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1.15 Insight: Competing in the Global Space Economy

In the popular imagination, the space industry implies launch platforms, rockets, and satellites — the incredibly sophisticated, government-backed systems that enable us to get to space. While these systems are certainly critical to the global space economy, they make up just a fraction of the global space industry. According to a 2019 report from the Space Foundation, commercial activity accounts for nearly 80% of the global space market — and, of total global space activity, infrastructure and support industries generate almost US\$100 billion in economic activity, fully one-third of commercial space activity.¹ Moreover, in 2018 revenues from global commercial space activity reached a record high of \$328.86 billion. That total represents a 162% increase in revenue since 2005 and 6.6% in revenue growth since 2017. In light of such rapid growth — especially in industries seemingly unrelated to the space economy — all companies should seek to compete in and benefit from this expanding market.

The Apollo program proved it took a village to put a human on the moon. The program anchored and propelled our space industry, and space infrastructure and technology continue to support services and products critical on a global scale. NASA counts nearly 2,000 consumer products that leverage innovation from the space industry to enhance life on Earth. The Apollo program relied upon vast networks of contractors and disparate industries — both technical and non-technical — that came together to achieve a unified success. Space suits alone require expertise in textiles, raw materials, design, manufacturing, assembly, and quality control. We are, once again, at a great juncture in space exploration. As we turn national attention to the Artemis program, disparate industries will again unite to achieve shared goals.

Tangential Growth

While direct government investment generates the foundation for these industries to thrive, a more remarkable phenomenon of the space industry is the energization of enterprises with products and services not directly engaged in the process of getting human beings to space. This global space economy is predicted to exceed \$1.1 trillion by 2040.² Technological advancements have driven and will continue to drive the viability and economic capacity of the industry, and such growth is attractive for investment potential and job creation. Initial ventures will include activity in and commercialization of space itself; less visible but perhaps more significant will be the creation and energization of secondary and tertiary markets the space industry will create.

The U.K. aerospace industry has already illustrated the immediate effect the space economy has on secondary markets. The Sustainable Aviation Group's commitment to reduce carbon emissions to zero by 2050 involves innovation in engine efficiency and in hybrid and fully electric engines, sparking developments in engineering and manufacturing.³ This path to 2050 also involves the UK assuming a leadership role in the development of sustainable aviation fuels; that initiative alone envisions the construction of up to 14 plants to support fuel production. Stakeholders in the group include Boeing and Virgin Atlantic, sister company to Virgin Galactic. Such an objective materially affects these companies' profit structures and evidences a business model that, in both commercial aviation and space, takes account of a structurally interconnected market. Prominent members of the space industry will therefore experience the material transformation of an entire sector as a result of a single industry-specific objective.

Neither are these tangential markets STEM-specific alone. As SpaceX, Virgin Galactic and others continue to pursue commercial human spaceflight, the space tourism industry will require services as varied as cuisine, design, and accommodations. Such a tourism industry will likely generate innovation in fashion and advertising, too, as individuals and companies seek to curate and leverage a fitting aesthetic. As a highly visible cultural moment and luxurious pastime simultaneously, space tourism may well function as a catalyst for far-reaching architecture and design choices, as did the space race in the middle of the 20th century.



CNBC, the U.S. business news television channel, notes that the transformation of the space industry in the wake of new startups has blurred distinctions between what constitutes primary, secondary, and tertiary markets. In an investor guide, CNBC categorized space companies according to three types: public companies that are purely space-focused, public companies with exposure through a subsidiary, and private companies that soon may go public or create spin-off divisions.⁴ Such industry flexibility has made companies with any exposure to space business more attractive to investors. It also suggests that new companies seeking to position themselves in the space market consider these secondary and tertiary markets, but also perhaps consider how market share they already possess in other fields might be made a space-related market.

Staying Competitive: Actionable Strategies for Space Success

The sheer number of technological advancements has increased the viability and economic capacity of the industry, with new entrepreneurs and companies shaping the landscape and driving innovation and new markets. In such a climate of growth and investment potential, companies need to not only compete but stand out. New entrants into the space ecosystem need to be creative and thoughtful in their approach. Existing players must reevaluate their strategies to ensure longtime viability and assess emerging markets for possible capabilities expansion.

To compete, companies must (1) understand the adaptability of their skills and services, (2) be able to anticipate shifts in the marketplace, and (3) pay attention to technologies and trends that aren't explicitly in the "space domain" but will be critical to mission success, exploration, and deep space habitation.

Follow Technology and Funding Trends

Ashley MacNeill of Morgan Stanley noted last year that angel investors, venture capital, and private equity firms have displayed an enormous amount of interest in the sector, and indeed that there is a "fear of being late to the party."⁵ Alongside real passion, then, is a recognition that space is an investment area that is just as prudent as it is interesting. In a marked shift from the Apollo era, in recent years private dollars have outpaced government funding, and private sector companies have been commanding the attention and news headlines. By construct, they are the industry that is the most agile.

