

How Costly is your C² Coordination? Assessing the Coordination Requirements within Command and Control

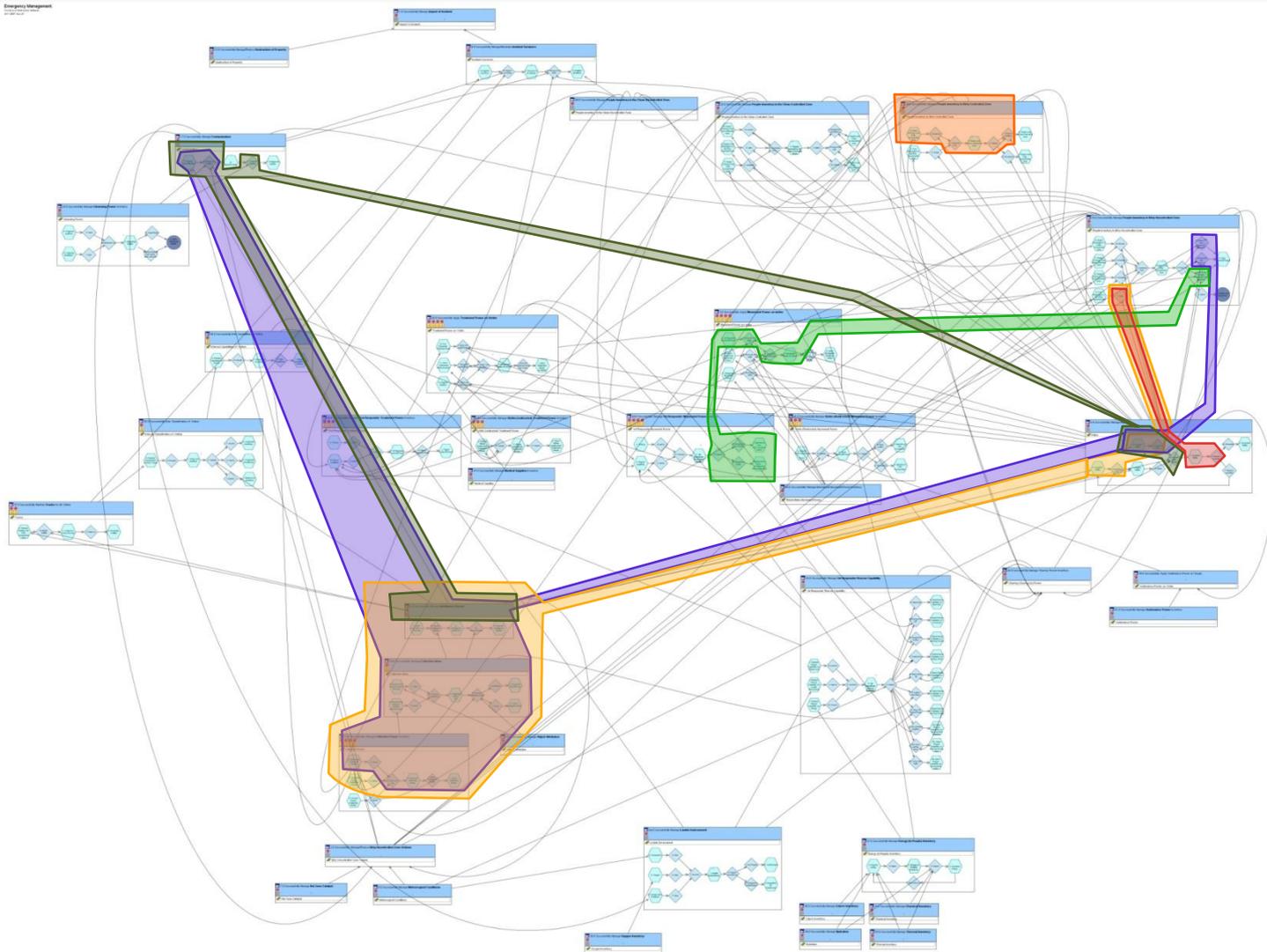
Resilient Cognitive Solutions

