



The Terminology Challenges of Communicating Value in Space Enterprises

Summary of Findings – September 3, 2019

This document represents a Summary of Findings. Additional material, including a more detailed whitepaper is forthcoming.

Over the past fifteen years, commercialization and privatization activities in space have grown in significance for national policy and strategy; in interest in financing and investing from both government and private entities; and in activity for developing disruptive or innovative technologies. Commercial activities in the space sector are becoming accessible to a wider variety of actors, and this trend will only become more important for global sustainability and economic development. Meanwhile, the terminology that is used to describe the energy and activities of those active in the sector creates significant confusion and, in many cases, erodes academic and professional business analysis of the space industry, creating poor strategic decisions by those coming into the market and lastly, wasting resources (time, people and capital).

Introduction and Objectives

In order to describe and create value out of space activities the community has developed terminology to describe certain types or groups of space enterprise activity - most notably newspace and commercial space. Throughout this analysis we use the intentionally broad term "space enterprise" to describe both activities and companies operating within or utilizing the space domain. We do this based on dictionary definitions of the term 'enterprise': A: a project or undertaking, typically one that is difficult or requires effort and B: a business or company. Writing this paper has required us to distinguish between space companies and space activities on multiple occasions. Whenever we want to discuss both at the same time, we will use the term space enterprise to include both concepts.

Stakeholders are actively trying to encourage successful and sustainable models to promote further development. However, what makes these models successful is not always well understood and is often described in broad, non-specific language. Terms such as "newspace" and "commercial space" are widely used but appear to mean different things to different stakeholders; moreover, this may vary in different contexts. Creation of new terms leads to inconsistent definitions and understanding. Terms with inconsistent meanings or applications may be used in conjunction with established and well-defined business terms, creating a lack of clarity.

This study was motivated by a desire to provide insight into these issues and had three primary objectives:

1. Verify that language inconsistencies are occurring in the space industry, and identify significant examples.
2. Investigate and illuminate challenges/points of tension emerging from these inconsistencies.
3. Document these challenges in order to improve consistency in understanding.

Semi-structured interviews were conducted with stakeholders covering a wide representation of the space economy. Participants were predominantly from the United States, but the UK, France, Germany, Japan, India, China, and Canada were also represented. Our interview sample contained investors, industry professionals, entrepreneurs, analysts, government policymakers, and trade association representatives. The interviews conducted for this study indicate that use of these terms - with different contextual applications and meanings - has led to confusion in policy, business, and investing situations. Contextual confusion over terminology and definitions has contributed to skepticism about the “space industry” and in some instances created tensions.

Table 1, below, summarizes is an outline of the people we interviewed during this research, categorized by profession and country of operation.

Table 1: Interviewees by Role and Country

Sector Roles	Base Country/ Regions
4 Investor	1 Canada
5 Analysts	1 China
5 Government - Policy	1 EU/ India
6 Industry/Entrepreneur	2 EU
4 Investor relations and advocacy	3 Japan
3 Industry/Business Development	2 UK
2 Industry/Engineer	13 US
3 Trade Association Rep	9 US/Global
	32 Total

This research project has verified that significant terminology inconsistencies exist within the space sector. While many potentially problematic terms exist, “commercial space” and “newspace” readily presented themselves as strong examples of inconsistently used terms that create tension points in the industry. Both terms also highlight a key underlying challenge for the space industry: conveying the commercial value of the space domain. The term ‘space’ does not inherently convey this value and entrepreneurs, government officials, and investors struggle with both communicating and comprehending value in various space enterprises. Terms such as commercial space and newspace can be helpful for simply conveying that there is value in space enterprises, however confusion over varied definitions can create new challenges that do not help the overarching challenge of communicating value. To attempt to address this issue, this analysis presents an outline of key factors that industry professionals identified as being important for describing the value of a given space enterprise. Instead of attempting to argue for a firm definition of terms such commercial space or newspace, or attempting to present new terms to replace them, by presenting these factors we hope that they can be used to improve clarity in communication between stakeholders.

