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Recent Improvements in Acquisition Speed to Initial Operational Capability

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Recent Improvements in Acquisition Speed to Initial Operational Capability

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Abstract

Threats and technology are changing at a faster pace, so defense acquisition needs to respond quickly to meet warfighter and operator needs. With emphasis on speeding acquisition, has delivery of initial capabilities gotten faster? Analysis of the time between formal initiation of Major Defense Acquisition Programs (MDAPs) at Milestone (MS) B or C to achieved Initial Operating Capability (IOC) found statistically significant reductions since 2010. Using Selected Acquisition Report (SAR) and Modernized SAR (MSAR) schedule data, analysis found that MDAPs initiated at MS B since January 2010 took an average of 5.6 years compared to 8.7 years before 2010. MDAPs that initiated at MS C (i.e., using relatively mature technology and thus skipping MS B—a best practice for speed) reached IOC in an average of 3.5 years overall with no statistical difference before or since 2010. Combining these cases, programs started at either MS B or C since January 2010 took an average of 5.1 years compared to 8.1 years before 2010. While some caution is warranted given the relatively low population sizes, these results indicate that the Warfighting Acquisition System has made statistically significant progress in speeding initial capabilities to the warfighter.

Introduction

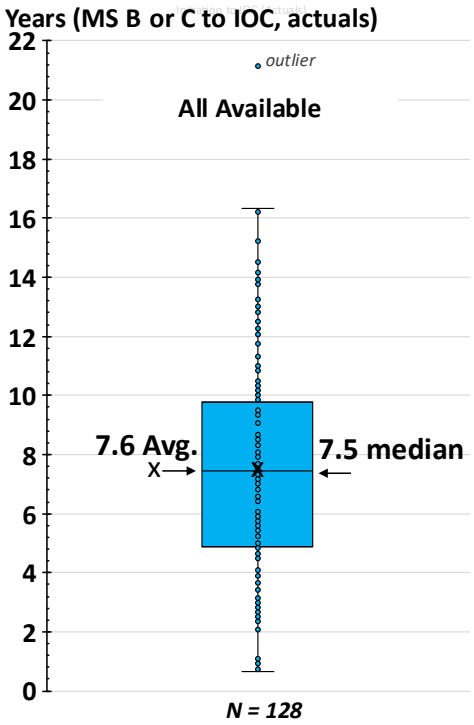
With the advent of increasing technological advancements and faster pace of increasingly capable threats, the United States has increasingly emphasized speed of acquiring and delivering capabilities to warfighters and operators.[1]

Perhaps the most cited speed measure is the time it takes for Major Defense Acquisition Programs (MDAPs) to field an Initial Operating Capability (IOC). Unfortunately, the most common view is to cite MDAP delivery time considering the population of all available MDAPs going back decades. At best, that may be the view shown in Figure 1 with averages and median at about 7.6 years, although there are tendencies to cite the worst extremes and ignore those cases faster than the central tendency. For example, while historically the worst case was a statistical outlier at 21.2 years (16.3 years would be the maximum if the outlier was removed), there are examples on the other end of the spectrum that reached IOC in under a year. Also, one-fourth of MDAPs reach IOC in under 5 years (the target for middle-tier programs), half under 7.5 years, and three-quarters under 10 years.

While helpful, the broad view in Figure 1 gives no insight into whether defense acquisition (especially at the MDAP level, where data are more widely available) is improving in speed. The large number of old MDAPs and the low rate at which new MDAPs are started makes it rather impossible to measure any trends to improve speed by just looking at the complete population as a whole.

[1] See, for example, Executive Order No. 14265, 2025; Secretary of Defense, 2017, 2022; Secretary of War, 2025a, 2025b, 2026; Under Secretary of Defense for Acquisition, Technology, and Logistics, 2014.

In response, this paper summarizes statistical analysis to compare the population of older MDAPs to those started more recently to see if the speed of acquiring MDAPs has changed given the more recent emphasis on speed.



