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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Defense Threat Reduction Agency **Date:** May 2021

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604551BR / <i>Catapult</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	8.110	0.000	7.166	-	7.166	-	-	-	-	-	-
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	-	8.110	0.000	7.166	-	7.166	-	-	-	-	-	-

Note

Catapult activities were previously justified under program element 0604134BR, Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing were realigned to this program element to better reflect the nature of these ongoing and enduring activities.

A. Mission Description and Budget Item Justification

This program element designs, develops, tests, and delivers mission capabilities that support the ability to aggregate, and analyze data on global emerging threats and expedites DTRA's technology transition from the laboratory to operational use to reduce risk within the acquisition process. This is done by evaluating integrated technologies or prototype systems in a high quality and realistic operating environment.

B. Program Change Summary (\$ in Millions)

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	8.110	0.000	7.166	-	7.166
Total Adjustments	8.110	0.000	7.166	-	7.166
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignment	8.110	-	7.166	-	7.166

Change Summary Explanation

The increase in FY 2022 from the previous President's Budget is due to the realignment of Catapult and TACEON RDT&E resources from PE 0604134BR to this new PE 0604551BR to better reflect the nature of these ongoing and enduring activities. In FY 2020, \$8.110 million was appropriately executed in PE 0604134BR for the Catapult Program of Record. Within the exhibit, execution is reflected in PE 0604551BR which was newly established for Catapult beginning in FY 2022.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency										Date: May 2021		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604551BR / <i>Catapult</i>				Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	-	8.110	0.000	7.166	-	7.166	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project enables DTRA's Catapult Information System Program to design, develop, test, and deliver mission capabilities that support the ability to aggregate, and analyze data on global emerging threats. Catapult allows DTRA to rapidly develop, engineer, test and deploy analytical tools, data science methodologies, and software applications in support of the Warfighter. Catapult and its associated Attack the Network Tool Suite (ANTS) integrates data sources that support the detection and identification of improvised threats, threat networks and actors, command and control, operations, intelligence, and engagement for neutralizing, attacking, and defeating both current and emerging improvised threats and threat networks.

DTRA's Mission Information Technology (MIT) capability, with its embedded Combatant Command (CCMD), Capability Data Integrators (CDIs), and reachback staff work continuously to create capabilities requested by users from the DoD, the Intelligence Community (IC), interagency partners, and the Whole of Government to ingest, fuse, analyze, and present mission-relevant data and information to users of their customized, mission-oriented tools and services. These capabilities reside in Catapult, a cloud technology-based data analytics platform developed and being delivered by DTRA that provides an extensible, continuously augmented, real-time repository of data on improvised threats and worldwide threat actors. Catapult is fully operational and accredited on the Secret Internet Protocol Router Network (SIPRNet) and Joint Worldwide Intelligence Communications System (JWICS). The Catapult architecture pulls from more than 850 data sources on SIPRNet and more than 170 data sources on JWICS. Catapult uses a set of more than 100 tools (ANTS) and services to provide national-level capabilities for data and information capture, discovery, access, aggregation, correlation, visualization, analysis, sharing, and distribution for users from the strategic level to the tactical edge.

This project also funds the Team for Analysis of Cyber Enterprise Operations and Networks (TACEON), which conducts market research as well as evaluates and coordinates commercially available or government-owned data technologies that can provide DTRA and its mission partners with an information advantage. TACEON will be used as an enterprise resource and not only provide services to the IT Directorate but also to other Agency IT stakeholders as well as mission partners in DTRA's quest to hone our data, information and knowledge technologies for worldwide mission support. TACEON will help with our evolution from a data to information and eventually to a knowledge centric organization.

The project achieves transformational mission capabilities and postures the Agency to meet emerging mission requirements through innovative technology solutions and service upgrades, Knowledge Management (KM) and Business Intelligence (BI) solutions.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2020	FY 2021	FY 2022
Title: RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	8.110	0.000	7.166

