Who’s Your Ally?

How Tech Startups Navigate Venture Capital and Federal Funding

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'Who's Your Ally? How Tech Startups Navigate Venture Capital and Federal Funding,' by Jonathan B. Miller <jmill@alum.mit.edu>

Who's Your Ally? outlines what a tech entrepreneur needs to know about the risk capital community and what it is like working with the federal government as a customer.

The six parts of 'Who's Your Ally?'

Concept of Operations

The parts to this article are:

0. Tough Tech Startups — On risk capital and dual-use ventures (the current article)

1. Selling to Uncle Sam — That time the US Government missed the airplane

2. Investor Motivations — Understanding returns on investment and innovation

3. Meet the Primes — The origins of the military-industrial complex

4. Systemic Challenges — The pathway to a billion-dollar venture

5. Help from Allies — Team tactics and the Friend-o-meter

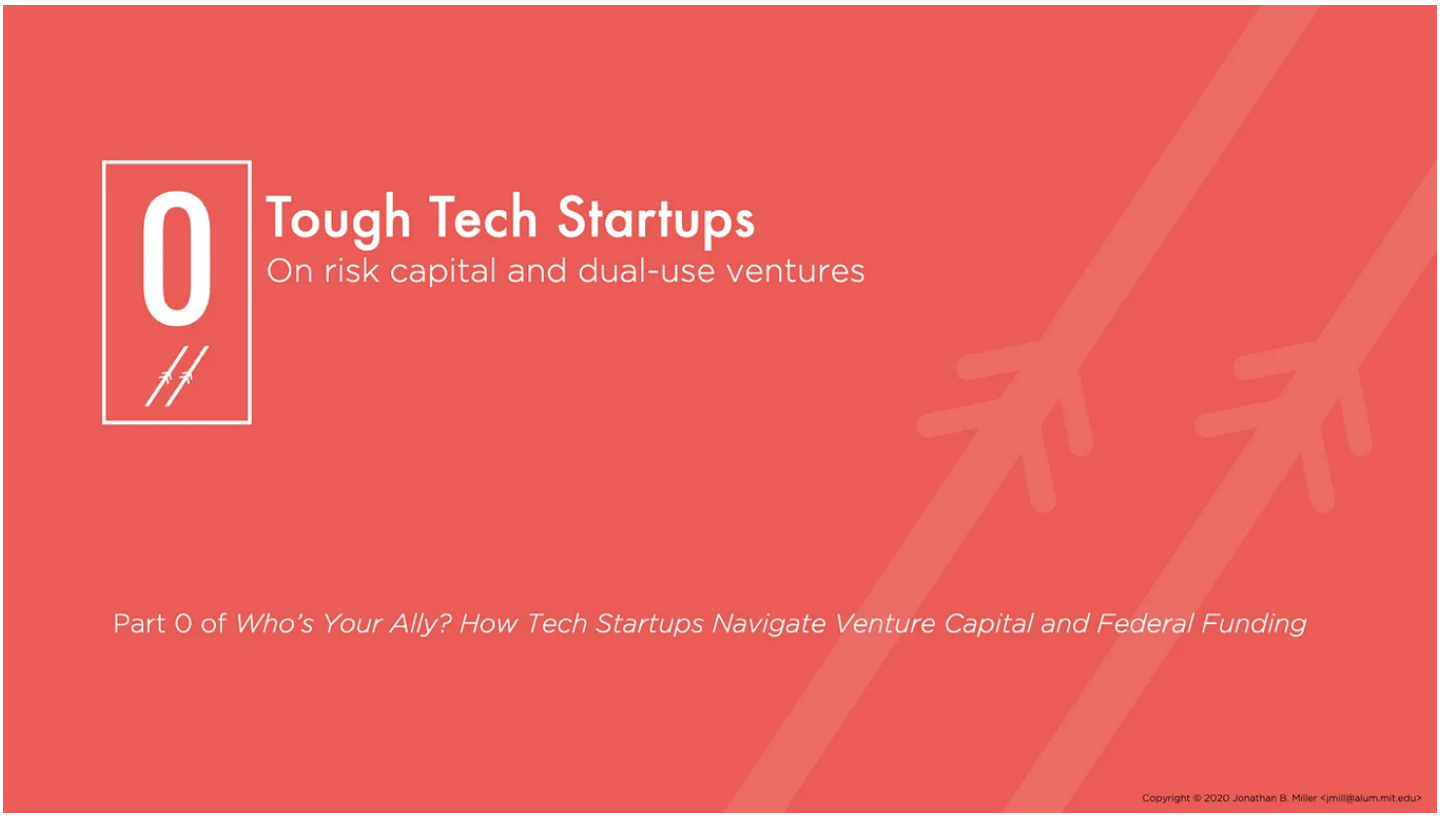
After interviewing hundreds of folks, from venture capitalists, to government representatives, to aspiring and successful dual-use entrepreneurs, I developed the tool for organizing venture capital firms along two key dimensions:

1) **Enthusiasm for dual-use opportunities**. Ratings: *Passionate*, *Friendly*, *Opportunistic*, *Unknown or has potential*.

2) **Comfort with tough technologies**. Ratings: *Tough Tech, Established Tech, Non-Technical*

How this content came to be

The basis for this content was originally presented in lecture form in January 2020 as part of the Massachusetts Institute of Technology's "Dual-use Ventures" course that my colleagues and I developed. The content has been extended and revised based on subsequent learnings. Portions of this article were published by the MIT Innovation Initiative in serial format in July 2020. The present article is in a longread format with additional revisions.



Part 0. Tough Tech Startups — On risk capital and dual-use ventures

"How can tech startups navigate venture capital and federal funding?" This is a series of six posts addressing the question, concluding with a map of investment firms which have exhibited varying degrees of interest in supporting such ventures.

At the MIT Innovation Initiative, we use the term *dual-use ventures* (DuVs) to indicate deeply-technical startup companies that serve, or could serve, commercial *and* government clients. An example of a dual-use company is Microsoft, as it serves commercial and government clients. While a dual-use venture may have Microsoft-sized ambitions, it is, alas, diminutive in size, often consisting of just a couple (or couple dozen) people. Examples of

commercial clients they may serve include enterprises and consumers. Examples of government clients include the US Department of Defense (DOD), National Science Foundation, or the Department of Health and Human Services. In practice, most observed US-based DuVs work with the US DOD, which has the largest Small Business Set Asides among US agencies.

Intended for 'tough tech' startup teams

This article is primarily written for founders and early team members of 'tough tech' startups. Whether spinning out of a pristine laboratory or an unkempt dormitory, tough tech ventures and the entrepreneurs building them may be loosely defined by their work in an emerging area where science meets engineering, and may sometimes be referred to as working in "deep tech" or "frontier tech". The markets which such companies could serve may not yet exist, and the companies' development milestones may be measured in years rather than months. While some readers may have experience applying for, receiving, and completing government contract awards, this series is intended to provide baseline environmental awareness for self-selected tough tech entrepreneurs with no government experience.

The following content is based on research specific to the United States venture ecosystem. Nevertheless, the gist of learnings may be globally translatable to other ecosystems, such as pertaining to the United Kingdom's Ministry of Defence (MOD) or the North Atlantic Treaty Organization (NATO). Interested readers may gain additional insight from my colleagues' May 2019 "Defense Innovation Report", written by Prof.

Fiona Murray and Dr. Phil Budden.

What Venture Capital is and is not

Venture capital is a form of private equity financing that supports creation and growth of new companies. Unlike their conservative banking counterparts, venture investors (or venture capitalists, "VCs") focus on startup teams with the potential to 'move the needle' of entire industries and generate big financial and strategic returns.

The bedrock of VC investing is a *fund*, which is a pool of money raised from a number of investors who form a legal construct called a *Limited Partnership* composed of Limited Partners (LPs). LPs include institutional managers, high net worth individuals, family offices, foundations, and a mix of other sources. Venture funds vary in value from a few tens of millions to billions of US dollars and these funds are, in turn, invested into startup companies in exchange for equity in the company. Each of these invested companies is a "venture-funded startup", or simply a *venture* with the cohort constituting the fund's *portfolio*. Risk of startup failure can be very high, so a venture fund must rely on one or two portfolio companies hitting a massive payday in order to compensate for the losses incurred by the rest of the startups in the portfolio.

Additional explanations of venture capital are available here and here. Venture capital in the context of dual-use ventures will be described later in this article.

Part 1. Selling to Uncle Sam — That time when the US Government missed the airplane

In the early 1900s, after successfully demonstrating their powered flying machine, the Wright Brothers tried selling their flyer design to the US Government. The feds, however, did not know what to do with it, so the Wright Brothers reluctantly approached European governments and found a receptive audience and a new customer base. Why were the Europeans willing to adopt this new technology while the Americans were dismissive? In brief, the Europeans had cognitive precedent for

experimental flying machines based on popular stories of gliders and balloonists who were challenging humanity's traditional confines of two feet firmly planted on Earth. For more on this, read David McCullough's *The Wright Brothers*.

Anyone can posit what is the modern equivalent of the Wright Brothers disruptive 'flying machine' that our governments should be supporting. Artificial intelligence, energy generation and storage, and synthetic biology are all massive fields with captivating — and terrifying — potential for civilian and defense applications.

