

Three Competing Options for Acquiring Innovation

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The DOD's technological edge is eroding.¹ Since 2015, the department has pursued a strategy to regain the lead. During the Obama administration, it was called the Third Offset.² The Trump administration has abandoned that nomenclature, but it is pursuing the same objective.³ The DOD seeks dominance in robotics, artificial intelligence, autonomous systems, and three-dimensional printing, among other fields. It recognizes, however, that such innovation will not come from the usual sources—government labs or the defense industrial base.⁴ Nondefense firms have a decisive lead: “the center of gravity in cutting edge, military applicable research is shifting abruptly away from the defense establishment to relatively new commercial firms.”⁵ The DOD must engage with these nondefense firms to build the next generation of weapon systems. But how should it do so?

Two decades ago, defense economists David Parker and Keith Hartley, mapped the options for procurement along a continuum. On the far left, managerial diktat determines sourcing, and prices have little role in the process. On the far right is a fully competitive market, where the “relationship between buyer and supplier is transitory, non-committal beyond the current purchase, and arm’s length”; between these extremes are, from left to right, subsidiary purchases, joint ventures, partnerships, networks, preferred suppliers, and adversarial competition.⁶ Parker and Hartley later quote Keiran Walsh, who distilled these options down to three:

[T]here are three basic ways of getting people to do what one wants done. One can force them to behave as one wishes them to. One can give them a set of incentives that aligns their interests with one’s own. Finally one can try to shape the values that they hold so that they will naturally want to do what you wish them to do.⁷

Walsh's three alternatives, Parker and Hartley explain, correspond to coercion, competition, and long-term partnering.⁸ Of course, the same option needn't be chosen for every procurement, and perhaps different alternatives may work better in some cases than in others. But the DOD must choose from these options as it determines how to buy innovation from nondefense commercial suppliers and perhaps should identify a default that works best in most cases.

Four judge advocates recently published articles putting forward three options for engaging with newcomers to defense procurement. Although uncoordinated, these articles neatly cover the range along the Parker-Hartley continuum—coercion, partnerships, and competition. This article dismisses the first, unpacks the second, and advocates the third, competition via open-systems architecture. This isn't merely

an esoteric legal debate. Effectively buying innovation from nondefense sources matters. Unless the DOD learns to do so, it will be unprepared for the next war.

National Security Law Writing Competition

Before coming to the question at hand, a short explanation is in order. Why did four Air Force lawyers take an interest in the same subject in the same year? The answer is that the Air Force Judge Advocate General School held its first national security law writing competition in 2016. The subject was public-private partnerships' (P3) potential for stimulating innovation and cutting costs:

Since its inception, the Air Force has been on the forefront in developing and incorporating cutting-edge technologies to enhance its mission effectiveness, from aircraft to spacecraft to capabilities in cyberspace. However, in an era of constrained resources, the Air Force has had to explore other avenues by which it can *retain its technological superiority while also managing costs. One attractive methodology for accomplishing these goals is the public-private partnership, which brings public agencies and private entities together to combine resources to achieve common goals and objectives.*⁹ (emphasis added)

Four judge advocates' submissions have since been published, two in the *Air Force Law Review*, one in the *Army Lawyer*, and the last in the *Administrative Law Review*.¹⁰ Given how the question was framed and the Air Force's high hopes for P3s,¹¹ two articles, not surprisingly, take for granted that P3s answer the DOD's innovation challenges. A third ignores P3s and advocates additional measures for coercing private industry. The last takes a different tack, arguing that P3s are overrated and are particularly ill-suited for innovation, favoring instead the advent of arms-length competition through wider use of open-systems architecture.

Coercing Private Industry

Col Linell Letendre finds troubling the fact that the nondefense commercial sector has outpaced the defense industrial base in certain technologies.¹² As her article's title suggests, she is especially alarmed by Google's dominance in autonomous systems.¹³ Her concerns are not without merit. As she notes, Google has recently acquired eight of the field's leaders, several of whom had previously competed for Defense Advanced Research Projects Agency contracts.¹⁴ She argues Google's uncooperativeness with subpoenas for prosecuting child pornographers suggests it will not prove the stalwart member of the arsenal of democracy that Ford was.¹⁵ Corporate values have surely changed since World War II; this is no small problem.¹⁶ But Letendre's cure is less persuasive than her diagnosis.

