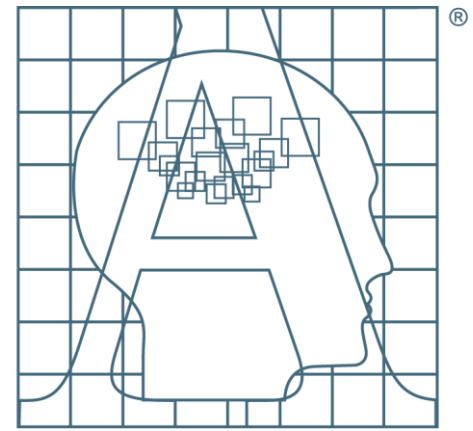

The Command Operations Dashboard: A Common Operating Picture of the Operators

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June 2014

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Outline

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- Background
- COD Requirements Development
- COD Software Components
- Some current use cases
- Plans

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Background

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Army Training

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- We are currently focused
  - On battalion, brigade and division exercises
  - Where Mission Command is trained by observer/coach/trainers (OCTs)
  - In a realistic mix of live virtual constructive forces
  - At home stations or combat training center facilities
- OCTs
  - Conduct these exercises
  - Teach the elements of Mission Command
  - Are each assigned to observe, coach and train a specific warfighter function
  - Support the commander's training goals
  - Run the mid and final AARs for the training unit

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Mission Command (ADP 6-0)

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- Mission command is
  - The exercise of authority and direction by the commander
  - Using mission orders to enable disciplined initiative
  - Within the commander's intent
  - To empower agile and adaptive leaders in the conduct of unified land operations
- Principles of Mission Command
  - Build cohesive teams through mutual trust mutual adaptation
  - Create shared understanding
  - Provide a clear commander's intent
  - Exercise disciplined initiative
  - Use mission orders
  - Accept prudent risk

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Importance of Communications for Mission Command

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- The Army's large, distributed operations require effective teamwork
  - Across space and cyberspace
  - Over time
  - And in every echelon
- Aspects of good teamwork include
  - High levels of unit **cohesion** to help units withstand the demands of combat (TRADOC Pam 525-3-1, p. 21)
  - Mutual **trust** that flows through the chain of command (ADRP 6-0, p. 2-2)
  - Clear **understanding of commander's intent** so subordinates can exercise proper initiative in unexpected situations (ADRP 6-0, p. 2-4)
  - Accurate and timely **situational awareness** which enables mission command (TRADOC PAM 525-3-3, p.40)
- Good teamwork relies on good communication
  - Information needs to flow up and down the chain of command as well as laterally to adjacent units and organizations (ADRP 6-0, p. 2-86)
- How can commanders or OCTs know if a part of the organization is experiencing poor teamwork?
  - Most of these communications are hidden from view
  - In distant face-to-face interactions
  - In massive digital streams
- How can commanders or OCTs know if the **pattern of communications** indicates:
  - Poor cohesion or trust
  - Poor information flow
  - Precursors of a communication breakdown

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COD Requirements Development

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Requirements collected for an OCT-edition of the COD

- 28 OCTs interviewed and observed during WFX
  - 228 possible requirements identified
  - 35 must-haves
  - 48 outside scope of current project
- 10 OCTs completed a survey
  - 145 requirements on survey
  - Ratings
  - Ranks
- 120 requirements above threshold
  - 35 must-haves
  - 85 from survey
- 34 fulfilled to date
  - 21 must-haves
  - 13 from survey

Category	Category Description Requirements in this category are focused on...
Filtering Options	Identifying the specific features that OCTs could select from to manipulate and select what subset of the data they would like to view.
Monitor Content of Communications	Monitoring what types of information/ topics were being discussed (key words, specific emails, topics).
Monitor Flow of Communications	Monitoring the flow of communications between individuals, units, WFFs, etc.
Monitor Process	Monitoring or tracking when and how well the unit is engaging in specific processes (e.g., MDMP; battle drills).
Monitor Team States	Monitoring and assessing critical cognitive and affective team states and how they change over time (e.g., trust, cohesion).
Track Key Events	Monitoring and tracking key events during the exercise, including SIGACTs, meetings, etc.
Type of Data	Identifying the different data sources (e.g., email, Ventrilo, F2F) that the COD needs to capture and analyze.
Overarching ("Big Picture")	Monitoring and assessing big picture information during the exercise (more general requirements than other categories).
System Design/Layout	Specifying what design features the COD needs to include.
System Flexibility	Specifying the level of flexibility the COD needs to have to adapt to different exercises, units, etc.