	Min.	Q1	Median	Avg.	Q3	Max.	IQR	St.Dev.	N =
Overall	0.7	4.9	7.5	7.6	9.8	21.2	4.9	3.8	0.7

NOTE: If the outlier at 21.2 years was removed, the max. would be 16.3 years.

Figure 1. Time from MDAP Initiation at MS B or C to Achieved IOC

Data Sources and Analytical Approach

Here we use schedule data for MDAPs as recorded in SARs and MSARs available in the War Department's Advana database as of April 2025. This includes 128 MDAPs that have achieved MS B or C as early as June 1979 and as late as May 2023. Additional MDAPs that have not achieved IOC yet were excluded. The MDAP portfolio categories used below are those created by the department in 2025 for internal uses. Officially, MDAPs are formally established with their cost and schedule baselined at Milestone (MS) B,[2] but some programs skip MS B and are initiated at MS C. This is also the point when SARs (and more recently MSARs) are provided to Congress. Note that within and across capability areas, the dollar size and complexity of MDAPs can vary widely, but we examine all MDAPs as a group to identify any trends.

MDAPs are relatively few in number and started relatively infrequently compared to smaller acquisition programs. Therefore, to identify any recent improvements, we selected January 2010 as a dividing time between older and more recent MDAPs with the hopes of obtaining sufficient population sizes to find any statistical differences. This selection was somewhat arbitrary but followed the passage of the Weapon Systems Acquisition Reform Act of

[2] See the "Program Initiation" entry in the Defense Acquisition University (DAU) Glossary (DAU, 2026).

2009 that renewed emphasis on rigor in managing acquisition programs. Other dates could be chosen, but risk having insufficient population sizes for statistical tests.

In general, IOC is attained "when some units and/or organizations in the force structure scheduled to receive a system have received it and have the ability to employ and maintain it" (DAU, 2026). The period between initiation and IOC generally includes system development, test, and initial production to deliver an initial operational (fielded) capability. In some cases, we used program events that were analogous to IOCs. Also, in the few cases where an MDAP schedule had multiple IOCs, we used the earliest achieved IOC to measure the speed to delivering some initial capability.

Statistical Tests

To compare cycle times between two populations of MDAPs before and since January 2010, we used the Mann Whitney test (also known as Wilcoxon rank sum test with continuity correction). Comparisons with p-values above 10% were deemed not statistically significant. We noted any instances with very weak statistical results (p-values between 5%–10%) but only deemed statistical significance for p-values <5%. Any outliers were identified using the Tukey algorithm to identify any cases that were above the third quartile (Q3) by over 1.5 times the inner-quartile range (i.e., greater than Q3 + 1.5∗(Q3–Q1)).

