

ASEAN-in-Practice Podcast Episode 13 Transcript

Denis: Good morning and welcome to the ASEAN in Practice podcast show. My name is Denis Hew, Senior Research Fellow at the Centre of Asia and Globalisation, Lee Kuan Yew School of Public Policy, National University of Singapore. In today's episode, we turn our focus to the rapidly emerging space economy and the opportunities it presents for Southeast Asia.

With the rise of innovation and the increasing democratisation of space, the sector is shifting from being largely state led to one driven by commercial new space actors. This transformation is opening up a wide range of new and largely untapped opportunities for countries in the region. Singapore, in particular, is positioning itself as a regional hub for space technology, industry development, and regulatory innovation.

In this episode, we explore both the opportunities and the challenges that lie ahead and consider how Singapore and the region can collaborate more closely with its partners in shaping the region's future in the space economy.

To help us unpack the strategic priorities and challenges ahead, we are delighted to have with us, Lynette Tan. Lynette is a leading figure in Asia's space ecosystem and the CEO of Space Faculty where she leads initiatives in satellite development, space science research, and talent development for the growing space economy. Drawing on experience spanning government, industry, and deep tech, she has been instrumental in shaping Singapore's space sector. She has served in various senior global leadership roles in space organisations including the Board Member of Japanese-listed company Synspec, advisor to space-inspired startup MyelinZ, Industry Advisory Board Member at the Embry-Riddle Aeronautical University. She also sits on the board of non-profit organisations including the Science, Technology, Engineering, and Mathematics (STEM) Foundation. Lynette was also named a trailblazer on the inaugural Singapore 100 Women in Tech list and is a Karman fellow recognising her contributions to the global space community. Lynette, welcome to the show. Let me start by first asking you what exactly is this emerging new sector called the space economy?

Lynette: Well, first of all, thank you for having me here, Denis. It is a real pleasure to be on this podcast and to speak to your audience, particularly about something I am very passionate and excited about. The space economy is fundamentally a knowledge economy.

Most of the economy or the commercial and key activities lie in the hardware where we build satellites, not just launch vehicles or what we commonly refer to as rockets, that is just potentially up to 5 to 6% of the space economy or the space industry. Most of that is in the hardware and in the downstream application. And even at the downstream application, very simply, space can do a few things. It can help you navigate. You see that in your Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) systems. It can help you communicate. So, in the past, in my generation, we watched satellite TV. Football or *Sing! China*. These are satellite, space-enabled. They allow us to communicate, pass, and receive information. And then lastly, it is Earth observation. We use it to look through various sensors to look at Earth or to look outside into space. So that downstream application forms the bulk of the space economy. And these downstream applications are enabled by the hardware, which is a critical part. So, one thing to take away is while we always think about astronauts and we think about rockets, they do form a less than 20% or sometimes even less

than 15 to 10% of the space economy. The Space economy is about allowing us to be efficient and effective today on Earth.

Denis: Right. So, it is more than just about rockets and astronauts. And your company focuses on the human capital part of the space economy. Could you maybe elaborate a little bit about that?

Lynette: Yes. So, well, I think it is also because of our position in Singapore. And this is a Singapore-based organisation. We realised that, you know, the downside of space being too hyped up is sometimes people have a very romantic or, you know, unrealistic view of space. Education is important in order to realise the true potential of what the space industry and the space technologies can do, not just in downstream applications today, but what does it mean for Southeast Asia? What does it mean for small countries such as Singapore tomorrow in the next 10 years, 20 years, 30 years? So how we approach space is many times looking at some of the more sensational publicity and headlines: SpaceX, deep space asteroid mission and there are also a lot of references to pop culture and movies.

However, do this knowledge and concepts apply in Southeast Asia? Is it a matter of looking at what US and now today, China and India are doing and then scaling it down to a Southeast Asian profile or to what Singapore can do? I do not think it is a linear transformation. I think we need to fully understand what space technologies offer, what the mindset is required in space, what are the inherent characteristics and value proposition we have in Singapore and in Southeast Asia, and then very intelligently architect the future so that we cannot just be a part, but potentially an active driver in the space industry today and tomorrow.

Denis: You mentioned India, we talked earlier and how they were able to launch satellites at a lower cost. I think they sort of leverage on their skilled labour, much cheaper skilled labour than say developed countries, right? Like the US. Are there some lessons there, particularly for developing members in Southeast Asia?

