

A potential client has entered your office and seriously asked you “What it would take to fund and operate a profitable successful economic private settlement on the moon?”

Funding and operating a successful economic private settlement on the Moon will require an overarching community development strategy, followed by scientific / technological work, pioneering drive, and a resilient commercialization plan. Historically, this set of activities has not been carried out sequentially, but all the elements are necessary to achieve a profitable private settlement on the Moon. The Moon is no different than the Earth with respect to community development. Some may think that the Moon is an extension of Earth, so it will carry the legacy of Earth (or a particular nation-state’s community design). Or perhaps the thinking is that since humans will not likely live there, a community does not exist. I believe that the moment that humans make decisions through machines that impact the land mass of the Moon, a community is created. Why it exists, who is responsible, what are the critical principles that build the culture of that land mass, and how rule of law is enforced are all questions that must be addressed before a profitable, resilient, and stable economic settlement can occur. The following paragraphs are dedicated expanding this thought.

Settlements were built on Earth based on the need to belong to a collective where individuals’ values will be recognized (even if that recognition is as part of the collective), while enabling individuals to compete and succeed socially and economically. While there will be biases among groups within a community as a result of differing values or genetic mutation, all individuals residing within a selected land mass are part of an overarching community strategy.

An overarching community strategy is necessary before spending time and resources. To make this logic flow simple, the strategy is composed of two parts – why are we going there and who or what is the critical focus of the community? The first thinking point for community development is addressing the why? for settlement on the Moon. The why? may be for the value of the Moon’s natural resources, or may be associated with the need for humans to live a new way of life, or perhaps because the resources on Earth are not enough for the population currently residing on it. Regardless of what the reason is, it must be clear to all who are to take part in the endeavor. If there are multiple divergent plans for the same piece of property, then the possibility of conflict increases. Therefore, clarity is required if the landmass and contents of the Moon are to be divided. Answering the question of why? helps in addressing other key areas of the community development strategy.

The second question that has to be answered within the community or settlement strategy is who or what is the critical focus of the community? On Earth, while some of us may take it for granted, safety is the most critical item that the community addresses because without it, any other aspect of the community will be unstable. In the case of addressing the Moon, safety will be inherent in existence as like Earth, however, the approaches to establishing safety may supersede that of safety itself. The approaches to developing the safety in the community on the Moon is something not discussed, but should be addressed early to maintain stability. There are many ways to approach this, but for this essay, I offer three for consideration: human led, machine supporting; machine and human collaboration; and machine led, human supported. A human led, machine supporting environment to developing safety is an environment where humans do the decision making and the thinking necessary to ensure we achieve the mission requirements. Machines in this case are objects created for our use and when the task(s) are completed, they are discarded. One would say that if we were to go to the Moon today, this is the most likely and feasible approach we would use. In this case, the Moon as a community is an extension of the Earth and behaviors on Earth are simply replicated in

space through the use of machines. Meanwhile, a machine and human collaboration environment would consist of machine learning or artificial intelligence in support of humans. In this environment humans continue to do the preponderance of decision making, while the machines would focus on the thinking necessary for stability and success. Depending on the situation, machine learning may lead to machine decision making. As this type of environment develops, humans multi-task, have a partner in thinking and decision making as well as have foresight into situations that may be dangerous. Lastly, a machine led, human supported environment is one where machines are autonomous decision makers with minor limitations (such as acting against humans, or being destructive) and be there to support humanity. This environment lends itself to allow for machines to manage through unemotional and analytical analysis to provide the best solutions with limited biases. This environment is unlikely to occur anytime soon, however, this may be the most stable way to develop an economy that supports all of humanity. Machine learning / artificial intelligence, like human learning, can and may become biased over time, but we have an opportunity to provide corrections faster than we do humans today. Regardless of the approach, what is important to understand is that an overarching community strategy is necessary in order to determine the best approach to support those of the community.

The scientific and technological work required to sustain operations on the Moon is in its infancy today. Regardless of the overarching community strategy used, our technology is simply not enough to generate interest and demand for what the Moon has to offer. There are plenty of technology road maps being built by many large corporations, nonprofits and private individuals. The commonalities of these technology road maps and activities begin to link teams of like-minded individuals. Progress happens with like-minded individuals. While the technology is limited, there are still opportunities through technology to set the path for a profitable successful economic private settlement on the Moon. Consideration of lunar land mass mapping, ore sampling and remote excavation are some of the opportunities where our technology today can set the conditions for settlement.

Pioneering are the actions that connect those who are wishing to belong to a community to the land mass in which they are going to establish the community. For the pioneering to the Moon it is more than just a launch system and a rover. It is beyond the science of getting and establishing the settlement. Pioneering is the agreement(s) made between individuals, groups, or nation-states, to commit to getting to the Moon and establishing a settlement for a common goal. Some of the agreements are legally binding, but no pioneering action occurs without emotional interest. It is the endless possibilities available upon arriving to the Moon that will drive the private settlement to be established and thrive. Without an agreed and understood pioneering approach, the infrastructure, and effects on those on earth are negatively impacted. Ultimately, getting to the Moon becomes a dysfunctional exploration, where competition thrives and depending on the stakes and the risk, may lead to conflict and destructive behavior. All the technology can be in place to go to the Moon, but pioneering is the key to taking action to be in the settlement in a manner that the settlement and be sustained and resilient.

Commercializing the Moon begins on Earth. One can assume that it will take a long time for the Moon to be independent economically and technologically from Earth. As such, we can expect that the demand and requirement signal will come from those residing on Earth. Therefore, an effort needs to be clearly established to reach individuals, corporations or nation states that have stable economies today to determine if their demands or requirements can be better supported from the Moon. If that requirement is not consistent or coming from those who can afford it, then you will have an unstable economic settlement on the Moon. One can argue that an economic settlement could be built so that the Moon becomes a stop on the way to other

locations in the universe. Keep in mind that in order to have that in place then all the other steps I have presented need to be addressed for the location of interest.

While preparing my answers, like many others, I looked at other great ideas that approach the answer to this question:

<http://www.space.com/21588-how-moon-base-lunar-colony-works-infographic.html>
<http://www.airspacemag.com/daily-planet/mining-the-moon-fueling-the-future-180948757/>
[http://www.ulalaunch.com/uploads/docs/Published_Papers/Commercial_Space/CisLunar_Mark
etplace_Master_Final.pdf](http://www.ulalaunch.com/uploads/docs/Published_Papers/Commercial_Space/CisLunar_Mark
etplace_Master_Final.pdf)

Where my mind often drifted to is to asking where the details of the community. Why is it there? Is it for the benefit of all humanity, specific nation-states, private wealth? What and Who is the decision maker in each of these communities? What are the pioneering actions that will set great science up for success?

This essay does not provide specific answers, but ask for you to a “call to action” to provide an answer to this question in a manner that drives the dialogue – building the community.