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High Speed Navigation in the lens of FRAM

Bachelor thesis in Cognitive Science
University of Linköping

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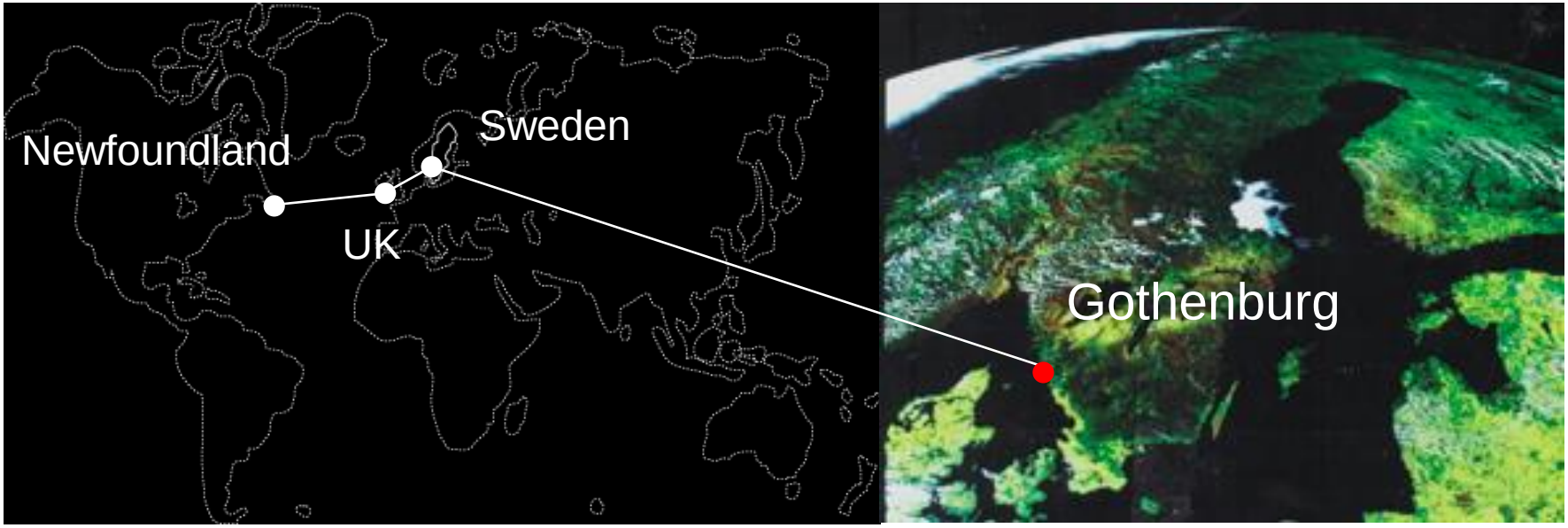
Research collaboration