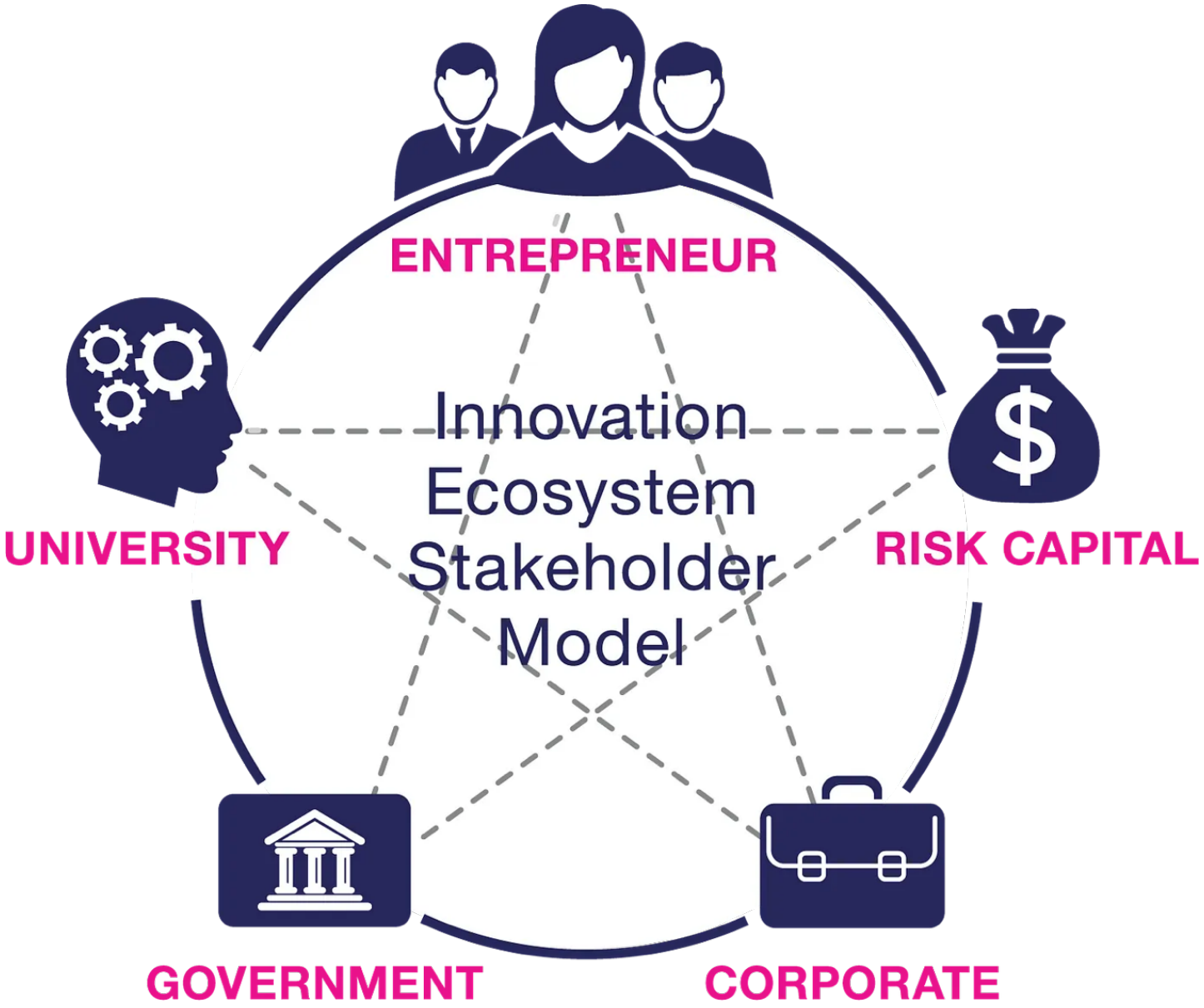
It's not just about Airplanes… or Guns

In Part 0, tough-tech dual-use ventures (DuVs) were described. DuV s are expanding frontiers in almost any industry, including, but not limited to, Enterprise Software, Analytics, Internet of Things, Robotics, Biotech, Energy, and other tough tech specialties that could be wildly successful in transforming industries and worldviews.

There is an assumption among the business community that the US government is slow to buy… and slow to stop buying. The steep front-loaded challenges of securing a lucrative government contract of the Phase III or post-Phase III SBIR/STTR ("Small Business Innovation Research" and "Small Business Technology Transfer") variety can be, in hindsight, a terrible waste of effort or a valuable opportunity. An example of the former is the statement I received from an investor: "Just sell to commercial markets

because you'll learn faster." For the latter, plenty of entrepreneurs with whom I have spoken have relayed to me the surprise they experienced when they saw just how many non-dilutive federal funds were available. While most venture investors perceive a startup's government funding as non-recurring revenue, it is revenue nonetheless, though best complemented by strong commercial interest.

Governments, entrepreneurs, investors, academics, and corporations must collaborate to successfully foster deeply technical startups that can mutually benefit the commercial and government sectors. The Innovation Ecosystem Stakeholder Model developed by Prof. Fiona Murray of MIT depicts these relationships.



The five stakeholders of the Innovation Ecosystem include entrepreneurs, risk capital (venture capital), corporates, governments, and universities. Model by Prof. Fiona Murray of MIT.

To summarize several of the reasons why venture investors are interested in DuVs:

- Strong and consistent demand signal: As mentioned previously, although the government is slow to buy, it is slow to stop buying, and revolutions aside, there will always be “a government”.

- Preservation of control: Federal funding is non-dilutive capital, so a startup's equity pie need not get sliced too thin or too early.
- De-risking: A startup that is able to generate revenue from sufficiently distinct customer segments like governments and the private sector has risk differentiation. For example, the US government is less sensitive to market fluctuations than the private sector. Alternatively, government agencies are impacted by political regime changes, while the private sector is fast-moving though always influenced by the national economy.

In the following section, I will describe observations and guidelines so tough tech founders can understand investors' motivations.

Part 2. Investor Motivations — Understanding returns on investment and innovation

The following is an overview of several venture investor "demographics". Entrepreneurs who seek venture funding must understand investor demographics, motivations, and key performance indicators. In the preceding Parts 0 of this series, dual-use ventures (DuVs) and venture capital investors (VCs) were described. In Part 1, their prominence in the Innovation Ecosystem Stakeholder Model was exhibited.

The two ROIs: Returns on Investment and Innovation

On the spectrum of venture funds, there are two ends: The Finance-minded and the Strategy-minded.

Pure financial funds pursue a return on *investment* ("ROI"). This is measured in local denomination, typically $USD since most — but not all — dual-use ventures serving the US federal government are US entities.

Pure strategic funds pursue a return on *innovation* ("the other ROI"). Innovation is measured in a variety of ways, none of which are particularly accurate for capturing the underlying drivers. For example, "innovation" is sometimes measured as "number of patents filed/awarded", "number of trends detected", etc. Different types of organizations study this topic from different angles:

A. academic research institutions like MIT,

B. non-profit research and development organizations like SRI International, corporate skunkworks like Alphabet X,

C. consulting giants including McKinsey & Co., and

D. venture accelerators like 500 Startups.

Most venture funds are somewhere along the spectrum, favoring one ROI over the other ROI, or perhaps striving for both.

There are VCs, there are CVCs, and then there's In-Q-Tel

While all investment funds could be plotted somewhere along the ROI spectrum, the venture capital funds themselves differ in capital structure, management methodology, and market expertise.

Traditional venture capital (VC) funds tend to be financial-oriented with a target return on investment of approximately twenty percent capital growth per year. This means that investors are hoping for any particular startup in the fund's portfolio to generate 10x returns, to help cover the losses from all the other portfolio startups that fizzled out. Venture investment funds target returns as soon as three years from investment, although some patient funds may be willing to wait a decade or more. Ultimately, traditional VCs are looking for a 'great business', one that will shift markets or play into emerging markets.

Unlike traditional VCs, the corporate venture capital (CVC) funds are associated with sponsoring corporate entities as the primary funder of its namesake venture investment arm. CVCs tend to balance financial and strategic investments, or may pursue pure strategic investments. The managers of a given CVC fund may be under an explicit or implicit charge to identify synergies within the parent corporation. Thus, CVCs are often not strictly financial returns-driven.

In 2019, the US Department of Defense launched the Trusted Capital Marketplace to facilitate connections between startups pursuing private funding and vetted venture investors who are ready to fund such startups. Created to counter the risk of overt influence or outright exfiltration of human and technological assets by and to particular nations, chiefly China and Russia, the Trusted Capital Marketplace of defense-friendly investors is nascent, though there are informal networks of such investors already.

In-Q-Tel, a special not-for-profit venture capital firm, constitutes a third VC 'class' relevant to DuVs. In-Q-Tel is like a CVC who represents the US Intelligence Community, which comprises more than a dozen agencies, offices, and bureaus. In-Q-Tel began in 1999 as the investment arm of the Central Intelligence Agency and grew to represent the Department of Homeland Security, the National Security Agency, and other US intelligence groups. In-Q-Tel investment partners tend to have earned their stripes in the traditional VC-CVC world; they scout for startups and investment opportunities based on declassified-but-private "Problem Sets" provided as guidance by the Intelligence Community.

Angel investors, private citizens, or groups thereof who invest their personal capital in early-stage companies are essential members of the startup ecosystem by providing early financial and strategic support to new companies. I do not delve into angel investment explicitly here since much has been written about this investor group. Likewise for “impact” angel investors, who tend to have a strong strategic thesis in addition to financial objectives.

Each investor and investment group have their preferred stages of investment, which are commonly referred to as Pre-Seed, Seed, Series A, B, C, etc. Likewise, there is also preference to seek or avoid ‘leading a round’ of syndicated, multi-investor fundraising for a startup. For example, In-Q-Tel, with its typical investment check size ranging from $USD 250,000 to $500,000 (which is considered a small investment size), is not a significant or leading investor except for Seed round venture financing.

Investors and the Defense Industry

Defense industry investors tend to be reserved when it comes to promoting their dual-use venture portfolios.

