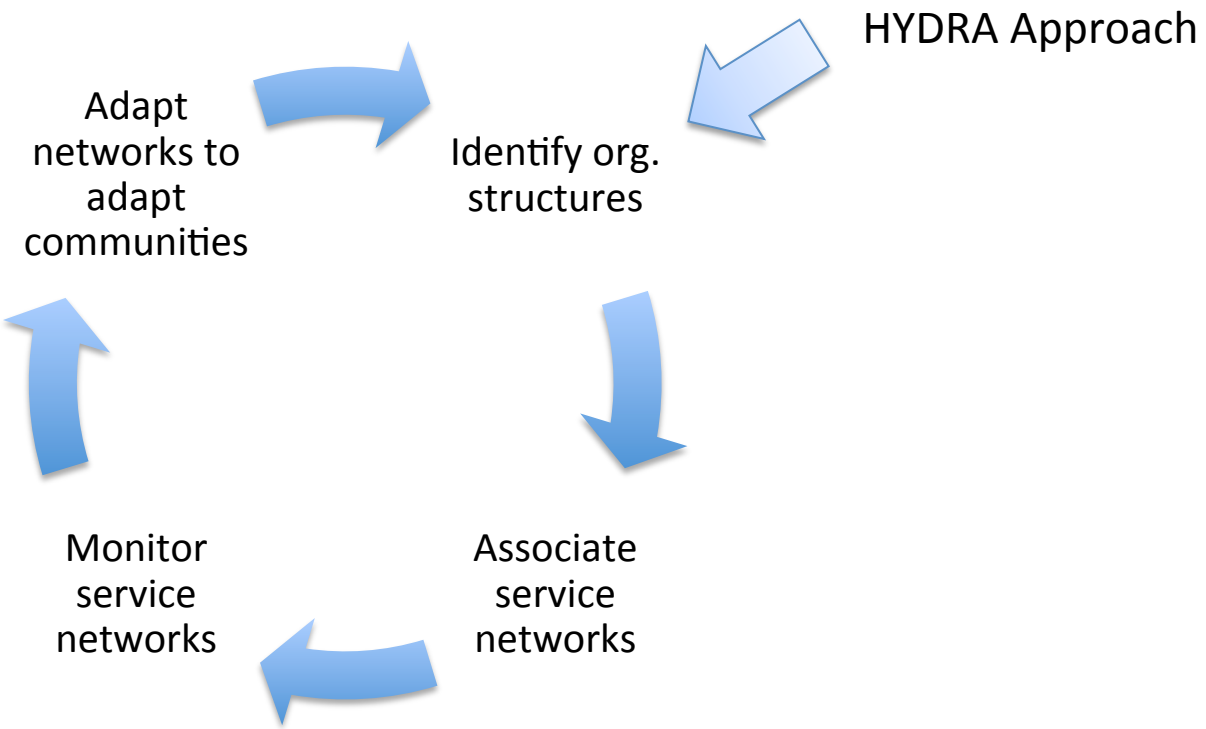


What is an org. Structure?

"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:

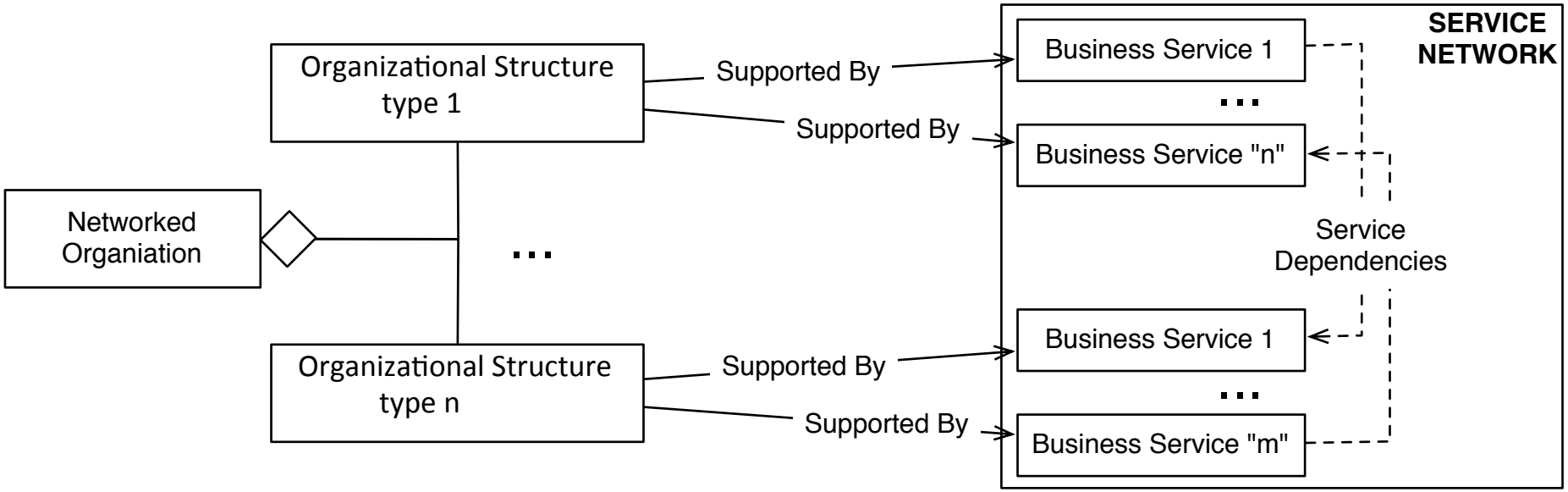
1. ***Networked organizations*** *can be expressed by known* ***organizational structures*** *from previous research*
2. *Adaptation can be enacted on the* ***Service Networks*** *that* ***sustain*** *these* ***organizational structures***

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



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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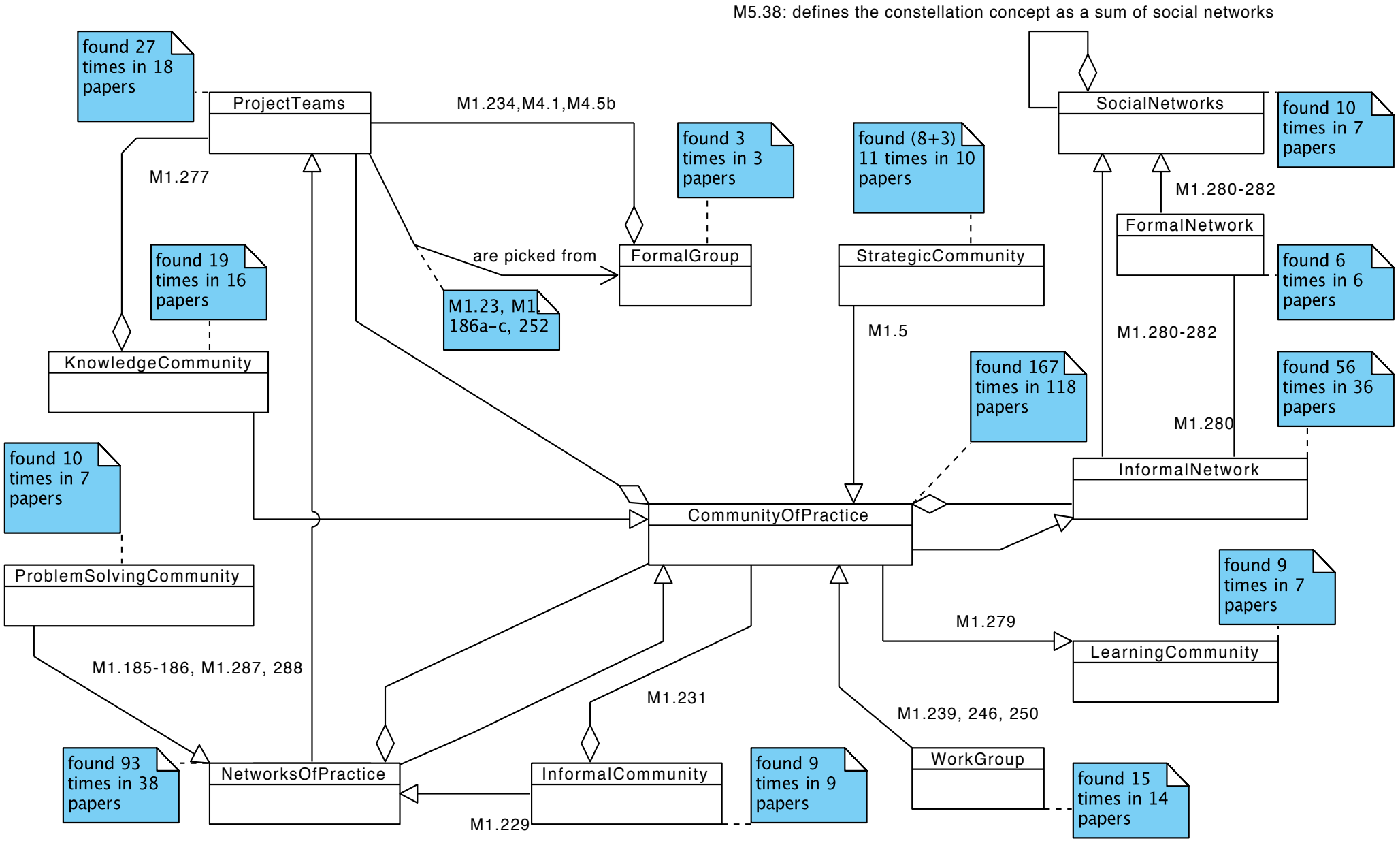
RQ1 Key Findings: **state-of-the-art in org. structures [1]**