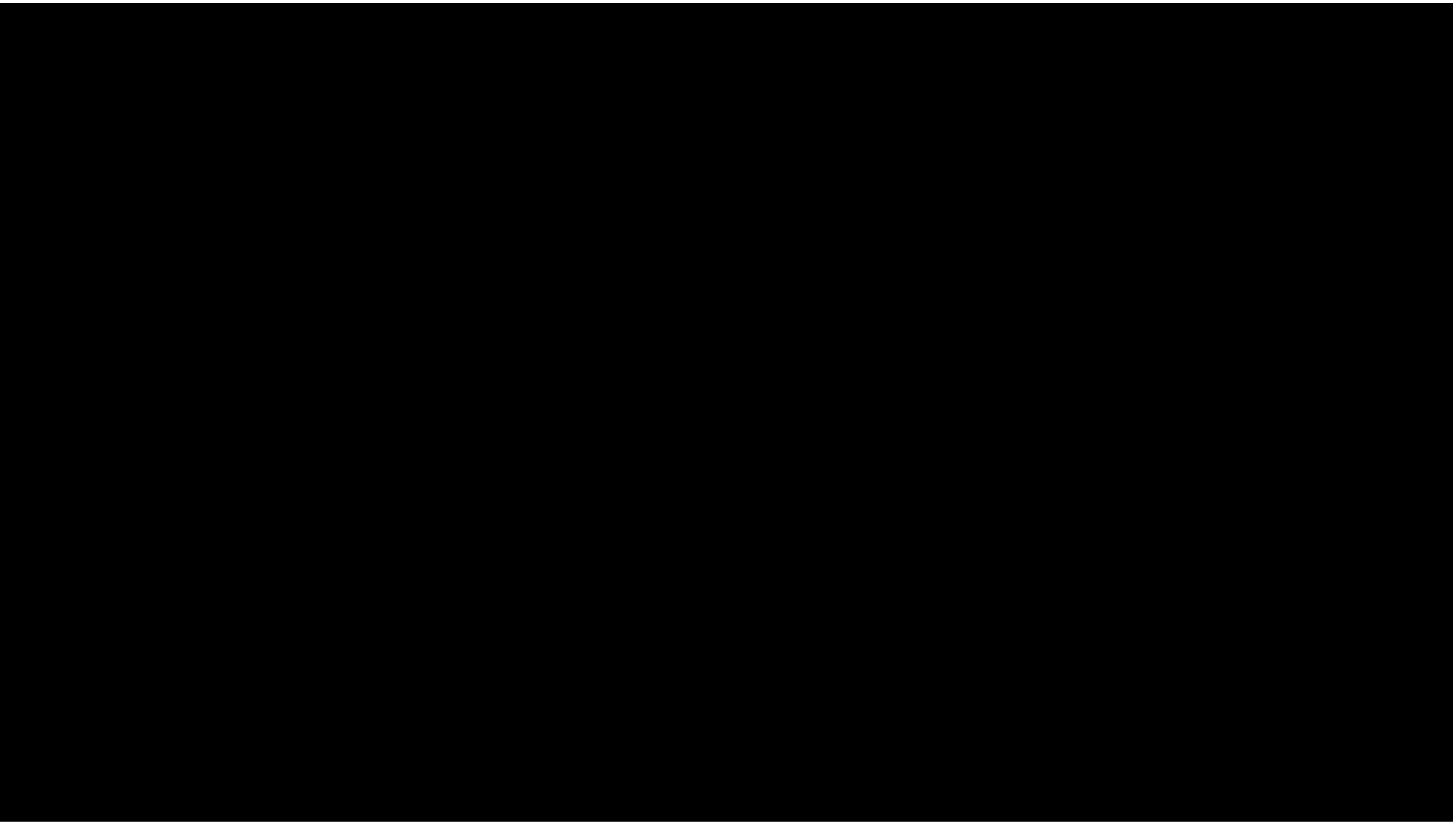
Chalmers University of Technology

SSRS

Memorial University of Newfoundland

STResearch





Chronological development

Swedish Amphibious Corp

- Hard shell strategy to movability
- Slow boats old school navigation to more adopted methodology.
- Need of a methodology to fit the purpose and new constraints

Chronological development

Swedish Sea Rescue Society

- Slow steel fishing boats type to GRP water jet propulted high speed crafts.
- Changed recruitment base

Chronological development

Swedish Maritime Authority

- Number of serious accidents
- Looked at the Amph. Corps.
- Legislated a 40 hours training – TNA?

High Speed Navigation as Imagined

Characteristics of High Speed Navigation

Challenging situation – need for resilience?

- Increased speed is an increased challenge
- Time shortage
- Reduced display effectiveness due to WBV
- Lack of local knowledge
- Demanding tasks - shouts

- Reduce speed or negotiate safety

Characteristics of High Speed Navigation

Crew tasks/workload - driving

Challenging situation

- Speed and responsibility
- accentuated need for a dedicated driver
- Understanding of other vessels

