Maritime Domain Awareness: Assessment of Current Status

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MDA Spiral 1 Tools, Features Provided and Benefits of Tools

Tool	Features Provided	Benefits of Tool
Comprehensive Maritime Awareness (CMA)		
	Anomaly detection	* Automates a previously manual process
	Info sharing across organizational nodes	* Facilitates collaboration
	Object tracking	* More tracks can be monitored
	Integrates multi-source data, search agents, confidence reporting, and information	* More comprehensive correlation across multiple sources of
	remote access	
FASTC2AP		
	Defines/automates info mgmt tasks	* Generates alerts, emails, OTH Gold msgs - update GCCS-M tracks
	Helps manage situation awareness	* Access to multiple databases
	Processes large amounts of data by analysis, fusion, and exploitation agents	* Helps manage situation awareness and track behavior in an AOR
TRIPWIRE		
	Mines unstructured text data and analyzed	* Increased relationships
	alerts analysts	

MDA Spiral 1 Tools, Features Provided and Benefits of Tools

Tool	Features Provided	Benefits of Tool
MAGNET		
	Intelligent agent logic	* Faster access to data
	Web browser to query other data sources	* More sources queried in less time
	System queries regarding topics of interest in area	* Increased number of analytic models
		* Increased archived data for analysis
TAANDEM		
	Real-time track processing	* Prediction and activity monitoring
	Identify deviant tracks	* Real-time track processing
	Provides annotated tracks with alerts	* Rule-based anomaly detection
E-MIO Wireless		
	Satellite transmission/ reception for unclassified boarding data authoritative dbs	* Automatically inserts data into
GOOGLE EARTH	Map capabilities	* Overlay analysis from other tools to detailed map
Global Trader		
	Anomaly detection, pattern matching/	* Supports queries regarding cargo

Maritime Domain Awareness: Spiral 1 Metrics

Program Metrics Structure

Structure is required to support results roll-up to higher-level metrics.

Effective				
Accessible	**Reliable**	**Capable**	**Usable**	**MOE**
Capacity	Robust	Sufficient	Clear	**MOP**
Available	Persistent	Flexible	Trusted	"
Compatible	Secure	Accurate	Manageable	"
Extensive	Assured	Timely	Relevant	"
Efficient		Reach	Compliant	"
		Automatic	Deployable	"
Military Utility				
Improved	**Needed**	**Applicable**	**Wanted**	**MOU**
Ready				
Effective	**Utility**	**Life-Cycle**	**Personnel**	**MOR**
System Readiness is a roll up of the component readiness measures (MOR).				

Readiness in the acquisition sense, not operational or deployment readiness.

Assessment Framework Addresses Five Distinct Assessment Areas

- ***System Performance*** concerns **how well a system performs its functions**, its support of MDA operations, warfighter acceptance, automation, and system management and security functions.
- ***Operations Performance*** addresses the **quality of knowledge management concerning vessels of interest** (VoIs), MDA intelligence, surveillance, and reconnaissance (ISR), and MIO.
- ***Warfighter Performance*** focuses on **operator acceptance and understanding of the MDA mission**, as well as unit and individual capability to execute that mission.
- ***Organization/Guidance*** focuses on the **fit of organizational structures and processes to the MDA mission** including Maritime Headquarters with Maritime Operations Center (MOC), the sufficiency of agreements between entities, and the adequacy of guidance within entities.
- ***Supportability and Readiness*** concerns factors that ensure MDA Spiral-1 systems are **robust and reliable**.

MDA Capability Indicators (or Assessment Metrics)

Area	Effective	Utility	Area	Effective
System Performance	Accessible Capable Reliable Usable	Improved Needed Applicable Wanted	Warfighter Performance	Capable Reliable
Operations	Accessible Capable Reliable		Organization /Guidance	Accessible Capable Usable

Example of MDA Assessment Metrics: Assessment Area, Capability Indicators, and Metrics

System Performance Assessment Area	Capability Indicators	Metrics
Technical Performance	Improved	-5 to +5 rating of improvement over existing system by system feature
	Needed	System fills a gap in existing capabilities, Y/N
	Applicable	System is applicable to MDA activities, by activity, Y/N
	Wanted	-5 to +5 rating of operator desire to have system available
Information Retrieval	Accessible	Roll-up of information accessibility
	Available	% of time information is available
	Efficient	Number of steps to access information
	Capable	Roll-up of capability to retrieve required information
	Sufficient	% of information needed for assessment
	Timely	Time required to retrieve information