The Vast Emptiness of 'Space'

The key underlying challenge for the space industry that emerged from this research is the challenge of communicating value. Much of this challenge can be tied to the term space itself. "Space" is a term that carries a lot of meaning with it. For those in the industry, "space" can be a key part of their identity. Many of those interviewed expressed pleasure and excitement toward sharing that they were in the space industry to those outside of it. However, many also recognized that use of the term "space" does not convey any sort of value. The commercialization of space is being willed into existence – a large amount of advocacy, business and governmental strategy effort is being placed into enabling and growing a commercial space sector. Yet, defining "space" as an industry or economic sector does not make natural sense. The term 'space' does not convey any value or particular commercial potential. It is not a resource, nor a type of business. Space is an area of operations, a place to do business – but it is not an industry segment itself.

Interviews reflected a perception that association with space has the effect of catching people's interest, and in starting conversations. An international government representative reflected that *"the word space, has the power to attract people."* A U.S. private sector business development executive responsible for sales into non-space industry reported that a space connection makes introductory conversation easier: *"and so, so they are talking just because space is cool."* A U.S. trade association officer argued that space is *"enjoying a moment right now in this [Trump] Administration. What I mean by that is that there's a lot of excitement in this administration about, you know, some aspects of space."*

Despite the seeming value of the term in attracting attention; consistently throughout the interviews both investors and entrepreneurs expressed concern that the use of the term "space" to identify a sector of investing interest and potential is at best too broad to have any value or use and at worst is confusing and off-putting. These stakeholder groups argued for a need in investment-related conversation to quickly move beyond the use of "space" to describe the activities of a company to more industry, applications, or customer specific terminology. The following table summarizes anecdotal remarks provided through interviews.

Table 2: Interviewee Impressions of the Term "Space"

<i>"space" is...</i>	Investors	Entrepreneurs
Too broad	<p>"Ah, it's so broad to be useless. So the problem is, if the person you're speaking to, doesn't really have a framework to be able to see where it fits, um, mostly because people aren't exposed to it."</p> <p>- U.S. Venture Capitalist (1)</p> <p>"The space sector is kind of like saying I'm in technology. It could mean anything."</p> <p>- International Venture Capitalist (2)</p>	<p>"I believe that, you know, if to say you're a space company, you kind of don't communicate anything at all...you are communicating nothing because space, is not a product or a service or whatever."</p> <p>- International Entrepreneur (3)</p> <p>"Space is too nebulous, right?" [Concerning sales to non-space industry companies]</p> <p>- U.S. Business Development Lead (3)</p>

"space" is...	Investors	Entrepreneurs
<p>Off-putting or Confusing</p>	<p>"Two weeks ago we were in Bahrain, and the first confusion point was space. ... A lot of the folks, thought were talking about space like WeWork."</p> <p>- U.S. Early Stage Investor (5)</p> <p>Different "definitions and association and connotation between people who are deep in the space industry and people who are not. In the sense where maybe we use a word or phrase or something within, within space, that is used very differently externally"</p> <p>- U.S Early Stage Investor (9)</p> <p>"Space gives the impression that it is going to be a long time before any return on investment. It's a knee jerk reaction."</p> <p>- International Venture Capitalist (2)</p>	<p>"Also a lot of times means that you're only going to be able to do space-familiar investors, you know, investors that have done it in the past or are looking to do it now. It's very difficult to convert a non-space investor to a space investor"</p> <p>- U.S Start-up Founder (6)</p> <p>There is a need to show "I'm not just a space nerd that, you know, wants to spend people's money so I can play around space"</p> <p>- U.S Start-up Founder (7)</p> <p>"The kind of anchoring point that lots of people have about space is NASA and NASA is, you know, supplied by legacy aerospace firms. And when you describe that industry relationship, the very vertical relationship, then there's not really a place to talk about entrepreneurial and innovation activities."</p> <p>- U.S. Space Advocate (8)</p>
<p>Lacking specifics</p>	<p>"I think that it would immediately require, further elaboration to specify what it is that the company really does. Are you going to space? Are you leveraging space-based data? Or are you generating that data? Do you ever return to the ground or do you stay in space? Are you doing interplanetary or are you just staying in Earth orbit. Just calling something a space company doesn't answer any of those questions. And it sets the expectation that okay, this person is doing something in regard to outer space or somehow leveraging space resources. But it doesn't specifically state how or why."</p> <p>- U.S Early Stage Investor (9)</p>	<p>"I mean, at the end of the day, you can call yourself whatever, you know, nobody, no investor cares about what you call yourself, right? It's, what is the value that you are building that they care really about?"</p> <p>- International Entrepreneur (3)</p> <p>"I think it all really comes down to that industry specific terminology. The more I talk to investors, the more I use these kind of similes ... just because it can preempt so many questions and you know, it makes it a lot clearer."</p> <p>- U.S Start-up Founder (7)</p>