Crew of two

Working jointly - film

FILM

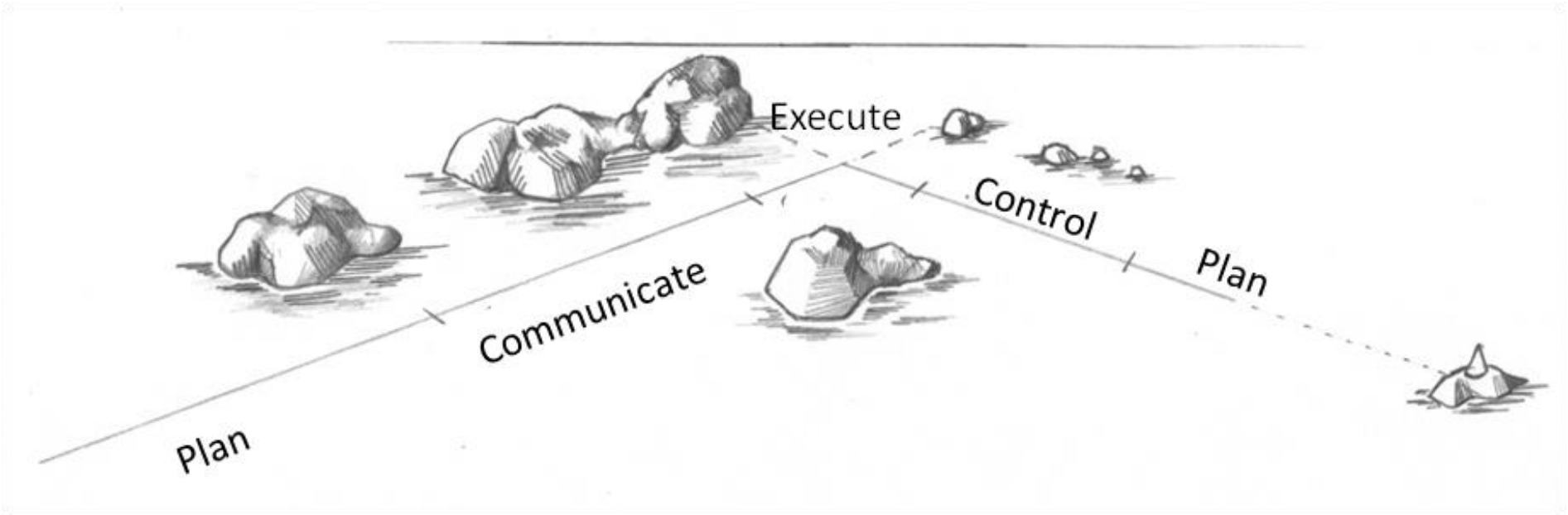
Basic methodology

The foundation

1. Working phases
2. Set of standard instructions
3. Positioning & navigation techniques

DYNAV methodology

The Phases

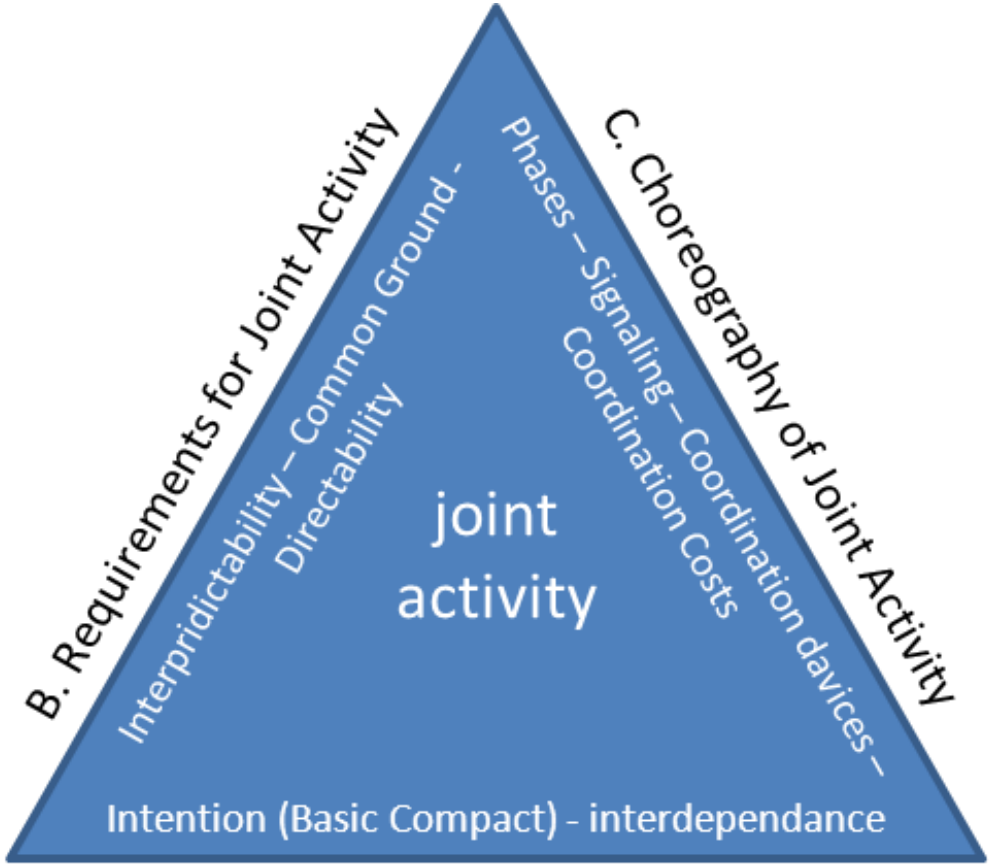


DYNAV methodology

Standard instructions

- General briefing about the situation
- In what direction next turn will be (port or starboard)
- What the next steering mark will be.
- On what information cues the turn shall be executed
- Where there are dangers.
- The next course and how to control the outcome of the turn.