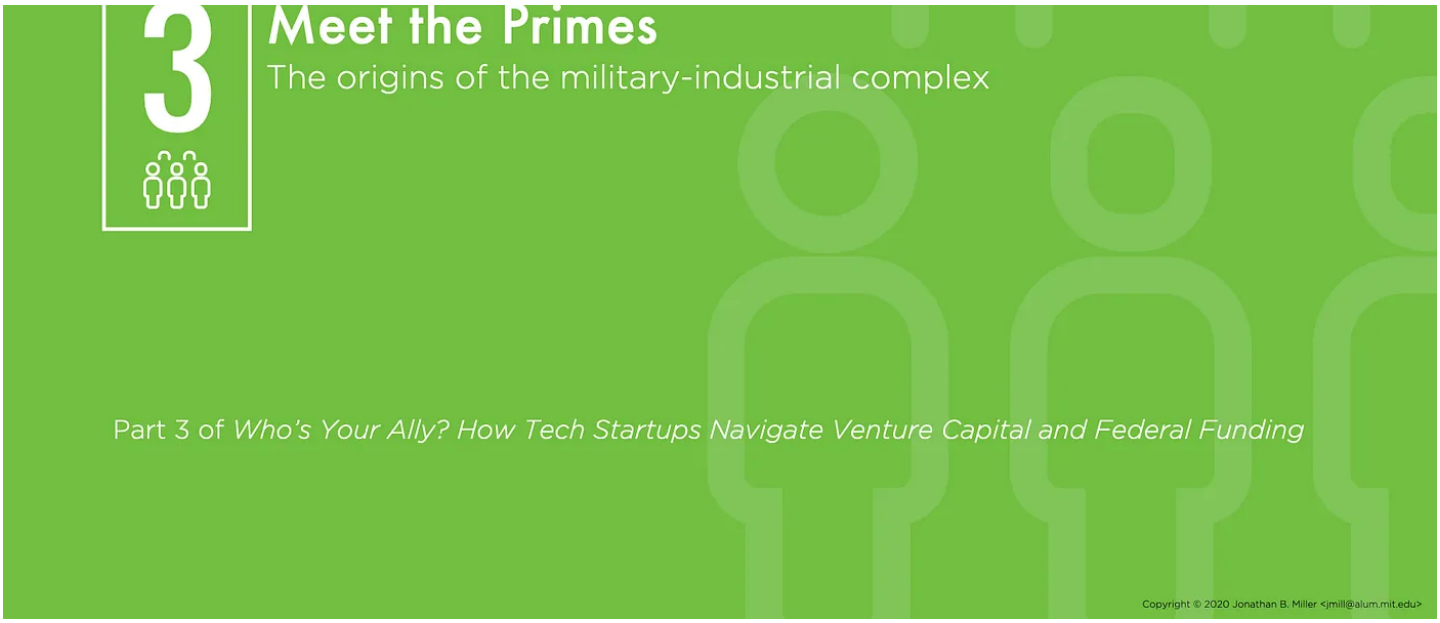
The defense industry overall is naturally “quiet”. Several factors contributing to the austere atmosphere include strict, institutionalized confidentiality procedures, respect for authority, and explicit hierarchical chain-of-command. There is a practicality to avoiding undue visibility, as it usually means exposure to fewer questions to answer, and thus less risk of overstepping confidentiality requirements. Such lack of information and

data transparency, however, may also alienate ‘non-traditional’ defense technology partners.

Furthermore, some groups are against investment in defense applications on principle. For example, in 2018, Googlers organized a successful withdrawal of Google’s bid for the lucrative US Department of Defense’s ten billion dollar Joint Enterprise Defense Infrastructure (JEDI) cloud computing contract. Despite aforementioned protests, Google applied for and was awarded the Anthos multi-cloud management contract by the DOD’s Defense Innovation Unit. Other tech titans, including Microsoft and Amazon, have more favorable relationships with government agencies and support defense collaborations.

The observations above contextualize the operating environment for a DuV entrepreneur. The defense-oriented investment community contains several distinct demographics and underlying motivations. These are important for entrepreneurs to understand in order to seek financial support for their tough tech ventures.

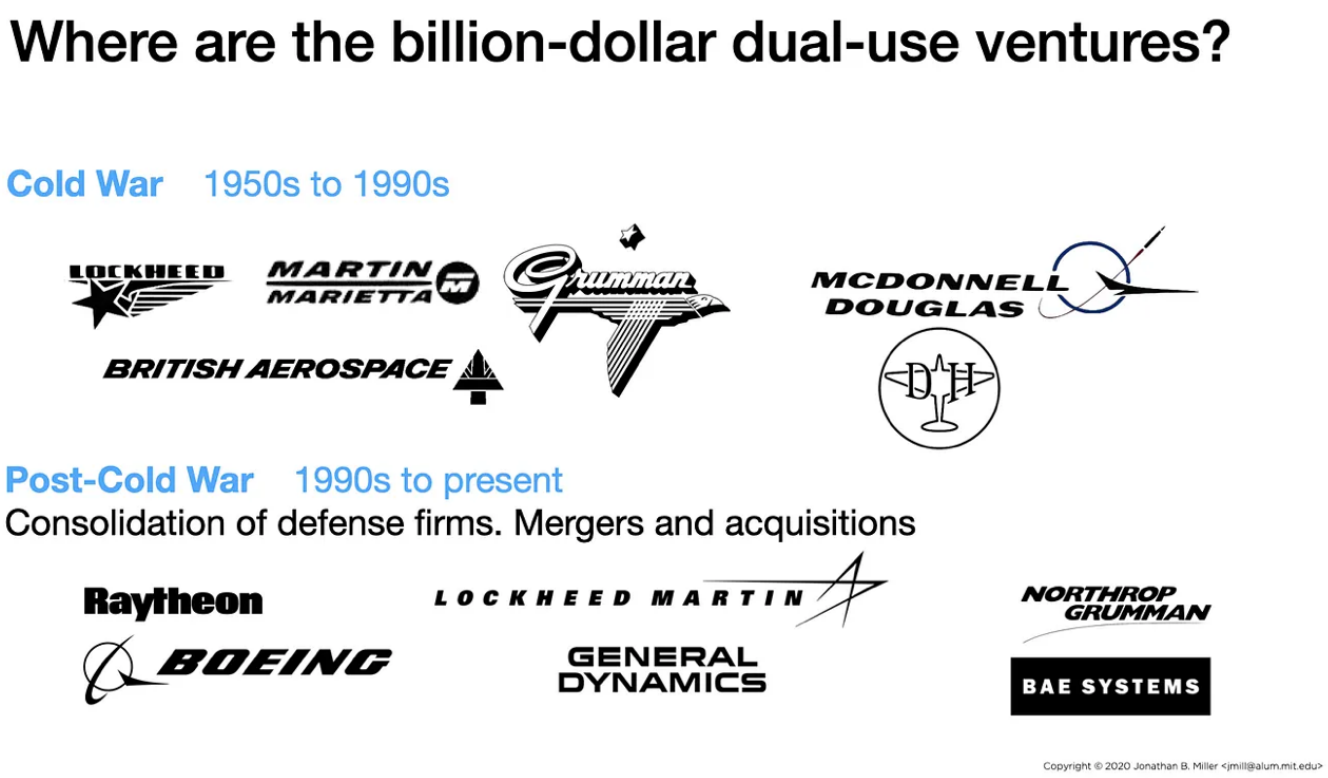
In the next section, I discuss complexity within the defense industry.



Part 3. Meet the Primes — The origins of the U.S. military-industrial complex

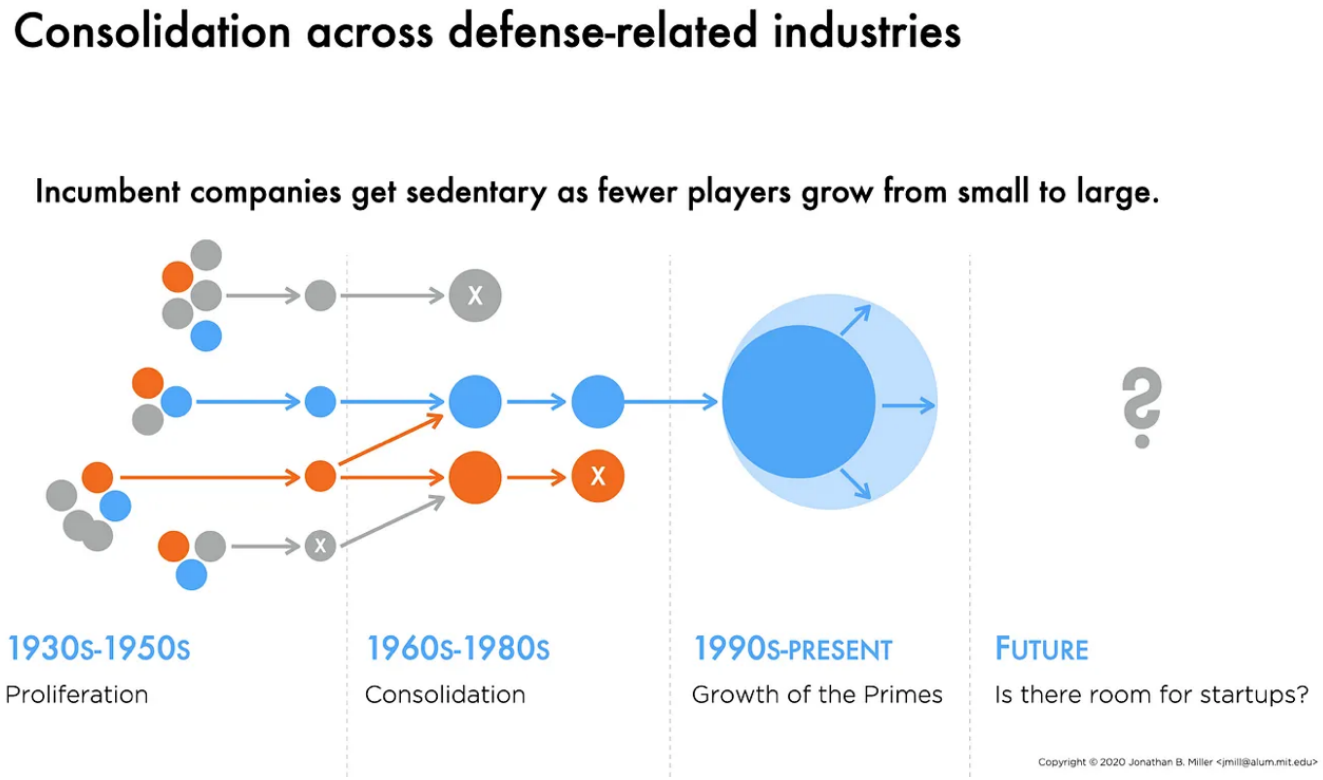
In 1961, President Dwight D. Eisenhower issued a stern warning about the growth of the "military-industrial complex".