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Description: This Project enables DTRA's Catapult Information System Program to design, develop, test, and deliver mission capabilities that support the ability to aggregate, and analyze data on global emerging threats. Catapult allows DTRA to rapidly develop, engineer, test and deploy analytical tools, data science methodologies, and software applications in support of the Warfighter.</p> <p>This project also funds the SETA Capability Research Architecture Cell (CRAC) which identifies, investigates, explores, evaluates, and tests prototypes of emerging and cutting edge information technology that provides superior advantage to analysts and warfighters. CRAC builds partnerships with mission partners in DoD, IC, IA, Academia, National Labs and Industry to support, develop and integrate plans, programs, requirements, resources, technology and innovations across the mission spectrum for DTRA.</p> <p>The project achieves transformational mission capabilities and postures the Agency to meet emerging mission requirements through innovative technology solutions and service upgrades, Knowledge Management (KM) and Business Intelligence (BI) solutions.</p> <p>FY 2021 Plans: N/A</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Develop predictive Data Science models through supervised and unsupervised Machine Learning against current and emerging threats; including fusion of multi-INT data across unclassified and classified data sets to identify networks and locations of interest to DTRA and its mission partners. - Create a new development environment to enable "technology at the edge" to support real-time development of new Data Science models/algorithms at mission partner sites to enhance existing or future Catapult Machine Learning models. Implement role-based access control and dynamic query analytics across Catapult data through Elastic Search to enable users to quickly retrieve known affiliates, family members, contacts, aliases, email addresses and other information about entities and enemy threat networks without running additional queries. - Create "Functions as a Service" by commoditizing common used functions and analytics across the ANTS to enable scalability and elasticity across the tool suite allowing ANTS capabilities to execute analytics against larger and more diverse data sets. - Extend Catapult architecture to allow for shared services across Whole of Government to enable analytics to be re-used in other platforms and tools across various IC and DoD organizations. - Develop Active Learning interface and pipeline to enable crowdsourced input for training and tagging data to feed new Data Science machine learning models. 			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>- Modularize Catapult’s Data Processing Framework to enable targeted data transformation based on data source, artifact mime type, artifact size, or any number of other source specific properties; Add better processing support for structured data, imagery, financial, SIGINT, Measurement and Signature Intelligence (MASINT), Internet of Things (IoT), and cyber data to broaden the scope of the Catapult Analytics stack.</p> <p>- Determine the capabilities that go beyond simple content identification and labeling, and move toward understanding the story and context of the video or image (Computer Vision for Improvised Threats).</p> <p>- Determine unsupervised and supervised techniques to cluster relevant information and enable accurate insight for analysts to improve the understanding of (1) themes, (2) intent of extracted text, (3) topics, (4) authenticity, etc. within the given data set(s) (Natural Language Processing – Understanding and Context).</p> <p>- Improve processing with alternative hardware (neuromorphic processors, Field Programmable Gate Arrays, etc.) by determining the best next generation hardware designed to maximize the runtime efficiency, accuracy, and limited space/power consumption of select AI/ML solutions.</p> <p><i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> The increase from FY 2021 to FY 2022 is due to the realignment of Catapult and TACEON resources from Project PE 0604134BR to this new PE 0604551BR to better reflect the nature of these ongoing and enduring activities.</p>			
Accomplishments/Planned Programs Subtotals	8.110	0.000	7.166

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 22/0602178BR: <i>CWMD Applied Research</i>	45.359	40.615	48.112	-	48.112	-	-	-	-	-	-
• 31/0603160BR: <i>CWMD Advanced Technology Development</i>	61.317	46.837	84.660	-	84.660	-	-	-	-	-	-
• 143/0605502BR: <i>Small Business Innovative Research</i>	13.329	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks
N/A

D. Acquisition Strategy
Assessment and selection of best performers to provide contractual services to develop and operationalize requirements through the new future contract vehicle (IMAX) at the least risk, optimal cost and proven technically. Performer base selection includes research developers across DoD and other Government agency laboratories, academia, and industry.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Defense Threat Reduction Agency **Date:** May 2021

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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Catapult Information System	C/CPAF	TBD : TBD	-	5.218	Aug 2020	-		5.969	Aug 2022	-		5.969	Continuing	Continuing	-
Subtotal			-	5.218		-		5.969		-		5.969	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Catapult Information System	C/CPAF	Booz Allen Hamilton : Reston, VA	-	0.917	Aug 2020	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.917		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Catapult Information System	C/CPAF	TBD : TBD	-	0.500	Mar 2020	-		0.963	Aug 2022	-		0.963	Continuing	Continuing	-
Team for Analysis of Cyber Enterprise Operations and Networks (TACEON)	C/CPAF	TBD : TBD	-	-		-		0.234	Sep 2022	-		0.234	Continuing	Continuing	-
SETA - Capability Research Architecture Cell (CRAC)	C/CPAF	Zel Technologies : Reston, VA	-	1.475	Jan 2020	-		-		-		-	Continuing	Continuing	-
Subtotal			-	1.975		-		1.197		-		1.197	Continuing	Continuing	N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	8.110	0.000	7.166	-	7.166	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Catapult and Technology Analysis</i>	
Catapult / CTN Tool Suite Program of Record Support	
Team for Analysis of Cyber Enterprise Operations and Networks (TACEON)	

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Catapult and Technology Analysis</i>				
Catapult / CTN Tool Suite Program of Record Support	4	2022	4	2026
Team for Analysis of Cyber Enterprise Operations and Networks (TACEON)	4	2022	4	2026