Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604027N *I Digital Warfare*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	19.217	37.000	54.699	-	54.699	46.700	41.826	42.962	43.823	Continuing	Continuing
3255: *AI Dev Ops*	0.000	0.000	15.000	24.979	-	24.979	14.980	9.981	9.985	10.185	Continuing	Continuing
3256: *Warfighting Pilots*	0.000	0.000	2.000	2.998	-	2.998	3.998	4.998	5.999	6.119	Continuing	Continuing
3425: *Digital Warfare*	0.000	19.217	20.000	26.722	-	26.722	27.722	26.847	26.978	27.519	Continuing	Continuing

A. Mission Description and Budget Item Justification

Overseen by the OPNAV N9, the Digital Warfare (DW) line is focused on defining and delivering the Naval Operational Architecture (NOA) for Distributed Maritime Operations (DMO). The NOA consists of networks, infrastructure, data, and tools and analytics to support improved lethality and decision making in DMO. The DW line funds integrated model-based systems engineering (MBSE) and analysis of the mission and multi-mission requirements for intel, tactical and, operational level of war capabilities, and the development of reference architectures, data models, and operationally relevant implementations that enable the definition and allocation of digital requirements into existing and new programs of record (PORs). The DW line also funds digital environments, including the Integrated Modeling Environment (IME) and artificial intelligence development operations (AI Dev Ops), to enable cross-functional/organizational teams to collaborate on developing and implementing the NOA.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	20.000	50.120	55.744	-	55.744
Current President's Budget	19.217	37.000	54.699	-	54.699
Total Adjustments	-0.783	-13.120	-1.045	-	-1.045
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-13.120			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.783	0.000			
• Program Adjustments	0.000	0.000	-1.000	-	-1.000
• Rate/Misc Adjustments	0.000	0.000	-0.045	-	-0.045

Change Summary Explanation

The FY 2020 funding request for Project 3425 was reduced by (-$3.120) million to account for the availability of prior year execution balances.

The FY 2020 funding request for Project 3255 was reduced by (-$10.000) million to account for unjustified growth.
The FY 2021 funding request for project 3425 was reduced by (-$1.045) million to account for the availability of prior year execution balances.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604027N *I Digital Warfare*

Overall increase from FY20 to FY21 is due to the standing up of domain teams and software tools required to support the domain teams.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3255 / *AI Dev Ops*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3255: *AI Dev Ops*	0.000	0.000	15.000	24.979	-	24.979	14.980	9.981	9.985	10.185	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3255 AI DevOps consists of complementary lines of effort focused on developing and delivering AI technology applications at the Fleet, Force, and Unit levels. Fleet implementation is focused on delivering architectures, data models, and software tools to support the ability of the Maritime Operations Center (MOC) Director to make better, faster decisions at the operational level of war. Force implementation is focused on delivering architectures, data models, and software tools to support Strike/Task Group commander situational awareness, maneuver, positioning, and fires coordination. Unit level implementation is focused on providing tactical submarine operators modern Artificial Intelligence (AI) and Machine Learning (ML) techniques (developed in coordination with Project Maven under USD[I]) to address undersea warfare problems. This project directly supports our National Defense Strategy for building a more lethal force by investing in Advanced Autonomous Systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Artificial Intelligence Development Operations (AI DevOps)	0.000	15.000	24.979	0.000	24.979
Articles:	-	-	-	-	-
FY 2020 Plans: -$8M to maintain the Project Harbinger effort started under the Algorithmic Warfare Cross-Functional Team (AWCFT). The $8M includes acoustic data acquisition and transfer ($0.4M), data labeling efforts ($1.5M), data engineering lab ($1M), algorithm development and computing infrastructure ($3.6M), algorithm integration ($1.2M), and fielding to fleet ($0.3M). Increase above the $5.2M in AWCFT FY19 funding is for algorithm development and integration. Digital Warfare Office (DWO) works directly with Undersea Warfighting Development Center (Groton) and COMSUBFOR (Norfolk) for Harbinger and has already tested it on a VACL SSN. This is in direct support of our National Defense Strategy to build a more lethal force using Advanced Autonomous Systems and the CNO's Design 2.0 LOE Green Paragraph 5. -$2M for data architecture team (funds people) to develop a robust and sustainable data strategy for Naval operations to include all sensor data (acoustic, ISR, EW, etc). This expertise does not currently exist in the DoN. -$15M for a DWO project to apply AI/DevOps to the operational level of war. It will develop planning and execution decision aids in support of U.S. Pacific Fleet and the Navy's Distributed Maritime Operations (DMO) Concept. The project will clean and integrate existing Navy data, leveraging and expanding upon the AI DevOps components established for Project Harbinger. It includes data acquisition and transfer ($1.1M), data labeling efforts ($2.5M), data engineering lab ($2M), algorithm development and computing infrastructure ($7.3M), algorithm integration ($1.9M), and fielding to fleet ($0.2M). This is in direct support of our National Defense					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3255 / *AI Dev Ops*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Strategy to build a more lethal force using Advanced Autonomous Systems and the CNO's Design 2.0 LOE Blue Paragraph 6. ***FY 2021 Base Plans:*** - Expand the AI DevOps pipeline (data acquisition and transfer, data labelling, data engineering, algorithm development and computing infrastructure and fielding to fleet) to additional fleet, force, and unit applications and data sources. - Fleet implementation - Deliver architectures, data models, and software tools to support the ability of the Maritime Operations Center (MOC) Director to make better, faster decisions at the operational level of war. - Force implementation - Deliver architectures, data models, and software tools to support Strike/Task Group commander situational awareness, maneuver, positioning, and fires coordination. - Unit level implementation - Sustain and expand AI DevOps pipeline for undersea warfare to include additional undersea platforms, including IUSS, surface ships, and aircraft. - Evolve the data strategy to support these additional applications and the NOA. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $9.979M from FY 2020 to FY 2021 - Full operating capability realized in FY21 with mission area teams at full strength for the entire year, establishing and evolving common architectures to realize the Navy Operational Architecture, and full operating capability of descriptive MBSE toolsets.					
Accomplishments/Planned Programs Subtotals	0.000	15.000	24.979	0.000	24.979

