DevOps Performance Engineering: A Quasi-Ethnographical Study

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DICE Horizon 2020 Project
Grant Agreement no. 644869
http://www.dice-h2020.eu

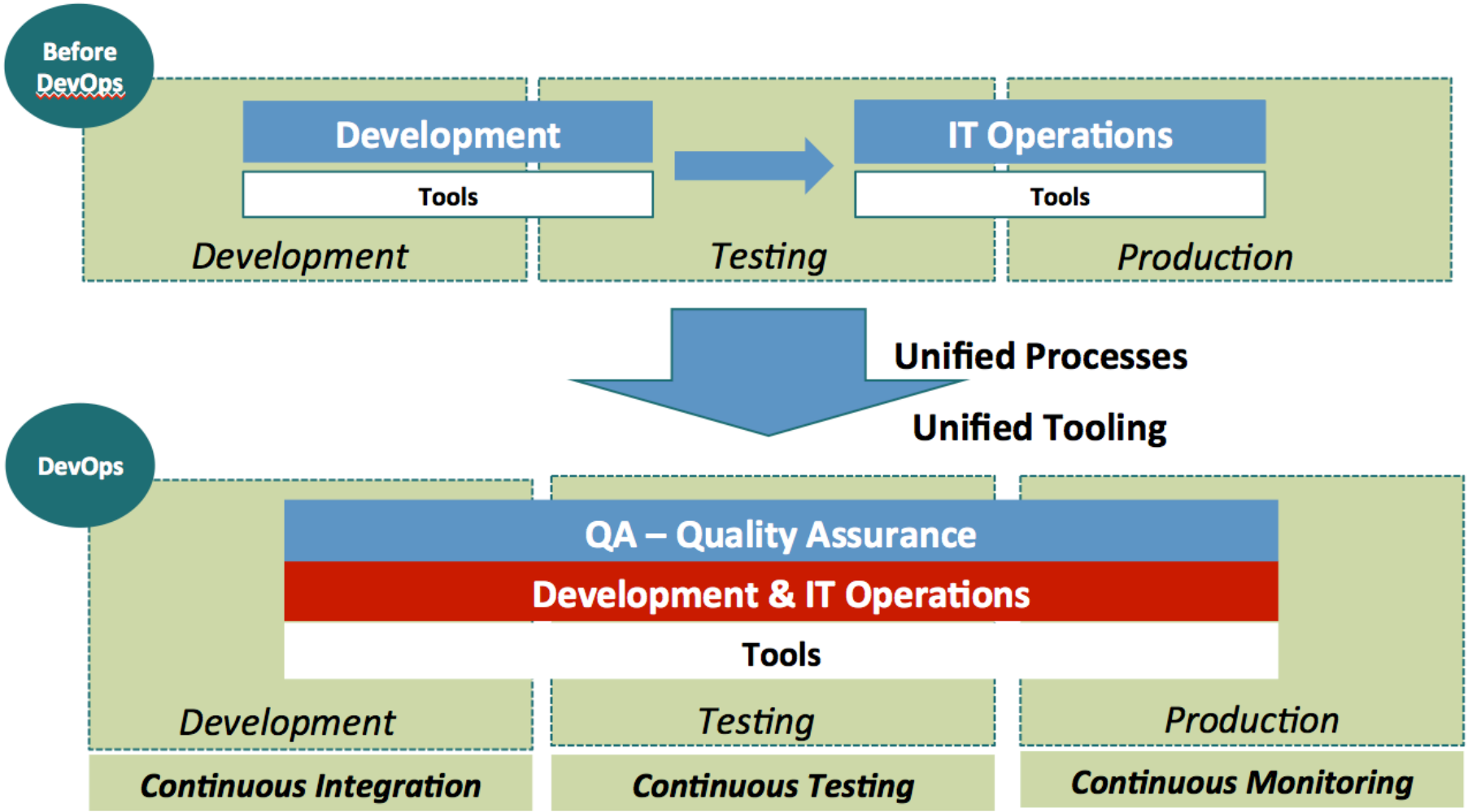
Funded by the Horizon 2020
Framework Programme of the European Union

Roadmap

1. DevOps in pills and research problem
2. Research challenges and approach
3. Research Playground: The Phoenix Project
4. Results: 13 Processes in DevOps to be analysed
5. Conclusions and Research Agenda