Due to the difficulty of communicating value with the term space, terms such as 'commercial space' and 'newspace' emerged to describe new value propositions for the space domain. This research shows there are various definitions of commercial space and newspace, largely based on the types of value that the user is trying to convey.

Commercial Space

The definition of commercial space has been debated for well over a decade. However, as our interviews clearly demonstrated, no definition has been universally adopted. A collection of highlight

definitions that came from the interview process can be seen in the table below. The underlying concept that was predominantly agreed upon was that commercial space refers to non-government space activities and actors. However, what that meant in reality varied in significant ways. The main differences stemmed from two key points. The first being to what extent a government can be involved in a commercial space enterprise, whether it be through funding or as a customer. The second point being whether commercial space pertained to the conceptualization of a Business-to-Business ('B2B') and Business-to-Consumer ('B2C') space economy, or referred to establishing a competitive procurement environment for government led space programs.

Table 3: Definitions for Commercial Space Offered by Interviewees

Commercial Space Definitions	
Interviewee Sector Role	Quoted Definition
Analyst	Basically what it comes down to when we say commercial, we're talking about some private individual or company that has gone out there, put money down and is expecting money in return for the services or products they produce
Industry/Business Development	I would say, if you look at it on the basis of revenue and who their revenue comes from... Commercial is business to business
Industry/ Engineering	Even the companies we think of as commercial companies, a lot of their money fundamentally comes from government end users. So, you know, what does it mean to be commercial? I think it should be about the end customer being consumers, or true commercial activity in the sense that it is people like you and me that are the source of revenue
Investor	There's several different definitions I've used [for commercial space] before. The one that I always go to is the intent for the... Why does the company exist? And if the company's intent was to be a commercial company and its goal is to have the majority of its revenue coming from other commercial entities or individuals, then it's commercial, if they have some cost plus contracts somewhere, they did a few SBIRs, whatever. That's fine. It's the intent of the company that I go to.
Government - Policy	when we use the terminology of commercial space company, we mean the company's customer is not the governmental entity. So, [local company], which is a rocket launch service company, if they get a contract from the government, then it's not included in the commercial space.
Industry/Engineering	And so a lot of people were asking, well, what does that mean and how commercial is commercial? If you take one government contract for R&D rather than sales, does that make you not commercial anymore? And all those kinds of things. I haven't heard anyone ask that question in a little while, but it may be that I'm just not in the community where they're continuing to ask that anymore.
Industry/Engineering	Yeah, it is a little, there's a little bit of an eye test to it and, um, uh, you know, there's the famous quote from the Justice who is asked to define pornography and says, I don't know if I can, but I know it when I see it. There's a little bit of that to it. I would say generally speaking, I would define a commercial aerospace company as a company that derives the majority of its funding and a majority of its revenue from business that is not conducted directly with the government.

Commercial Space Definitions	
Interviewee Sector Role	Quoted Definition
Trade Association Representatives	<p><u>Person 1:</u> And that's why I go back to what is the difference between commercial space and noncommercial space. For me, the distinction is what market are you trying to serve? I mean the government customer versus non-governmental customers.</p> <p><u>Person 2:</u> yeah, but I think that's where some of our companies would push back a little bit because the government is a customer and... you know, does it come down to the type of contract that we're talking about, or how involved the government is in the process? Is that where you draw the line between commercial and noncommercial? The government is saying we need you to solve this problem versus we need this widget? I think there are, there are some shades of gray there even in a government customer versus a non-government customer.</p>
Trade Association Representative	if the delineation here is commercial versus noncommercial, or we only want the commercial companies, I hear that as code for we only want companies that only do space.
Industry Consultant	If they sell only to the government, in my mind, they're not really a commercial space company. And I guess to be more specific, if they're selling to a government agency using the federal acquisition regulations where it's that type of highly regulated, you know, government contracting environment, then I would not consider that a commercial company, uh, because for that reason, and that's how I would define it, I guess that's what I use as a definition is if they're following the requirements of the federal acquisition regulations and they're clearly selling to a government agency. So no, I would not include that as part of the commercial space industry. But if that same company sells both to government and to commercial buyers, then yes, I feel you do have to consider them part of the commercial space industry.