Data Collection

1. Workflow Analysis and Process Engineering Workshop (PEW):

- **Overview of MDA activities, site visits ton NAVCENT, ONI, 2F, 3F, 5F, and 6F.**

- **Document the way MDA is currently done and to identify where new tech's are expected to have the greatest impact.**
- **Validated in PEW, NPS, Jan 2008, and was mapped to the Maritime Headqrtrs with Maritime Operations Center (MHQ w/MOC) core processes.**

2. Technical Risk Reduction Limited Objective Experiment, SPAWAR, SD, June 2008

- **First simultaneous testing of multiple MDA technologies using Fleet participants.**

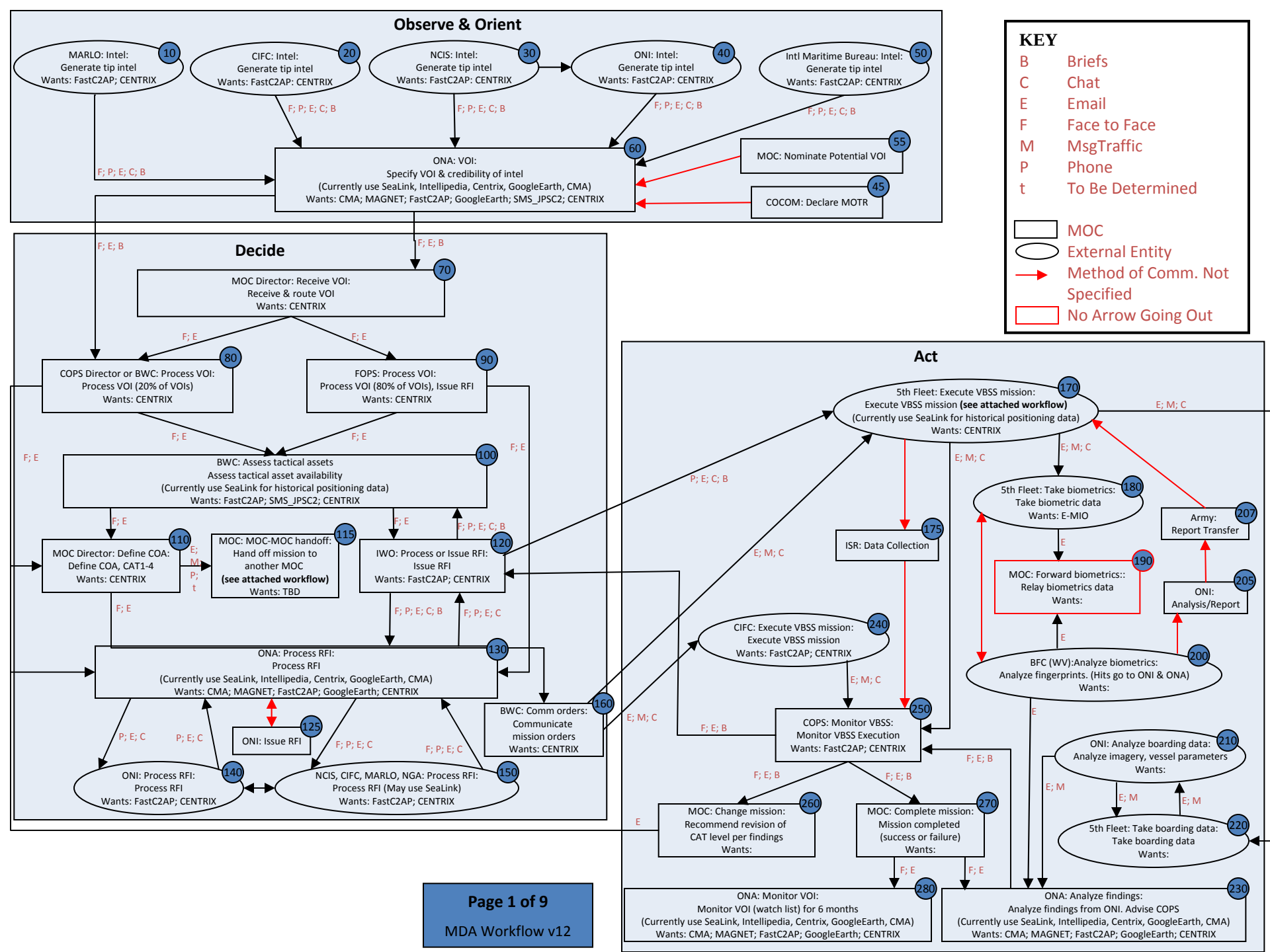
3. Visit Board Search and Seizure (VBSS) School, San Diego