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Top OCT ranked requirements (lower Average means ranked more critical).

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Category	Top Requirements	Average	SD
Data Sources	Face-to-face	2.90	2.18
	Ventrilo	3.80	2.53
	CPOF	4.40	2.01
	VoIP	4.60	1.90
	Email	4.70	2.54
Filters	Specific mode of communication	3.80	2.25
	Directional flow (sent vs. received)	4.20	1.48
	Specific system	4.50	2.42
	Specific document	4.70	2.11
	PIR	4.80	2.97
Categorize	PIR	2.10	0.74
	CCIR	2.40	1.35
	SIR	4.90	1.79
	TAI	4.90	1.85
Content	Monitor PIRs	1.10	0.32
	Monitor SIRs	2.40	1.17

Category	Top Requirements	Average	SD
Flow--Details	Key words in comms	2.30	1.06
	Breakdown by comms mode	2.80	1.81
	Quantity (#) of comms sent or received	3.00	1.25
	List of specific emails	3.20	1.55
Flow--Tracking	CCIR	2.00	0.82
	SIGACT	2.40	1.17
	PIR	2.60	1.35
	MSEL inject	3.00	1.05
Key Events--Tracking	Briefs	3.10	2.02
	Working group meetings	3.20	1.32
	SIGACT	4.50	2.88
Process	Track running estimates	2.00	1.05
	Speed of a decision	2.20	1.14
Comparison	When CDR is present vs. absent	1.50	1.08
	Across event types	2.50	1.18
	Day vs. night	2.80	0.79

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COD Software Components

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COD Components

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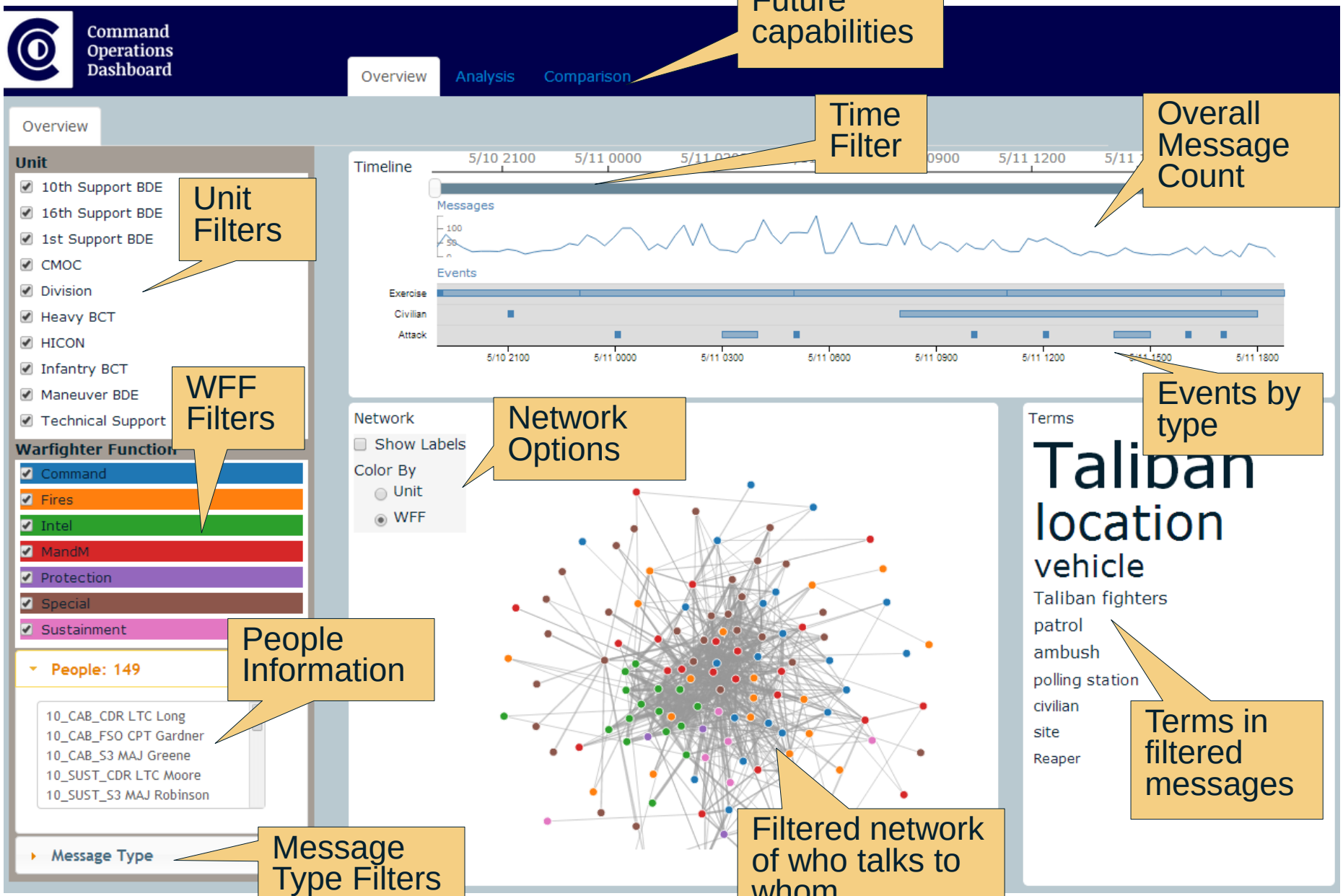