Letendre's remedy is the proverbial iron hand in a velvet glove. She advises that the DOD "appeal to a common set of values" with companies like Google.¹⁷ Where that fails, however, she would have the president use his already formidable wartime powers to compel the private sector and would also recommend the expansion of such powers.¹⁸ Indeed, her "main takeaway" from the examples of Apple and Google declining to voluntarily cooperate in law enforcement matters "is the necessity for strong tools."¹⁹ This signifies coercive sourcing or what falls on the far left of the Parker-Hartley procurement continuum.²⁰ What the government needs, it takes.

Letendre's model for an effective industry relationship is the subservient role that industry played from the attack on Pearl Harbor to the close of the Second World War. Yet World War II presents a special case. America was ill-prepared for a two-front war, especially with two highly capable industrialized nations.²¹ Industry came to heel because America faced existential threats. But what worked in the medium-term for a war that would last less than four years would make a dubious policy for a long-term innovation strategy. Worse, she argues that the Selective Service Act should be extended to give the DOD power to seize intellectual property.²² That is precisely what the private sector fears most about doing business with the DOD.²³ Granting such expansive powers would not only irreparably damage the DOD's already fraught relationship with industry but could also chill investment in innovation generally.²⁴ In short, Letendre's proposal would kill the goose that laid the golden egg.

Public-Private Partnerships

Sliding toward the middle of the Parker-Hartley continuum is the public-private partnership.²⁵ While the definition of P3s is notoriously hard to pin down,²⁶ P3s are essentially long-term government contracts.²⁷ Savings are thought to accrue from the reduction in transaction costs, greater economies of scale, and efficiencies that arise from bundling.²⁸ On this basis and because P3s are said to provide a new revenue stream, P3s have become fashionable.²⁹ Indeed, a bipartisan consensus is forming that P3s are the answer to all manner of public policy challenges.³⁰

Capt Matthew Ormsbee and Maj Nicholas Frommelt both posit that P3s are the best way to buy innovation.³¹ That premise is unexamined. They devote their attention to explaining how existing authorities can be used or expanded upon to enable greater use of P3s.³² Undoubtedly such legal authority already exists and could be expanded on, but their articles beg the question considered here. Namely, what is the best way to buy innovation?

Setting aside general problems with P3s that are often ignored given the irrational exuberance for this fashionable policy tool, the premise that P3s are consistent with innovation is false.³³ P3s are ill-suited to innovation in part because they work best in sectors where uncertainty and risk are low, and purchasing defense innovation is just the opposite. P3s have a solid record for projects in transportation, energy, and water, where requirements are typically stable and well-defined. But they have proven less useful when applied to sectors with rapidly changing requirements such as information technology.³⁴ Innovation is more like the latter in the sense that its requirements are unstable and uncertain.

Most new technologies are a bust; no one knows in advance which of these will pay off. Thus, few private-sector partners will want to assume the level of risk that uncertain long-term contracts would entail.³⁵ Alternately, many would be more than happy to enter into long-term relationships as long as there is no genuine risk transfer and the government effectively privatizes profits and socializes losses. It is unclear, however, how the government would benefit from such an arrangement.

Ormsbee commends such arrangements. He argues that P3s are an ideal "*marriage of expertise and assets*" (emphasis added).³⁶ The problem with his marital met-

aphor is the *Blade Runner* curse. Ridley Scott's 1982 film predicted a dystopian future in which Atari, RCA, and Bell Telephone still dominated the business world in 2019. The fact that these companies have ceased to exist or lost their edge has nothing to do with a film's curse.³⁷ Today's technological leaders are tomorrow's losers.³⁸ Case in point, mighty General Electric recently fell off the *Fortune* 500 list.³⁹ Suppose that innovation P3s had been locked in with IBM in the 1960s or Microsoft in the 1990s. These would have seemed like sensible choices at the time but would have appeared foolish in hindsight.⁴⁰ Public officials tend to unduly favor incumbents over new entrants. P3s exacerbate this tendency, lengthening and deepening public-private contractual relationships. In a word, marrying today's leaders will not buy tomorrow's innovation.