A consistent theme in interviews was a perception of a current government emphasis on – and generally a preference for – commercial space. Interviewees described the current use of the word “commercial” as a buzzword in government policy and regulation. Interviews also noted that inconsistencies in uses of the term in government – both inconsistencies domestically in the U.S. and in differences in different national contexts – is creating some points of potential tension. In certain cases organizations or stakeholder groups are being incentivized, by government and or investor interests, to use terms like commercial space, when other terms may be more appropriate

Newspace

During the interview process it quickly became clear that in practice newspace currently has no universally accepted definition, and its range of usage has made it resistant to a firm definition. Some interviewees suggested that newspace and commercial space meant the same thing, while most considered them to be different. In general there were some broad aspects of what newspace referred to that were predominantly agreed upon. Most agreed that newspace referred to a change in the way space activities are conducted. There is also general agreement that moving from cost-plus to fixed-

price contracting is a key underlying principle to the newspace concept. Beyond that, definitions begin to vary more. There was a strong association with either start-ups or a start-up mentality, but what this meant in effect depended heavily on the interviewee. There were three clear definition categories that emerged that had irreconcilable differences with each other. These categories can be loosely identified as defining newspace as a type of company, as a type of activity, and as a macro-trend.

Table 4: Definitional Factors for NewSpace Offered by Interviewees

Newspace Definitions	
Interviewee Sector Role	Quoted Definition
Investor	I would say that it's, that group of startup companies, um, this completely new way of doing business with a silicon valley startup mentality that has never been possible before in the aerospace industry. Cutting costs, cutting time to product delivery, and really putting the way space is done down on its head. This includes the cubesat revolution and includes the launch revolution, it includes, you know, all of those companies that are helping build out that ecosystem, this new way of doing business in space.
Industry/Entrepreneur	I would say that it is not a who but a what that defines newspace. I would suggest that Boeing and ULA are trying to get in or trying to do newspace activities. I wouldn't say that no, they're too old and too big and they don't count. I'd say in particular it is people who are using modern off-the-shelf hardware to make cheap... products that utilize space and, you know, that might be disposable or semi-disposable or have a shorter lifespan; and who are applying this kind of silicon valley-ish start-up thought to it. I think those are all the necessary and sufficient conditions, but it's a heavy commercial focus. Did I say that already? Maybe that's the most important one. A commercial focus, which I guess sort of drives the other points versus traditional aerospace, which is intended to be or which puts cost to the side to focus on reliability and robustness and you know, these more sort of kind of traditional aerospace metrics.
Investor	Commercial, commercial could be the superset. I'd look at commercial to also include the old space or the bigger space companies, bigger budgets, longer timeframes, larger groups and then the new space I would be the more nimble organizations in that.
Investor	It took on a life of its own about a decade and a half ago and basically it was used just as a counter term for what they considered old space, which was essentially just NASA cost-plus government contracting.
Analyst	It's now kind of become appropriate more broadly for like just new stuff that's happening in space
Industry/Entrepreneur	I mean maybe what newspace is more than anything is a kind of a mentality and a philosophy of how we're going to solve the space economy problem that we've had for at least 30 years, maybe longer. And that's the mentality that we're subscribing to at the moment. And so we use that term.