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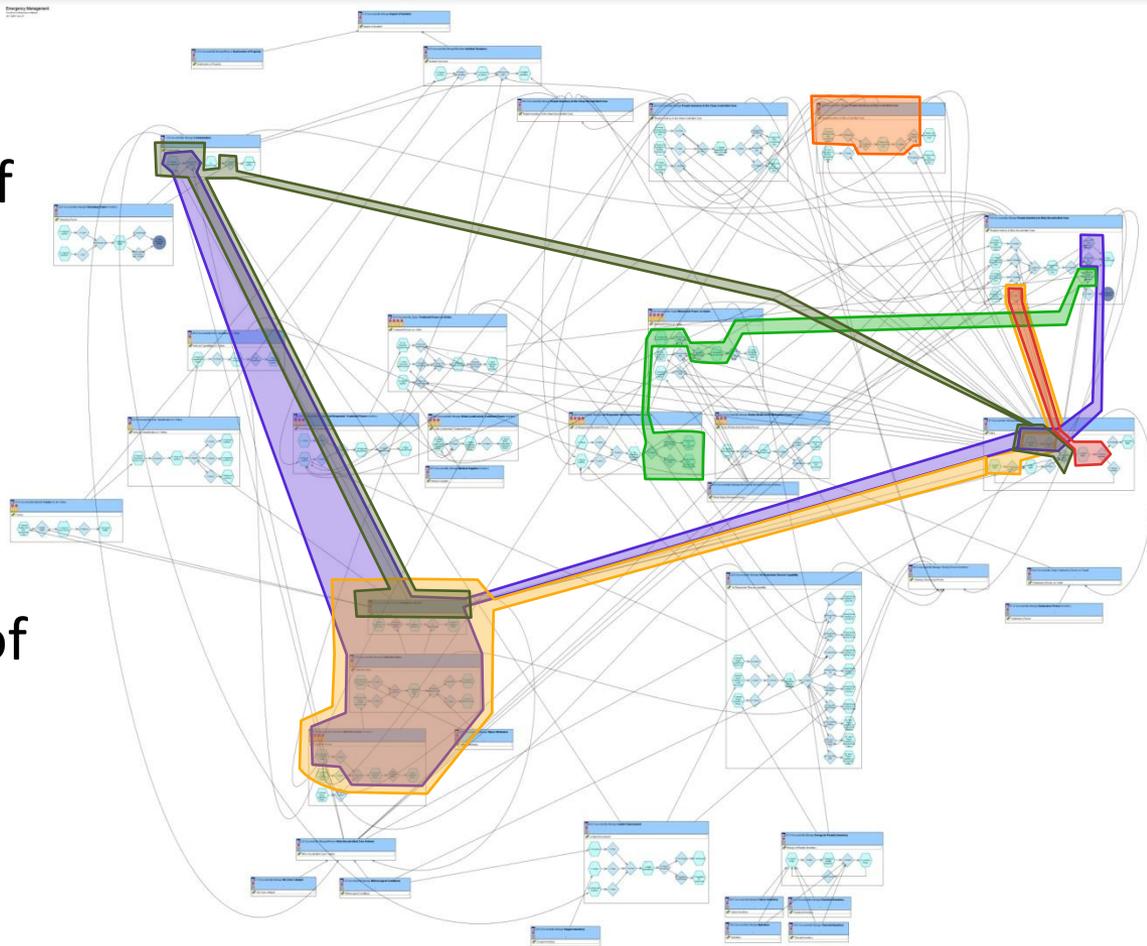
Martin Voshell, Brian Prue, & David Woods

A ruler to assess an Organization's structure – The functional goals of the domain