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

DW is a non-acquisition effort that informs and matures Navy decisions, which in turn impacts acquisition programs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3255 / *AI Dev Ops*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AI DEVOPS - Fleet	Various	JHU/APL : Various	0.000	0.000		1.500	Feb 2020	2.000	Oct 2020	-		2.000	Continuing	Continuing	Continuing
AI DEVOPS - Fleet	Various	See Note B : Various	0.000	0.000		0.750	Nov 2019	1.000	Oct 2020	-		1.000	Continuing	Continuing	Continuing
AI DEVOPS - Fleet	Various	See Note C : Various	0.000	0.000		1.000	Feb 2020	3.500	Nov 2020	-		3.500	Continuing	Continuing	Continuing
AI DEVOPS - Fleet	Various	See Note D : Various	0.000	0.000		1.080	Feb 2020	0.479	Oct 2020	-		0.479	0.000	1.559	-
AI DEVOPS - Fleet	Various	AFRL : Rome NY	0.000	0.000		5.520	Nov 2019	9.800	Nov 2020	-		9.800	0.000	15.320	-
AI DEVOPS - Unit	Various	See Note E : Various	0.000	0.000		0.000	Nov 2019	0.100	Nov 2020	-		0.100	0.000	0.100	-
AI DEVOPS - Unit	Various	See Note F : Various	0.000	0.000		0.000	Dec 2019	0.100	Dec 2020	-		0.100	0.000	0.100	-
AI DEVOPS - Unit	Various	NIWC PAC : Various	0.000	0.000		4.400	Nov 2019	3.400	Dec 2020	-		3.400	0.000	7.800	-
AI DEVOPS	Various	See Note G : Various	0.000	0.000		0.000	Nov 2019	3.600	Nov 2020	-		3.600	0.000	3.600	-
AI DEVOPS	Various	See Note A : Various	0.000	0.000		0.750	Nov 2019	1.000	Nov 2020	-		1.000	0.000	1.750	-
		Subtotal	0.000	0.000		15.000		24.979		-		24.979	Continuing	Continuing	N/A

Remarks

Note A: FFRDCs (MIT LL, others) - $750K
Note B: UARCs (UT ARL, GTRI, others) - $750K
Note C: Commercial Industry (Lockheed Martin Manassas, others) - $1.0M
Note D: Warfare Centers (NUWC Newport, others) - $1.080M FY20 - .021K FY21

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		15.000		24.979		-		24.979	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3255 / *AI Dev Ops*