However, the government sector will always ground the space economy, and the newly minted Space Force as the sixth branch of the U.S. military has helped reignite public interest in and support for space. This catalyzing momentum will lead to more federal investment both directly and in government-adjacent contracts, creating a premium source of funding for companies looking to break into the space sector. It also has the capacity to help accelerate technologies and capabilities necessary for reaching our space exploration goals.

Companies seeking to stay competitive should monitor funding patterns and trends in the space economy, as Congressional budgets and commercial investment are crucial bellwethers for industry growth patterns. They will tell you what the money is going toward and where their future interests lie. Both are good indicators of whether a product and service is relevant or if a realignment of capabilities is necessary.

Additionally, companies should keep abreast of the drivers in this investment space. Morgan Stanley's "10 Drivers of the New Space Ecosystem," includes traditional sectors such as deep space exploration, but relative newcomers such as satellite internet, asteroid mining, and space tourism expand the space industry beyond traditional research- and defense-oriented space goals. Moreover, near-term investment is likely to impact other industries beyond the space sector: Morgan Stanley foresees effects in the IT hardware and telecom sectors, for example.⁶ Even the advent of 5G is likely to both depend on and disrupt the market space. Fundamentally, companies should think creatively about how space investment will or might transform their industry and their customers.



Think About Direct and Adjacent Markets

Along with a creative approach to space investment, companies looking to leverage the new space market should also consider ways they might offer services adjacent to the market rather than intervening in the market directly. As Unmanned Aerial Vehicle and Unmanned Aerial Systems technologies grow, the market will expand with the need for parts, services, and maintenance. Moreover, it is crucial for companies to envision market interventions beyond technical support — the space industry has revolutionized even face cream,⁷ creating much broader opportunities for businesses to become part of the burgeoning space industry. The U.S. Chamber of Commerce indicates the influence the space economy has had on adjacent markets like direct-to-home television, geolocation, and navigation, and it predicts new revenues accruing from new product development and asteroid mining.⁸ Adjacent services will reshape the space industry perhaps more extensively than purely space-focused businesses, and companies should seize the opportunity to consider how their service might play in this larger field.

Revisit Business Strategies to Ensure Agility

A crucial component to providing direct or adjacent services will be a business strategy that is agile enough to keep pace with the evolving market space. According to the Brookings Institute, as private growth outpaces government growth, the industry dynamic will shift from government-driven space activity to supportive and strategic activities driven by private investment, yielding a market that is “diverse, multi-centered, and technology-intensive.”⁹ Companies with deep roots in big government and military projects are responding to market pressure by becoming more entrepreneurial and collaborative with the broader community. Individual companies should seek to intervene in this market partly by reconceptualizing the market: The reality of the space industry is one that is global, collaborative, commercial, and competitive. One example is Momentus’ space transportation service, which has announced new customers for a 2021 launch.¹⁰ Momentus is focused on neither hardware sales nor research, but rather offers SmallSat delivery — yet another frontier in the global space economy.

A space-ready business strategy should consider the fundamentally international character of the market. As Curt Nickisch of the Harvard Business Review’s IdeaCast succinctly puts it, “If you believe competition is pretty stiff in the global economy, try space.”¹¹ The customer base for space is increasingly global, and so too are competitors in the provision of goods and services. Competitive companies might consider shorter development and integration timelines to take advantage of such a reshaped market: Commercial off the shelf (COTS) solutions might be integrated to deliver faster and more cost-effective solutions to many different enterprises, for example. As government contracts shift from firm fixed-price to fixed-price to emulate more of a commercial approach, companies with an available product stand ready to benefit from such a nimble business strategy.

Evaluate Business Approach to Match the Level of Market Entry

As companies prepare to enter or expand within the space economy, they should also consider the relationship between their business strategy and the level of market entry they seek. A company looking to integrate a product into a larger, existing system to improve that system will need to approach market entry differently than a company seeking to support the broader space economy with a more adjacent service. Simultaneously, funding sources might help determine strategies for market entry, whether that source be grant money, government contract funding, or private investment. TechCrunch lays out different ways that companies have already entered the sector, citing successful examples of market entry that range from “brute force” full-scale launch platforms such as SpaceX to “stealth” long-term positioning success stories like Rocket Lab, the U.S. company offering launch on demand for small payloads.¹² In light of the range of entrance options, companies should be clear-sighted about the kind of entrance they want to make into the broader economy as they develop and revisit their business strategies. Faster, better, cheaper is a goal, not a strategy.



Start Local

Companies should consider ways they can begin at a local level to enhance the space ecosystem. Individual communities and states may already possess a wealth of resources for companies, and companies should directly engage in technical support by supporting and growing with those who already work within the space ecosystem. For example, companies might seek to partner with already existing tech industries in their local area or state. Such partnerships make a space intervention more attainable for companies seeking more exposure to the growing space economy.

As the global space economy continues to evolve and energize markets beyond its immediate reach, companies may be surprised to learn they are already a player. From that vantage point, companies should envision and begin to deploy strategies to position themselves for explosive growth and take advantage of the burgeoning global space economy.



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