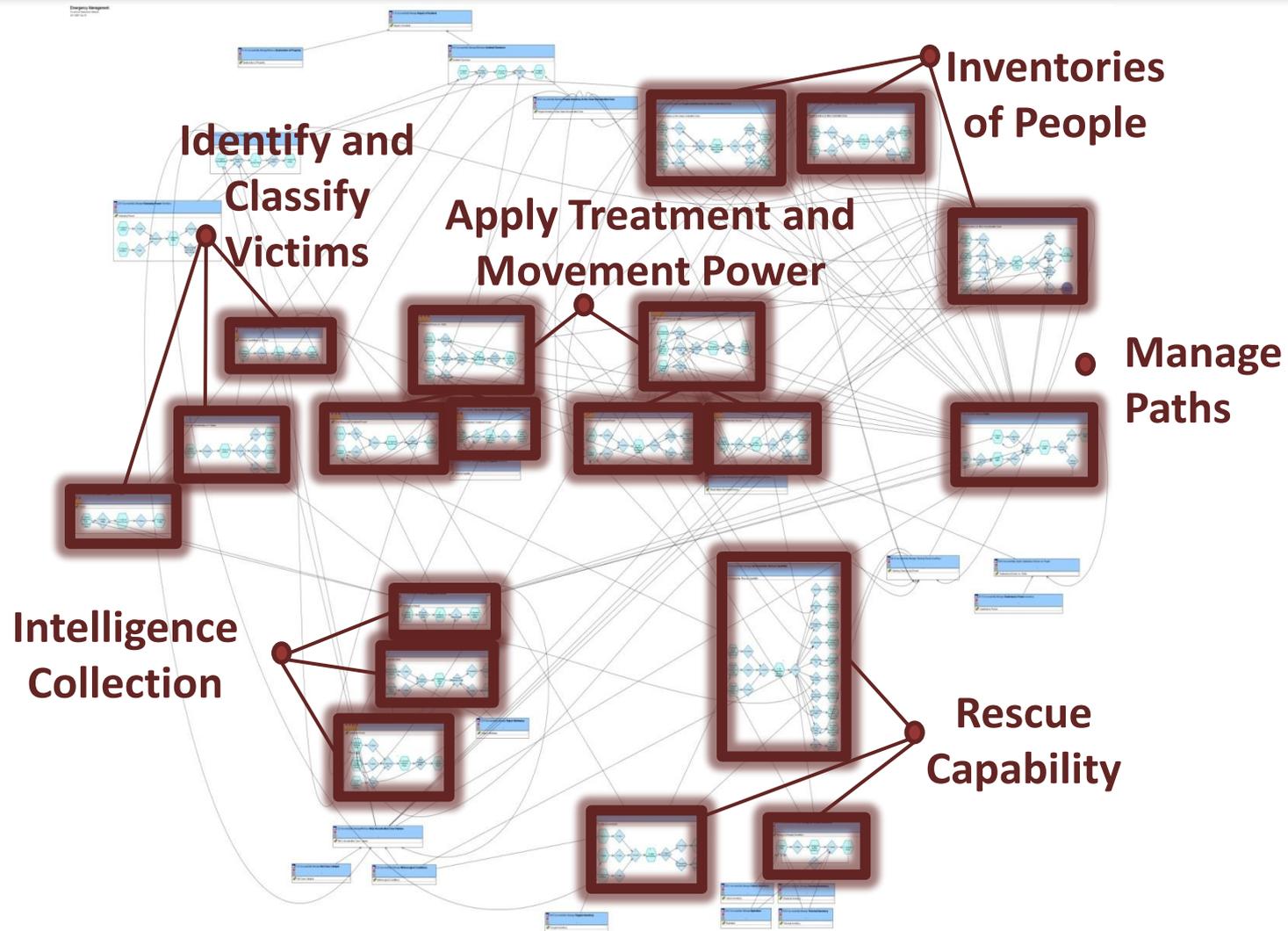
Applied Cognitive Systems Engineering Approach

1. Establish the functional structure of the goals of the domain
2. Map the organizational roles of the C2 teams
3. Extended the concept of a coordination loop* into a functional perspective



*Please attend presentation #XXX to hear more about Coordination Loops from The Cognitive Systems Engineering Lab of Ohio State Univ.

Functional Abstraction Network for Emergency Management

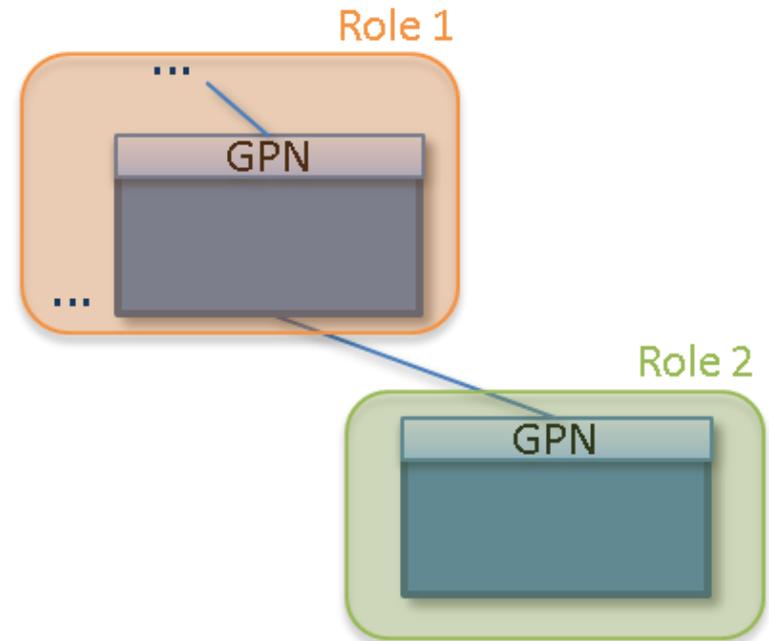


Functional Insights/Potential Metrics (1)