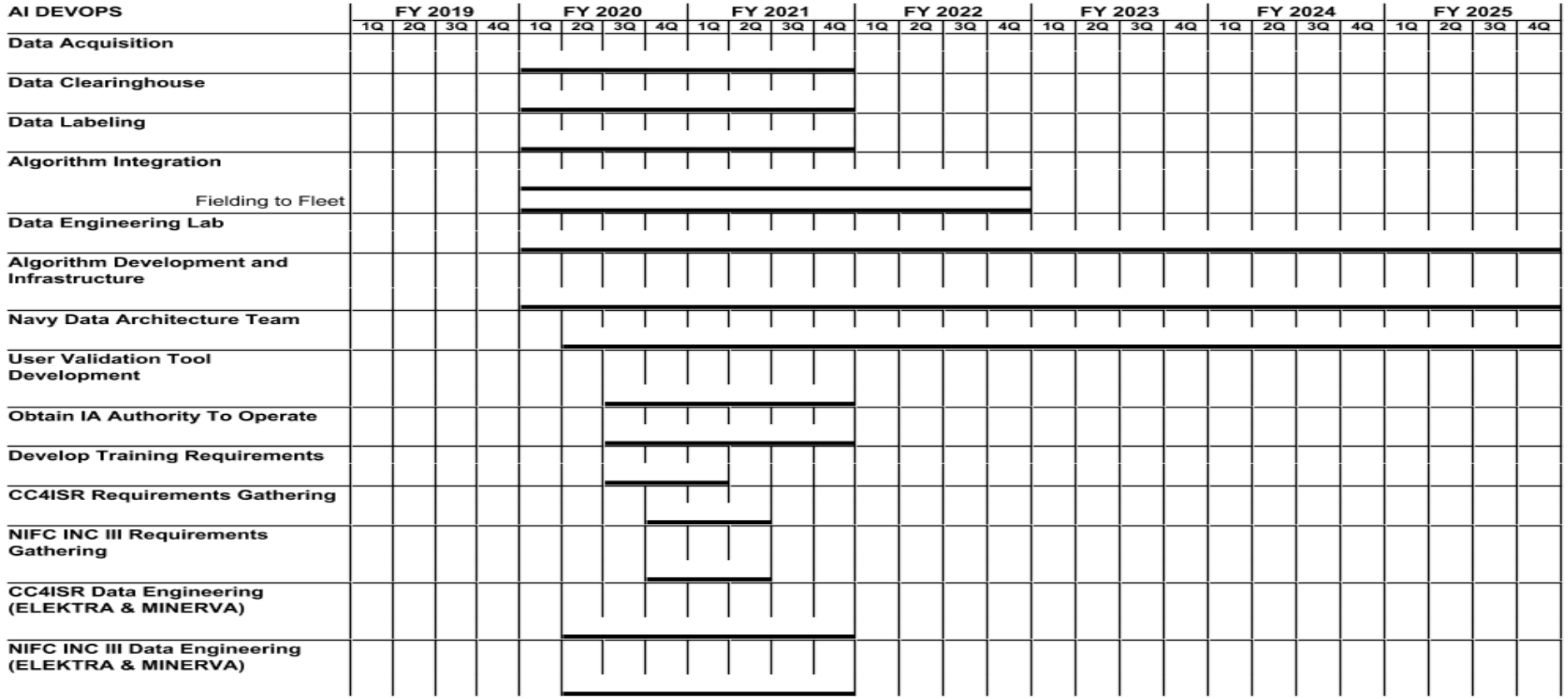

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3255 / *AI Dev Ops*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AI DEVOPS				
Data Acquisition:	1	2020	4	2021
Data Clearinghouse:	1	2020	4	2021
Data Labeling:	1	2020	4	2021
Algorithm Integration:	1	2020	4	2022
Algorithm Integration: Fielding to Fleet:	1	2020	4	2022
Data Engineering Lab:	1	2020	4	2025
Algorithm Development and Infrastructure:	1	2020	4	2025
Navy Data Architecture Team:	2	2020	4	2025
User Validation Tool Development:	3	2020	4	2021
Obtain IA Authority To Operate:	3	2020	4	2021
Develop Training Requirements:	3	2020	1	2021
CC4ISR Requirements Gathering:	4	2020	2	2021
NIFC INC III Requirements Gathering:	4	2020	2	2021
CC4ISR Data Engineering (ELEKTRA & MINERVA):	2	2020	4	2021
NIFC INC III Data Engineering (ELEKTRA & MINERVA):	2	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3256 / *Warfighting Pilots*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3256: *Warfighting Pilots*	0.000	0.000	2.000	2.998	-	2.998	3.998	4.998	5.999	6.119	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DW requires extensive information exchanges and message compatibility in order to fully exploit kinetic weapons / target pairing tools. These tools and the related weapons require a robust and extensive set of data to properly engage a target. The Warfighting Pilot effort begins the process of creating message and data standards that will drive Navy to a uniform set of message standards and data. In order to fully leverage and improve the information exchange and weapon employment opportunities, regardless of data link or message type used, a standardized data and message standard is required to maximize todays sensors for over-the-horizon combat identification & targeting.