4. Trident Warrior 08 – held aboard multiple Navy ships

5. Empire Challenge 08 – China Lake Naval Station and in San Francisco Harbor, 2008.

6. FAIRGAME – Simultaneous, multiple sites: Naval Maritime Intelligence Center (NMIC), NAVCENT, PACFLT, Maritime Intelligence Fusion Center, Pacific (MIFCPAC), MIFCLANT, SSC-SD and NCIS, July 2008

- **Primary source for COMOPTEVFOR to perform the QRA on all MDA technologies**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F; P; E; C; B
ONA: VOI: Specify VOI & credibility of intel (Currently use SeaLink, Intellipedia, Centrix, GoogleEarth, CMA) Wants: CMA; MAGNET; FastC2AP; GoogleEarth; SMS_JPSC2; CENTRIX
60
MOC: Nominate Potential VOI
55
COCOM: Declare MOTR
45
KEY
B Briefs
C Chat
E Email
F Face to Face
M MsgTraffic
P Phone
t To Be Determined
MOC
External Entity
Method of Comm. Not Specified
No Arrow Going Out
Decide
F; E; B
MOC Director: Receive VOI: Receive & route VOI Wants: CENTRIX
70
F; E
COPS Director or BWC: Process VOI: Process VOI (20% of VOIs) Wants: CENTRIX
80
FOPS: Process VOI: Process VOI (80% of VOIs), Issue RFI Wants: CENTRIX
90
BWC: Assess tactical assets Assess tactical asset availability (Currently use SeaLink for historical positioning data) Wants: FastC2AP; SMS_JPSC2; CENTRIX
100
MOC Director: Define COA: Define COA, CAT1-4 Wants: CENTRIX
110
E; M; P; t
MOC: MOC-MOC handoff: Hand off mission to another MOC (see attached workflow) Wants: TBD
115
IWO: Process or Issue RFI: Issue RFI Wants: FastC2AP; CENTRIX
120
F; P; E; C; B
F; P; E; C
ONA: Process RFI: Process RFI (Currently use SeaLink, Intellipedia, Centrix, GoogleEarth, CMA) Wants: CMA; MAGNET; FastC2AP; GoogleEarth; CENTRIX
130
ONI: Issue RFI
125
BWC: Comm orders: Communicate mission orders Wants: CENTRIX
160
P; E; C
ONI: Process RFI: Process RFI Wants: FastC2AP; CENTRIX
140
NCIS, CIFC, MARLO, NGA: Process RFI: Process RFI (May use SeaLink) Wants: FastC2AP; CENTRIX
150
Act
5th Fleet: Execute VBSS mission: Execute VBSS mission (see attached workflow) (Currently use SeaLink for historical positioning data) Wants: CENTRIX
170
E; M; C
5th Fleet: Take biometrics: Take biometric data Wants: E-MIO
180
Army: Report Transfer
207
ISR: Data Collection
175
MOC: Forward biometrics:: Relay biometrics data Wants:
190
ONI: Analysis/Report
205
CIFC: Execute VBSS mission: Execute VBSS mission Wants: FastC2AP; CENTRIX
240
BFC (WV):Analyze biometrics: Analyze fingerprints. (Hits go to ONI & ONA) Wants:
200
COPS: Monitor VBSS: Monitor VBSS Execution Wants: FastC2AP; CENTRIX
250
F; E; B
ONI: Analyze boarding data: Analyze imagery, vessel parameters Wants:
210
E; M
5th Fleet: Take boarding data: Take boarding data Wants:
220
MOC: Change mission: Recommend revision of CAT level per findings Wants:
260
MOC: Complete mission: Mission completed (success or failure) Wants:
270
F; E
ONA: Monitor VOI: Monitor VOI (watch list) for 6 months (Currently use SeaLink, Intellipedia, Centrix, GoogleEarth, CMA) Wants: CMA; MAGNET; FastC2AP; GoogleEarth; CENTRIX
280
ONA: Analyze findings: Analyze findings from ONI. Advise COPS (Currently use SeaLink, Intellipedia, Centrix, GoogleEarth, CMA) Wants: CMA; MAGNET; FastC2AP; GoogleEarth; CENTRIX
230
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MDA Workflow v12