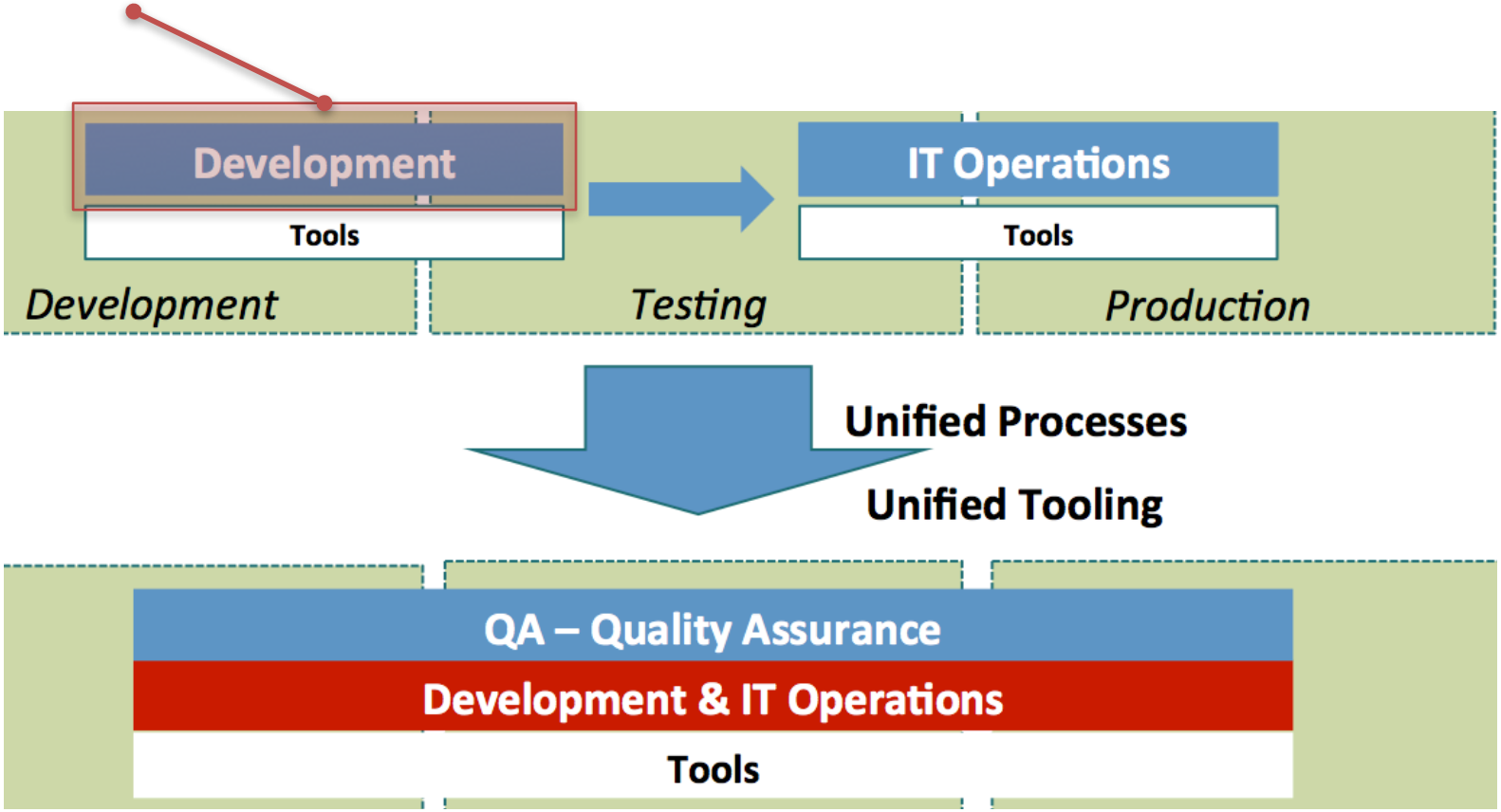
DevOps in pills!

- DevOps is "A set of practices and tools to reduce the time to commit a change to production, while ensuring high-quality." (*Bass et al.,'15*)



DevOps in pills!

