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I co-founded Skybox Imaging Inc. to revolutionize the use of commercial satellite imagery in characterizing daily activity on the surface of our planet. At Skybox we combine our own low-cost microsatellite design with a Silicon Valley approach to storing, processing and disseminating massive quantities of imagery and derived data. Skybox was incorporated in January 2009, after a year of incubating the concept while conducting graduate research in Aeronautics & Astronautics at Stanford University. We received our initial venture investment led by Khosla Ventures in the summer of 2009, with a second financing round a year later, in which Bessemer Venture Partners joined our initial investors. To date Skybox has received twenty one million dollars in venture capital financing. Throughout the process of conceptualizing, funding, and growing a high-tech venture we have been the beneficiaries of several opportunities without which our progress to date would not have been possible; we have also faced numerous challenges along the way..

As graduate students at Stanford, my co-founders and I were presented with a number of resources that were instrumental in the creation of the company. From courses designed to help innovators understand business plan creation and the venture capital financing process to numerous investor introductions provided through the extended Stanford network, there existed a distinct pipeline to help educate and foster entrepreneurship from within the University. That being said, the University was also very clear through its practices and actions that, should one be truly interested in pursuing an entrepreneurial venture, the proper venue for such activity was outside the University.

Even with these incredible resources at our disposal, we still found substantial barriers preventing us from getting our company off the ground. The primary hurdle, and the one faced by all entrepreneurs, was gaining access to capital. Venture investors are experts at pattern recognition, they observe opportunity trends that have been successful in the past, and look for new investments that exhibit the potential to follow the same trend. As a result, it is incumbent upon the entrepreneur to find a way of demonstrating how his or her venture has the potential to follow one of these valued trends. For some companies this is easy, but we were attempting to convince investors surrounded by opportunities vying to be the next Facebook or Twitter to invest in a company building, launching and operating satellites. Even with the myriad of introductions to venture capitalists that we received, it took months of restructuring the opportunity, and hundreds of meetings that ended in eloquent variations of "No", to finally find a way of positioning our company as a good fit for venture capital.

Although built upon a foundation of experience fostered within a university research setting, Skybox does not maintain any active research partnerships with universities. In general it is very difficult for new ventures and universities to find productive methodologies for co-development of new technologies. Both entities are typically capital constrained, and often have competing goals with respect to commercialization of technology and publication of research. New companies are myopically focused on customer adoption and creating competitive barriers; universities are interested in maintaining a sustainable base of novel research.

Beyond a difference in objectives and commonality in resource scarcity, direct collaboration between universities and new ventures is often challenged by a fundamental mismatch in operational tempo between the two types of organizations. Graduate students, conducting multi-year projects, produce the majority of university research. Conversely, the pace within new ventures is much faster. For example, our organization has grown almost 400% over the last nine months. This inherent lack of synchronicity between the two groups makes productive collaboration restrictively difficult to pursue. Based upon these challenges, and the manner in which Stanford made it clear to us that it was time to take our idea outside the University if we were going to pursue it further, it is my strong opinion that the proper time for separation from universities is when a new venture moves beyond the realm of fundamental research and into the world of commercialization.

Numerous universities have programs, Stanford University's Office of Technology Licensing for example, that assist in fostering relationships between university researchers and organizations interested in the commercialization of their intellectual property. The difference between such programs and the aforementioned difficulties in collaboration is that these licensing programs are typically designed to facilitate the transfer of existing IP to external entities for commercialization rather than collaboration in research. There are numerous instances in which this type of intellectual property transfer has worked extremely effectively; Google and Yahoo were both founded through this mechanism for example. Although Skybox is not based upon direct transfer of IP from the university, we exhibit the same transition from untargeted research to focused commercialization as we departed from academia into the world of entrepreneurship.

It is similarly challenging for new ventures to engage and collaborate with larger, more entrenched companies. Large organizations often operate on similar time scales to universities, creating the same set of challenges addressed previously. Most start-up companies tend to be very flat organizations, lacking traditional organizational bureaucracies, and are characterized by their decisiveness and ability to change directions quickly. This nimbleness is one of the key reasons why start-up companies are able to innovate. Larger, more established, organizations are often much more hierarchical and resistant to change. In fact, the type of rapid iteration

and course-correction that is essential to new venture success is often characterized as high-risk activity when observed within large organizations. Consequently, this operational incompatibility makes it very difficult for start-up companies to successfully collaborate with large organizations.