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Current Use Cases

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Scenario Background

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- Data are from a large Division level exercise 2010
  - Why? These are the only Army email network (not content) data that have been declassified.
  - Unclassified content have been added back in for demonstration purposes.
  - People's names have been changed, but the unit, warfighter function, and role names are from the exercise.
- Coalition Forces are conducting Counter Insurgency operations during a national vote in Afghanistan
- A U.S. Army Division is controlling a number of brigades
  - Given the scenario, Civil Affairs (G9) and MISO (G7, PsyOps) are important
  - Only the Division (and a few LNOs) wore Sociometric badges
  - The Division staff were in a single large Command Post (CP)
- The scenario takes place over a 24-hour period, which was conducted over 4.5 work days
  - The data are displayed in scenario time

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Use Case: G2-G3 Interactions

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- The OCT covering the G2 (Intel) shop wants to know how well the G2 is coordinating with the G3 (Movement and Maneuvers, Operations)
- During observations in the CP, the OCT does not see the G2 and G3 speaking very much, nor on the phone much, but perhaps they are communicating through email
- The OCT has no access to these digital communications, so he uses the COD to see if they are communicating, and if so, about what
- To narrow his focus, the OCT chooses a time point when he thinks the G2 and G3 should be communicating, such as after an IED
- Given the information, he wants to create a graphic to present to the G2 and G3 as a teaching point

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Use Case: G2-G3 Interactions Results