In a similar vein, Frommelt relies on a Defense Acquisition University study finding that both public officials and incumbent contractors are generally content with the results of long-term contracts.⁴¹ That is precisely what economists would predict.⁴² Each group has its reasons for preferring the status quo. Public officials are not only subject to principal-agent problems, meaning they have the incentive to pursue their own interests instead of their employer's (for example, avoiding the extra work that awarding to a new entrant would entail by choosing the incumbent).⁴³ They also prefer to stick with the devil they know.⁴⁴ And few incumbents are clamoring for more competition that would disrupt a steady revenue stream.⁴⁵ *Of course* both sides are happy. Their mutual felicity, however, is a poor measure of effectiveness. In a word, insulating incumbents from pesky new competitors does not constitute a sure recipe for innovation.

Competition Through Open-Systems Architecture

On the far right of the Parker-Hartley procurement continuum lies spot pricing.⁴⁶ One step to the left is what some pejoratively call *adversarial* competition.⁴⁷ Such competition is unfashionable in private-sector sourcing, and government has sought to emulate efficiencies that arise from long-term, amiable relationships between buyers and sellers.⁴⁸ Hence, the widespread enthusiasm for P3s. Parker and Hartley are skeptical. They argue that incentives in the public sector differ to such a degree that what works in the private sector can create perverse incentives when applied to public sectors.⁴⁹ Short of coercion, therefore, competition is the only viable alternative to collaborative relationships.

DOD acquisition leaders emphasize that defense procurement's most pressing need in is "more innovation and more competition."⁵⁰ Far from advocating closer alliances with a clique of prime contractors or today's technology leaders, these leaders see competition and innovation as compatible, interactive, and even causally related.⁵¹ Competition, in short, yields innovation. Such innovation will come from the wider commercial sector and even from beyond our shores, from "global allies, friends, and trading partners who share our values and can assist us in pursuing innovation and technology superiority."⁵²

OSA enables "competitors with superior technology to win their way into our programs."⁵³ DOD leaders are not alone in recognizing OSA's potential. Congress's procurement watchdog, the Government Accountability Office (GAO), has long pro-

claimed the value of OSA, “to increase competition throughout a program’s life cycle to save taxpayer dollars while providing the best available technology to the warfighter.”⁵⁴ And, the Defense Science Board’s Task Force on Open Systems issued a clarion call in its 1998 report, arguing that while the DOD’s challenges are enormous, “significant relief [is] close at hand[.]”⁵⁵

On paper, OSA is a cornerstone of the DOD’s innovation strategy. In practice, however, the DOD has been a slow adopter. The GAO has repeatedly issued reports criticizing the armed forces, especially the Army and Air Force, for their failure to implement OSA.⁵⁶ It would seem there is much more enthusiasm for P3s than for OSA. Significant relief to vexing problems may be close at hand,⁵⁷ but for reasons that are not immediately clear, progress toward OSA has been limited.

What is OSA? Answering this question requires a step back to explain a persistent problem in defense economics. Market forces yield vendor lock: even if the DOD initially employs competition, it eventually becomes dependent on the original manufacturer.⁵⁸ When vendor lock is coupled with rapid technological growth, systems are “antiquated before they are fielded, parts are obsolete and unobtainable, support is a nightmare, costs soar, and the program becomes only marginally viable.”⁵⁹ But one commercial practice offers a “glimmer of hope.”⁶⁰

OSA promises to disrupt vendor lock, enable competition, and spur innovation. Here’s how. First, OSA is modular. *Modular* refers to goods that are discrete, self-contained units.⁶¹ Second, OSA is open. *Open* goods have public standards, enabling third-party vendors to compete with the original manufacturer for spare parts and upgrades.⁶² Thus, OSA signifies an interoperable, connectible approach.⁶³ It thereby fosters “collaborative innovation of numerous participants.”⁶⁴