***SPE** has **focused** mostly **in** analyzing **products** and at self-contained phases*



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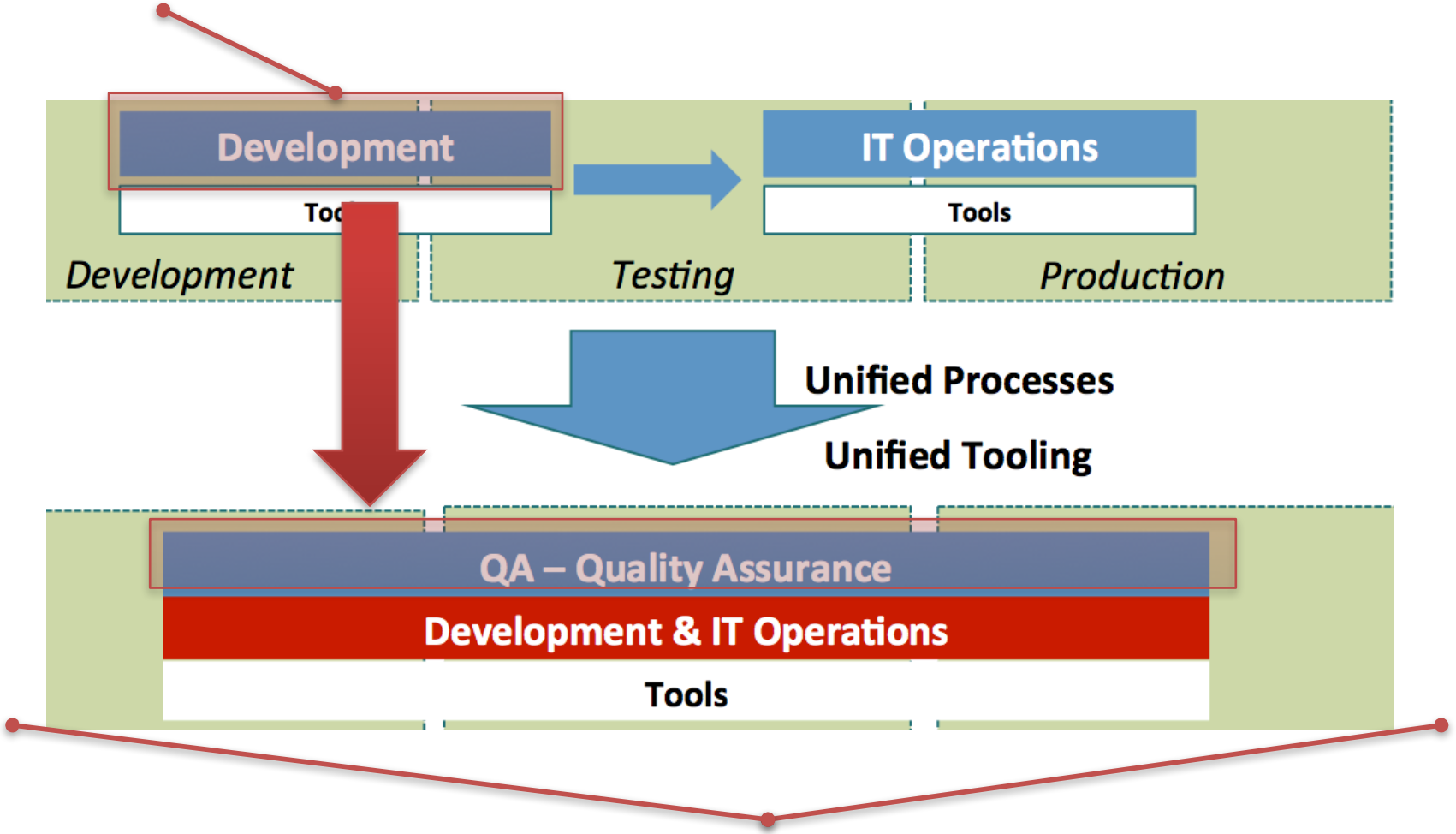

***Can SPE span the entire DevOps process?** To what degree? how/where?...*

Research Problem

- SPE, typically product-scoped discipline…
  - Can we enlarge its scope? E.g., to encompass:
    - Tasks
    - People
    - Organizational structure
    - Multiple phases
    - Multiple views
    - …

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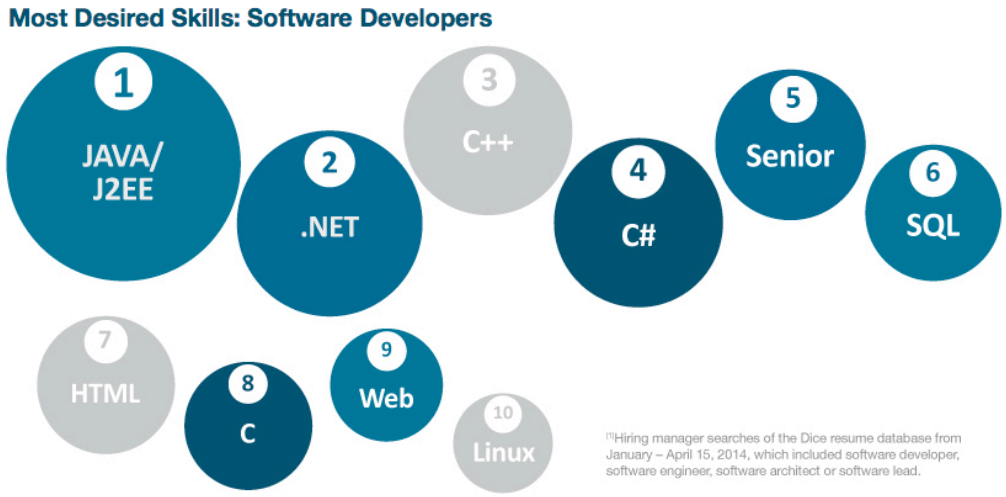