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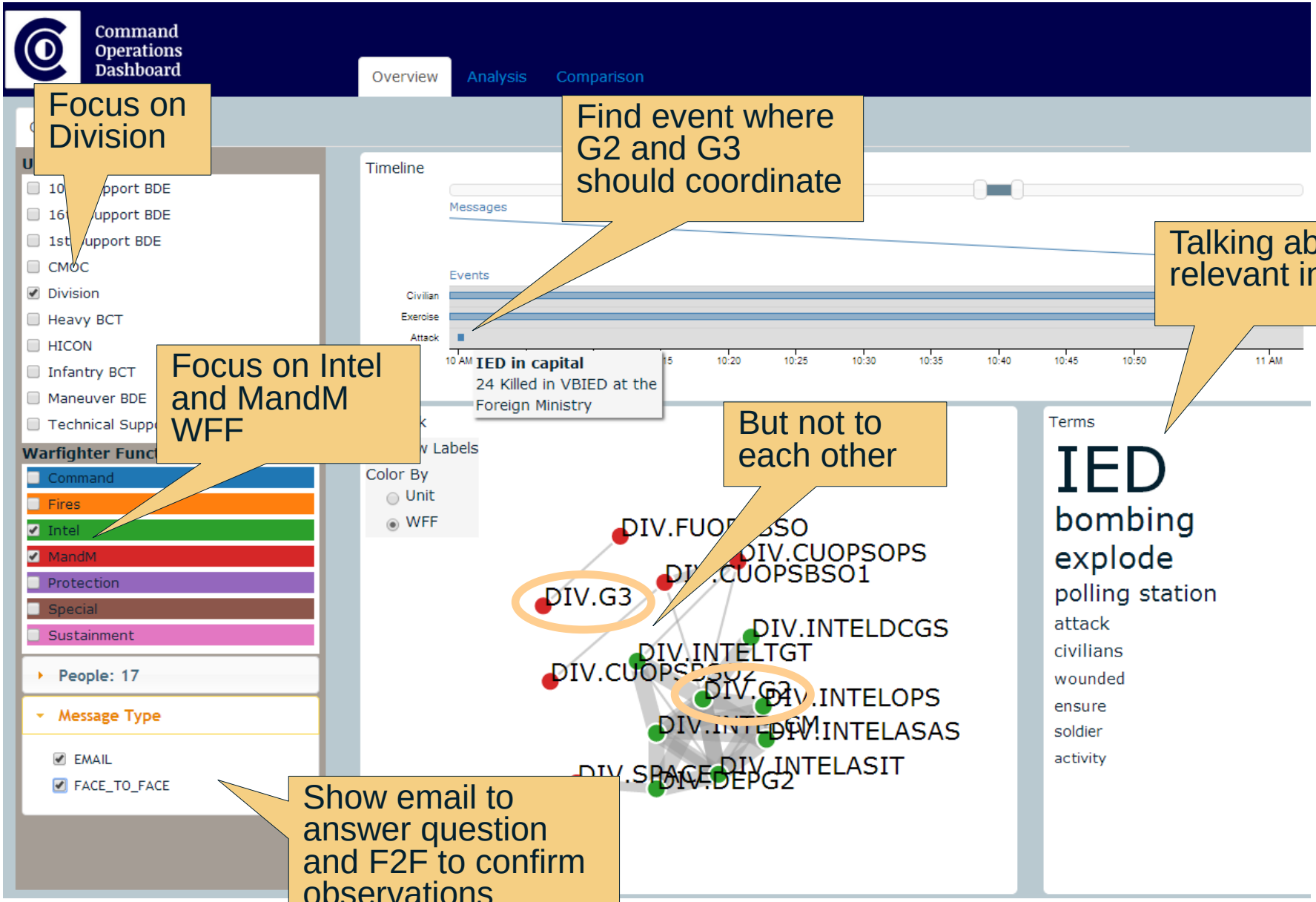

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Use Case: Intra-CP Communications

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- The Intel OCT wants to know how well the Division G2 is coordinating with other Intel shops in other units
- The OCT can see the coordination within the Division since they are all in one CP, but can not see other interactions
- The OCT uses the COD to select just the Intel WFF, but all other Units to see the interactions
- Overall, there are good communications, but there is also a 7 hour gap where the Maneuver BDE Intel has no comms with other Intel teams

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Use Case: Intra-CP Communications Results