What is most intriguing about OSA is that it seems to incorporate the same principles as platform economics, a business model that is revolutionizing the private industry. Two Massachusetts Institute of Technology economists recently described this phenomenon in their book, *Machine, Platform, Crowd: Harnessing Our Digital Future*,⁶⁵ which *The Economist* summarized in a book review:

The largest cab company owns no vehicles (Uber), the biggest hotelier has no property (Airbnb), the most comprehensive retailer holds no inventory (Alibaba), and the most valuable “media” company creates some content but not much (Facebook).⁶⁶

Consider two examples. Apple and Microsoft invented platforms that transformed personal computing, but they were not themselves responsible for the outpouring of technology that ensued.⁶⁷ Most innovation came from third-party vendors whose brands are not household names. “There are important parallels for the DoD.”⁶⁸

“In like manner,” the author argues in his previous article, “OSA would have the DoD function as a systems integrator that would purchase the components for its weapon systems from competing commercial suppliers.”⁶⁹ “This would relegate incumbent contractors to competition with wider industry and commoditize what was previously a highly specialized niche market.”⁷⁰ Introducing competition analogous to platform economics would establish OSA as an “innovation enabler.”⁷¹

Conclusion

The DOD's current approach to buying innovation is schizophrenic. P3s seek longer-term, more collaborative relationships with private industry. OSA pulls in the opposite direction. It seeks to disrupt vendor lock by stimulating competition from the wider industry, especially from new entrants. Insofar as policymakers seek to pursue innovation simultaneously using both procurement methods, such a policy would be misguided and self-contradictory. Given the concurrent enthusiasm for both P3s and OSA, it is surprising that no one seems to have noticed that the two strategies are mutually exclusive, or at least that they would engage with industry in incompatible ways.

The DOD can, of course, choose conflicting procurement strategies for different programs—and perhaps sometimes ought to do so to experiment and see what works best. But it should not choose conflicting strategies for the same acquisition simultaneously. Further, the strategy that works most often should be the default.

Returning to the Parker-Hartley continuum, will the DOD choose coercion, partnerships, or competition? Coercion is a dead-end and antithetical to free enterprise; it should be a last resort, not a standing acquisition policy. The siren song of P3s is alluring because collaborative relationships work well in private industry. The public sector, however, is different. P3s would exacerbate the defense market's natural flaws, locking in long-term contracts with a few firms and crowding out new entrants. They would effectively codify vendor lock. That is just more of the same. But OSA's untapped potential has been recognized for decades. It promises to stimulate competition and innovation on an unprecedented scale.

To repurpose G. K. Chesterton's observation, "[competition] has not been tried and found wanting. It has been found difficult and left untried."⁷² Long-term partnering with a few firms, by contrast, has definitely been tried. Calling such partnerships P3s is clever rebranding, but it is old news. Why not try something new? 🌟

Notes

1. DOD, *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge*, 1, 3, <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

2. Chuck Hagel, secretary of defense (keynote address, Defense Innovation Days, Newport, RI, 3 September 2014), <http://www.defense.gov/News/Speeches/Speech-View/Article/605602>.

3. DOD, *National Defense Strategy*, 3; and Jon Harper, "New National Defense Strategy Prioritizes High-Tech Equipment, Acquisition Reforms," *National Defense*, 19 January 2018, <https://www.nationaldefensemagazine.org/articles/2018/1/19/new-national-defense-strategy-prioritizes-high-tech-equipment-acquisition-reforms>. This explains that the Trump administration's innovation strategy will no longer be called the Third Offset but that there will be significant continuity with that program.

4. Bob Work, deputy secretary of defense, "The Third U.S. Offset Strategy and Its Implications for Partners and Allies" (speech, Willard Hotel, Washington, DC, 28 January 2015), <https://www.defense.gov/News/Speeches/Speech-View/Article/606641/the-third-us-offset-strategy-and-its-implications-for-partners-and-allies/>.