DWO funds will support the technical development and fleet demonstration efforts necessary to establish the viability of a common multi-domain Track Data Standard solution. The result will be a fully defined and documented message standard that will be capable of implementation across multiple data link systems. The funds will also support the development of operational and systems. physics based models for various kinetic long range weapon.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: New Accomplishment/Planned Program Entry	0.000	2.000	2.998	0.000	2.998
Articles:	-	-	-	-	-
FY 2020 Plans: Build messaging standards to support LR CID&T Tactical Level of War (TLW) & Operational Lever of War (OLW) requirements. -Identify and deliver, in an operationally relevant manner, technologies related to message delivery and source data fusion. -Document field data for message standards. -Coordinate with message standards governance elements across DoD to enable the resulting standard inclusion into existing systems and weapons. -Support ingest of LR CID&T data to OLW & TLW planning tools. -Develop plan and test new track message using existing fleet events. -Digital Platform - Demonstrate common environment for warfare system computing. -Digital Platform - Demonstrate common track management for digital transformation across multiple systems.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3256 / *Warfighting Pilots*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Demonstrate integration of Combat Systems (CS) & Command & Control (C2) infrastructure and data sets through a scalable cloud computing services environment in support of TLW & OLW planning and execution tools. -Digital Platform - Adapting the operating environment for different SWAP profiles and mission requirements. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1M from FY 2020 to FY 2021 - Demonstrate integration of Combat Systems (CS) & Command & Control (C2) infrastructure and data sets through a scalable cloud computing services environment in support of TLW & OLW planning and execution tools.					
Accomplishments/Planned Programs Subtotals	0.000	2.000	2.998	0.000	2.998

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3256 / *Warfighting Pilots*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Warfighting Pilots	TBD	Warfare CTR : Various	0.000	0.000		2.000	Feb 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Warfighting Pilots	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.498	Dec 2020	-		0.498	Continuing	Continuing	Continuing
Warfighting Pilots	C/CPFF	NUWC : West	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Warfighting Pilots	C/CPFF	IWS : NAVSEA	0.000	0.000		0.000		1.250	Nov 2020	-		1.250	Continuing	Continuing	Continuing
Warfighting Pilots	C/CPFF	C4I : NAVAIR	0.000	0.000		0.000		1.250	Nov 2020	-		1.250	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		2.000		2.998		-		2.998	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		2.000		2.998		-		2.998	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3256 / *Warfighting Pilots*