Organizational-Functional Fit

Any time an organizational role crosses a support-supported link, coordination demands can be identified

Emergency Mgmt Example:
Applying Movement Power onto a victim to get them out of the Dirty Zone

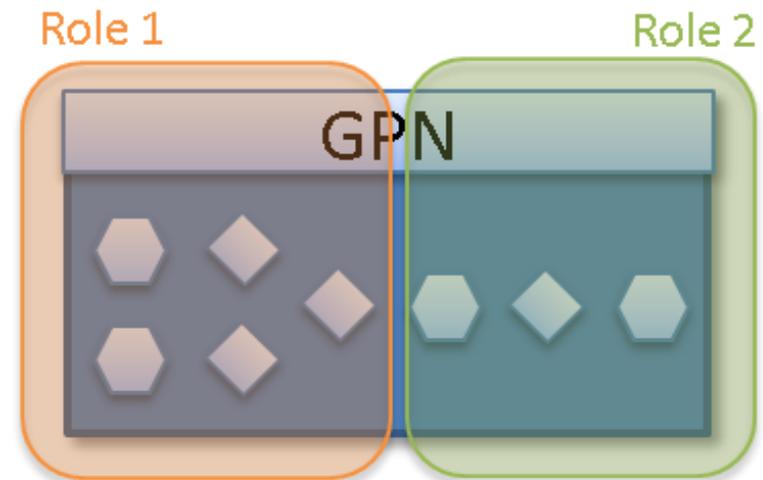


Functional Insights/Potential Metrics (2)

Goal-Process Coordination Loop

When roles divide portions of the same Goal-Process Node, additional coordination pressures are placed on process monitoring decisions

Emergency Mgmt Example:
Management of Movement
Power for an incident

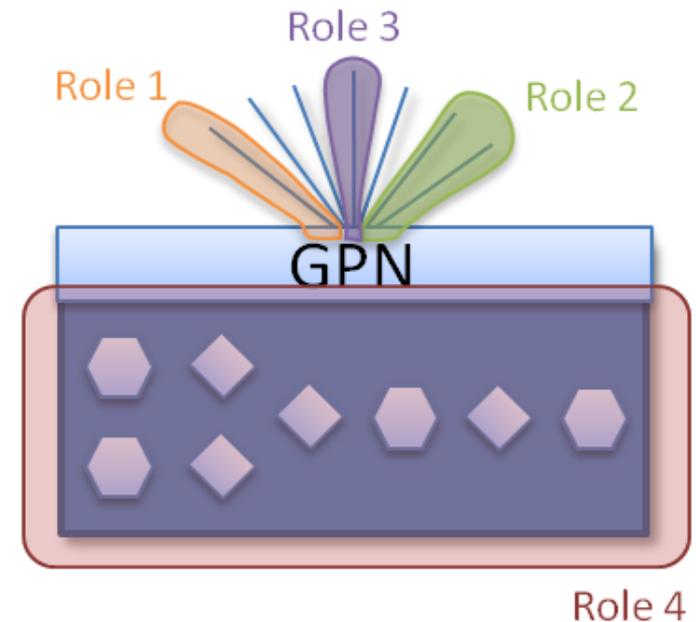


Functional Insights/Potential Metrics (3)

Demand Balance Observability Loop

When several roles are requiring support from a common function, the roles need to know that there are other demands present, to understand the impact on the support provided.

Emergency Mgmt Example:
Management of Paths for
movement into and out of the
Dirty Zone



Leveraging Potential Metrics

As a Cognitive Systems Engineer designing Decision Support Systems:
We assess to improve support

These potential metrics are geared to help improve

- Better observational techniques in the world
 - *Having an idea about the decisions in the domain helps focus your observation and stress the coordination needs*
- Redefining organizational roles
 - *By reducing the mismatch, there is less explicit coordination design needed to overcome it*
- Designing explicit coordination support around decisions in the domain
 - *The all too common “shared whiteboard” lacks specificity to have specific value*

Conclusion

Coordination assessment needs to begin with understanding your C² system in a functional frame of reference

- The greater the mismatch, the higher the coordination costs
- The mismatch is amplified by scale, complexity, and spatial distribution of team members
- Relationships inherent in the decision space become implicit requirements for coordination design
- Design for coordination support must happen within the domain's decision making context