5. Ben FitzGerald and Kelley Saylor, *Creative Disruption Technology, Strategy, and the Future of the Global Defense Industry* (Washington, DC: Center for a New American Security, 2014), 5.

6. David Parker and Keith Hartley, "The Economics of Partnership Sourcing Versus Adversarial Competition: A Critique," *European Journal of Purchasing and Supply Management* 4, no. 2 (June 1997): 115–16, <https://www.sciencedirect.com/science/article/pii/S096970129700004X>.

7. *Ibid.*, 124.
8. *Ibid.*
9. “The Judge Advocate General’s School 2016 National Security Law Writing Competition—Deadline for Submissions: 15 April 2016,” University of Miami Career Development Office Blog (15 October 2015), <https://cdo.law.miami.edu/?p=7447>.
10. Linell A. Letendre, “Google. . . It Ain’t Ford: Why the United States Needs a Better Approach to Leveraging the Robotics Industry,” *Air Force Law Review (AFLR)* 77 (2017): 51–64, <https://heinonline.org/HOL/LandingPage?handle=hein.journals/airfor77&div=5&id=&page=>; Matthew H. Ormsbee, “Silicon Symbiosis: A Blueprint for Public-Private Partnerships in U.S. Air Force Acquisition of New Technology,” *AFLR* 77 (2017): 235–58; Nicholas C. Frommelt, “Better Buying Power and Incentivizing Public-Private Partnerships Through Non-Monetary Incentives,” *Army Lawyer* (January 2017): 13–23; and Daniel E. Schoeni, “Whither Innovation?: Why Open Systems Architecture May Deliver on the False Promise of Public-Private Partnerships,” *Administrative Law Review* 70, no. 2 (2018): 409–58.
11. USAF, *Air Force Future Operating Concept*, 15 September 2015, 22, 26, 40, <https://www.af.mil/Portals/1/images/airpower/AFFOC.pdf>.
12. Letendre, “Google. . . It Ain’t Ford,” 56–57.
13. *Ibid.*, 57–58.
14. *Ibid.*, 57.
15. *Ibid.*, 53, 58–59.
16. Regarding Google’s willingness to share artificial intelligence and autonomous systems technologies with the DOD, which seem to be Linell Letendre’s primary concern, Google has a mixed record. On the one hand, it signed a contract in 2017 that would use these technologies to increase the accuracy of drone strikes. On the other, it has struggled with a revolt from employees who hail from computer science programs at top universities and “bring liberal, anti-war views from the academia with them.” “Playing with Fire: Google Runs into More Flak on Artificial Intelligence,” *Economist*, 16 June 2018, 55–56, <https://www.economist.com/business/2018/06/16/google-runs-into-more-flak-on-artificial-intelligence>.
17. Letendre, “Google. . . It Ain’t Ford,” 60.
18. *Ibid.*, 54–56, 61–63.
19. *Ibid.*, 59–60.
20. Parker and Hartley, “Economics of Partnership Sourcing,” 116–17, 124.
21. William B. Burnett and William E. Kovacic, “Reform of United States Weapons Acquisition Policy: Competition, Teaming Agreements, and Dual Sourcing,” *Yale Journal on Regulation* 6 (1989): 249, 257–59.
22. Letendre, “Google. . . It Ain’t Ford,” 61–63.
23. Samuel Mark Borowski, “The Inchoate Mistake: Demystifying the Defense Department’s Competition Problem,” *Public Contract Law Journal* 45 (2016): 183, 188.
24. Section 809 Panel, *Report of the Advisory Panel on Streamlining and Codifying Acquisition Regulations*, vol. 1, interim report, (Washington, DC: Section 809 Panel, January 2018), 7–8, https://section809panel.org/wp-content/uploads/2018/01/Sec809Panel_Vol1-Report_Jan18_FINAL.pdf, noting that small business participation in DOD contracts decreased by 70 percent from 2011–14 and observing that there has been an overall decline in competition in the defense market due to mergers and acquisitions.
25. Parker and Hartley, “Economics of Partnership Sourcing,” 116–17.
26. Dominique Custos and John Reitz, “Public-Private Partnerships in the USA,” *American Journal of Comparative Law* 58 (December 2010): 555, 557–58, https://academic.oup.com/ajcl/article-abstract/58/suppl_1/555/2683720?redirectedFrom=fulltext.
27. Christopher Bovis, *Public-Private Partnerships in the European Union* (New York: Routledge, 2014), xii.
28. Parker and Hartley, “Economics of Partnership Sourcing,” 115–16, 19; and Eduardo Engel, Ronald D. Fischer, and Alexander Galetovic, *The Economics of Public-Private Partnerships: A Basic Guide* (New York: Cambridge University Press, 2014): 80–81, 140–41.
29. *Ibid.*, 12–13; and Parker and Hartley, “Economics of Partnership Sourcing,” 115.