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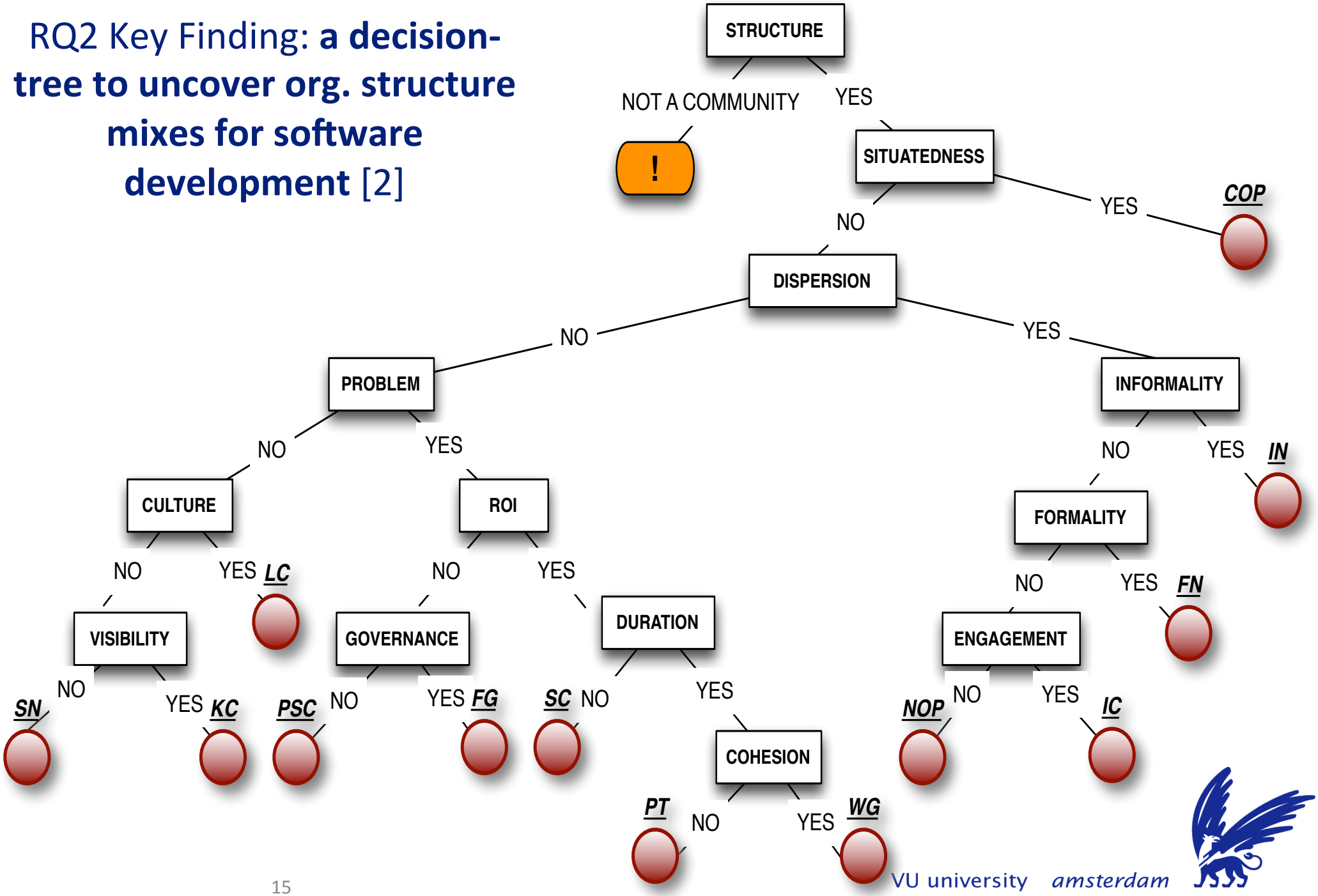
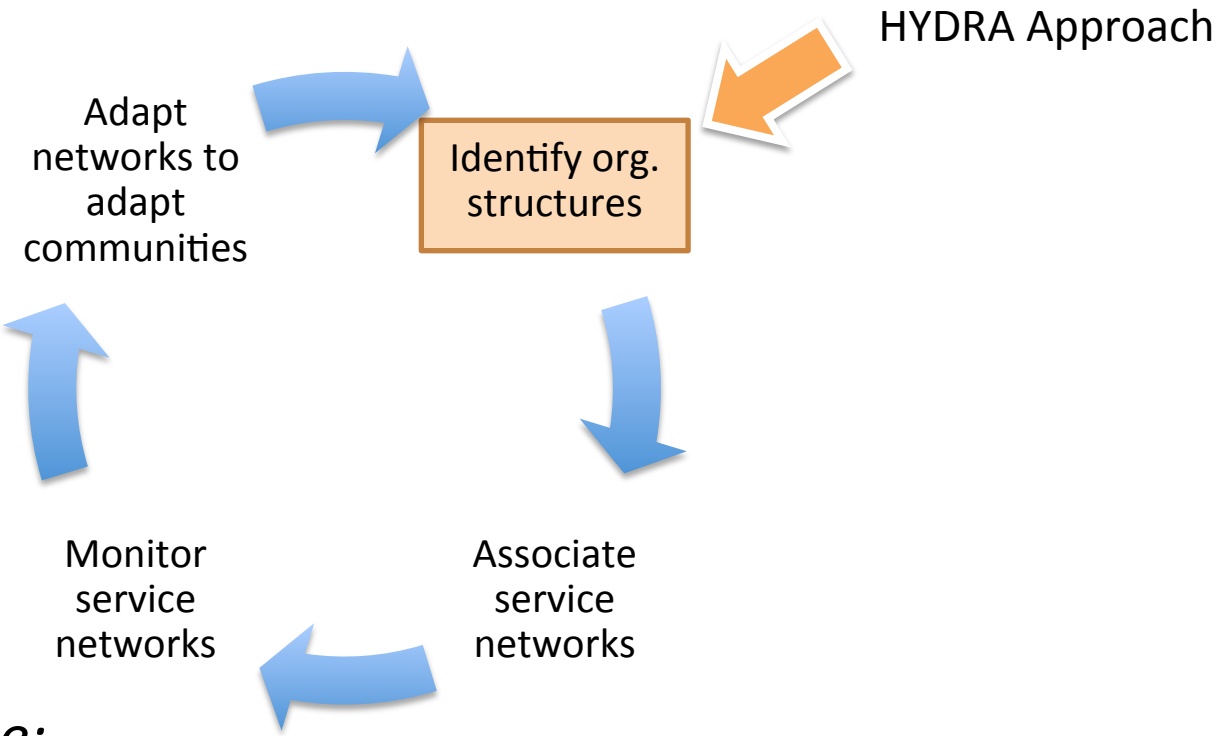
RQ2 Key Finding: **a decision-tree to uncover org. structure mixes for software development** [2]