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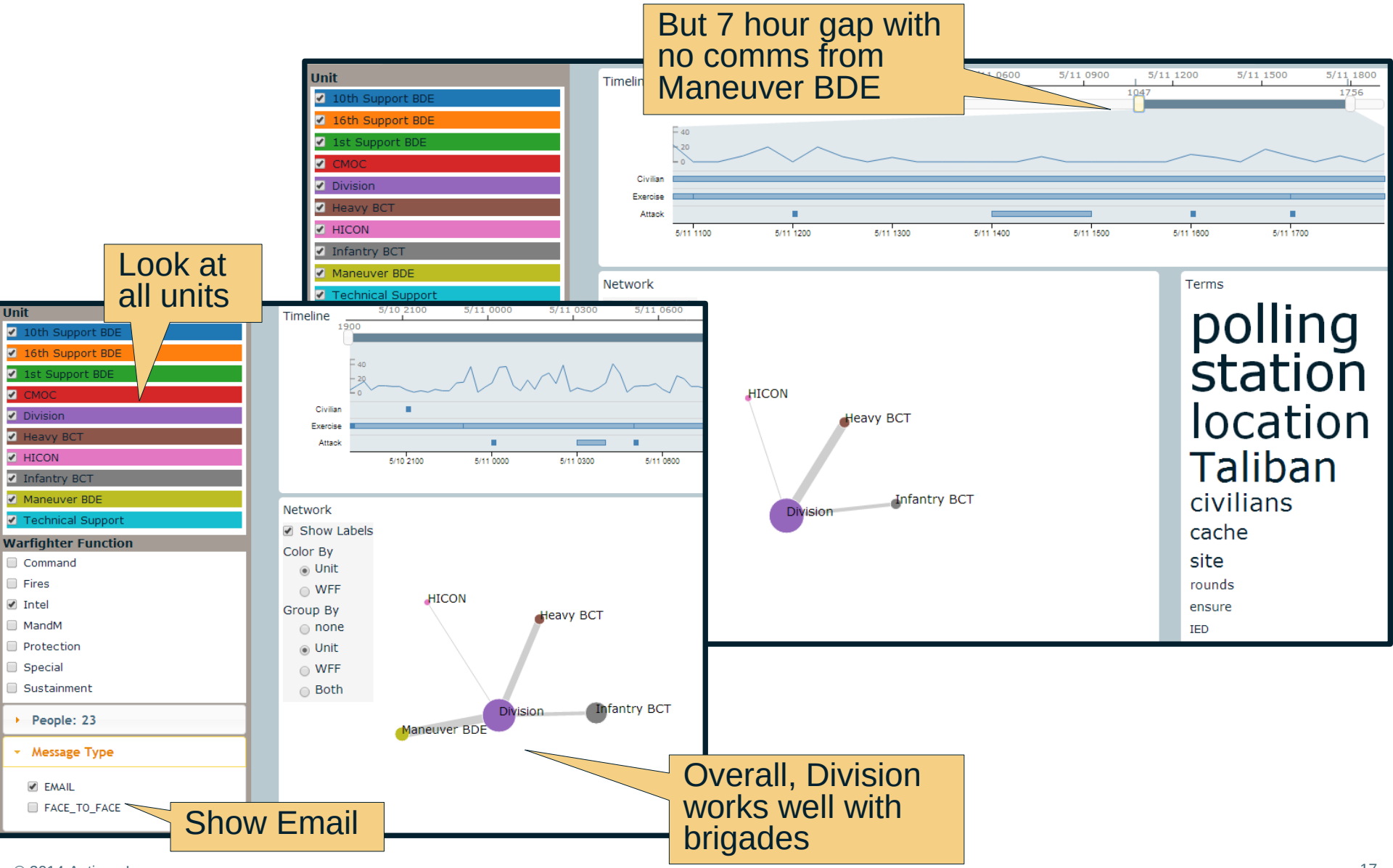

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Use Case: Civil – Military Interactions

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- Civil Affairs (G9 Shop) personnel often not integrated into decision making processes
- The OCT covering these personnel thinks they are doing a good job of demonstrating their capabilities, but wants to confirm this
- To narrow the focus, the OCT highlights the G9 in the network and focuses on a time when the G9 should be integral to operations, e.g., around the time that the polls start
- The OCT sees that the G9 are very central to the network

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Use Case: Civil – Military Interactions Results