30. Ben Goldman, "Do Brookings and Heritage Agree on Public-Private Partnerships?," *Streetsblog USA* (blog), 20 January 2012, <https://usa.streetsblog.org/2012/01/20/do-brookings-and-heritage-agree-on-public-private-partnerships/>.
31. Ormsbee, "Silicon Symbiosis," 240, 248–50; and Frommelt, "Better Buying Power," 16–18, 23.
32. Ormsbee, "Silicon Symbiosis," 250–53; and Frommelt, "Better Buying Power," 19–22.
33. Schoeni, "Whither Innovation," 443–44.
34. Elisabetta Iossa and David Martimort, "The Simple Micro-Economics of Public-Private Partnerships" (working paper, Brunel University, 2009), 2–3, <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.554.755&rep=rep1&type=pdf>.
35. Elisabetta Iossa and David Martimort, "Risk Allocation and the Costs and Benefits of Public-Private Partnerships," *RAND Journal of Economics* 43 (2012): 442, 464.
36. Ormsbee, "Silicon Symbiosis," 240.
37. Jonah Goldberg, "The 'Blade Runner' Curse and the Overestimation of Corporate Might," *American Enterprise Institute*, 29 September 2017, <http://www.aei.org/publication/the-blade-runner-curse-and-the-overestimation-of-corporate-might/>.
38. Kevin D. Williamson, "Hey, Where's My Corporate Dystopia?," *National Review*, 11 March 2013, <https://www.nationalreview.com/2013/03/hey-wheres-my-corporate-dystopia-kevin-d-williamson/>.
39. Geoff Colvin, "What the Hell Happened at GE?" *Fortune*, 24 May 2018, <http://fortune.com/longform/ge-decline-what-the-hell-happened/>.
40. "Big Blue Yonder," *Economist*, 21 October 2017, <https://www.economist.com/business/2017/10/21/ibm-lags-in-cloud-computing-and-ai-can-techs-great-survivor-recover>; and "Schumpeter: Microsoft Blues," *Economist*, 11 May 2013, <https://www.economist.com/business/2013/05/11/microsoft-blues>.
41. Frommelt, "Better Buying Power," 16–17, citing Christopher P. Gardner et al., "Balancing Incentives and Risks in Performance-Based Contracts," *Defense Acquisition Review* 22 (2015): 472, 487, 497–99.
42. Oliver E. Williamson, "Franchise Bidding for Natural Monopolies—In General and with Respect to CATV," *Bell Journal of Economics* 7, no. 1 (1976): 73, 83–89; and Parker and Hartley, "Economics of Partnership Sourcing," 124. See also William S. Cohen, "The Competition in Contracting Act," *Public Contract Law Journal* 14 (1983): 1, 21–22, describing the institutional bias against competition among contracting officers and program managers.
43. Parker and Hartley, "Economics of Partnership Sourcing," 118; and Steven L. Schooner, "Contractor Atrocities at Abu Ghraib: Compromised Accountability in a Streamlined, Outsourced Government," *Stanford Law and Policy Review* 16 (2005): 549, 565, attributing lack of competition to considerations of "speed, convenience, personal preference, and human nature" that affect the contracting officer's decision.
44. William S. Cohen, "The Competition in Contracting Act," *Public Contract Law Journal* 14 (1983): 1, 21–22, describing the tendency to rely on the same contractor again and again; Michele Estrin Gilman, "Legal Accountability in an Era of Privatized Welfare," *California Law Review*, 89 (2001): 569, 599–600, reporting that once they are chosen, contractors become entrenched due to close relationships with government officials; and Janna J. Hansen, "Limits of Competition: Accountability in Government Contracting," *Yale Law Journal* 112, no. 8 (2003): 2465, 2471, observing that incumbents "cozy up to risk-averse government administrators."
45. Parker and Hartley, "Economics of Partnership Sourcing," 124, explaining that public-choice theory predicts that incumbent contractors who lose from competition will oppose it, preferring instead the simplicity of cozy relationships with government officials.
46. *Ibid.*, 116–17.
47. *Ibid.*, 115, 121, 124.
48. *Ibid.*, 115–16.
49. *Ibid.*, 119–22.
50. Borowski, "The Inchoate Mistake," 183–84, citing Frank Kendall, under secretary of defense, *Better Buying Power 3.0 Interim Release*, white paper (Arlington, VA: Defense One, 19 September 2014), 6–8.
51. Frank Kendall, under secretary of defense, *Implementation Directive for Better Buying Power 3.0—Achieving Dominant Capabilities Through Technical Excellence and Innovation* (Arlington, VA: Defense

