

strategy&

***Aerospace and
Defense Trends
2018–19***

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**Keeping pace with a
focus on innovation**



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Introduction

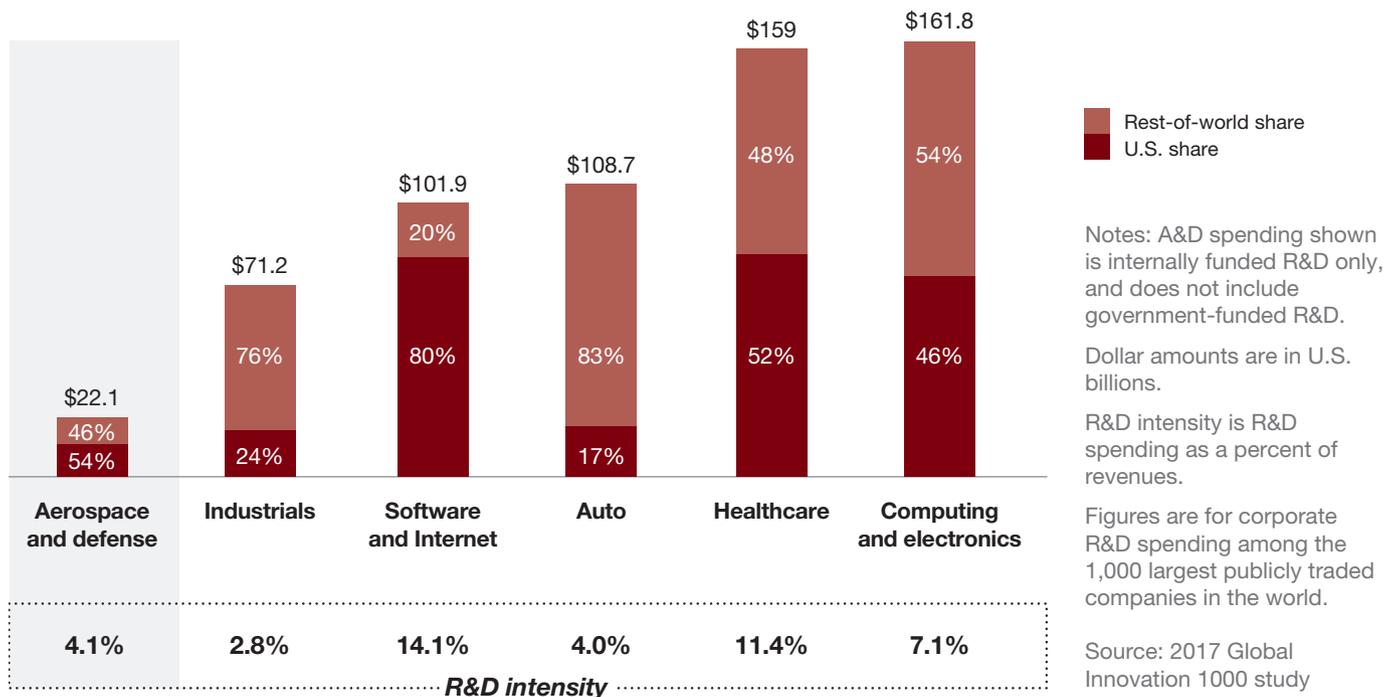
In 2017, examining the dynamics of the aerospace and defense (A&D) sector, we emphasized the need for global companies to focus on building relationships with defense agencies around the world. We said they should seek entrées into new lucrative markets even as their U.S. and E.U. business remains flat.

That assessment is still pertinent in 2018, even in the face of expanded U.S. defense budgets. There are many uncertainties surrounding how that money will be spent. For example, will the Pentagon return to the days of traditional long-term weapons development programs? Or will it take the more likely course of pursuing new partners — either legacy players or nontraditional entrants — that can invest in creative technology solutions and deliver them faster and cheaper? Another uncertainty involves the European Ministers of Defense, who are joining together as a bloc to increase investments in military equipment. Digitizing the armed forces and lowering procurement expenditures on big ticket items are priorities for them. Will this change leave A&D companies following traditional paths of product development out in the cold?

New R&D rivals

A global strategy built upon their own innovation and capabilities is the most viable path for most companies in this industry. But is that feasible? For some time now, defense contracting has been among the most risk-averse sectors, often opting to return capital to shareholders via share buybacks and dividend payouts, leaving research and development wanting. Indeed, in absolute numbers, the global A&D industry spends much less on research and development than other critical sectors. In terms of innovation intensity (the percentage of sales

Aerospace and defense companies are among the lowest R&D spenders



earmarked for R&D), its spending is also comparatively low — just 4.1 percent. (In Europe, it's a bit higher, at 5.1 percent; in the U.S., it's 3.6 percent.) To be sure, these aerospace and defense R&D budgets are on par with those of the auto industry when viewed as a percentage of sales, but they greatly trail expenditures made by technologically intensive companies, which have begun to enter this sector.

Slow-walking R&D efforts has never been a recipe for long-term success, and some of the significant threats confronting the A&D industry show why that's even more true in 2018. Commercial technology entrants have large and growing workforces dedicated to developing new technologies and can innovate rapidly.

U.S. Deputy Secretary of Defense Pat Shanahan, a 30-year veteran of Boeing, has spoken about the potential technology-deficit that defense companies must address. They may have once ruled the military equipment landscape and even led in innovation but that doesn't insulate them from hungrier, more determined competitors. SpaceX, founded in 2002, exemplifies this group. Elon Musk's company designs, manufactures, and launches advanced rockets, covering a range of activities that in the past could have been shared by a variety of defense contractors. And in its short life, SpaceX has already proven its ability to disrupt the defense business with a breakthrough that allows it to recover and reuse booster sections.