Lynette: Yes, so, you know, India has been working very quietly in the space sector. The last few major satellites that Singapore has built, they were launched in India. And until very recently, their Polar Satellite Launch Vehicle (PSLV) launch vehicle rocket had one of the highest success rates. And it is largely state driven. So, while we talk about the commercial opportunities in space, the Indian Space Research Organisation (ISRO), effectively the space agency, directs, leads, and funds many of these missions. They were also able to send satellites and probes onto Mars, similar to what the US did but at one-ninth the price.

So India has very, very high intellectual technical capabilities, and are able to leverage the scale of talent and cost competitiveness to carve their niche into space. In recent years, India is also now encouraging commercialisation of space technologies and to encourage the setting up of private entities. And many of these private organisations would have talent that used to work in the ISRO in India.

And this is how they are pushing the innovation. And they have a tremendous advantage, not just in skill, in ambition, in intellectual capability, technical capability, and in cost effectiveness. But they also are English-speaking, which for now, you know, that is still the dominant language in the space sector, which allows them to communicate transact very, very effectively with the key players in the global ecosystem.

Denis: Right, it seems like there is a surge as well in these new space actors, particularly driven by the private sector. What has driven that kind of shift? I mean, I do not know when it happened. Is it over the last 10 years or so? It started in the US, I believe, but maybe you can just explain to us how that shifts.

Lynette: Well, there are a few key drivers.

Maybe even we could go back to 20 years ago, you know, Sir Martin Sweeting in the 1980s. He was able to demonstrate smaller satellites that are able to perform functions very effectively and that led to using commercially available technology products. And with [lower costs], it lowered the entry barrier, the price entry barrier into the space sector, allowing more talent, more investment, and more attention to be given into the space sector. While he was in Surrey, he also trained many Asian pioneers in the space sector, including those in Korea and in Singapore. So over 20 years, the use of commercially available products became more widespread and costs dropped. And with the developments in the semiconductor sector, which is a key supplier to the space spacecraft satellites component, that has also driven tremendous innovation into the space sector. So, prices came down.

And what Elon Musk in the US did was the starting of SpaceX, which then drove the price point down of launch vehicles. So, on one hand, the satellites price is coming down because of the novel use of commercially available products. And on the other hand, the ride to get into space, that price was also coming down—driven by innovation in launch vehicle driven by commercial entity, SpaceX.

And coming together, that brought a dramatic price decrease to a level of capability development that is still respectable and competent for the space sector. And I think that is why we are starting to see more commercial entities coming in. Government is starting to take note of the agility that the private sector offers. Agility in working with different types of talents, agility in seeking private funds, and agility in finding different ways, business models, to push innovation. After 20 years, we are talking about this space commercialisation, but it really did not start overnight. We had space pioneers in different parts of the world, who were experimenting, they were courageous enough to try new ways of doing things to lead to where we are today, where every child and every professional can envision a career in space.

Denis: Well, closer to home, I think Singapore has positioned itself as an emerging hub for the space sector in Asia. What role does it play? And how can it strengthen its role in the whole regional and global space ecosystem?

Lynette: You know, this is a question that really means a lot to me. What is this role that we can play as an individual, as a Singaporean, as a country? So first, let us zoom out a little bit. Southeast Asia, where Singapore sits, Southeast Asia is at a backyard of not one, not two, but four significant space players, with already established or are coming up with launch capabilities. And we know who they are, China, China has its own space station, Tiangong. While many countries needed to come together to create the International Space Station (ISS), China did it on its own. And certainly India, which has been launching satellites for many American and Singaporean and Asian organisations, as well as organisations from Japan, and South Korea.

How do we then look at this landscape, literally, and decide that these countries surrounding us, or in our neighborhood, they are determined to master the next frontier, they are determined to master space? So, in that case, I feel we cannot wait and see, and it is not a choice. Otherwise, we are not at the table, we are not in a position to influence. And we need to do so with potential urgency, and definitely with clarity. We cannot compete with Japan, or China, or India in size, or in spending.

But we can compete with wit and creativity. Southeast Asia is still a hotbed for innovation and talent; there is a very, very highly skilled workforce across Southeast Asia, we have many graduates in Thailand, in Indonesia, in the Philippines, in Singapore. And we also have a unique advantage of being in a very warm climate, where we do not get too many seasonal changes, and being near equatorial belt for most of us.