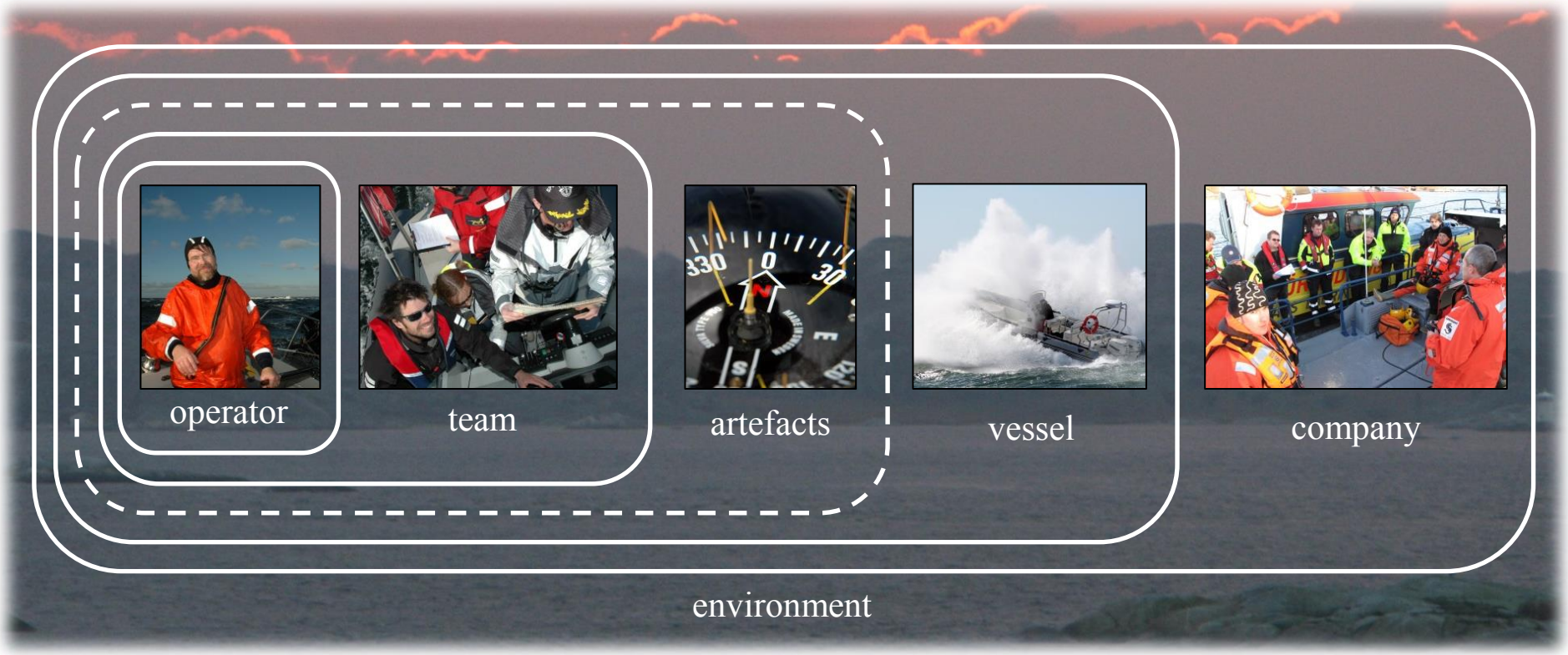
Common Ground in Joint Activity



A. Criteria for joint activity

Klein

The system



Methodology

- Observation
  - Navigation training in archipelago
  - Three full days
  - Video & audio captured
  - Semi structured group interview
  - transcription

- Analyse of data
  1. Identify functions that are enabled in High Speed Navigation.
  2. Identification of variability
  3. Focusing on specific parts of the model to visulise how variability can create unexpected result
  4. Suggestion of a way of to absorb variety

Work as done

Result – 21 main functions

1. Report direction of turn	11. Confirm heading mark
2. Confirm direction of turn	12. Report Waypoint
3. Briefing and identification	13. Confirm Waypoint
4. Confirm Briefing and identification	14. Describe environment
5. Report course	15. Confirm the description ov the environment.
6. Confirm course	16. Verifying of course
7. Identifying threats	17. Read information sources
8. Report threats	18. Adjustment of course
9. Confirm threats	19. Preparations for turning
10. Report Heading mark	20. Conducting turn
	21. Planning of rout