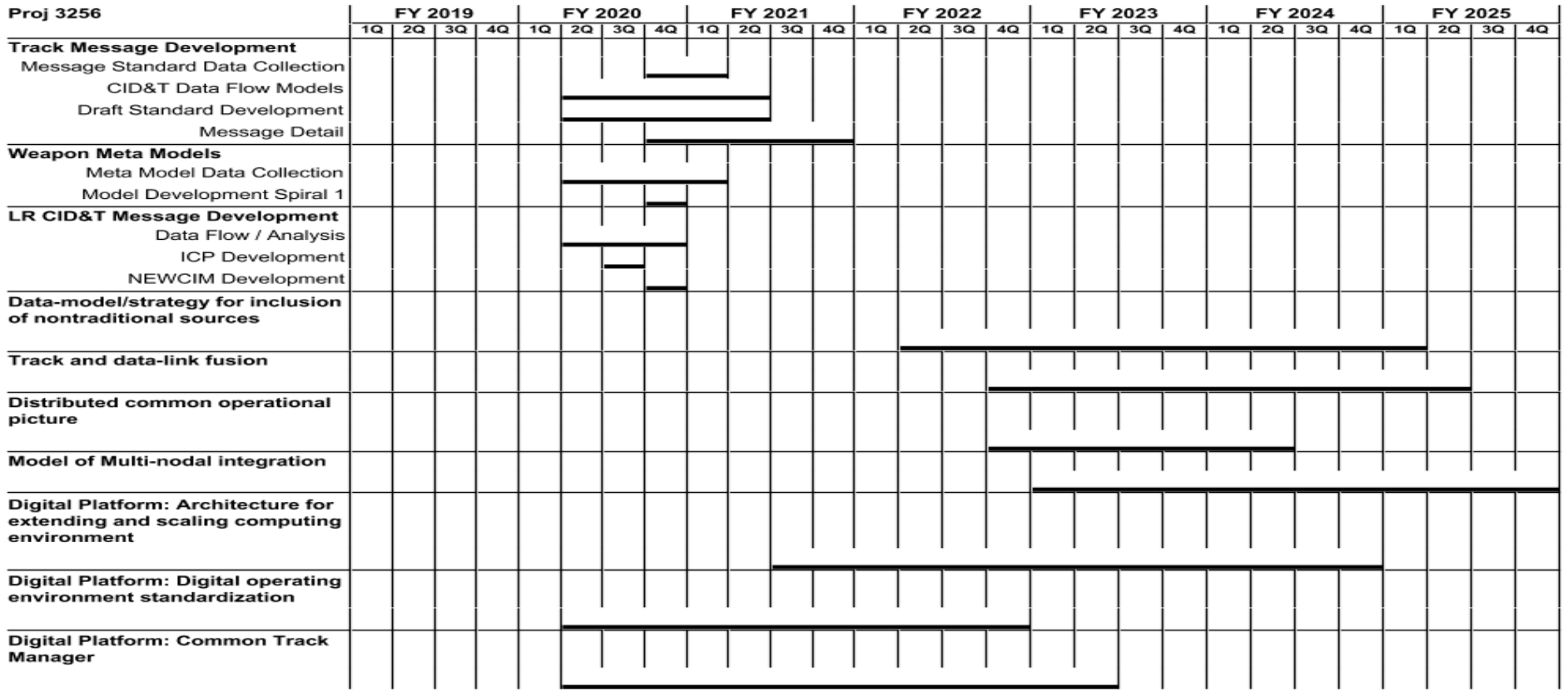

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3256 / *Warfighting Pilots*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3256				
Track Message Development: Message Standard Data Collection:	4	2020	1	2021
Track Message Development: CID&T Data Flow Models:	2	2020	2	2021
Track Message Development: Draft Standard Development:	2	2020	2	2021
Track Message Development: Message Detail:	4	2020	4	2021
Weapon Meta Models: Meta Model Data Collection:	2	2020	1	2021
Weapon Meta Models: Model Development Spiral 1:	4	2020	4	2020
LR CID&T Message Development: Data Flow / Analysis:	2	2020	4	2020
LR CID&T Message Development: ICP Development:	3	2020	3	2020
LR CID&T Message Development: NEWCIM Development:	4	2020	4	2020
Data-model/strategy for inclusion of nontraditional sources:	2	2022	1	2025
Track and data-link fusion:	4	2022	2	2025
Distributed common operational picture:	4	2022	2	2024
Model of Multi-nodal integration:	1	2023	4	2025
Digital Platform: Architecture for extending and scaling computing environment:	3	2021	4	2024
Digital Platform: Digital operating environment standardization:	2	2020	4	2022
Digital Platform: Common Track Manager:	2	2020	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3425 / *Digital Warfare*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3425: *Digital Warfare*	0.000	19.217	20.000	26.722	-	26.722	27.722	26.847	26.978	27.519	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Digital Warfare (DW) was previously funded in Naval Information Warfare Systems Command (NAVWAR) PE 0604231N (Tactical Command System), NAVSEA PE 0603582N (Combat System Integration), and NAVAIR 0605217N (Common Avionics) under DW Proj 3425 for FY18 and prior. FY20 and out funding was transferred from NAVWAR and NAVAIR and consolidated under NAVSEA. Mission functions and tasking remain unchanged due to this transfer. FY19 funding was transferred under NAVSEA.

A. Mission Description and Budget Item Justification

The DW technical initiatives directly support the Chief of Naval Operations (CNO) vision of inherent interoperability across the Navy enabling faster deployment of capabilities to the warfighter. Realizing this vision requires refinement of the Navy's Operational Architecture as defined in Design 2.0, assessing current Program Of Record (PoR) contribution to it,identifying gaps in capability, and establishing the roadmap to realization.

Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Naval Information Warfare Systems Command (NAVWAR), Program Executive Offices (PEOs),warfare and system centers, University Affiliated Research Centers (UARCs)/Federally Funded Research and Development Centers (FFRDCs), and industry partners will support
the Digital Warfare Office (DWO) under the Office of the Chief of Naval Operations (OPNAV) N2N6. In order to develop capability from the top down, the DWO will develop requirements for System of Systems (SoS) to include all of the associated interoperability requirements. Due to the complexity of this work, the DWO will evolve the traditional
requirements development methodology to a MBSE methodology that will encompasses associated model extensions, reports, views, configuration management, model development support, and documentation. This work will be completed by a series of teams, each focused on a separate threat domain, and made up of system modelers, fleet representatives, PoR
representatives, architecture, and interoperability experts.

The products generated by these teams will include NOA elements for prioritized mission and wafare domain areas, coordinated requirements recommendations, and potential areas for Science and Technology (S&T) and experimentation to fill gaps. The DWO will include emerging digital technologies including human/ machine teaming, data science, and artificial intelligence. In addition to traditional mission engineering, the teams will develop cross-cutting reference models and reusable library patterns to further define and refine the OA as well as provide a model interoperability component library for use by the SYSCOMS.