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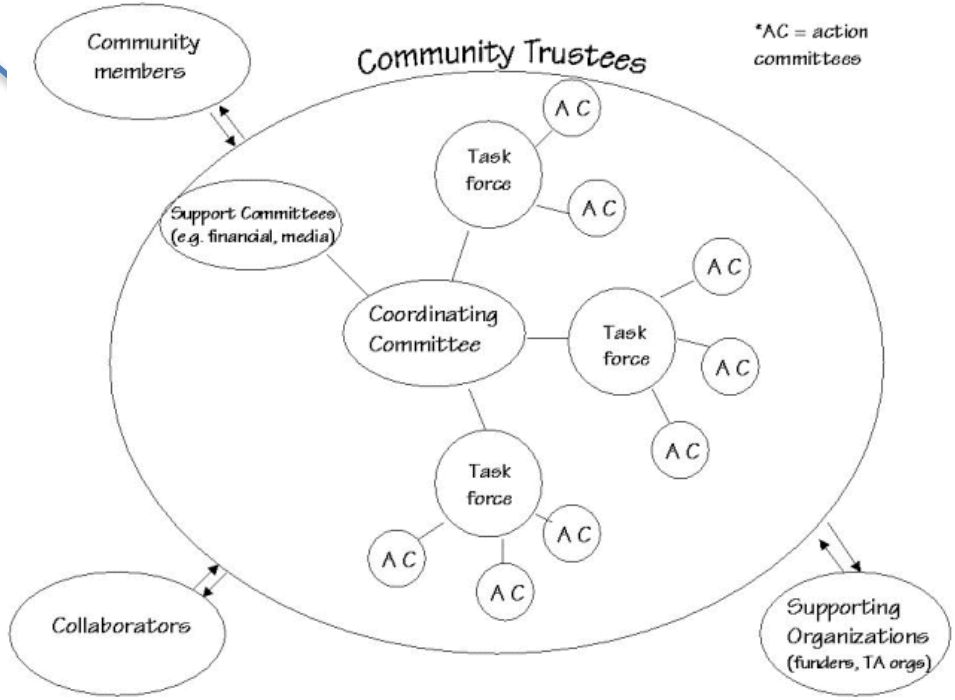

Research Challenges

This is what we mean with **DevOps Performance Engineering**: "*SPE applied to entire Dev- -Ops Organisational Structure and Community's Socio-Technical Processes*"

- RQ1: can model-based SPE support DevOps ***processes***? If so, ***how***?
  - ➔ *Performance Metrics Matching*
- RQ2: what **variables** and **processes** should be modeled?
  - ➔ *Input Information Matching*

Research Approach

- What are we looking for?
  - Typical DevOps Processes
  - Typical DevOps roles and variables

Exploratory Industrial Research:

1. Case-study;
2. Ethnomethodological Study;
3. …

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The Phoenix Project!

The Phoenix Project

Insights and ethnographical reference into the “three ways”:

1. FTL Dev-to-Ops;
2. Continuous Feedback;
3. Fine-grained Risks management & trouble-shooting;

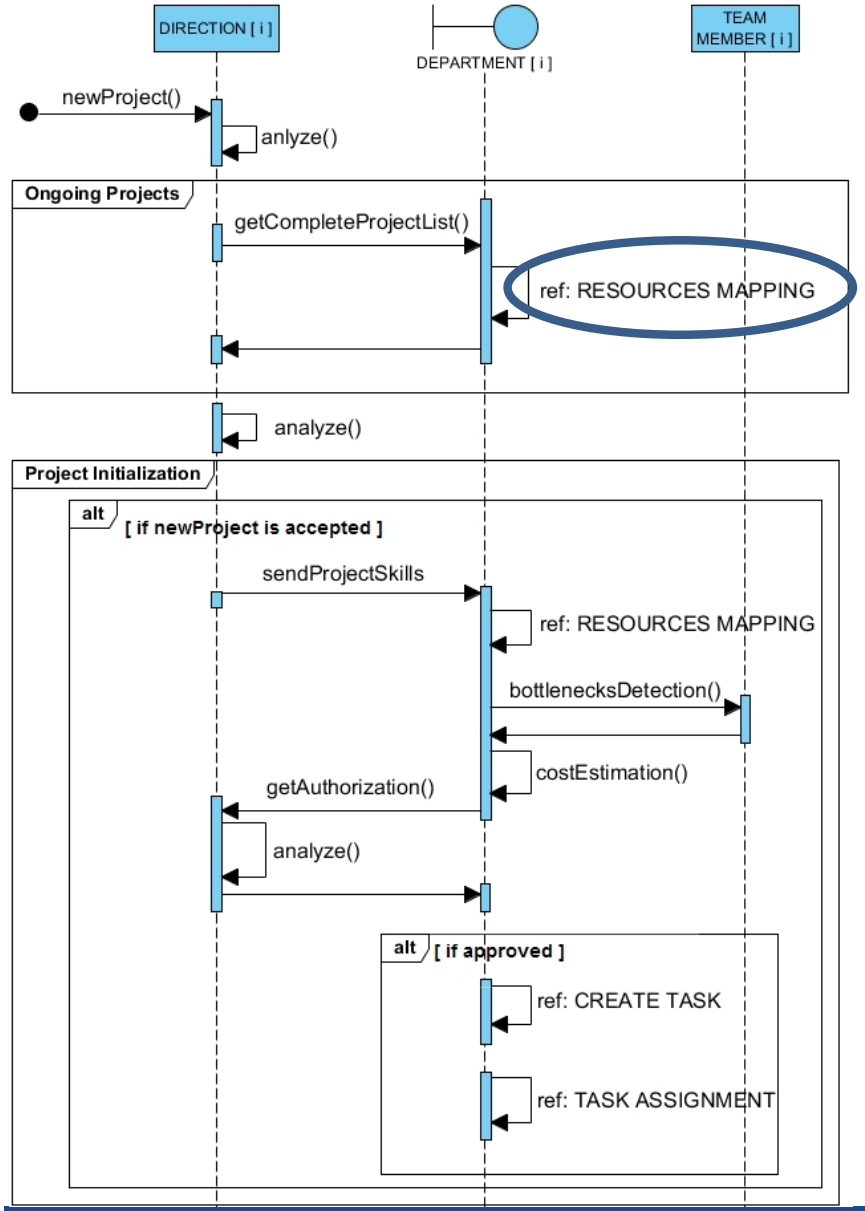
- 32 People Involved
- Big Product
- Continuous Everything