The First Era, largely defined by government reliance on civilian industry only while the nation was at war, had been the *modus operandi* until the onset of World War II. The Second Era of the military-industrial complex thus began, in which defense contractors proliferated. As a reference point, United States arms production exploded from one percent of annual Gross Domestic Product (GDP) in the early 1900s to forty percent of U.S. GDP in the 1940s, as written in William Lynn III's article "The End of the Military-Industrial Complex". From World War II through the Cold War, there were substantial innovations (with many civilian benefits) developed by a multitude of defense contractors. As an arguably 'architected' result, the American domestic economy became tied to the success of its defense industry, and thus overwhelmingly to the interests of the prime contractors that I describe later in the article.



The Cold War era led to the growth and maturation of many defense-serving companies, which then, through a barrage of mergers and acquisitions, consolidated to our present-state mega primes.

Following the collapse of the Soviet Union and, symbolically, the end of the Cold War, the United States and its defense contractors entered the Third Era. Massive consolidation of contractors, and a shift to focusing on civilian pursuits, counter-intuitively bred a sedentary period. Large firms, somewhat lethargic without existential threats to the nation or — nearly as important in some folks' views — to the firms' themselves, continued building a federal contracting system that oft favored incumbent players. The causes of the imbalance may be predominantly attributed to two emergent factors: 1) lobbying and 2) precedence.



The consolidation across defense-related industries in the United States over the past century could be marked by periods of proliferation in the 1930s-1950s, consolidation from the 1960s-1980s, and growth of the primes since the 1990s. Future contracting enablement could create more space for younger companies to become large firms.

In the early 2000s, with a maturing Internet, the transformative effects of the Information Age propagating globally, and repercussions of tragic events occurring on September 11, 2001, a slow shift in the (im)balance of power commenced. Small, nimble ventures were building sophisticated software and hardware systems that outperformed what the United States federal government could acquire from its familiar, established defense contractor community. Similarly, the DoD recognized its eroding technical advantage against current and anticipated adversaries and developed the "Third Offset Strategy", which prioritizes investment and adoption of tough technologies including autonomous systems, robotics, miniaturization, and

advanced manufacturing.

The DoD's generous application of the word "innovation" peaked around the mid 2010's with the rebranding of defense contractors from "private industry" to the "National Security Innovation Base". Some attribute this era of 'innovation' within the DoD to Secretary of Defense Ash Carter who established the Defense Innovation Unit Experimental and the Defense Innovation Board. Instantiations and sister programs have emerged, to varying levels of success. One of the most successful, the Air Force Innovation Hub Network (AFWERX), coalesced in late 2017 within the United States Air Force, functioning like a philosophical spark plug to a new way of federal acquisition regulation interpretation and engagement with startups. Other examples include:

- accelerators like MassChallenge's Safety and Security cohorts and the Techstar's Air Force Accelerator,
- technology demonstration organizations such as NavalX Agility and the Army's xTechSearch,
- regional lab-space collaborations including the Army Research Lab Open Campus initiative,
- DoD-funded challenges hosted by the non-profit SOFWERX organization in support of US Special Operations Command (SOCOM), and
- liaison-style offices outside of Washington, D.C., such as the DIU and Navy Tech Bridge sites.

The above initiatives represent several of a myriad of programs belonging to multiple branches of the DoD. For an experienced DuV founder, it's complicated; for an aspiring DuV entrepreneur, it can be downright off-putting.

One of the drivers of the above initiatives is the imperative for earlier identification and hastened onboarding of new, externally-developed technologies within the DoD. With the 'clean slate' formation of the US Space Force, there is an opportunity for quicker acquisition authority. For example, the force is building a software development program that is modeled after the Air Force's Kessel Run, though this has less to do with external contracting of startups and more with internal capabilities enhancement. If Space Force succeeds in establishing a risk-tolerant, expediency-conscious culture as General Jay Raymond told the House Armed Services Committee, then this disposition favors technical startups. However, if such virtues remain largely verbal promises, rather than authoritative or financial commitments, then an acquisition process favoring incumbents will remain.

The main takeaways of these developments in defense contracting are that startups must — and, in some cases, do — benefit from reinterpretations of existing contracting laws for:

a) Expedited contracting

b) Shielding from direct competition with incumbent primes, as some RFPs

(Requests for Proposals) are strictly for small entities via set-aside procurements

c) Stronger, less opaque pathways to engage with members of the DoD community, with the US Air Force demonstrating the strongest leadership to-date.

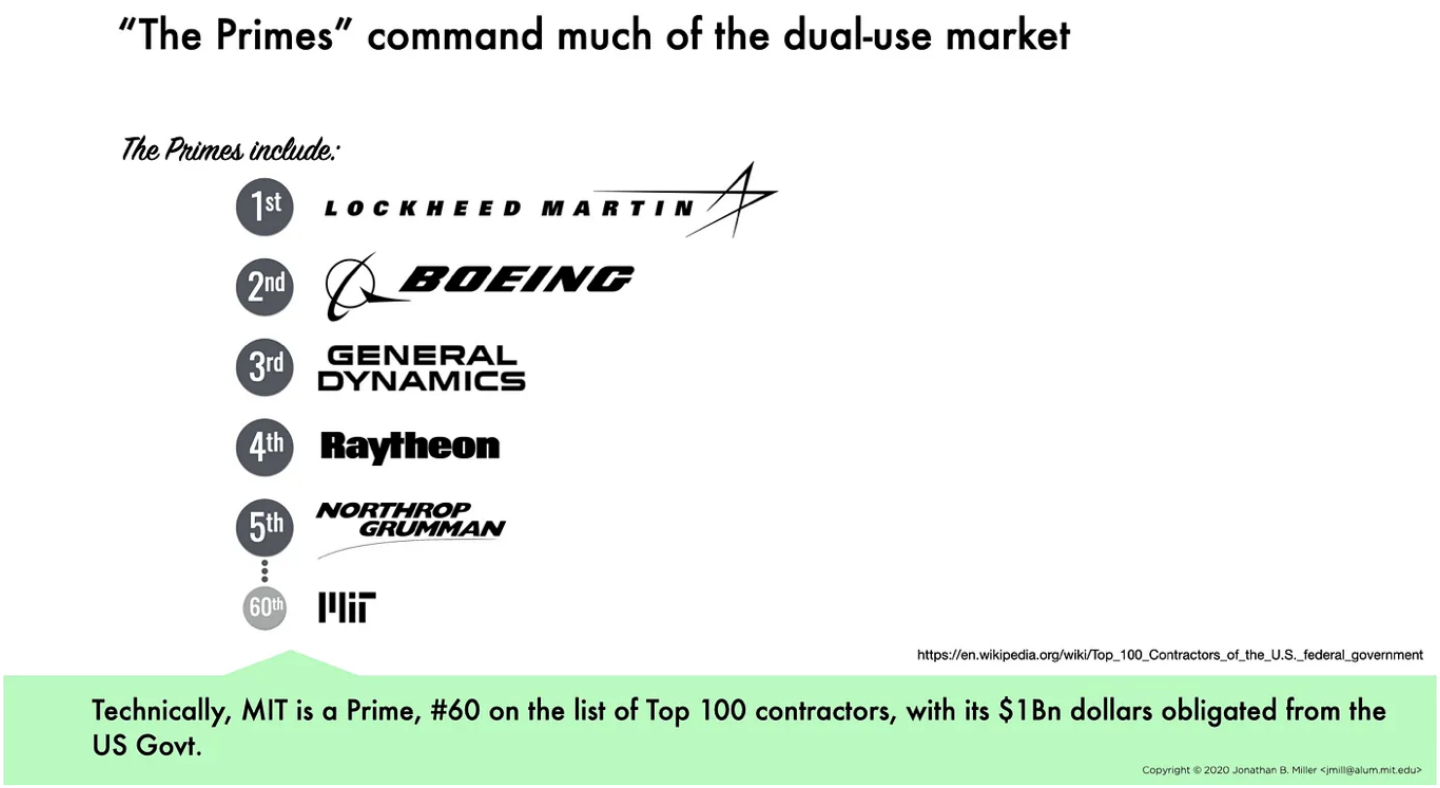
"The Government" and "The Primes"

"The Government" is a convenient, monolithic, and misleading view of the United States federal government, which can be decomposed into hundreds of organizations and thousands of departments employing millions of citizens. It is a massive system-of-systems, with different cultures, contracting implementations, and purchasing processes. Tough tech startups should approach with the mentality that there is probably much less interaction between and across agencies and departments than one would expect. As a vast organization, most parts of "the Government" aren't fully aware of what the other parts are doing because of the division of labor.

The Primes, or the top contractors of the US Federal Government, include:

1. Lockheed Martin
2. Boeing
3. General Dynamics

4. Raytheon
5. Northrop Grumman



The top five United States prime contractors are Lockheed Martin, Boeing, General Dynamics, Raytheon, and Northrop Grumman. For a sense of scale, I have noted MIT's location as the #60 prime contractor, which is largely allocated to the Lincoln Laboratory, with its $1Bn USD obligated from the US federal government. However, when people refer to "The Primes", it's usually the top five to ten contractors, who account for twenty to thirty percent of federal dollar obligations.

Prime contracting and the influence primes can exert on the market existed prior to World War II. For example, Mark Wilson writes in *The Business of Civil War*'s chapter "The Trouble with Contracting" that in the United States between 1861 and 1865, many small farmers complained that, due to the wartime Union government asking for large lots of horses (on the scale of five thousand horses per order), the majority of farmers were effectively cut

out from serving the war effort, though there were thousands of farmers who could feasibly provide twenty or thirty horses per farm, and thus tens of thousands of horses in aggregate.