DWO funding supports development of requirements modeling and data science experimentation environment at multiple security level. This environment will host the authoritative source of truth for Naval Echelon I requirements development, PoR requirements and architecture, and provide a virtual location for the engineering workforce to collaborate. The DWO will support experimentation to provide necessary fidelity in the requirements allocation process, focusing on areas that may provide solutions across multiple domains.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3425 / *Digital Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: SYSCOM/PEO DW Support	19.217	20.000	26.722	0.000	26.722
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue to develop functional baseline architecture of Navy capabilities. Provide SME support for the domain functional decomposition based on prioritized mission areas to include Anti-Submarine Warfare, Surface Warfare, Electronic Warfare, Air Warfare, and Strike Warfare. Develop an overarching Data Technical Baseline (DTB) and DTB profiles for Program of Records (PoRs). Generate PoR requirements based on functional models. - Support the distributed Model Based Systems Engineering (MBSE) and data science environment over multiple security enclaves. Test and deploy additional industry standard tools as required. Continue to scale to meet user demand. - Develop tool extensions to complement Joint Capabilities Integration and Development System (JCIDS) and Program Objective Memorandum (POM) processes. - Curate existing models in the modeling environment. - Continue to support fleet experimentation to provide necessary fidelity in the requirements allocation process, focusing on areas that may provide solutions across multiple domains. - Provide Subject Matter Expert support for data science teams in data exploration and analysis, information and knowledge extraction techniques, and application to mission area data requirements in support of enterprise productivity and warfighting pilots. Apply Machine Learning techniques to support human/machine teaming for decision making.					
FY 2021 Base Plans: - Continue to develop functional baseline operational architecture of Navy capabilities. Define the Naval Operational Architecture(OA) both as a standalone construct and in the context of warfighting mission areas. Provide SME support for the domain functional decomposition based on prioritized mission areas to include Anti-Submarine Warfare, Surface Warfare, Electronic Warfare, Air Warfare, and Strike Warfare. Develop an overarching Data Technical Baseline (DTB) and DTB profiles for PoRs. Generate PoR requirements based on functional models. - Support the distributed Model Based Systems Engineering (MBSE) and data science environment over multiple security enclaves. Test and deploy additional industry standard tools as required. Continue to scale to meet user demand. - Develop tool extensions to complement Joint Capabilities Integration and Development System (JCIDS) and Program Objective Memorandum (POM) processes. - Curate existing models in the modeling environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3425 / *Digital Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to support fleet experimentation to provide necessary fidelity in the requirements allocation process, focusing on areas that may provide solutions across multiple domains. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $6.722M from FY 2020 to FY 2021 - Full operating capability realized in FY21 with mission area teams at full strength for the entire year, establishing and evolving common architectures to realize the Navy Operational Architecture, and full operating capability of descriptive MBSE toolsets.					
Accomplishments/Planned Programs Subtotals	19.217	20.000	26.722	0.000	26.722

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3425 / *Digital Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare - FY19 and Prior	C/CPFF	JHU/APL : Laurel, MD	0.000	19.217	Oct 2019	0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	MIPR	MITRE : McLean, VA	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	C/CPFF	GTRI : San Diego, CA	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	WR	NAWCs : Various	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	WR	SSCs : Various	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	WR	NRL : Washington, DC	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	C/CPFF	G2OPS : San Diego, CA	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - FY19 and Prior	C/CPFF	Various : Various	0.000	0.000		0.000	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Digital Warfare - Integrated Model Environment (IME)	Various	NAVAIR : Pax River, VA	0.000	0.000		2.747	Nov 2019	4.078	Nov 2020	-		4.078	Continuing	Continuing	Continuing
Digital Warfare - Integrated Model Environment (IME)	Various	See Note A : Various	0.000	0.000		1.012	Nov 2019	1.501	Oct 2020	-		1.501	Continuing	Continuing	Continuing
Digital Warfare - Integrated Model Environment (IME)	Various	See Note B : Various	0.000	0.000		0.751	Nov 2019	1.115	Oct 2020	-		1.115	Continuing	Continuing	Continuing
Digital Warfare - Operational Architecture	Various	MITRE : McLean, VA	0.000	0.000		1.127	Nov 2019	1.673	Dec 2020	-		1.673	Continuing	Continuing	Continuing
Digital Warfare - Operational Architecture	Various	See Note C : Various	0.000	0.000		2.029	Dec 2019	3.011	Oct 2020	-		3.011	Continuing	Continuing	Continuing
Digital Warfare - Operational Architecture	Various	See Note D : Various	0.000	0.000		0.601	Nov 2019	0.892	Nov 2020	-		0.892	Continuing	Continuing	Continuing
Digital Warfare - Effort 4	Various	See Note E : Various	0.000	0.000		2.762	Nov 2019	4.099	Nov 2020	-		4.099	Continuing	Continuing	Continuing
Digital Warfare - Effort 4	Various	See Note F : Various	0.000	0.000		0.563	Dec 2019	0.836	Dec 2020	-		0.836	Continuing	Continuing	Continuing
Digital Warfare - Effort 4	Various	See Note G : Various	0.000	0.000		0.620	Nov 2019	0.920	Oct 2020	-		0.920	Continuing	Continuing	Continuing
Digital Warfare - Effort 4	Various	See Note H : Various	0.000	0.000		0.563	Nov 2019	0.836	Oct 2020	-		0.836	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3425 / *Digital Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare - MOC, CIC, TFCC	Various	See Note I : Various	0.000	0.000		0.816	Nov 2019	1.204	Nov 2020	-		1.204	Continuing	Continuing	Continuing
Digital Warfare - Other (Studies, MBSE, I&I, NCIP)	Various	Industry : Various	0.000	0.000		0.409	Jun 2020	0.557	Oct 2020	-		0.557	Continuing	Continuing	Continuing
		Subtotal	0.000	19.217		14.000		20.722		-		20.722	Continuing	Continuing	N/A