And while Western A&D companies battle new entrants at home, countries in other regions are expanding their defense capabilities and industries, hoping to erode the technological edge that legacy Western companies and countries have historically enjoyed. Some of them may become formidable rivals. Recent reports indicate that China is making a big push to develop military artificial intelligence technologies, and China and Russia are developing sophisticated air-to-air missile systems that use advanced imagery and sensors to thwart enemy intrusions before they pierce the skies.

As a result of these pressures, executives at large A&D companies must confront a critical imperative: change how you make decisions about capital expenditures and R&D spending to increase support for new technologies and partnerships with the goal of designing and engineering new products more quickly. In other words, adopt a more rigorous and less risk-averse approach to evaluating and making strategic investment choices (for example, product development, technology innovation, and R&D) that yield long-term value. Accept uncertainty as part of the normal course of business; view it as an opportunity, not a danger. At the same time, collaborate with defense customers to tap into technology innovation outside the A&D industry and adapt it to future platforms rather than developing bespoke solutions.

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We have already begun to see some movement in this direction, though not enough. Some U.S. A&D companies are using a sudden influx of free cash from massive tax cuts to widen R&D spending and investments in other capital assets (although many are still designating much of the windfall for shareholder payoffs that do little for future product development). For instance, in 2018, Northrop Grumman plans to increase capital expenditures by 11 percent and Raytheon says it is upping capital spending by 50 percent. Lockheed Martin says it intends to invest in new weapons development, while not providing any dollar figures. But these announcements are relatively few, limited to American companies and don't specify how much, if any, of the increased spending will go directly to R&D, as opposed to other typical capital investments.

In addition, some defense outfits have developed unorthodox innovation strategies to jumpstart new programs that formerly would not have been in their wheelhouse. The U.S.-based Sierra Nevada Corporation teamed up with Brazil's Embraer Defense & Security to retrofit Embraer's battle hardened A-29 light attack aircraft for the U.S. Air Force and other air forces worldwide. This contract grew out of a USAF effort to procure equipment with minimal and more rapid development work than traditionally required. Airbus has launched a new digital program called Quantum, which among other things seeks to create new business models around advanced technology. One of Airbus' initial Quantum efforts is the development of highly complex commercial drones to buttress its military unmanned device product lines.

Other A&D companies are explicitly trying to establish themselves as digital leaders through M&A or partnerships. Thales has acquired Dutch-based Gemalto for more than US\$5 billion, a deal that cements Thales' new strategic vision in this sphere. Gemalto is a major player in cybersecurity products, and Thales has been on a buying binge recently to open up new revenue streams from technology. Boeing Defense, Space & Security has joined with Saab Group to build a production aircraft that provides the U.S. Air Force with a new, advanced pilot training system that could replace the T-38 in the Air Force's T-X training program. The project is notable in that Boeing broke a norm by investing its own resources in R&D.

Some companies, such as Lockheed Martin (LM) are using venture funds to focus their long-term, strategic investments on technology innovation. LM's fund invests in early-stage technology companies that are involved in autonomous systems and robotics, cybersecurity, artificial intelligence, advanced electronics, and sensor technologies.

No A&D company can avoid the need to be much more nimble and forward-thinking than they've been in the past. Companies must

determine how to allocate capital to build differentiating capabilities, address current and future customer needs, help customers innovate, and, of course, maximize shareholder returns.

How can they develop an investment strategy to meet these goals?

A good starting point is a more disciplined approach to valuing strategic options. This involves analyzing specific financial indicators (such as cash flows or intrinsic value) generated by the company's current strategy, versus other strategic options. The cash flow can then be used to develop advanced products, instead of simply returning capital to shareholders. A&D companies should ensure that their approach to strategic investment decisions incorporates the following elements:

- A disciplined approach to managing capital investments as a portfolio of options, based on returns and on the drivers of intrinsic value. This includes a dynamic valuation of strategic options and trade-offs (potentially incorporating decision-tree analysis, what-if scenarios, and an analysis of real option value in a range of plausible future environments).
- Agility in the face of market uncertainty through a dynamic strategy process that is not constrained by annual financial-planning cycles.
- Reducing expenses by ruthlessly focusing on the assets, markets, business portfolio, technology, and core capabilities that provide the company's competitive advantage. (We call this a fit-for-growth program.) Too often, R&D funds are allocated to business units, letting them decide what to do with the money, rather than earmarked to fund specific priorities.
- Incentive and compensation programs that reward executives for investment decisions that result in successful innovation and improved competitive advantage. The traditional approach of offering bonuses for meeting annual performance objectives — equity returns, earnings, and the like — is counterproductive because executives can achieve these goals while actually destroying value in the company by, for instance, seeking savings through cutbacks in R&D.
- Changes in the corporate culture. The average defense contractor's workforce is skewed to a middle-aged demographic that is strong in developing and maintaining proprietary systems, but does not have the tech aptitude that increasingly drives weapons equipment efforts and advances today.

In those areas where commercial industries — particularly technology companies — may be several years ahead, defense contractors shouldn't

try to catch up on their own. They must realize that the government will purchase commercial products that are not proprietary in order to take advantage of their potential applications more quickly. To address this, defense contractors should partner with startups to adopt new technologies the A&D companies need. Acquisitions and venture capital-style investments are also possible in this realm. Boeing, Airbus, LM, and Raytheon have all bought interests in high-tech firms, working in areas that include cybersecurity, integrated circuits, drones, small electric airplanes, and augmented reality.

Conclusion

The A&D sector is clearly at a crossroads. And it is an especially challenging juncture because in recent years the industry has tended to pull in its horns rather than be bold and daring. Companies can choose either road, but only one — the one that requires companies to be less risk-averse — leads to a lucrative future.

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