Prime Survival

Ventures must be careful when working with the primes. Prime contractors will limit the growth of a startup as a natural survival mechanism, to exert control over potentially disruptive upstarts who may be thus limited in their abilities to subcontract with other primes or contract directly with the US government. Such means of influence may include invitations to participate in prime-hosted startup accelerators, incubators, subcontracting opportunities, and proof-of-concept demonstrations that tend to provide only short-term gains to a young venture, while primes benefit from using their name and resources to:

a) identify breakout teams and their technologies,

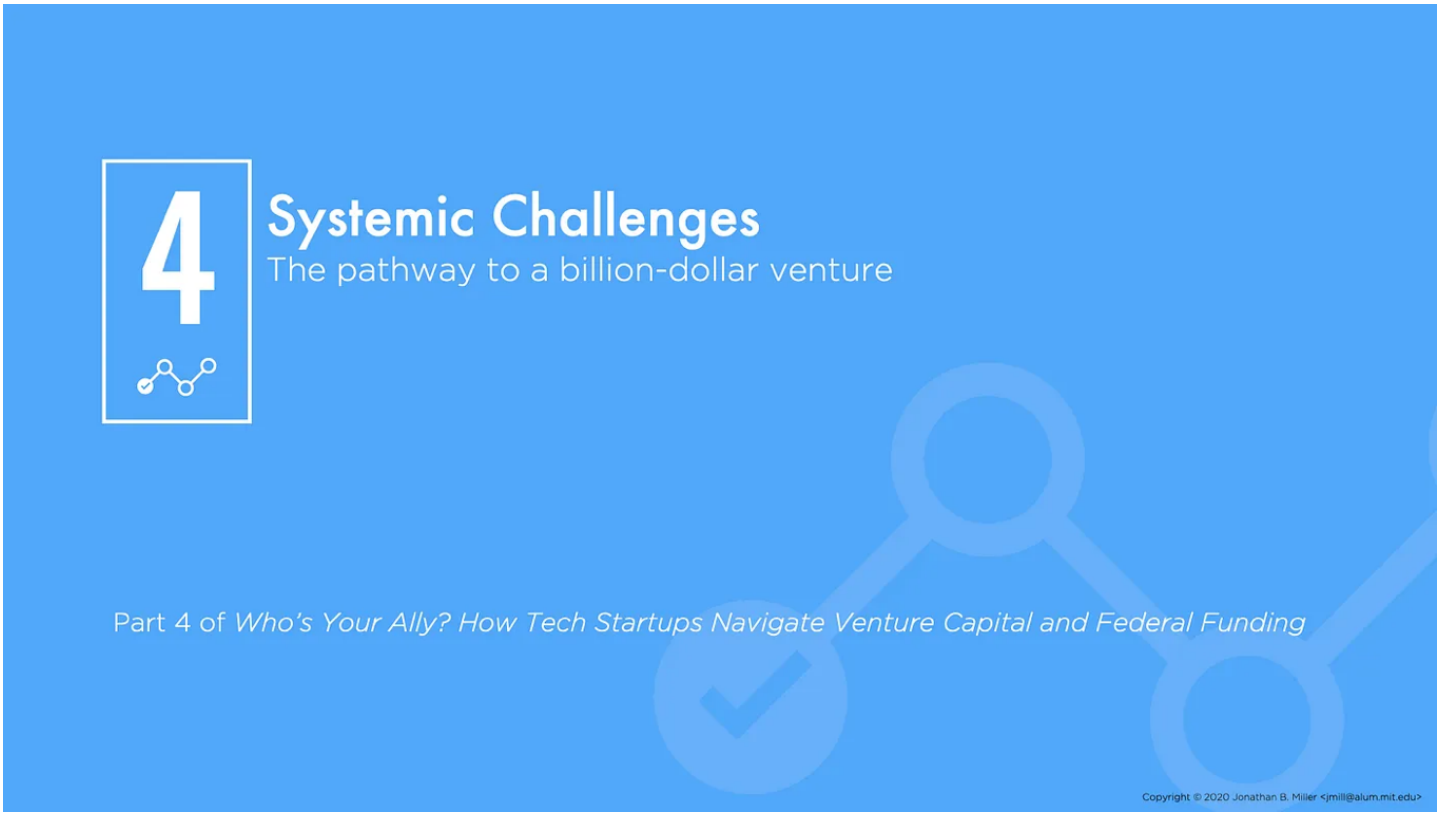
b) learn from and capitalize on access to those teams/technologies, and

c) maintain or strengthen the military-industrial ecosystem that favors the incumbents.

This is not to be misconstrued as “bad” or “good”, but rather it is an emergent yet unsurprising behavior that Eisenhower *et al* foretold long ago. The national security innovation base has developed contract vehicles, marketing, and, perhaps most importantly, a sense of recognition that the

frontier technology *du jour* may be housed not within a prime contractor's skunkworks as was likely in the past, but rather literally within an entrepreneur's house.

In the next part of *Who's Your Ally?*, I describe the environment in which any startup founder today must navigate.



Part 4. Systemic Challenges — The pathway to a billion-dollar venture

There are systemic challenges for startups in dual-use (predominantly

defense) opportunities to grow to the so-called “unicorn” billion-dollar-valuation startup status popularized in the media.

A billion-dollar startup, which typically provides an estimated 100x return on investment for early investors, is what a VC fund needs to pay the bills for all the losses incurred on the rest of a given fund’s investment portfolio.

There has been an uptick in billion-dollar DuVs despite extensive lobbying from major defense contractors (referred to colloquially and through the rest of this writing as “the primes”). Lobbying is an effective means to have requests for proposals (RFPs) written in such a way that limits the volume of proposals, since often A) the RFPs seek proposals that are so complex to satisfy that only primes have the expertise and human capital resources to apply, and B) only a figurative handful of companies qualify for bidding. For an opinion piece on lobbying-as-an-industry, read Palantir and 8VC founder Joe Lonsdale’s “Capture the Flag”. A holy grail of successful lobbying is to have an RFP come out with a sole source covenant. In other words, to have a request for bids on a project that, awesomely enough, only you, the young Padawan venture builder, qualify for. Lobbyists also seek influence on members of Congress, as they have the power to edit and approve DoD program office budgets by major acquisition, via the Major Defense Acquisition Program. Congress also approves budgeting for DoD “innovation” offices like Manufacturing.gov.

As a side note on terminology, “acquisition” to a startup team is often favorable and means being bought by a larger company to trigger a

liquidation event and, hopefully, a hefty payday reward to compensate for the startup's team's taking on of risk to build the venture. "Acquisition" in government vernacular is more akin to how a human acquires bread from a bakery or definitions from a dictionary, as in, the processes by which new capabilities, tools, etc., are attained.

There are three venture-capital funded startups to have become unicorns.

Since the Cold War ended, there have been only three multi-billion-dollar venture-capital-funded startups predominantly serving government clients:

(Anduril is technically not yet worth multiple billions of dollars, but its valuation crested one billion dollars as of September 2019 and perhaps soon it will be worth multi-billions.)

To make a dual-use startup that is especially interesting to traditional VCs, the startup has two boxes to check:

1. ✅ Big Idea
2. ✅ Billionaire Co-Founder

The first point, having a Big Idea, is fairly intuitive, though tends to be difficult to formulate in practice. The second point, having a billionaire co-founder, may be opaque to the readers as to why it has historically been a causal — rather than correlative — factor in the growth of the aforementioned unicorn dual-use ventures. Startups with billionaire co-founders have at least one key advantage over those without billionaire teammates: generously-funded, mostly-founder-owned companies have the financial runway and autonomy to spend money *for years* without needing to show evidence of technological, commercial, and governmental traction to external investors.

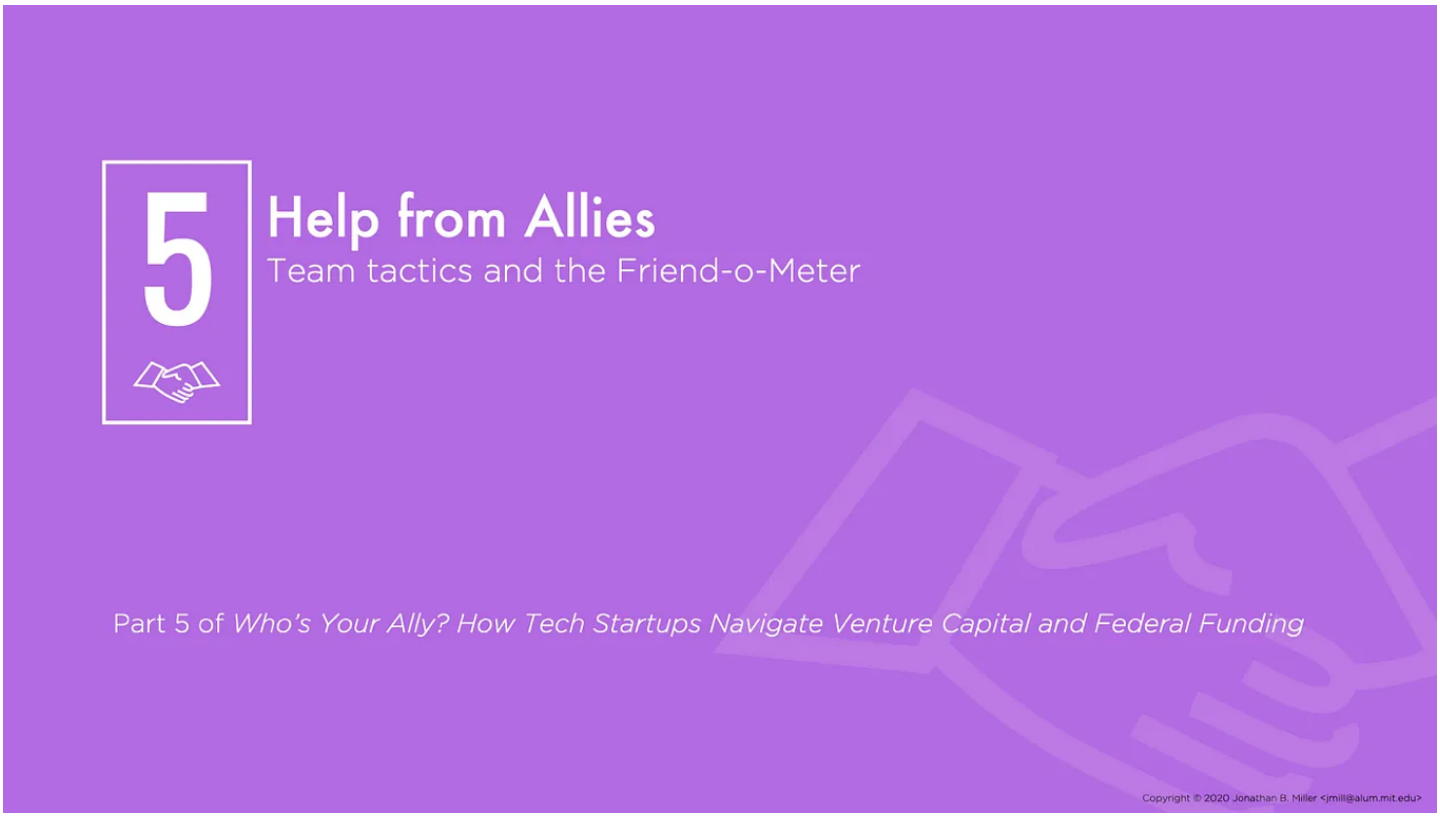
In the early days, such startups can afford to put two lobbyists on the payroll, to start doing their magic in Washington, D.C. for the next *n* years. This may be to the tune of approximately $24,000 per month per lobbyist, according to investors in two of the three companies listed above with whom I interviewed, and this amount is commensurate with quotes for lobbying support I received when pursuing contracts on behalf of one of my companies. Are these lobbyists necessary? In general, yes, absolutely, because their efforts can pay back handsomely by doing the political hustle needed to get those slow — yet mighty — Washington wheels turning in the startup's favor. For startups without access to or are unwilling to pay the total sum in cash, there may be some lobbying candidates who may negotiate alternative forms of payment or value exchange, though put in the