Graphics

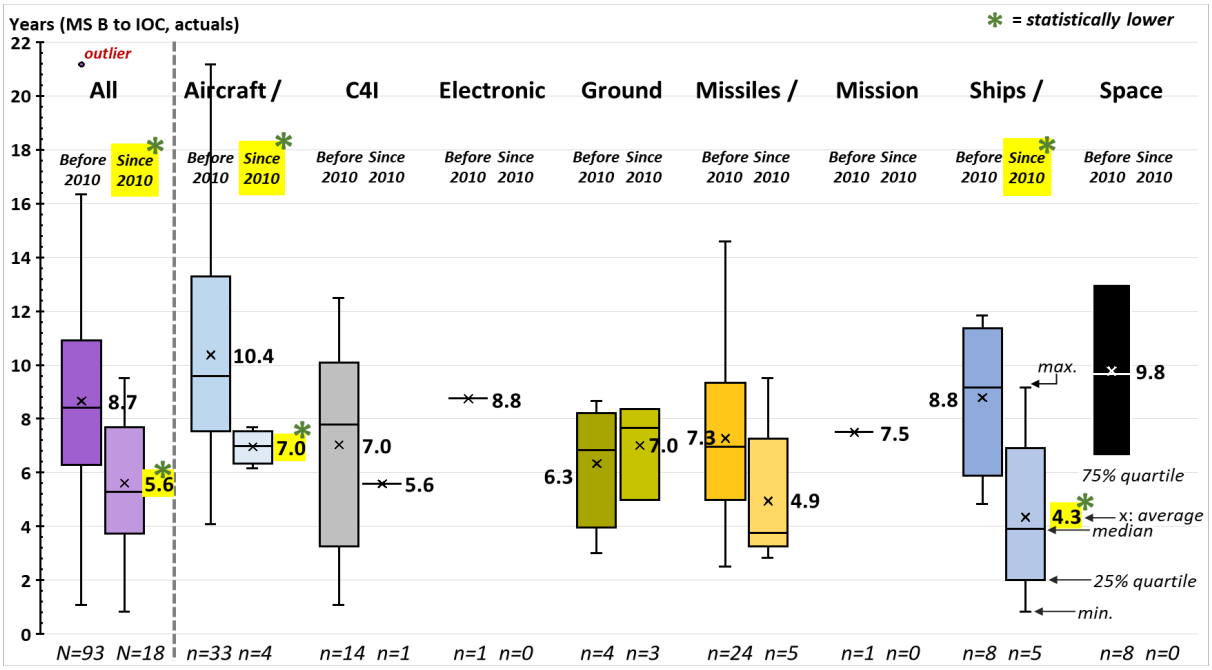
Figures below showing time from MDAP initiation to IOC are box-and-whisker charts, with the minimum (min.) at the bottom of the vertical line, a box from Q1–Q3 and a line for the median, and "X" at the average (avg.: the arithmetic mean), and the maximum (max.) at the top of the vertical line. Any outliners are identified with small circles. Numbers on the charts are averages. Any statistically significant differences between the population of MDAPs initiated before 2010 and since January 2010 are flagged with an asterisk (*). Numeric values are provided in tables below the charts.

Results

Let us first examine the population of MDAPs that were initiated at MS B (i.e., leaving out those that skipped MS B). We will then separately examine the MDAPs that started at MS C (i.e., skipped MS B), followed by comparing the full set of MDAPs that started at either MS B or C.

MDAPs Initiated at MS B

Figure 2 shows the time to actual (achieved) IOC for MS B–initiated MDAPs. The results show statistically significant improvements (reductions) in cycle time for all MDAPs overall as well as for MDAPs in the Aircraft/Aviation and Ship/Maritime capability areas for MS B–initiated MDAPs initiated at MS B since January 2010 compared to those initiated before calendar year (CY) 2010. Overall, average cycle time dropped from 8.7 years to 5.6 years. Average Aircraft/Aviation times dropped from 10.4 years to 7.0 years, and average Ships/Maritime times dropped from 8.8 years to 4.3 years. Medians were similar (see the table below the chart). Any apparent differences for the other capability areas are not statistically significant—in many cases because of very small population sizes.



Capability Area		Min.	Q1	Median	Avg.	Q3	Max.	IQR	St.Dev.	N =
Overall	**Before 2010**	1.1	6.3	**8.4**	**8.7**	10.9	21.2	4.6	3.6	93
	Since 2010 *	0.8	3.7	**5.3 ***	**5.6 ***	7.7	9.5	4.0	2.3	18
Aircraft/Aviation	**Before 2010**	4.1	7.5	**9.6**	**10.4**	13.3	21.2	5.7	3.8	33
	Since 2010 *	6.2	6.3	**7.0 ***	**7.0 ***	7.5	7.7	1.2	0.5	4
C4I	**Before 2010**	1.1	3.3	**7.8**	**7.0**	10.1	12.5	6.8	3.6	14
	Since 2010			**5.6**	**5.6**				0.0	1
Electronic	**Before 2010**			**8.8**	**8.8**				0.0	1
	Since 2010									0
Ground Systems	**Before 2010**	3.0	4.0	**6.8**	**6.3**	8.2	8.7	4.3	2.1	4
	Since 2010	5.0	5.0	**7.7**	**7.0**	8.4	8.4	3.4	1.5	3
Missile/Munitions	**Before 2010**	2.5	5.0	**7.0**	**7.3**	9.3	14.6	4.4	3.0	24
	Since 2010	2.8	3.2	**3.7**	**4.9**	7.2	9.5	4.0	2.4	5
Mission Support	**Before 2010**			**7.5**	**7.5**				0.0	1
	Since 2010									0
Ship/Maritime	**Before 2010**	4.8	5.9	**9.2**	**8.8**	11.4	11.8	5.5	2.5	8
	Since 2010 *	0.8	2.0	**3.9 ***	**4.3 ***	6.9	9.2	4.9	2.7	5
Space	**Before 2010**	5.2	6.6	**9.7**	**9.8**	13.0	13.8	6.4	3.0	8
	Since 2010									0