Remarks

Note A: Warfare Centers (NIWC LANT, NIWC PAC, others) - $1.012M
Note B: Commercial Industry (G2OPS, MITRE, others) - $751K
Note C: Warfare Centers (NSWC DD, NAWC AD, NUWC Keyport, NUWC Newport, NIWC PAC, others) - $2.029M
Note D: Commercial Industry (G2OPS, others) - $601K
Note E: Warfare Centers (NSWC DD, NIWC PAC, others) - $2.262M
Note F: UARCS (JHU/APL, others) - $563K
Note G: Research Laboratories (NRL, IDT, others) - $620K
Note H: Commercial Indusry (Lockheed Martin, G2OPS, others) - $563K
Note I: Warfare Centers (NSWC DD, NIWC PAC, NAWC AD, others) - $1.012M

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare - DISC Digital Transformation & Integration	Various	Various : Various	0.000	0.000		2.900	Dec 2019	3.000	Dec 2020	-		3.000	0.000	5.900	-
Digital Warfare - DISC Digital Transformation & Integration	Various	Various : DTIC IAC	0.000	0.000		2.600	Dec 2019	2.500	Dec 2020	-		2.500	0.000	5.100	-
		Subtotal	0.000	0.000		5.500		5.500		-		5.500	0.000	11.000	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / *Digital Warfare*	Project (Number/Name) 3425 / *Digital Warfare*	

Management Services ($ in Millions)