effort to carefully align incentives when forming the relationship.

Where do the venture capitalists come into the picture? If things were going fine with the startup, VCs probably wouldn't *need* to come into the picture. After all, despite the popular belief that raising VC money is the objective (at least for 'wantrepreneurs'), rather than a means, that's hopefully not at all the case for serious entrepreneurs. A reader may wonder, "Why is it so, that fundraising is a means rather than an objective?" Raising venture money is a way to add fuel to a fire, in which investors' cash and social networks are used to accelerate the growth of a vision. Said vision may or may not be built on a healthy business model. Raising money may be a critical skill, though fundraising efforts must run in parallel to the primary focus on building a great business.

A VC investment is a vote in the startup's favor that its team's vision, execution, and tech must grow fast to capture market share or to define an entirely new market. To use an overused analogy, a startup is like a rocket ship on earth, and VC support is akin to the booster rockets that give the rocket a fighting chance against gravity to successfully make its moonshot.

The present section describes the systemic challenges faced by DuV founders who aspire to build billion-dollar tech companies serving clients in commercial and government realms. In the next part of *Who's Your Ally?*, I describe suggested approaches for a DuV team to 1) evaluate whether it should seek venture funding and 2) learn how to do so. I also share a chart of supportive investment groups, which I refer to as the "Friend-o-meter".



Part 5. Help from Allies — Team tactics and the Friend-o-Meter

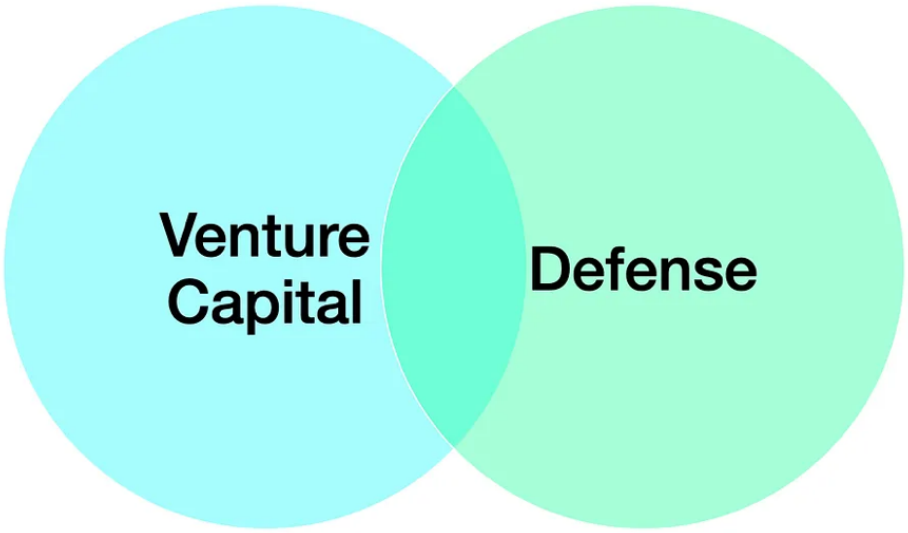
Fundraising should be viewed as a means rather than an end. I wrote about this in general terms in the prior part and expand on this concept below.

Fundraising and investing are two sides of the same transaction. Such transactions are highly dependent on human networks, and trends, marketing, and hype influence humans tremendously. For example, VCs will especially scrutinize *avant-garde* battery technologies because venture

investment in such startups proved to be hugely expensive and under-performant bets over the past decade. While this adds investment headwind with which a battery startup must contend, the startups that ultimately receive investment will have successfully navigated a high threshold that experienced VCs will have developed as a learned response or wariness, and thus the investment community overall exercises greater discernment with their investments in this space. The aforementioned example is one way the venture capital industry can learn from the past and apply to the present.

Founder beware: there is tricky terrain ahead

Aspiring defense-serving, VC-raising founders beware: you are treading into two industries that are both renowned for being opaque, tight-lipped, and relationship-driven.



A DuV founder is facing the union of a set of challenges that come from working in either the venture capital industry or the defense industry. To up the ante, pursuing the DuV path means founding teams are likely to face both simultaneously.

Any dual-use startup founder must have, or cultivate, 'ins'. Said founder must find allies who have extensive networks. In my observations, defense-related social networks are elusive to most technology founders and this is likely an experience shared by tech entrepreneurs emerging from other major research institutions like MIT.

Based on my observations, here are several hacks for a founder to get connected to defense:

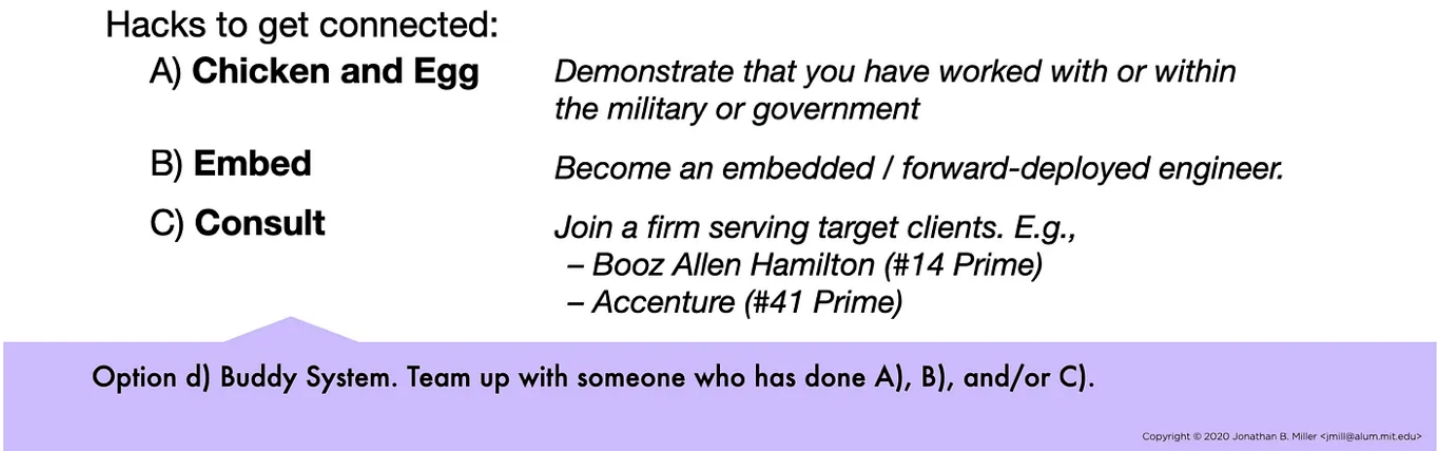
A) 🐣 **Chicken and Egg:** Demonstrate that you have worked with military or government representatives previously.

B) 🌍 **Embed:** Become an embedded or forward-deployed engineer.

C) 👔 **Consult:** Not excited about engineering? Join a consulting company serving governmental clients.

And one Bonus 🎁 hack:

D) 🤝 **Buddy System:** Team up with someone who has done A), B), and/or C).



These are several “hacks”, or approaches, to gaining broader exposure to, and rapport with, members of government social networks.

Each ‘hack’ is elaborated below:

- 🐣 **Chicken and Egg** involves exhibiting affiliation with (and empathy for) relevant dual-use problem sets. There is a positive reinforcement loop that can be nurtured to show that one has understanding of dual-use problem sets, leading to stronger professional connections with colleagues working in adjacent areas, which can enable further

refinement on the documented and latent needs within the problem set and empathy for the stakeholders. For tough tech founders, scientists, and engineers who envision a dual-use application for their work though may not have preëxisting government or military affiliation, a means to kickstart the reinforcement loop is to request 'curiosity calls' with individuals who may be currently or formerly working on or adjacent to a problem area of mutual interest within a government or military context. Note that a sales pitch is toxic and much care must be taken to avoid putting the interviewee in an uncomfortable (or even illegal) position of confidentiality. A DuV entrepreneur-researcher who is well-prepared, knowledgeable, and inquisitive in conducting informal interviews can learn much about emerging problem areas without delving into specifics, to discover new colleagues who may also be interested in the space, and, hopefully, to also leave his or her interviewees feeling like they, too, got smarter from the conversations.

- 🌍 **Embed** is an all-in tactic. Consider joining a firm that supports embedding, such as Palantir. A forward-deployed engineer works closely with one of the host company's clients, such as a government agency. A founder of a DuV valued at approximately one hundred million dollars told me his forward-deployed experience in Afghanistan was instrumental since, years later, he could draw on and market that first-hand experience as he built his company.
- 👔 **Consult** is a softer flavor of Embed. There are companies who specialize in government and government-adjacent consulting. Prime examples (pun intended) include Booz Allen Hamilton (#14 on

the list of top prime contractors), Accenture (#41), and Deloitte (#45).