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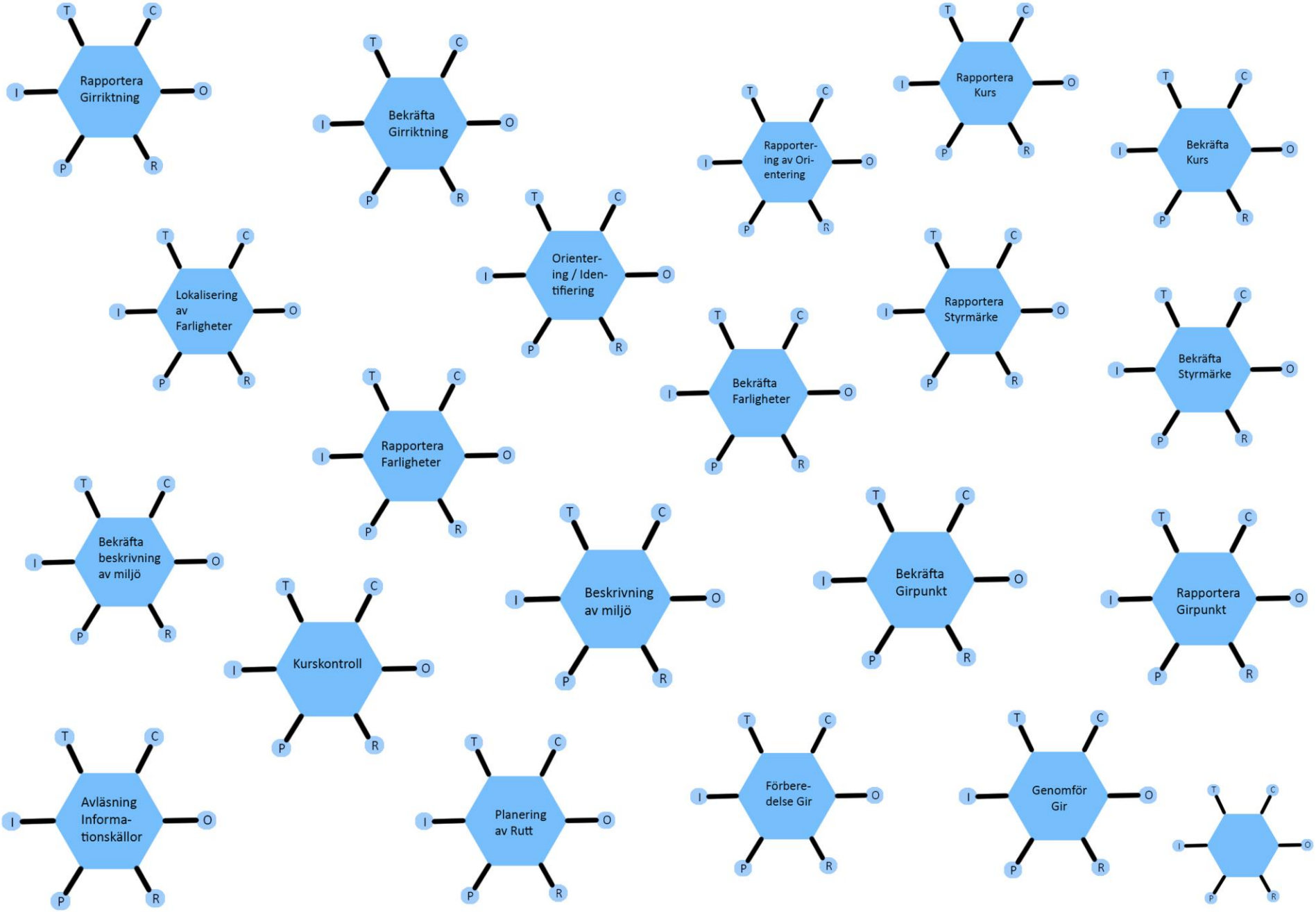