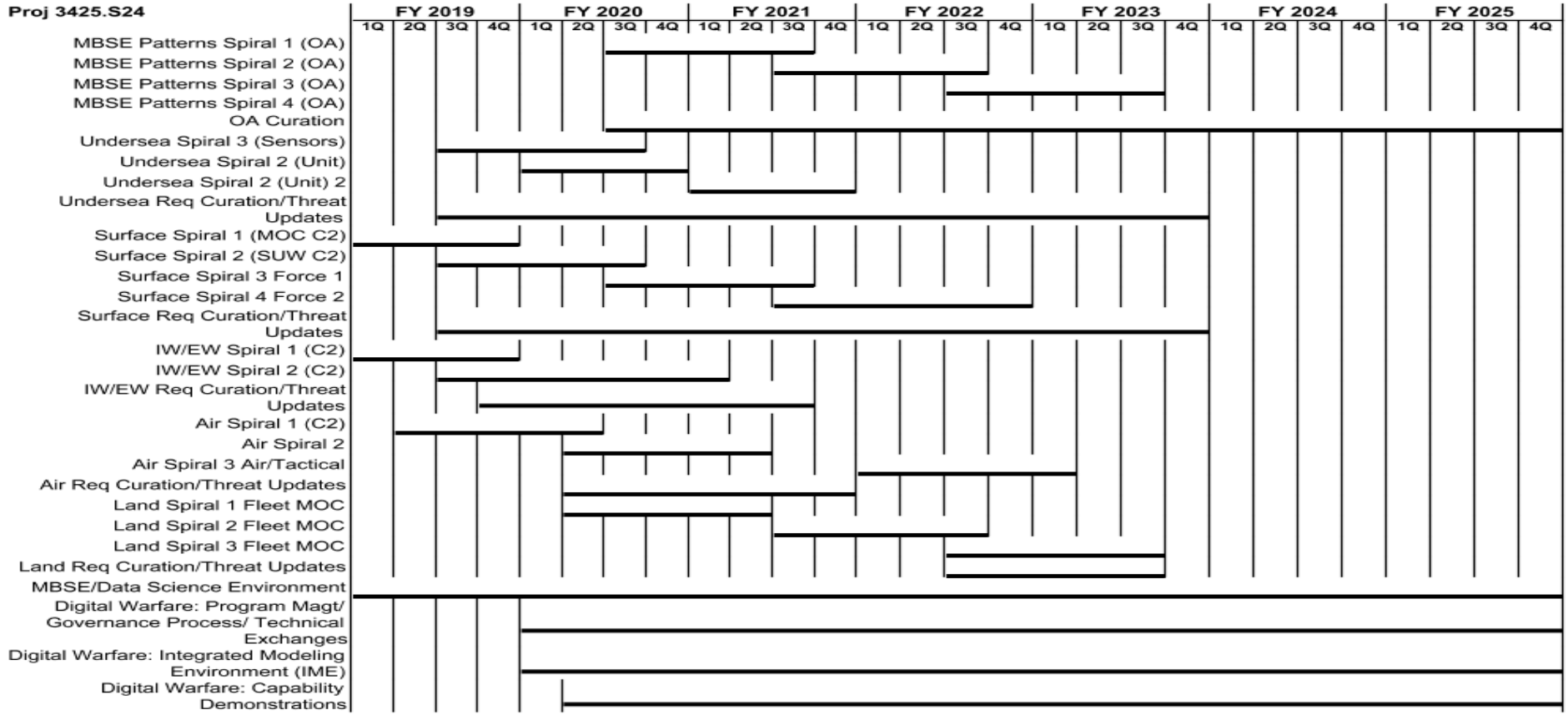
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare - DISC Digital Transformation & Integration	Various	Various : Various	0.000	0.000		0.500	Nov 2019	0.500	Nov 2020	-		0.500	0.000	1.000	-
		Subtotal	0.000	0.000		0.500		0.500		-		0.500	0.000	1.000	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	19.217		20.000		26.722		-		26.722	Continuing	Continuing	N/A

Remarks

FY 2020 funding request for project 3425 was reduced by (-$3.120) million to account for the availability of prior year execution balances.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3425 / *Digital Warfare*



2021PB - 0604027N - 3425.S24

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3425 / *Digital Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3425.S24				
MBSE Patterns Spiral 1 (OA):	3	2020	3	2021
MBSE Patterns Spiral 2 (OA):	3	2021	3	2022
MBSE Patterns Spiral 3 (OA):	3	2022	3	2023
MBSE Patterns Spiral 4 (OA):	3	2023	3	2024
OA Curation:	3	2020	4	2025
Undersea Spiral 3 (Sensors):	3	2019	3	2020
Undersea Spiral 2 (Unit):	1	2020	4	2020
Undersea Spiral 2 (Unit) 2:	1	2021	4	2021
Undersea Req Curation/Threat Updates:	3	2019	4	2023
Surface Spiral 1 (MOC C2):	1	2019	4	2019
Surface Spiral 2 (SUW C2):	3	2019	3	2020
Surface Spiral 3 Force 1:	3	2020	3	2021
Surface Spiral 4 Force 2:	3	2021	4	2022
Surface Req Curation/Threat Updates:	3	2019	4	2023
IW/EW Spiral 1 (C2):	1	2019	4	2019
IW/EW Spiral 2 (C2):	3	2019	1	2021
IW/EW Req Curation/Threat Updates:	4	2019	3	2021
Air Spiral 1 (C2):	2	2019	2	2020
Air Spiral 2:	2	2020	2	2021
Air Spiral 3 Air/Tactical:	1	2022	1	2023
Air Req Curation/Threat Updates:	2	2020	4	2021
Land Spiral 1 Fleet MOC:	2	2020	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604027N / *Digital Warfare*	**Project (Number/Name)** 3425 / *Digital Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Land Spiral 2 Fleet MOC:	3	2021	3	2022
Land Spiral 3 Fleet MOC:	3	2022	3	2023
Land Req Curation/Threat Updates:	3	2022	3	2023
MBSE/Data Science Environment:	1	2019	4	2025
Digital Warfare: Program Magt/ Governance Process/ Technical Exchanges:	1	2020	4	2025
Digital Warfare: Integrated Modeling Environment (IME):	1	2020	4	2025
Digital Warfare: Capability Demonstrations:	2	2020	4	2025