Newspace Definitions	
Interviewee Sector Role	Quoted Definition
Trade Association Representative	I mean, you know, perhaps the distinction between new space and old space, is who the market is, right? Who your primary market is. Right? So if you want to do the new space and old space, right? Old space quote typically is pure government customer, right? Those that can afford significant national space programs, right? That are new space serves to in general identify a market that is nonmilitary, that's non government, that is um, that is much, much larger in its nature eventually.
Investor	They [prime contractor] saw a future in a capsule and did it on their own dime. And now they're finding customers for it. If that isn't new space-y I don't know what is.
Trade Association Representative	The other thing about the distinction between new space and old space. And again, I hate to use that term, but I'm going to, how many of your new space companies are publicly held companies? The answer is not many. And so your old space companies are almost universally publicly held companies. And with that comes a whole different range of how companies conduct themselves because they conduct themselves in a much more transparent way. They have shareholders that they are responsible to, they are responsible to the government under FCC regulations.
Industry/Entrepreneur	New space would be a term applied to a new company or a new idea or a concept or an innovative approach to the way things were done before, or offering capabilities that were never previously allowed to exist or come to fruition. Another aspect of it, which is, you know, more abstract is that new space is very much taking seriously becoming a multiplanetary species.
Investor	(What is Newspace:) I see it as the same as commercial space. I hear it all the same. Like I said, I hear no different meaning for space 2.0 or space 3.0 to new space versus old space, which was government when new space now is private and commercial. But yes, we do kind of run into those terminologies interchangeably.
Investor	Newspace is opening up the frontier and the opportunities for a start-up to come up with an idea and a business around it. ... So it's really educating the market in terms of, uh, both sides, entrepreneurs to say you can actually start a business in space and it's not going to take forever or costs with the size of a city, or also educating investors that you do have an opportunity to invest in these new space companies. And the investment is in line with other types of investments.
Government - Policy	So in [our government] when we use [newspace], we're tending to refer to the increased kind of commercial ownership of space programs. So old space being the big institutional players, new space being, you know, funky little startups doing mini constellation missions.
Commenter on The Space Review	Perhaps that dependence on NASA might be a better definition of new space versus old space. New space companies are contractors dependent on NASA for their survival and growth, old space companies by contrast have enough revenue streams beyond NASA they are not depend on NASA for their survival and growth. As a result the old space companies have the bargaining power to enter into contracts that are fairer to their shareholders when working with NASA. New space companies don't have this freedom. Comment by 'Realist' http://www.thespacereview.com/article/1476/1

The tension points identified by interviews related to the term newspace almost uniformly related to industry and investor perceptions and use of the term, rather than governmental or policy use (only a few interviews mentioned policy connotations of the terms). The most frequently referenced tension points related to three areas: 1) utility of the term as a marketing tool 2) investor impressions of the term and its connotations 3) tribalism and divisiveness related to the term.

Addressing the Communication Challenges

When discussing why individuals used words such as ‘commercial space’ or ‘newspace’ to describe a space enterprise, there were several collective underlying concepts of value that they wanted to understand/be understood. There were ten identifiable key points that needed to be communicated, and where the potential areas of confusion/miscommunication occurred. Below is a table that presents these concepts in detail. Beside each concept are lists of the potential variations of these concepts that can be applied to a given space enterprise. Finally, in the third column are descriptions of why these concepts are significant. There are hundreds of possible combinations of these conceptual factors that could technically describe a space company or activity. So it is no surprise that a handful of terms are inadequate for communicating these ideas with any certainty.

These concepts and their variations are used to categorize or make decisions around capturing and leveraging value of space enterprises. The description column contains what is being evaluated when making decisions. When individuals use terms such as newspace or commercial space they are attempting to categorize enterprises based on value. This chart presents the wide variety of value sub-categories than can possibly be combined. When using categorizing terminologies, assumptions are made on types of value that are included or not within the definition of that term. When these assumptions do not match between individuals, the tension points discussed in the previous section emerge. By recognizing and more clearly articulating the value concepts identified below, these assumption misalignments can be more easily bridged.

Presenting these factors serves two main purposes. The first being to present the various potential value factors that investors, policymakers, and industry professionals are trying to understand when looking at space enterprises. When communicating the value of a space enterprise, these are the factors that one should consider and find ways to communicate effectively in order for maximum clarity. The second purpose is to help illuminate why terms such as commercial space or newspace are not precise enough to avoid confusion when categorizing enterprises.