Table 3. Distribution of Data by Assessment Area

Area	Number Data Items	Average Score
Operations Performance	70	2.4
Organization/Guidance	8	2.1
System Performance	219	2.4
System Supportability and Readiness	7	2.0
Warfighter Performance	0	-
Total / Average	304	2.4

Table 4. Distribution of Data by Score and Assessment Area

	Score			
Assessment Area	1: Deficiency	2: Concern	3: Strength	Total
Operations Performance	5	33	32	70
Organization/Guidance		7	1	8
System Performance	10	119	90	219
System Supportability and Readiness	-	7	-	7
Total	15	166	123	304

Distribution of Data by Technology

Technology	Frequency	Average Score
All Spiral-1	47	2.1
CMA	136	2.4
E-MIO Wireless	23	2.1
FASTC2AP	13	2.4
Global Trader	5	2.2
Google Earth	10	2.5
LiNX	5	2.4
MAGNET	2	2.0
MASTER	33	2.3
MDA DS COI	5	2.0
MIDAS	5	2.6
PANDA	13	2.9
Tripwire	7	2.9
Total/ Avg	304	2.4

Average Sum of Concern and Strength Scores by Technology

MDA Technology	Avg Sum of Scores
FASTC2AP	3.0
Global Trader	3.0
PANDA	3.0
Tripwire	3.0
CMA	2.8
MASTER	2.7
Google Earth	2.5
LiNX	2.3
MDA DS COI	2.0
E-MIO Wireless	1.5
MAGNET	n.a.