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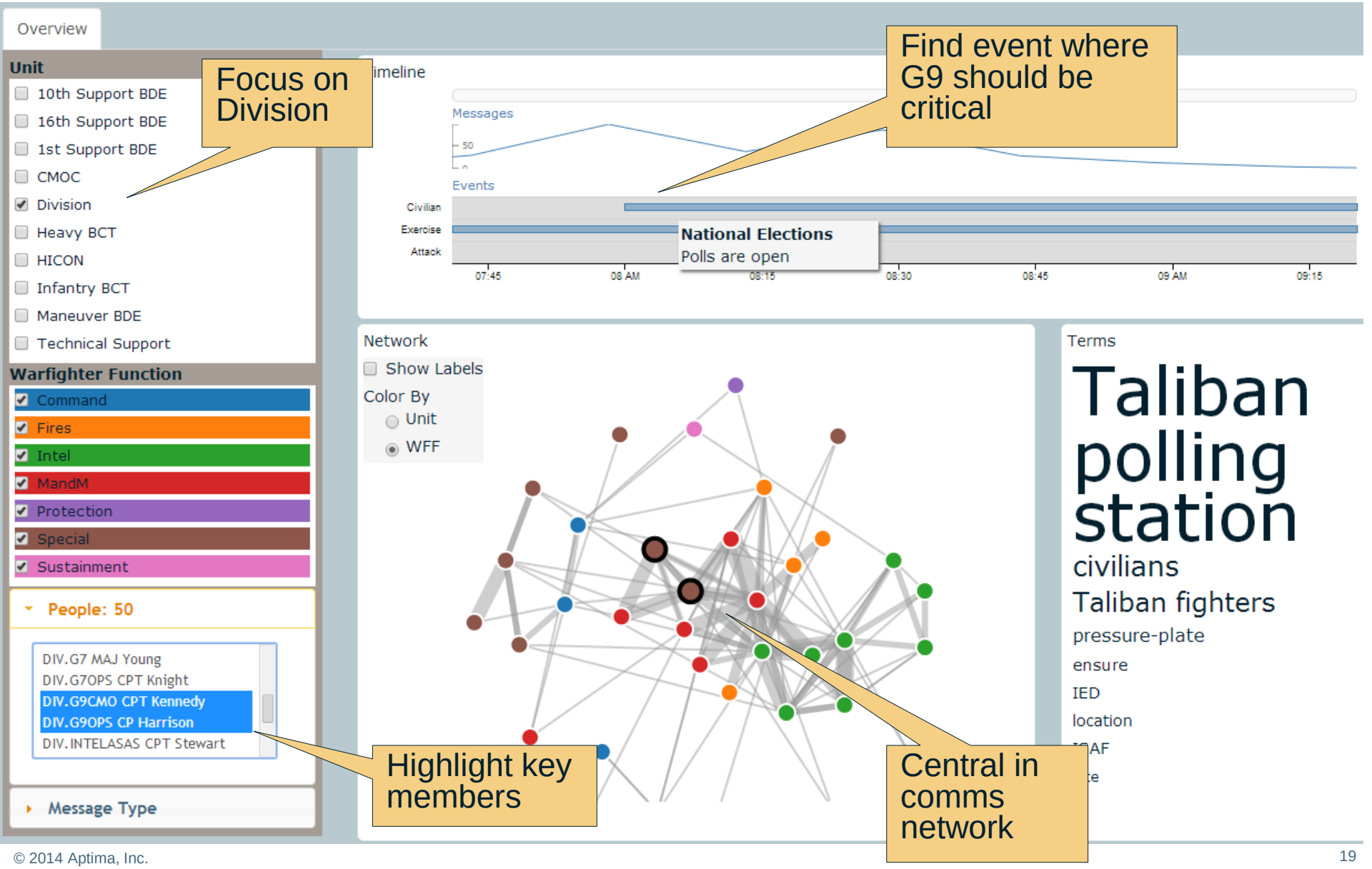

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Use Case: DNO Reaction

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- The Command group OCT wonders how well the division works during degraded network operations (DNO)
- He focuses on the division and finds an event which would effect the digital network (cyber attack)
- He'd like to see if face-to-face interactions compensate for a lack of email
- The OCT focuses on the Division (which had the badges to detect face-to-face interactions), identifies the DNO event, but wants to see that relative to the rest of the exercise so the time selected is simply the whole time
- Selecting email only vs. face-to-face only, the OCT sees that around the time of the DNO that email was at a low point, but face-to-face was at a high point

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Use Case: DNO Reaction Results