Table 5: Concepts for Describing Value

Concept	Variations	Descriptions
Customer Base	<p><u>Current:</u> Government Private Other</p> <p><u>Intended:</u> Government Private Other</p>	Customer base/source of revenue is significant for decision-making by all stakeholders. Whether a space enterprise has government or private customers helps determine potential influence toward GDP, ROI potential, and overall business strategy. In space in particular, recognizing that current and intended customer bases may vary in many cases is important. Other can refer to universities, research institutions, etc.

Concept	Variations	Descriptions
Funding Sources	Government Private Public	Primary sources of capital will have significant influences on the operations and incentives of a space enterprise. For example, government funding can be subject to additional regulations and public funding can require more transparency in business operations.
Ownership	Private Public State-Owned	Similar to sources of funding, the type of ownership an enterprise has can help investors, policymakers, and businesses determine how an enterprise might operate and what value potential it might have.
Cost Model	Cost-Plus Fixed-Price	Key element of defining newspace. Significantly different business models that investors and policymakers become increasingly concerned with. Developing capability vs developing market.
ROI Timelines	Short-term Mid-term Long-term None	Crucial for investment decisions, and perhaps the aspect that appeared to be the most frustratingly unclear to investors and entrepreneurs. Space enterprises can have immediate short-term potential value, they can have mid-term potential in relation to markets that are at or near being established, and they can have more longer-term potential in markets that do not yet exist and require significant leaps in development such as asteroid mining. Many enterprises also have no real ROI potential, as they are intended to develop capacity rather than generate revenue. These are clearly not desirable to investors, but may be more interesting to government space agencies.
Maturity	Concept Stage (Pre-Initial Funding) Development Stage At-Market (Ready to sell) Established (Generating Revenue)	Key part of investment evaluation. Different levels of development maturity are more interesting to different stakeholders. For example, Angel investors will be more interested in concept stage enterprises than venture capital investors will be. This should be established early in dialogues.
Geographic Potential	National International	Whether an enterprise has international market potential is important to policymakers that want to promote the growth of national GDP. It is also important to investors who do not want to invest in companies that are restricted by government regulations, which a national focus would suggest.
Market Spread (Industry)	Entirely Space Focused Diverse	Whether or not a company focuses entirely on space based activities, or if they also serve other industries, can have a significant influence on the desirability of an enterprise to investors and policymakers. In some cases a focus on space is preferable, and in others a diverse market spread can suggest a more secure business model.
Area of Application	Terrestrial (Earth)	For many investors, it is crucial that space enterprises have a clear terrestrial application. However, many entrepreneurs and space

Concept	Variations	Descriptions
	Extraterrestrial (Beyond Earth)	enthusiasts are trying to work toward establishing extraterrestrial market capabilities. This can lead to significant obstacles to overcome regarding funding, as extraterrestrial activities appear to be solely funded by government programs.
Enterprise Goals	Profit Space Exploration (Scientific) Space Exploration (Settlement) Terrestrial Societal Benefit	Key potential disconnect between entrepreneurs and investors. Investors typically only choose to invest in profit oriented enterprises. However, many space entrepreneurs express an overarching goal to encourage space exploration. Many government funded programs are also intended to develop exploration capabilities rather than profit potential.

Conclusion

The anecdotal information collected during this study revealed a number of communications challenges in the use of terminology to describe the global space enterprise. These challenges have little to do with the specific terms themselves but rather with the contextual significance of what is being communicated (or attempted to be communicated) in specific circumstances.

Even with relatively common and basic terms such as “commercial space” and “newspace” the complexity of different contextual uses and understandings is significant. These terms are intended to be used to increase clarity about the existence of value propositions in space. However, this analysis has demonstrated that these terms are used to convey different meanings by different users, resulting in some cases in tension points with implications across the space enterprise. In order to contribute to reducing these potential tensions this paper has described a set of underlying concepts that stakeholders are hoping to communicate when they use the terms newspace and commercial space. In order to communicate potential value more effectively it is important that stakeholders are cognizant of the potential differences in contextual meaning of the terms that they employ.

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