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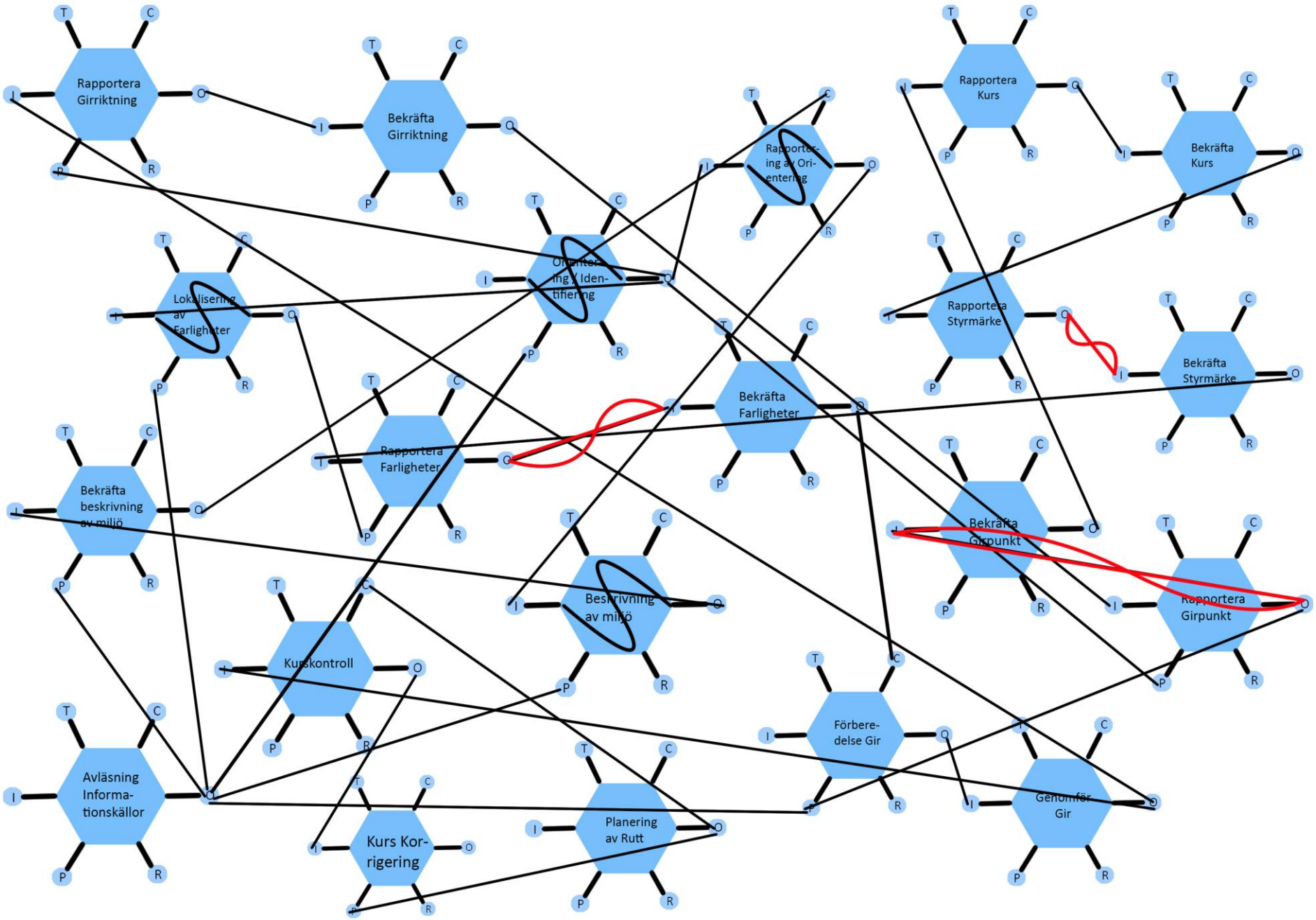