Mapping of SP-1 Technologies to MDA Capabilities

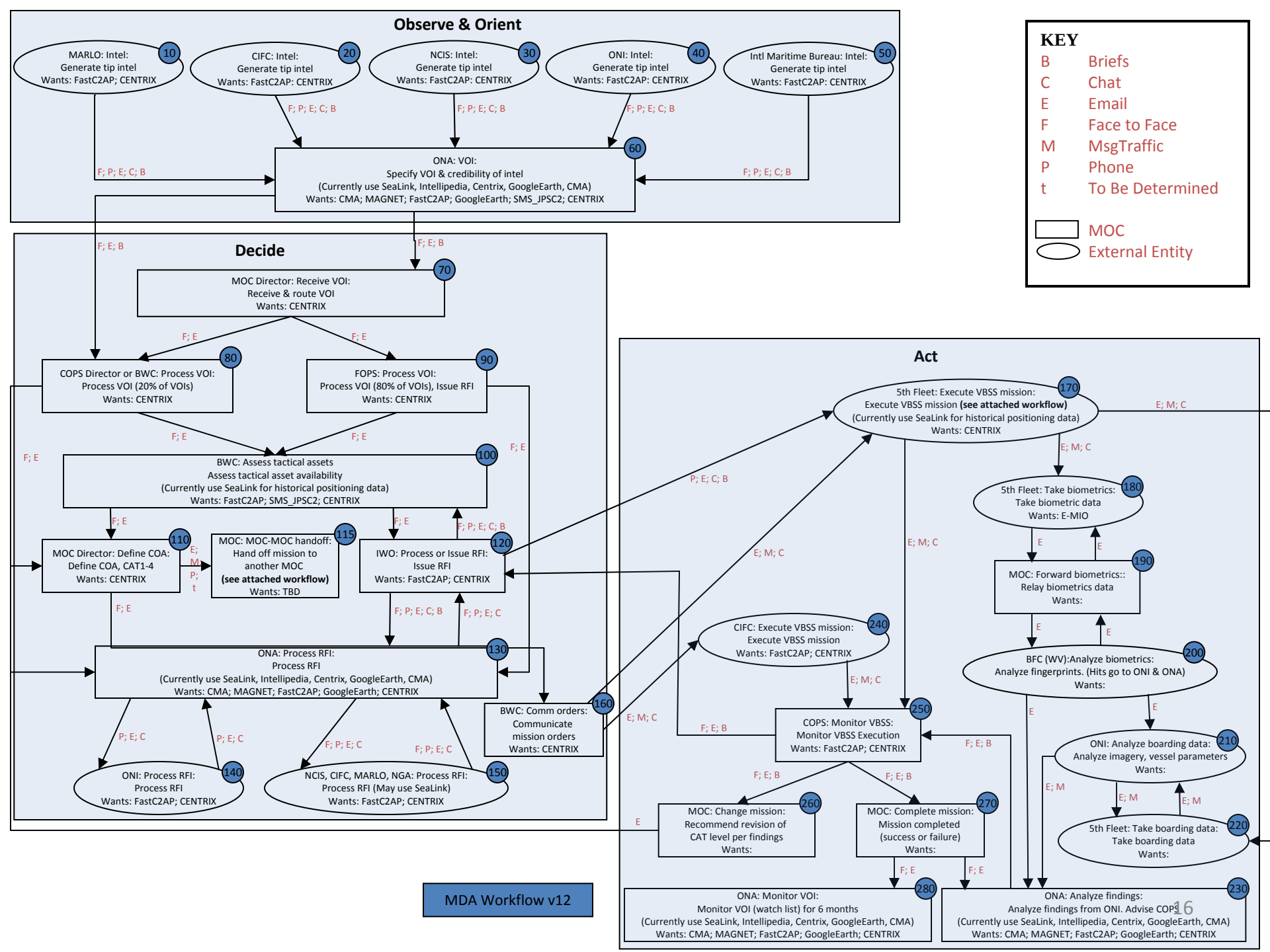
Capability	CMA	E-MIO Wireless	Global Trader	Google Earth	LiNX	MAG -NET	Data Sharing COI	Trip-wire	FAST C2AP
Assessment Score	2.4	2.1	2.2	2.5	2.4	2.0	2.0	2.9	2.4
Monitor	X		X			X	X	X	X
Collect	X	X	X		X	X	X	X	X
Fuse	X					X		X	X
Analyze	X		X			X	X	X	
Disseminate	X		X	X		X	X	X	X

Summary of Findings: Areas of Greatest Concern

- Operations Performance for EMIO
- Several sub-areas of Organization/Guidance concerning MDA Compatibility (specifically, alignment of MDA activity with ONI)
- Guidance (especially the need for MDA CONOPS, TTPs, and SOPs)
- Agreements (concerning data sharing)
- System Management
- Security
- System Supportability
- Readiness

Mapping of SP-1 Technologies to MDA Capabilities Thresholds

Capability Class	Capability	CMA	E-MIO Wireless	Global Trader	Google Earth	LiNX	MAG-NET	Data Sharing COI	Trip-wire	FAST C2AP	Potential Gaps	Potential Redundancy
Monitor	**MT1**	X					X	X	X	X		**Y**
	MT2	X					X		X	X		**Y**
	MT3								X			**Y**
	MT4	X					X		X	X		**Y**
	MT5			X								**Y**
Collect	**CT1**	X		X			X	X	X	X		**Y**
	CT2									X		**Y**
	CT3										**Y**	
	CT4		X									**Y**
	CT5					X	X					**Y**
Fuse	**FT1**	X					X			X		**Y**
	FT2								X			**Y**
Analyze	**AT1**						X		X			**Y**
	AT2										**Y**	
	AT3	X						X				**Y**
	AT4						X					**Y**
	AT5										**Y**	
	AT6			X								**Y**
Disseminate	**DT1**				X							**Y**
	DT2										**Y**	
	DT3	X		X						X		**Y**
	DT4							X				**Y**
	DT5	X								X		**Y**
	DT6								X			**Y**
	DT7								X			**Y**
	DT8	X					X		X			**Y**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B Briefs
C Chat
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F Face to Face
M MsgTraffic
P Phone
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