- Plenty of DevOps processes
- Large Timeline
- …

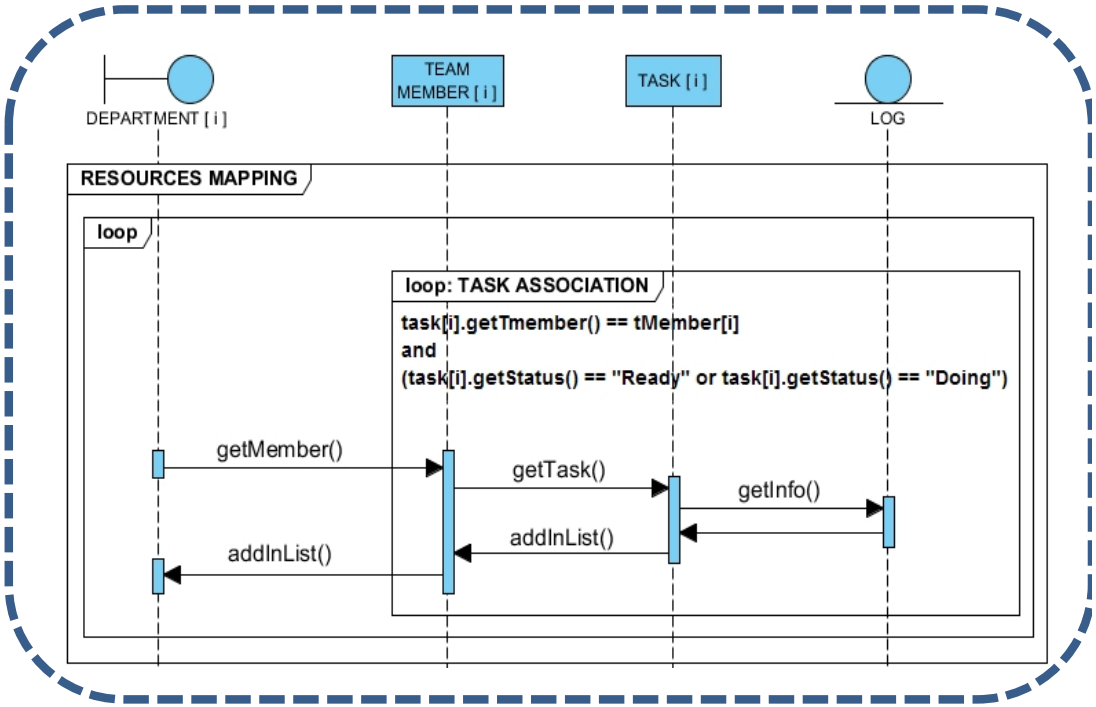
Results Summary

- 13 interlinked organisational processes (e.g., increment planning, task allocation, risk analysis & prioritization) ;
- 6 new roles (e.g., continuous architect);
- SPE may play a role in supporting all of them

Results (cont'd)



Resource Mapping & Task Allocation



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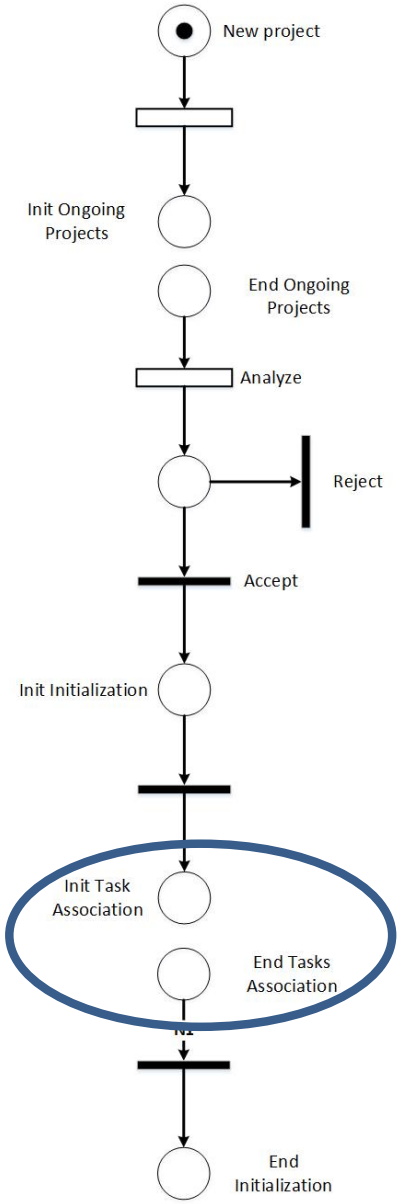