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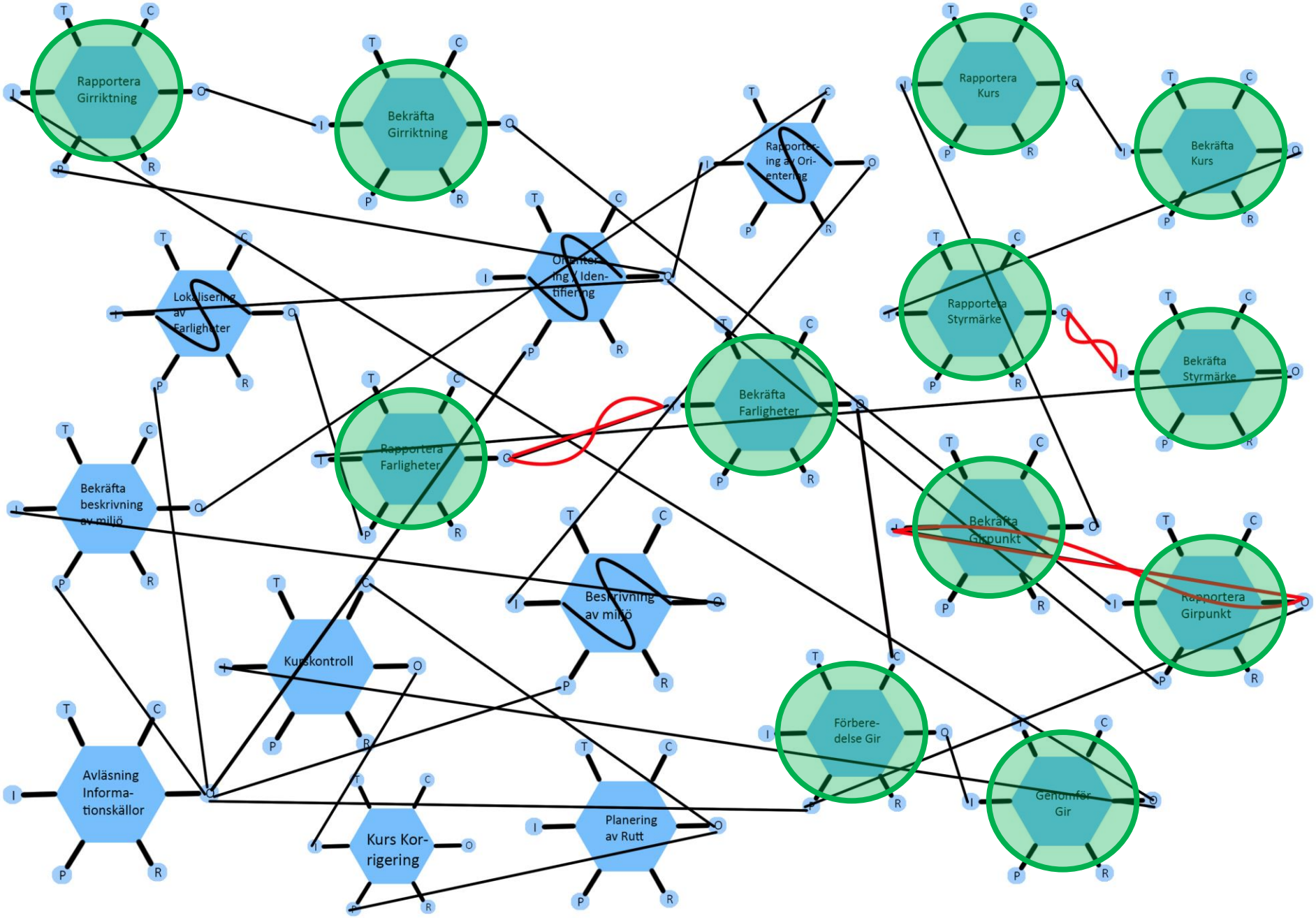