RQ2 Key Finding: use of the tree

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



Validating the tree:

- *Empirical Evidence*
- *Proof of correctness-by-construction for the decision tree*

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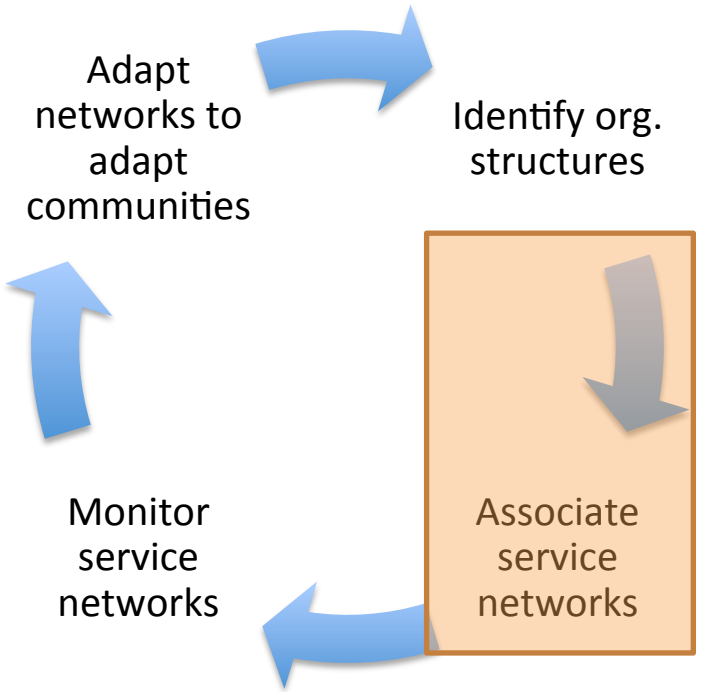
RQ3: How can one represent the resulting "socio-technical web" with services?

- empirical data describing org. structures (F+NF requirements)
- Use service identification methods & org. data mining* [4]



* ServiceWave 2010

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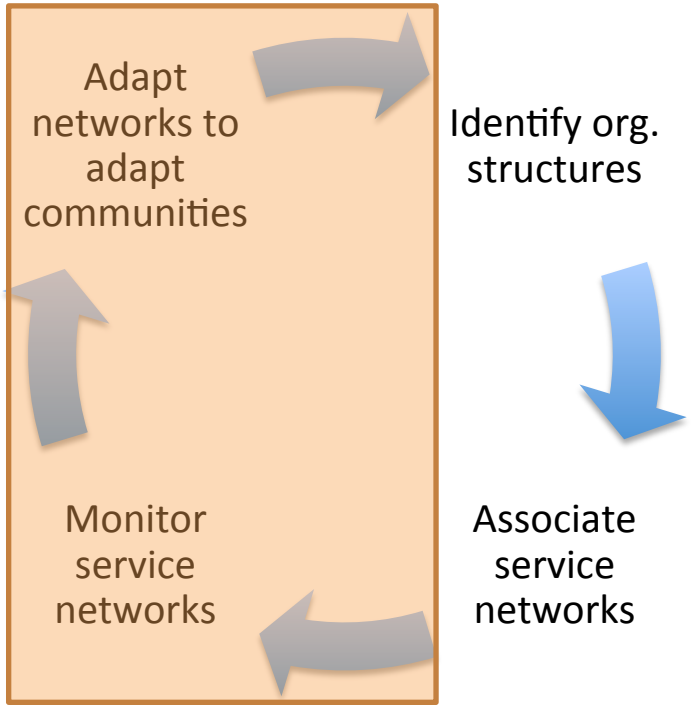
RQ4: How can one support the resulting "socio-technical web" with service networks?

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

- [1] D.A. Tamburri, P. Lago, Hans Van Vliet "Organizational Social Structures for Software Engineering" - ACM Computing Surveys, 2012
- [2] IEEE Software, Special-Issue on Bridging Software Communities through Social Networking, "Uncovering Latent Social Communities in global software development" 2012
- [3] "supporting cooperation and collaboration in global software engineering with agile service networks" – Proceedings of ECSA 2011 – Essen (DL) - 2011
- [4] "Patricia Lago: Service Identification Methods: A Systematic Literature Review. ServiceWave 2010: 37-50"
- [5] "Marcelo Cataldo, James D. Herbsleb, Kathleen M. Carley: Socio-technical congruence: a framework for assessing the impact of technical and work dependencies on software development productivity. ESEM 2008:2-11"