***** Statistically significant difference.

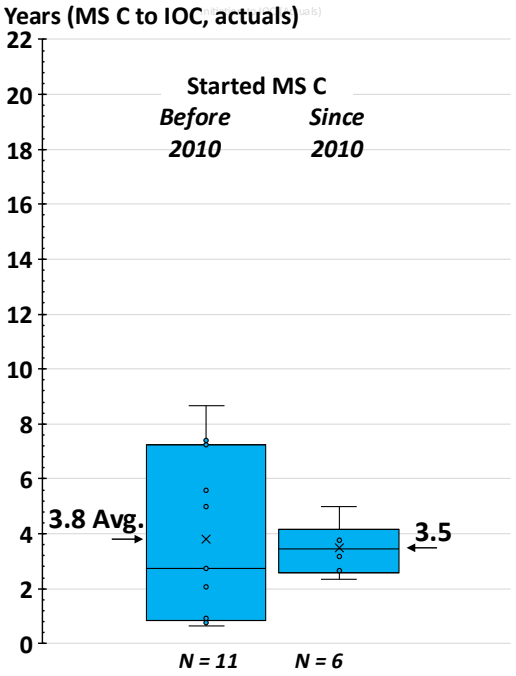
NOTES: Includes only actuals cycle times in years from achieved MS B to achieved IOC (or equivalent). The cycle times *Overall,* for *Aircraft/Aviation*, and for *Ship/Maritime* capability areas were statistically lower since January 2010 than before (Mann-Whitney Test for unpaired data; p-values were 0.0008, 0.05, and 0.01, respectively). Differences for other capability areas were not statistically significant. The one outlier shown was in the Aircraft/Aviation area before 2010. If the outlier at 21.2 years was removed, the max. would be 16.3 years.

Figure 2. Time from MDAP Initiation at MS B to Achieved IOC (Before and Since January 2010)

MDAPs Initiated at MS C

Very few MDAPs started at MS C—either before or since January 2010 (11 before and 6 since). As shown in Figure 3, there were no statistical differences between the two populations.

While the median and averages were similar, the variation was higher in the population before 2010 (again, with a very small population size). Thus, initiating MDAPs at MS C (i.e., with relatively mature technologies not requiring development) may be delivering at about the same speed, but caution is warranted because of the very small number of MDAPs initiating at MS C.