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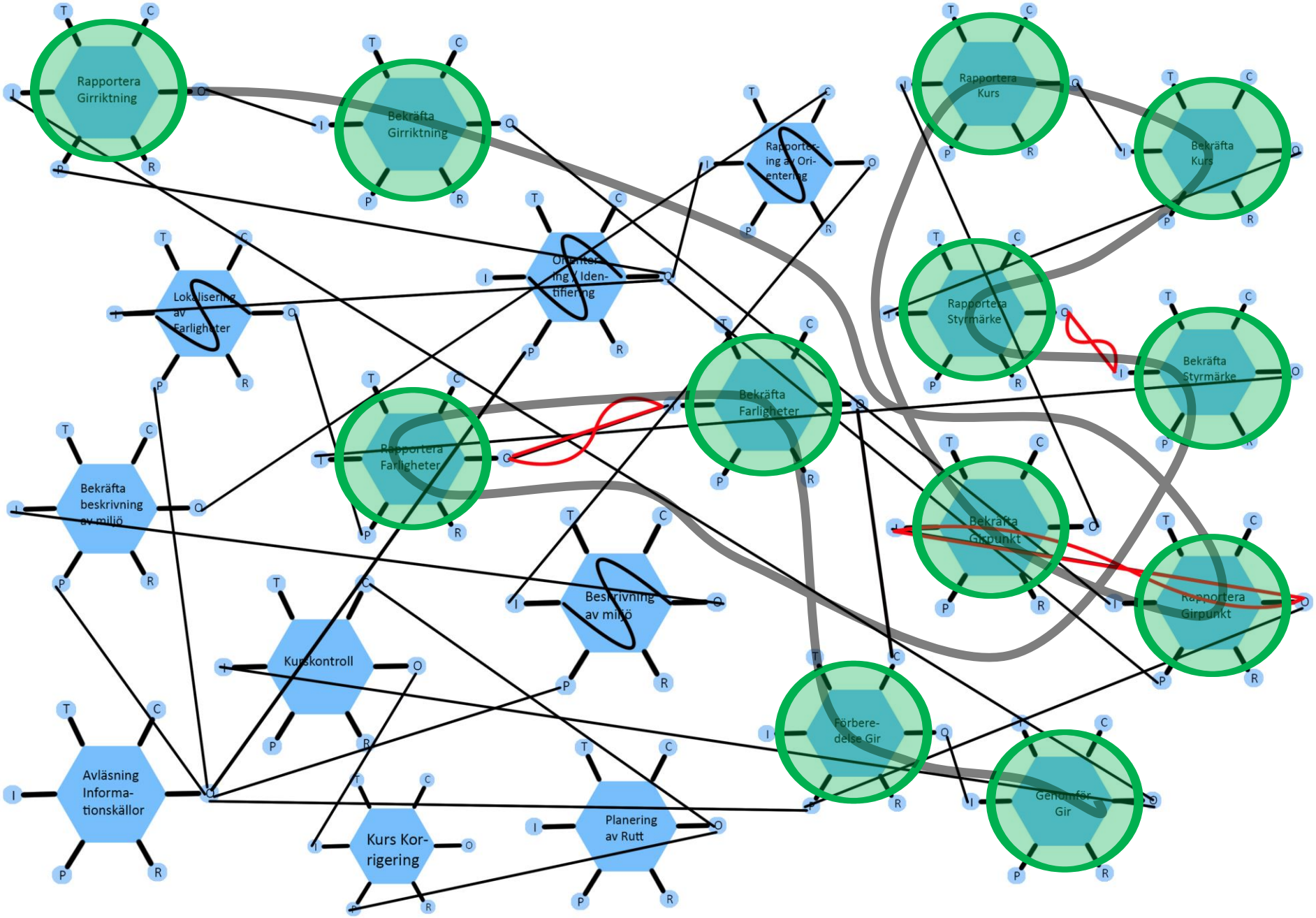
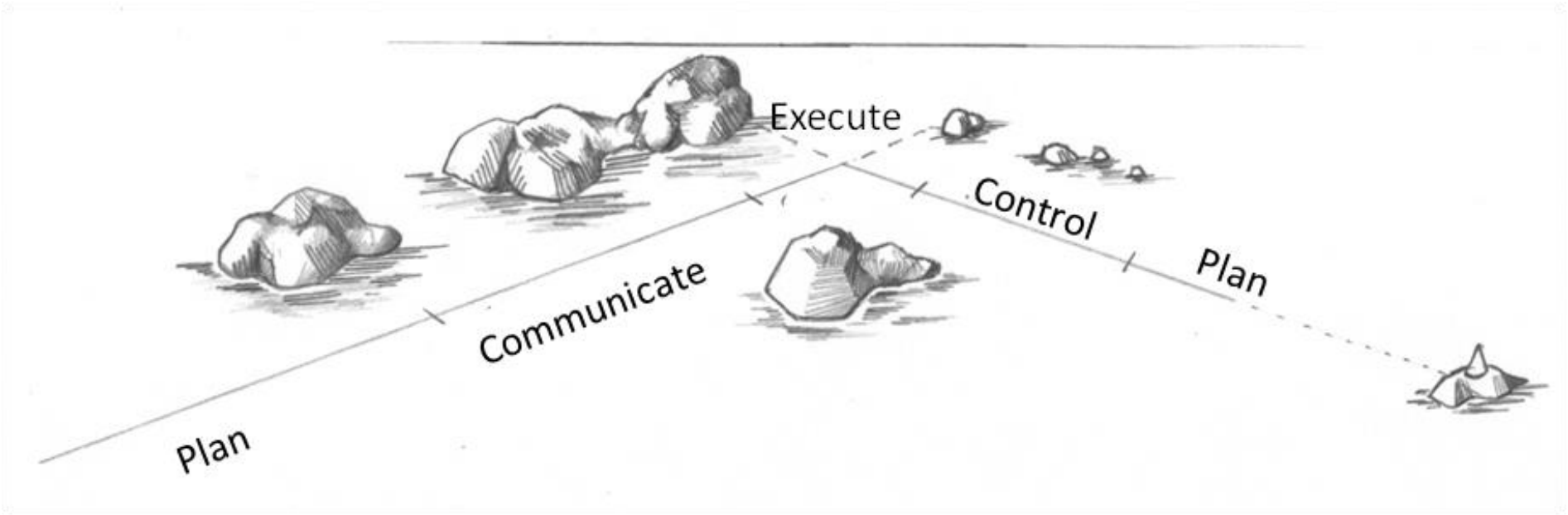


DYNAV methodology

The Phases



Discussion

- Is this an acceptable way of representing functions of creating Common Ground as “describing” and “confirming”? What problems does it impose? Could it be done more suitable?

- How to represent the function of reducing speed to get more time to achieve common ground at that moment? Is this the requisite variety needed to avoid grounding. The system identifies that common ground is threatened and slows down to get more time to repair common ground.

- Control is an aspect not used frequently in this FRAM. How could that better be represented in the model?

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