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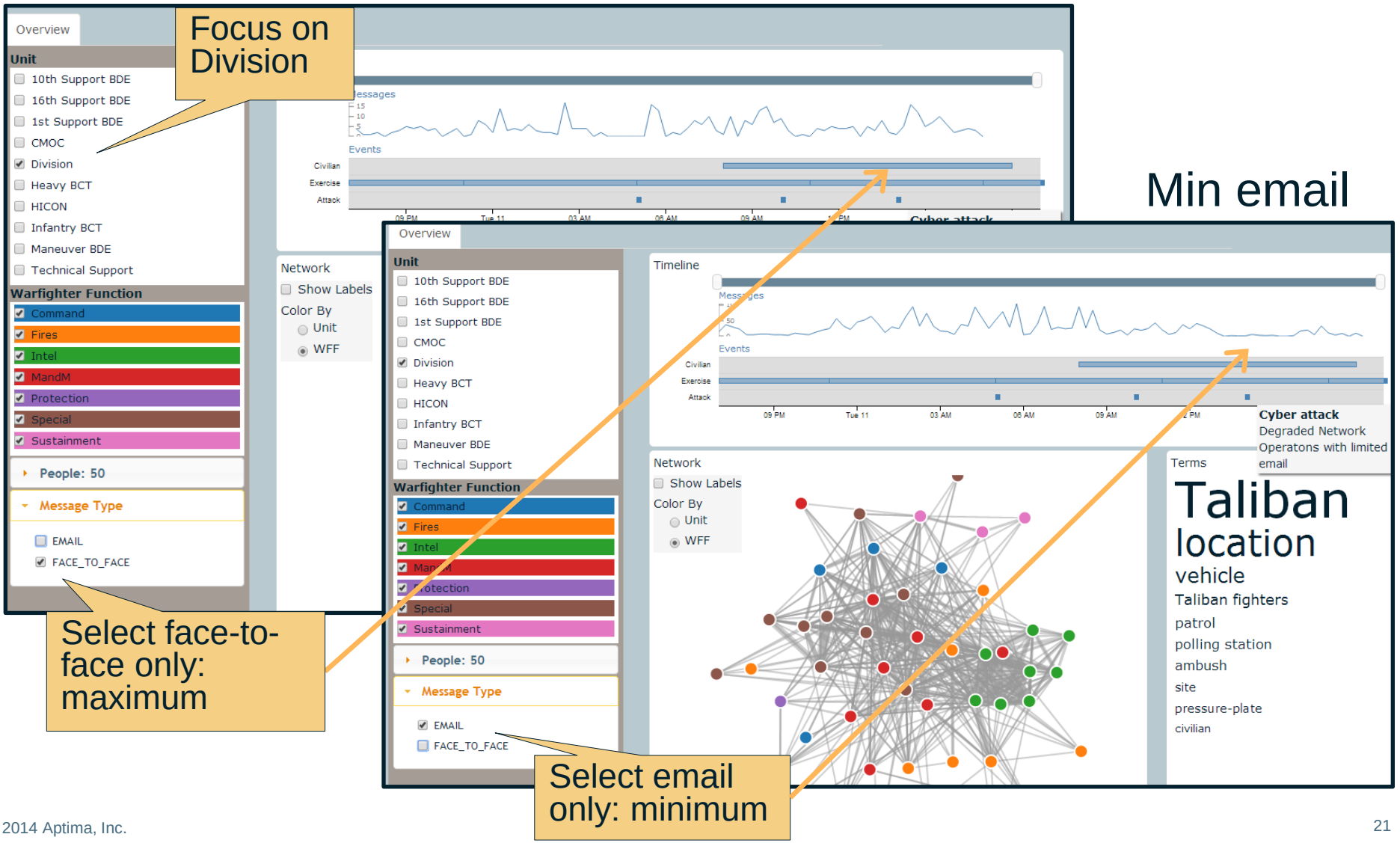

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Plans

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Plans

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- Data collection
  - Upcoming exercise this summer to collect more data and test usefulness of COD during training
- Proposals submitted to fund further data collection and COD development

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Conclusion

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Conclusion

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- Command Operations Dashboard
  - An end-to-end system created to collect, organize, analyze and display information for use by the OCTs
  - Provides real-time information about communications within the training unit
  - Can help
    - Guide OCTs to parts of the unit requiring more support
    - Provide solid evidence of both healthy and harmful interaction patterns
    - Improve training by moving from AAR to current action assessment
- Further needs
  - For better unobtrusive measurement of team states to support training and operations
    - All communications channels must be made available
    - Many proprietary systems, without APIs, are currently being used
  - Ideally, the Army would make this type of access a requirement, at least in training settings, so the full power of the sensor and big data revolutions can be applied

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Questions?

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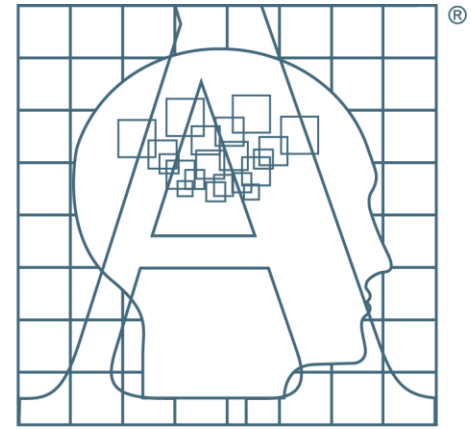

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