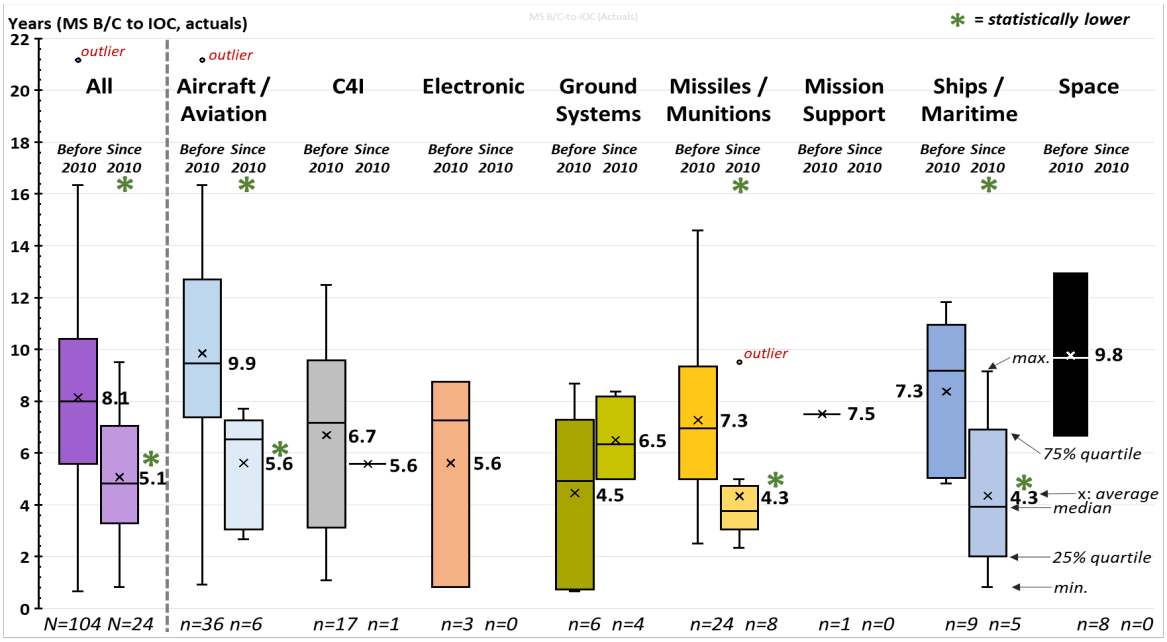


	Min.	Q1	Median	Avg.	Q3	Max.	IQR	St.Dev.	N =
Before 2010	0.7	0.8	2.7	3.8	7.2	8.7	6.4	2.9	11
Since 2010	2.3	2.6	3.5	3.5	4.2	5.0	1.6	0.9	6
Overall	0.7	1.5	3.2	3.5	5.3	8.7	3.8	2.4	17

Figure 3. Time from MDAP Initiation at MS C to Achieved IOC (Before and Since January 2010)

MDAPs Initiated at Either MS B or C

Finally, when combining MDAPs initiated at either MS B or C, we find the cycle times slightly lower than viewing just the MS B MDAPs, probably because the MS C MDAPs tend to be faster to IOC as a population. Figure 5 plots the results. The average cycle time dropped from 8.1 to 5.1 years overall. Aircraft/Aviation and Ships/Maritime MDAPs continued to be faster since 2010 (dropping from 9.9 to 5.6 years on average for the former and 7.3 to 4.3 years for the latter). Also, there were three Missile/Munition MDAPs that started with MS C, so that capability area was also statistically faster, dropping from 7.3 to 4.3 years on average. The remaining capability areas showed no statistically significant differences (again, with very small population sizes probably limiting the statistical tests).



Capability Area		Min.	Q1	Median	Avg.	Q3	Max.	IQR	St.Dev.	N =
Overall	**Before 2010**	0.7	5.6	**8.0**	**8.1**	10.4	21.2	4.8	3.9	104
	Since 2010 *	0.8	3.3	**4.8 ***	**5.1 ***	7.0	9.5	3.7	2.3	24
Aircraft/Aviation	**Before 2010**	0.9	7.4	**9.5**	**9.9**	12.7	21.2	5.3	4.1	36
	Since 2010 *	2.7	3.0	**6.5 ***	**5.6 ***	7.2	7.7	4.2	2.0	6
C4I	**Before 2010**	1.1	3.1	**7.2**	**6.7**	9.6	12.5	6.5	3.5	17
	Since 2010			**5.6**	**5.6**				0.0	1
Electronic	**Before 2010**	0.8	0.8	**7.2**	**5.6**	8.8	8.8	7.9	3.4	3
	Since 2010									0
Ground Systems	**Before 2010**	0.7	0.7	**4.9**	**4.5**	7.3	8.7	6.6	3.1	6
	Since 2010	5.0	5.0	**6.3**	**6.5**	8.2	8.4	3.2	1.5	4
Missile/Munitions	**Before 2010**	2.5	5.0	**7.0**	**7.3**	9.3	14.6	4.4	3.0	24
	Since 2010	2.3	3.0	**3.7 ***	**4.3 ***	4.7	9.5	1.7	2.1	8
Mission Support	**Before 2010**			**7.5**	**7.5**				0.0	1
	Since 2010									0
Ship/Maritime	**Before 2010**	4.8	5.0	**9.2**	**8.4**	11.0	11.8	5.9	2.6	9
	Since 2010 *	0.8	2.0	**3.9**	**4.3**	6.9	9.2	4.9	2.7	5
Space	**Before 2010**	5.2	6.6	**9.7**	**9.8**	13.0	13.8	6.4	3.0	8
	Since 2010									0

