Big Data Programs at the Defense Advanced Research Projects Agency

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The Department of Defense is investing big in goods and services related to big data. This investment, however, is not spread evenly across the department. It exists instead in certain agencies where the spending is deep and related to a variety of other programs. One of these agencies is Defense Advanced Research Projects Agency, or DARPA, as it is commonly known. DARPA does research and assessments related to the applicability of cutting edge technologies to U.S. national security, including unmanned systems, robotics, cyber security, mobility, networking and computing technologies, and others.

Underlying the research and development work at DARPA are significant investments in advanced algorithms, analytics, and data fusion that illustrate the importance of "big data" to the efficient use of next generation systems and weapons platforms. Put differently, more and more of DoD's weapons and communications systems, as well as the platforms that carry them, are becoming extremely complex. They are now so complex, in fact, that big data analytics and algorithms are necessary for them to function properly. Big data analytics and algorithms are thus a foundational technology without which an increasing number of advanced DoD weapons systems and platforms would not function.

Knowing this makes a big difference when it comes to understanding where business opportunity can be found at the DoD. Big data is such a complex subject, and its uses are so varied, that it is rare if an acquisition calls explicitly for a specific solution by name or the term "big data." This makes selling big data solutions and services to defense customers tricky.

Getting back to DARPA, the fact is that big data is in use across the agency. It appears primarily in R&D work related to software development, algorithm design, and data fusion efforts. The two tables below identify programs that have big data requirements related to them. Table 1 lists DARPA programs in which big data goods or services are the primary requirement. Table 2 shows DARPA programs in which big data requirements are but one of many different pieces of work. These programs have been drawn from the DARPA Research, Development, Test, and Evaluation Budget Request for FY 2016.

Table 1: DARPA Big Data Programs in FY 2016 RDT&E Budget Request

Agency	Program	FY 2014 ($M)	FY 2015 ($M)	FY 2016 ($M)
DARPA	ENGAGE	11.82	0.00	0.00
DARPA	Scalable Optical Nodes for Networked Edge Traversal (SONNET)	0.00	0.00	8.00
DARPA	Quantitative Methods for Rapid Response (QMRR)	0.00	8.60	15.59
DARPA	XDATA	25.80	33.22	38.72
DARPA	Network Defense	15.00	29.50	35.00
DARPA	Nexus 7	11.98	0.00	0.00
DARPA	Multifunctional Materials and Structures	22.67	18.73	22.90
DARPA	Media Forensics	0.00	14.93	17.00
DARPA	Mining and Understanding Software Enclaves (MUSE)	4.50	8.00	12.10
DARPA	Graph-theoretical Research in Algorithm Performance & Hardware for Social networks (GRAPHS)	5.21	4.90	2.90
DARPA	Performance Optimization in Complex Environments	0.00	0.00	11.80
Totals		**96.98**	**117.88**	**164.01**

As we can see in Table 1, spending rises from approximately $97 million in FY 2014, to the $164 million that DARPA forecasts in FY 2016. This represents a projected 69% increase over the course of three fiscal years.

Turning to the list of programs that includes both big data specific projects and those with a big data component (the gold lines in Table 2 below), we can see that the trend is the same – spending at DARPA on big data related R&D is on the rise. The increase is a more modest 21% from FY 2014 to FY 2016, but this is still a positive return in an overall declining DoD technology market.

Table 2: DARPA Programs with Big Data Related Requirements in FY 2016 RDT&E Budget Request

Agency	Program	FY 2014 ($M)	FY 2015 ($M)	FY 2016 ($M)
DARPA	ENGAGE	11.82	0.00	0.00
DARPA	Scalable Optical Nodes for Networked Edge Traversal (SONNET)	0.00	0.00	8.00
DARPA	Quantitative Methods for Rapid Response (QMRR)	0.00	8.60	15.59
DARPA	XDATA	25.80	33.22	38.72
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DARPA	Graph-theoretical Research in Algorithm Performance & Hardware for Social networks (GRAPHS)	5.21	4.90	2.90
DARPA	Performance Optimization in Complex Environments	0.00	0.00	11.80
DARPA	Plan X	35.60	43.42	25.15
DARPA	Transparent Computing	0.00	10.00	15.36
DARPA	Adaptable Information Access and Control (AIAC)	0.00	7.09	17.60
DARPA	Insight	36.91	43.53	11.66
DARPA	Enabling Quantum Technologies	30.54	19.88	9.02
Totals		200.03	241.81	242.80

Summing up, the DoD's spending on big data, particularly on R&D, is rising. Because money is flowing to R&D efforts, the fact that the work is related to big data may be hidden in general project descriptions. The best thing to do when searching for big data related work is to seek out complexity. Where agencies like DARPA are conducting R&D work on complex systems, the integration of massive volumes of sensor data, the development of advanced algorithms for controlling unmanned systems, and/or fusing large data sets into common pictures, that is where you'll find big data related spending.