A common thread found amongst most entrepreneurs in the technology sector is that they are working on technologies that are fundamentally transformative within their respective markets. Many, if not most, of these companies eventually come into conflict with existing regulatory environments. This stems from the fact that when the particular regulations were originally developed, the type of technology creating conflict was not even in the realm of consideration. As a member of the aerospace industry, Skybox has felt this pain since the day of its founding.

As a commercial earth observation satellite company, we must operate under NOAA, FCC & ITAR regulation. Each one of these has presented its own set of challenges in our growth. For example, in obtaining a license from the FCC to operate an earth observation satellite a company must post a five million dollar surety bond. While this may not be overly burdensome for a traditional imaging satellite program, which costs over 500 million dollars, our satellites are over an order of magnitude less expensive, resulting in greater than ten percent of the overall program cost being consumed by a federal licensing bond. This is a very difficult challenge for a new venture being funded with equity dollars to weather.

The second major example of burdensome federal regulation is ITAR. As a satellite manufacturing company, virtually everything done by our engineering organization is governed under the ITAR. Even the most benign mechanical bracket can only be manufactured by an ITAR certified machine shop. The vast majority of local machine shops are not ITAR certified, and have no interest in becoming certified due to the high cost, burdensome documentation requirements, and increased liability. As a result we have an artificially reduced supply market, which has resulted in our manufacturing costs being increased by a factor of ten. Furthermore, these machine shops are typically very busy, which means we have a lead-time that is two to three times longer than if we were operating in a less regulated industry.

Perhaps even more concerning is the fact that the ITAR regulations have had the unintended consequence of actually decreasing domestic competitiveness in the aerospace industry. As a relative newcomer to the industry I have not seen the progression of the regulations over the years. What I have seen, however, is that when it comes to low-cost, transformative, satellite technologies, international developers have significantly surpassed the state of domestically developed technologies. A number of our high-performance, specialty, components are obtained from international suppliers. Additionally, when we have approached these suppliers about the possibility of co-development or manufacturing support they have declined due to the fact that their primary customer base is outside the United States. International developers are rejecting the idea of deeper collaboration with American companies due to the concern that they will not be able

to export the resulting technology to their existing customers due to ITAR; this is a real problem for American innovation.

While I have highlighted a few specific regulations that have impeded growth at Skybox, it is important to remember is that there is no “one-size-fits-all” solution when it comes to reducing regulatory burden for entrepreneurs. What are needed, however, are mechanisms to help entrepreneurs re-cast these issues as blockers to innovation, with the ultimate goal of alleviating the regulatory burden. No one wants to inhibit innovation within our nation, yet it is incredibly expensive and difficult for entrepreneurs to interact with the federal government. At Skybox we have spent thousands of man-hours and hundreds of thousands of dollars solely trying to better understand the regulations that are relevant to us, and educate regulators about what we are doing and how we are doing things differently. We are the lucky ones; we are well financed and have comparatively strong ties to the federal government. Many other entrepreneurs are not so lucky.

I was asked to recommend ways in which the federal government can promote new business creation and growth in technology innovation. Ultimately, the private sector is very efficient at identifying technologies that have real commercial viability and providing the capital necessary to grow these technologies. The best way that the government can assist in this process is become a better customer to innovative companies. Existing government acquisition models have not kept up with the pace of technological innovation. Traditionally, the government has explicitly defined the technologies that it is interested in obtaining, and the contractors build systems that meet exactly those requirements. This is not how the private technology sector does business. I am not advocating government acquisition of technology merely to support private research and development. I am intimating that entrepreneurs in the technology sector have made numerous capabilities for the private sector, which may also be applicable to the public sector. Many innovative technology companies do not even consider doing business with the federal government because it is simply too costly to do so. Entrepreneurs are successful in the private sector because they find ways of delivering capabilities that do more with less; this is the same challenge that we face as a nation today.

Working with new ventures is dissimilar from working with other types of organizations. It requires alternate communication and outreach strategies, new acquisition methodologies, and differing types of governmental support. It also yields novel solutions, engages our nation’s best and brightest, and ensures that we remain the technological powerhouse that has been our enduring strength. We must find new ways of tapping the incredible resource that is our entrepreneurial base to solve the challenges that face our nation. This change will not be immediate, nor does it require significant capital to support. With concentrated effort, advocacy and partnership we can bring government and the technology innovation sector together for our mutual and enduring benefit.