***** Statistically significant difference.

NOTES: Includes only actuals cycle times in years from achieved MS B or C (if the program skipped MS B and initiated at MS C) to achieved IOC (or equivalent). The cycle times *Overall* and for *Aircraft/Aviation*, *Missiles/Munitions*, and *Ship/Maritime* capability areas were statistically lower since January 2010 than before (Mann-Whitney Test for unpaired data; p-values were 0.0002, 0.009, 0.01, and 0.01, respectively). Differences for other capability areas were not statistically significant. The one outlier shown was in the *Aircraft/Aviation* area before 2010. If the outlier at 21.2 years was removed, the max. would be 16.3 years.

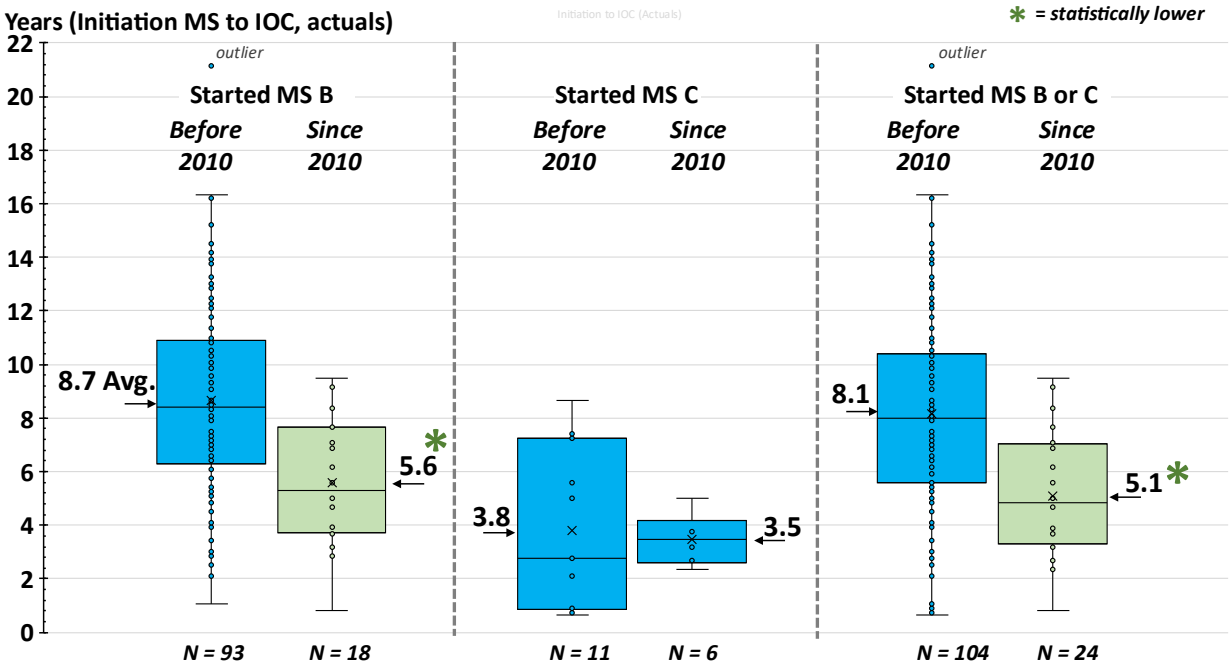
Figure 4. Time from MDAP Initiation at MS B or C to Achieved IOC (Before and Since January 2010)

Discussion

Figure 6 provides a summary view of the three cases: MS B, MS C, and MS B/C MDAPs (independent of the capability portfolio details in earlier figures). Again, statistically significant

improvements in speed are seen in the first and third cases but not in the smaller but already faster MS C cases.