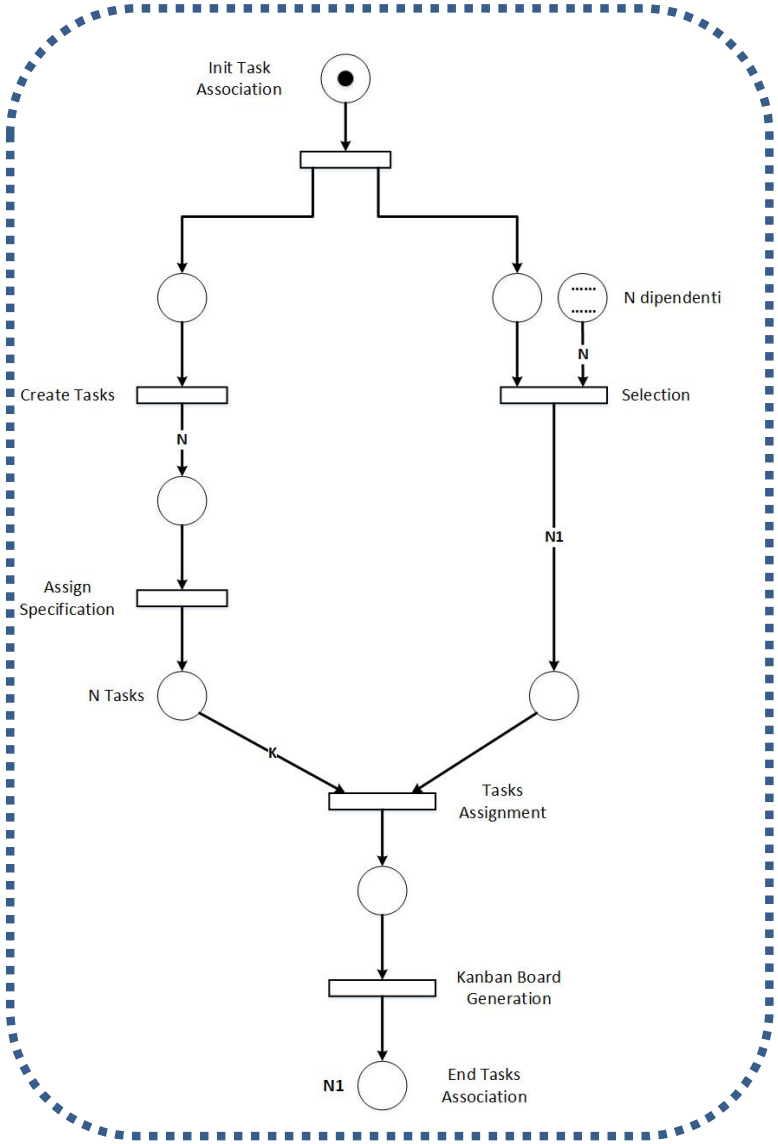

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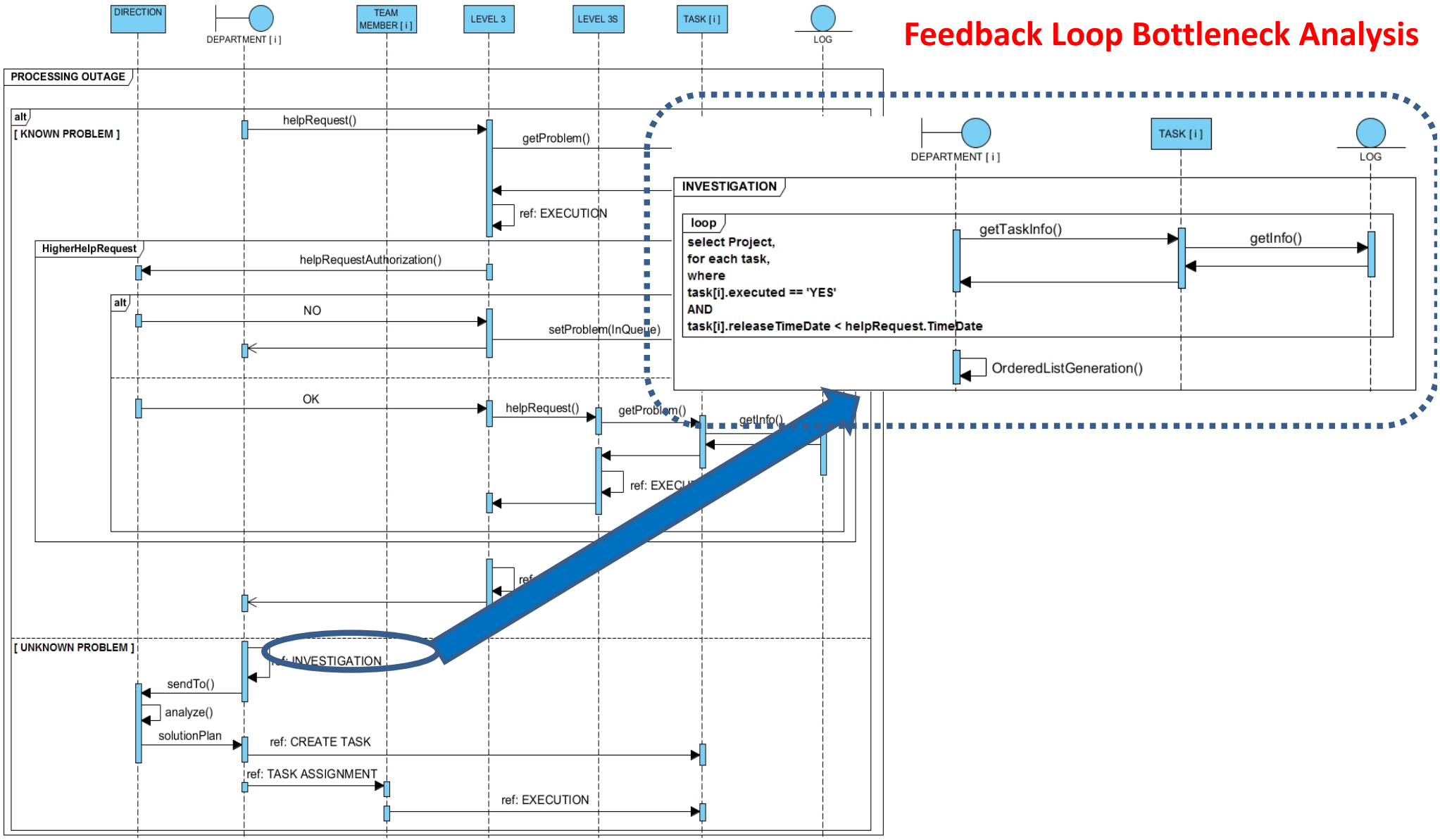