- 🤝 **Buddy System** underlies all of the above approaches. In a reputation- and trust- based ecosystem like venture capital and defense, we may be evaluated more stringently by the company we keep. Effectively co-founding a startup is akin to a form of marriage, so with whom one chooses to go into business is tantamount, and an outward projection of some part of ourselves, our values, and our character.

These are four tactics I have observed over the course of my research effectively applied by successful DuV founders. There are some programs across the United States that provide support for startup teams to identify potential customers within the government. For example, at MIT, in 2020 we launched a DuV-oriented program for MIT-affiliated members who are building tough tech companies.

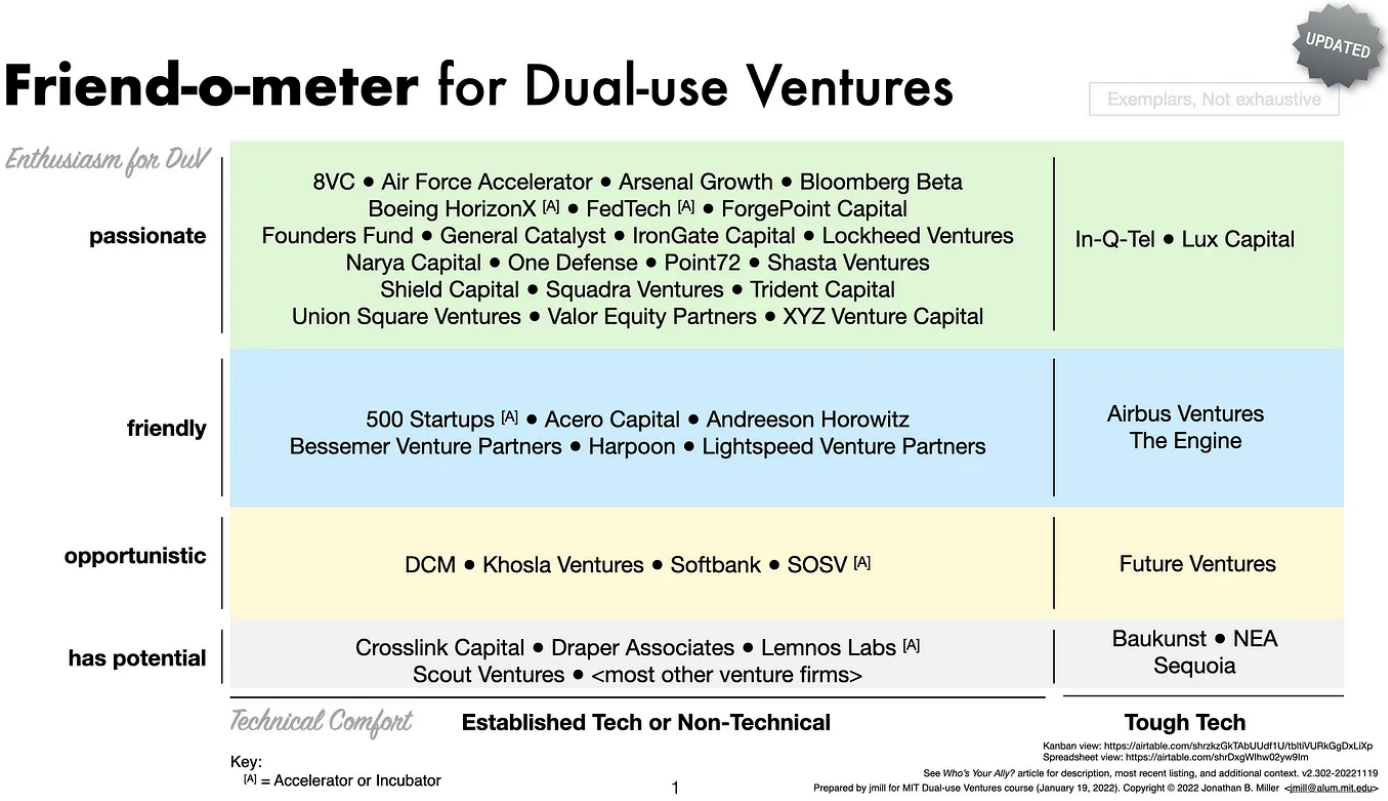
Introducing the "Friend-o-Meter"

There are varying degrees of support among Venture Capital firms and their willingness to invest in DuVs.

After interviewing hundreds of folks, including venture capitalists, government representatives, and successful dual-use entrepreneurs, I developed a tool for organizing venture capital firms along two key dimensions:

- **Enthusiasm for dual-use opportunities.** Ratings: *Passionate, Friendly, Opportunistic, Has potential or unknown.*
- **Comfort with tough technologies.** Ratings: *Tough Tech, Established Tech, Non-Technical*

As a first-pass at organizing this landscape, presented below is the Friend-o-Meter.



The Friend-o-Meter provides a glimpse into the firms which have demonstrated interest in supporting the two tenants of dual-use ventures: 1) Enthusiasm for dual-use opportunities and 2) Comfort with tough technologies.

The DuV Friend-o-Meter is clearly not exhaustive. However, it *is* indicative of the health of the investment community and, thus, a sense of the

magnitude of impact possible with the two ROIs: return on investment and return on innovation. (To read more on this, please refer back to an earlier piece in this series, *Part 2: Investor Motivations*.) Note that the list of firms designated as "passionate" is denser than the other sections — this is intentional, to be most useful to the dual-use entrepreneur. If we were to list all known venture firms, the majority would be placed in the "has potential or unknown" designation, greatly distorting the scale depicted here.

For *Enthusiasm for dual-use opportunities,* this is qualitatively organized from high to low, top to bottom.

- "Passionate" indicates that at least two investors in the firm, if not the whole firm, invest almost entirely in DuVs.
- "Friendly" indicates that there is at least one investor, or the full-time-equivalent among a team of investors, who views government contracting as a source of revenue that complements a venture's commercial objectives. Such investors may themselves have past experience in leadership roles investing into, operating, or otherwise supporting DuVs, and know how to navigate the varied phases of SBIRs and STTRs.
- The "Opportunistic" designation is applied to firms who may occasionally support a DuV, though it is absolutely not part of their main investment thesis.
- Finally, the "Has potential or unknown" designation is where the majority of investment firms occupy (despite how it is not drawn to

scale in the accompanying graphic). Such investors may be wary of investing into a startup which has a member of the DoD on its client list, and this may be due to: a) lack of experience in government contracting; b) concerns over branding or marketing; c) perceiving government contracts as non-recurring revenue; d) viewing contracts as distractions from a startup's strategic plan; or e) combinations of the above and other rationale. While some such investment firms may be discounted completely, plenty are not aware or haven't yet been exposed to an attractive DuV opportunity, so a little education may go a long way to gain support from investors within the "Unknown or has potential" designation.

For *Comfort with tough technologies*, this is a scale with two buckets.

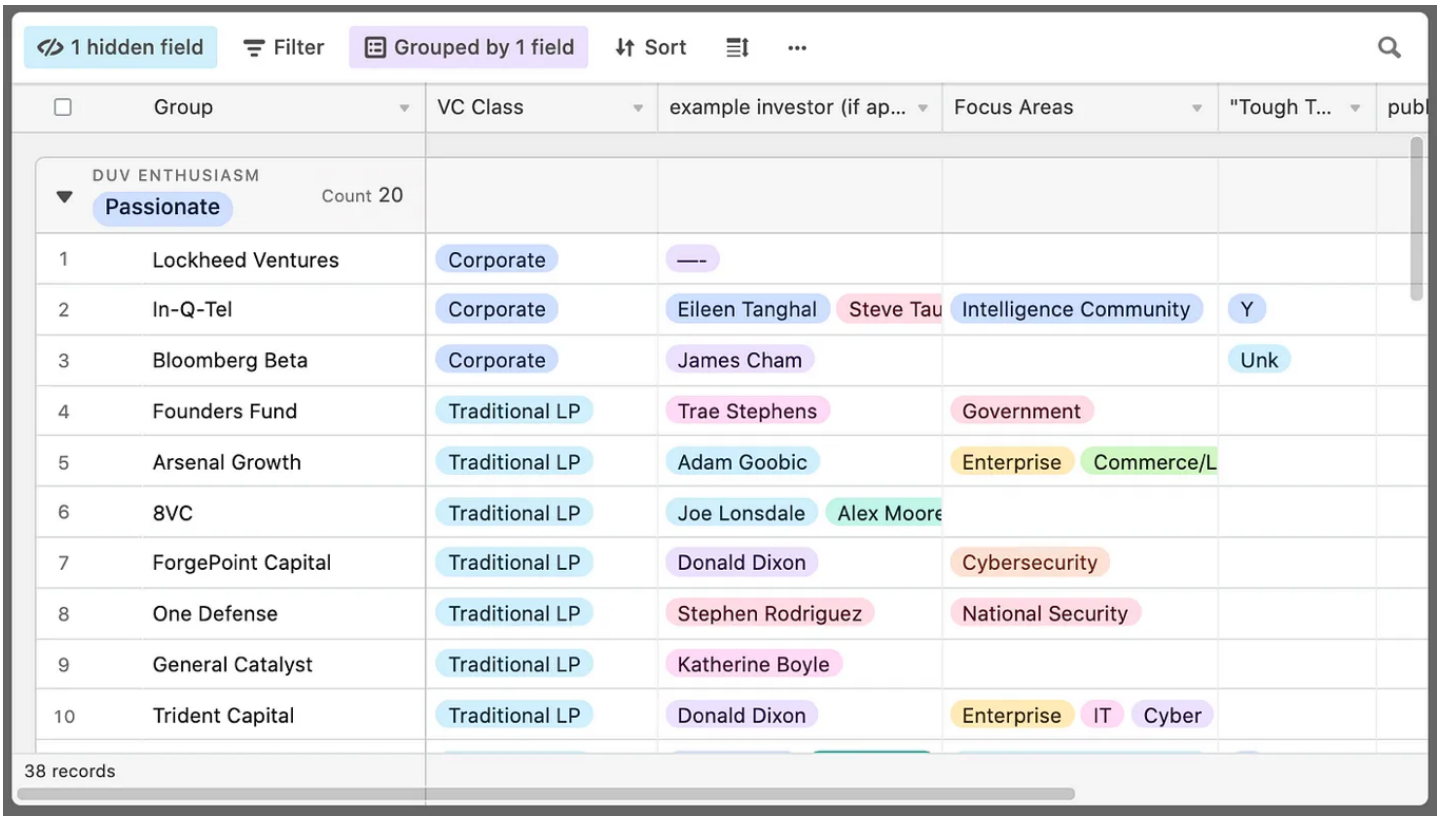
- "Established Tech or Non-Technical" is a broad label that includes firms and programs that tend to work with technologies that are somewhat established. The commercial-technical fields they utilize or serve may be looked up in market research reports and a reasonable estimate of technical rick can be formulated.
- "Tough Tech" is a designation for the venture capital providers who invest in companies commercializing frontier technologies. Tough technologies have advantages and application areas that may serve multiple nascent fields, though specific benefits and markets may remain vague (or unsubstantiated by customer revenue) for some time.