- One, 19 April 2015), [https://www.acq.osd.mil/fo/docs/betterBuyingPower3.0\(9Apr15\).pdf](https://www.acq.osd.mil/fo/docs/betterBuyingPower3.0(9Apr15).pdf), 8–10, 14–15, 23–24.
52. *Ibid.*, 23–24.
53. *Ibid.*, 14.
54. Government Accountability Office, *Defense Contracting: Early Attention in the Acquisition Process Needed to Enhance Competition*, GAO-14-395, May 2014, 6–8, 21–26, 34, <https://www.gao.gov/products/GAO-14-395>.
55. Wayne L. O'Hern, Jr., under secretary of defense, cover letter, *Report of the Defense Science Board Task Force on Open Systems* (Washington, DC: October 1998), 2.
56. For example, see US Government Accountability Office, GAO-13-651, *Defense Acquisitions, DoD Efforts to Adopt Open Systems for Its Unmanned Aircraft Systems Have Progressed Slowly*, 2014, 4–5, 12–16, <https://www.gao.gov/products/GAO-13-651>.
57. O'Hern, *Defense Science Board Task Force on Open Systems*, 7.
58. GAO, *Early Attention*, 6.
59. O'Hern, *Defense Science Board Task Force on Open Systems*, 7.
60. *Ibid.*, 9.
61. DOD, *DoD Open Systems Architecture Contract Guidebook for Program Managers 2013*, 137–38.
62. *Ibid.*, 138.
63. Andrew P. Sage, *Systems Engineering* (New York: John Wiley & Sons, Inc., 1992), 168.
64. Nickolas Guertin and Thomas Hurt, "DoD Open Systems Architecture Contracts Guidebook for Program Managers," *Defense AT&L*, September–October 2013, 30, 32, <http://www.dtic.mil/dtic/tr/fulltext/u2/a608725.pdf>.
65. Andrew McAfee and Erik Brynjolfsson, *Machine, Platform, Crowd: Harnessing Our Digital Future* (New York: Norton, 2017).
66. "A New Way to Work," *Economist*, 15 July 2017, 72.
67. Defense Science Board, *Open Systems*, 5.
68. *Ibid.*
69. Schoeni, "Whither Innovation," 453, citing USAF, *Strategic Master Plan*, 28.
70. *Ibid.*, citing McAfee and Brynjolfsson, *Machine, Platform, Crowd*, 220.
71. *Ibid.*
72. George J. Marlin, Richard P. Rabatin, and John L. Swan, eds., G. K. Chesterton, *The Collected Works of G. K. Chesterton*, Vol. 4 (San Francisco: Ignatius, 1987): 23.



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