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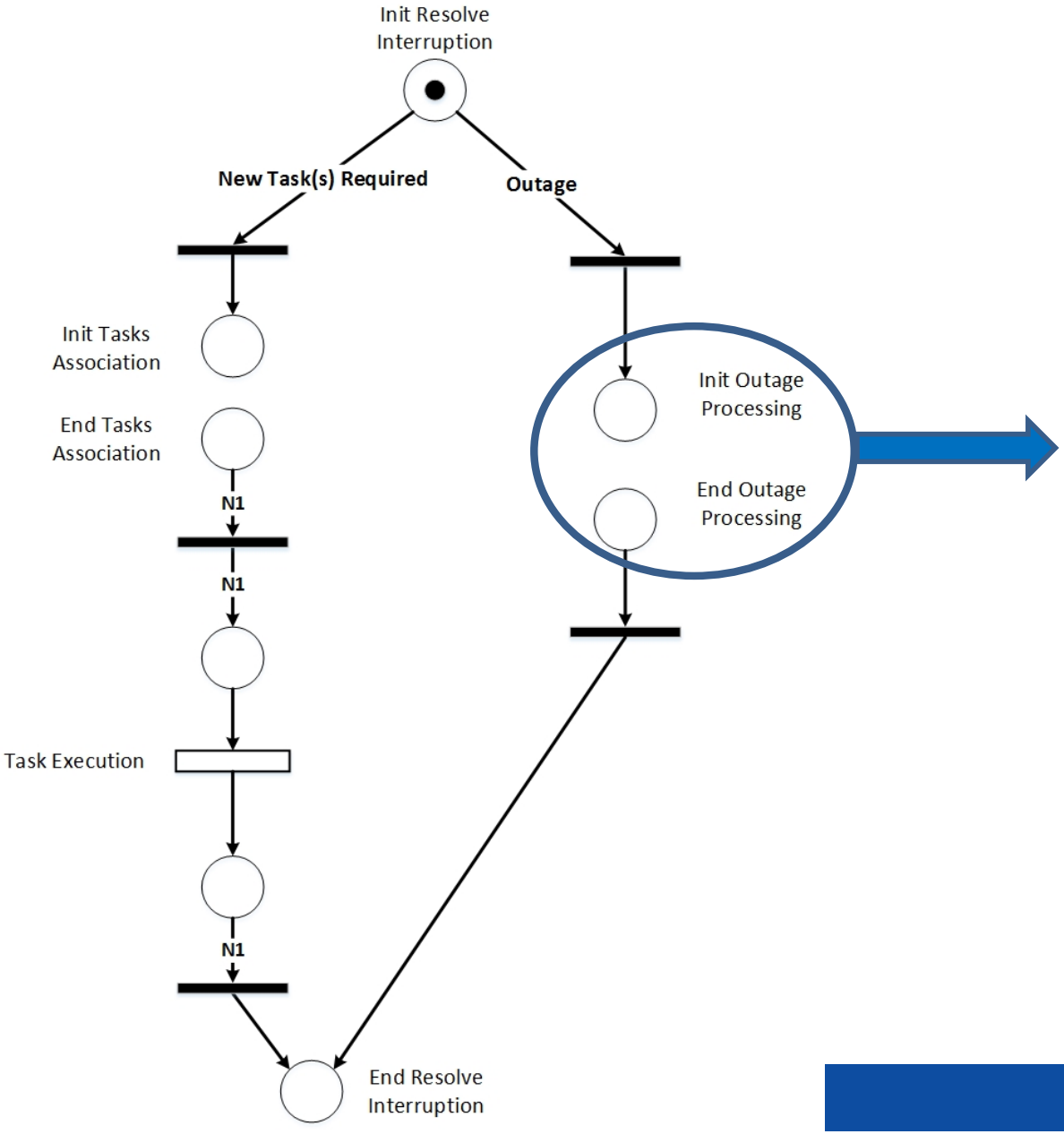