The *Comfort with tough technologies* scale is intended to designate firms which are suited for longer investment horizons. Many firms are structured to seek a "liquidation event" such as a financial acquisition or I.P.O. within a few years of investment into a startup. "Tough tech" investors understand that plenty of transformative technologies, particularly lab-to-market plays, often necessitate a longer investment horizon, sometimes measured on the order of five to fifteen years, and thus structure their teams, funds, and Limited Partners' expectations to better cultivate deeply technical expertise, with a corresponding aim for outsized ROIs and industry transformations. Technical-leaning firms may support portfolio companies with in-house engineers, add technical partners or a Chief Technology Officer, and other structural variants to align the firm with the unique qualities of tough tech startup investment sourcing, diligence, and growth.

Future work to extend this analysis may include quantitative delineation among these ratings, such as based on the percentage of portfolio allocated to DuVs as measured by $USD invested or market capitalization. A firm's role in leading or co-leading investment into tough tech, traditional tech, etc., may also be helpful for stratifying the Friend-o-Meter.

A maintained version of the Friend-o-Meter will be available here for some time:

- Kanban view: https://airtable.com/shrzkzGkTAbUUdf1U/tbltiVURkGgDxLiXp
- Spreadsheet view: https://airtable.com/shrDxgWIhw02yw9Im



1 hidden field | Filter | Grouped by 1 field | Sort

DUV ENTHUSIASM: Passionate — Count 20

	Group	VC Class	example investor (if ap...	Focus Areas	"Tough T...	publ
1	Lockheed Ventures	Corporate	—-			
2	In-Q-Tel	Corporate	Eileen Tanghal, Steve Tau	Intelligence Community	Y	
3	Bloomberg Beta	Corporate	James Cham		Unk	
4	Founders Fund	Traditional LP	Trae Stephens	Government		
5	Arsenal Growth	Traditional LP	Adam Goobic	Enterprise, Commerce/L		
6	8VC	Traditional LP	Joe Lonsdale, Alex Moore			
7	ForgePoint Capital	Traditional LP	Donald Dixon	Cybersecurity		
8	One Defense	Traditional LP	Stephen Rodriguez	National Security		
9	General Catalyst	Traditional LP	Katherine Boyle			
10	Trident Capital	Traditional LP	Donald Dixon	Enterprise, IT, Cyber		

38 records

View the Friend-O-Meter: https://airtable.com/shrDxgWIhw02yw9Im

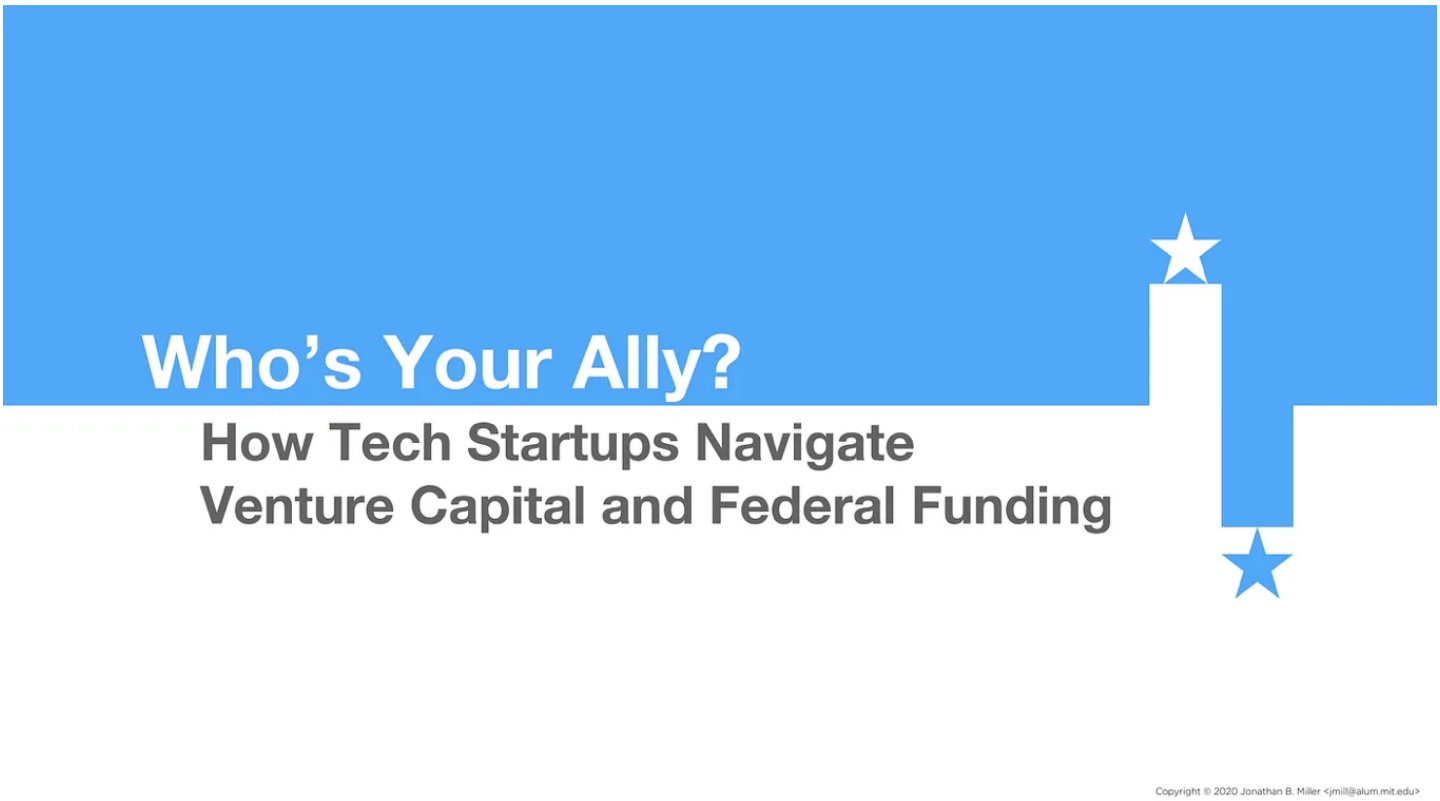
Do you know of a venture investment firm that should be on the DuV Friend-o-Meter? Additional firms can be suggested by contacting us. For any firm suggested, please list DuV startup(s) invested in, thought leadership in the space, and other indicators of support for DuVs, such as evidence of CFIUS/FIRRMA compliance.

My background

I performed applied R&D in robotics and telehealth for a nonprofit on behalf of the US Army and Navy and then became a venture founder, advisor, and investor. Having started several tech companies, I enjoy

helping others grow. I am a contributor in frontier tech work for Airbus Ventures, Alphabet X, and the Massachusetts Institute of Technology, where I am a research affiliate with the MIT Innovation Initiative. You may connect with me via email, LinkedIn, and on Twitter.

Thank you to Kathryn Person, Gene Keselman, Irina Franklin, Malvika Verma, and Mariemma Miller for reviewing drafts of this article. Thank you to the many entrepreneurs, investors, and researchers who shared their time and experiences with me as I was putting together this work.



'Who's Your Ally? How Tech Startups Navigate Venture Capital and Federal Funding,' by Jonathan B. Miller <jmill@alum.mit.edu>

Startup Lessons | Entrepreneurship | Defense | Venture Capital | Technology

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lab-to-market tough tech commercialization. Airbus Ventures, Alphabet X, WFS Group, MIT. Barefoot marathoner, pilot-in-training. LinkedIn.com/in/jmill

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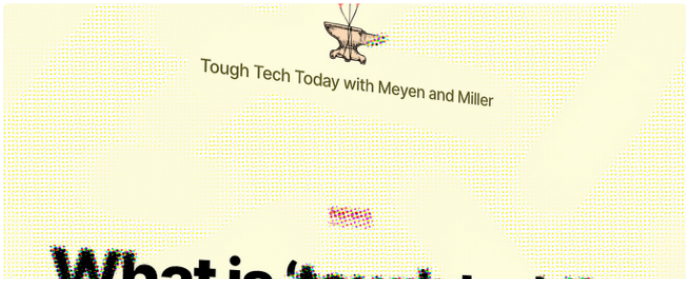

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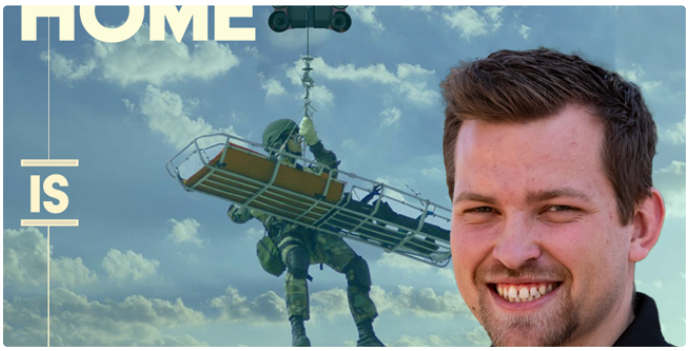

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