These results show that efforts to speed acquisition are having a significant, measurable effect—albeit with a relatively small population size and some caution about the types of MDAP systems before and after these time periods. For example, the complexity of the MDAPs initiated since 2010 may be a factor. Still, these results show that efforts to speed acquisition are having a significant effect even for the Department's largest and most complex weapon systems: MDAPs.



Capability Area		Min.	Q1	Median	Avg.	Q3	Max.	IQR	St.Dev.	N =
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	Since 2010 *	0.8	3.7	5.3 *	5.6 *	7.7	9.5	4.0	2.3	18
MS C Initiated	Before 2010	0.7	0.8	2.7	3.8	7.2	8.7	6.4	2.9	11
	Since 2010	2.3	2.6	3.5	3.5	4.2	5.0	1.6	0.9	6
MS B/C Initiated	Before 2010	0.7	5.6	8.0	8.1	10.4	21.2	4.8	3.9	104
	Since 2010 *	0.8	3.3	4.8 *	5.1 *	7.0	9.5	3.7	2.3	24

*** Statistically significant difference.**

Figure 5. Time from MDAP Initiation to Achieved IOC (Before and Since January 2010)

It is also interesting that the central tendency of MDAPs initiated since 2010 achieve IOC in about the same time as Middle Tier program are supposed to deliver: 5 years (Under Secretary of Defense for Acquisition and Sustainment, 2020, pp. 4–5).

Software Acquisition Pathway seek delivering minimum viable products (or minimum viable capability releases) in 1 year or less (i.e., well under 5 years), but most of these are not at the size and complexity of an MDAP (Under Secretary of Defense for Acquisition and Sustainment, 2020, pp. 3, 16).

Suggestions for Future Research

It will be useful to see if this trend in speed to IOC for MDAPs continues. Also, further research is warranted to compare the characteristics of the MDAPs before and after 2010 to seek any potential drivers; for example, are these size and complexity effects, or are MDAPs using best practices of utilizing mature technology or Agile development methods to speed time to fielding. In particular, understanding what may be traded for speed (e.g., system performance, resilience, or cybersecurity) would be useful to inform future decisions in how to more rapidly deliver capabilities to warfighters and other operators.

Summary

Surprisingly (given general beliefs about the speed of defense acquisition), our analysis found that recent MDAPs reached IOC statistically faster than historical ones. The average and medians are now about 5 years instead of the prior 7–8 years. Also, MDAPs that leveraged mature technologies (a best practice for speed) tended to have reached IOC in about 3.5 years on average and thus could be a pattern for wider use.

While passing statistical tests, some caution is warranted because the population sizes are relatively small (especially for individual capability areas), and the mix in types and complexity of the MDAPs since 2010 may differ from the population of MDAPs starting before 2010. Nevertheless, these results show that efforts to speed acquisition are having a significant effect—even for the Department's largest and most complex weapon systems—and speed can be increased (albeit through various practices and tradeoffs).

Acronyms and Abbreviations

AIRC	Acquisition Innovation Research Center
AT&L	Acquisition, Technology, and Logistics
DoD	Department of Defense
CY	Calendar Year
IOC	Initial Operating Capability
IQR	Interquartile Range
Max.	Maximum
MDAP	Major Defense Acquisition Program
Min.	Minimum
MS	Milestone
MSAR	Modernized Selected Acquisition Report
N	Population Size
Q	Quartile
Q1	First Quartile
Q3	Third Quartile
SAR	Selected Acquisition Report
SERC	Systems Engineering Research Center
St.Dev.	Standard Deviation

UARC	University-Affiliated Research Center
UCLA	University of California, Los Angeles
U.S.	United States
USD	Under Secretary of Defense

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