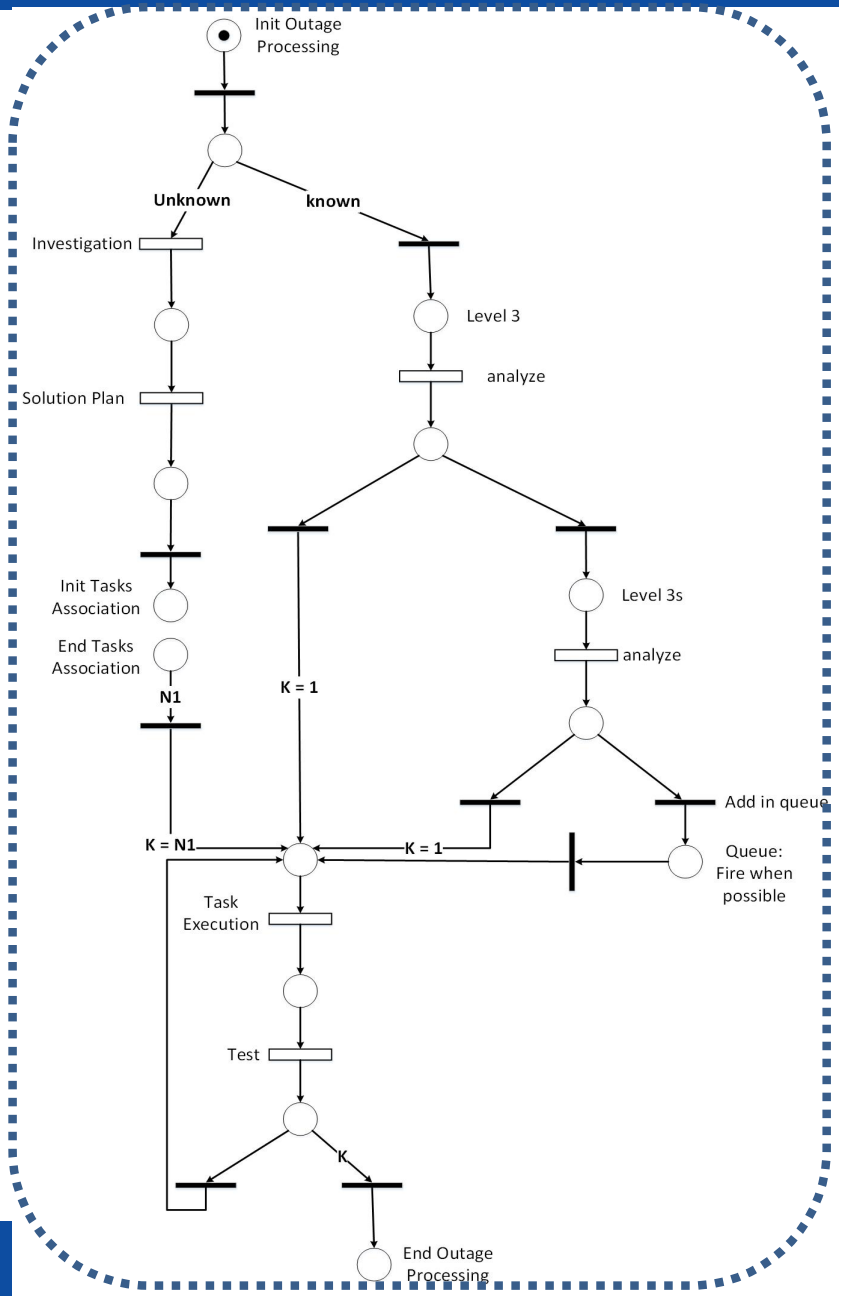

Imagine…

- … What if you could populate those PNs, QNs, … with quantities? You could:
  - Compute best fit task-to-skill allocation suggestions;
  - Test an organizational structure's "performance";

What's Missing

- Quantities!
  - Velocity, e.g., task arrival rates, …
  - People, e.g., skill-descriptors and their "weight", …
  - Structure, e.g., quantifiers for organisational characteristics
  - …

Conclusions & Research Agenda

- SPE & DevOps organisational structure → **Synergy!**
  - There's plenty to do with SPE:
    - CH1: Modelling concurrency of people, skills, processes, … ;
    - CH2: jointly analyzing complex processes, products, people;
    - …
- Ref. Work, e.g., Joel Spolsky's Evidence-Based Scheduling;
- We'll try the following:
  - Proceed with Performance metrics & input information matching;
  - Multi-View Modelling of DevOps for SPE;
  - Uncertainty analysis in DevOps;

Questions?

- Thanks!