So besides intellectual capability, and then technical knowledge, which is something that Space Faculty does; in providing training and know-how, I think there is also something about an innovative mindset that we need in Southeast Asia, and in Singapore. So, we don't just copy and paste, or copy and scale down like how I explained, but we really have to think about what our unique advantages are, individually as a country, Singapore, Thailand, Malaysia, Indonesia, Philippines, and then collectively as a bloc, which then makes us more powerful.

So, this is an interesting time. I do feel we are forced into it simply because of how the chessboard has been laid out. But I think it is also an exciting time, because for now, we could look up into space, we could either see a strategic vulnerability, or we could see an opportunity.

Denis: I was watching some of these videos, and you talked about the Chinese space station, and apparently the video show, it is really very, it is almost like going to an Apple store. Everything is very clean, it is very organised, very high tech. And it helps to be a late starter, I guess, because you have got all these new technologies to use. And then you go to the ISS station, and there were wires everywhere, it is very messy, right? So anyway, there are very good points. And I guess one of the things that I was going to ask you is, it makes sense for the region to collaborate, particularly whether it is talent development or technical cooperation. But there are challenges, right? There are challenges for Southeast Asia, even Singapore. So maybe you could just maybe highlight a little bit about some of these challenges. We do have advantages too. I was told that being close to the equator, it is easier to launch, I believe. So geographically, we have some advantages. But in terms of human talent and other things, what do you see are the challenges that we face, or constraints, and how do we overcome them?

Lynette: Well, one of the things, many startups, venture capitalists, they can grow in a very large scale [manner], China and the US, it is because of still a relatively homogenous market - very large, singular bloc of market. Southeast Asia, in a way, resembles the EU in that you have many different markets, different languages, different cultures. But unlike the EU, it could be akin to what we have here in ASEAN. So, working together as a bloc allows us to collectively share resources towards an ambition. But at the end of the day, we are still discrete and independent countries. So, the challenge is the ability to really work together and to trust one another to work collaboratively. But of course, that opportunity is if we do it, we also bring a different flavour into the space sector. One of the opportunities I do see, particularly for Singapore, is again, you know, in today's world with the geopolitical tension,

Volatile, Uncertain, Complex, and Ambiguous (VUCA) is coming back, it's been chaotic, right, you come back to the one thing—people and trust. And as late Minister Lee Kuan Yew said, Singapore's only resource is people. And in today's world, you do not need people who are just skilled and disciplined and organised and technically capable. You do need people who can be trusted.

So having ethical discernment, having the ability to imagine and to create the future, the ability to weigh long-term consequences, to uphold integrity, right, to make principled, clear decisions in ambiguous situations, even if one is very small. These are going to be characteristics which will be very appealing to people who are trying to seek normalcy, and who are trying to be progressive and move productively, peacefully into the next century. And I think that is something, as Singapore, being with Asian values, something we can offer, and that is something we do provide. And that is something we should definitely think about.

Denis: So maybe one last question, looking ahead next 10, 20 years, what role do you hope Southeast Asia will play in the global space ecosystem? What would you consider a success story for the region in the near future?

Lynette: Well, I think, you know, if we have the narrative across Southeast Asia, where we develop our collaborative space mission, or coming up with business model or collaborative model that the world can learn, I think that would be a very valuable story to tell. And ultimately, in Singapore and in Southeast Asia, we remain relatively trusted as a bloc and as an individual country.

And I hope this is where many superpowers and many big countries can trust us with their most critical assets major projects, major investments, intellectual property, bringing their children to live in ASEAN to live in Malaysia, to live in Singapore. So, [I hope] the world can trust us with the future. And to entrust upon Southeast Asia some of their most critical and important assets. And many of that are actually intangible.

I think that is something very interesting to think about. We don't want to navel-gaze, look at where our limitations are, where the problem is, but I think in the space sector, we should allow ourselves and indulge a little into stargazing and look into the future and have the courage to build something that might not exist today, but we can imagine. And I think that would be a truly beautiful story for Singapore and for Southeast Asia.

Denis: Lynette, thank you so much for sharing your insights on the growing role of space in Southeast Asia. Today's conversation has highlighted both the opportunities and challenges for the region, from building a vibrant space economy and nurturing the next generation of talent to fostering collaboration within ASEAN and with its global partners. To our listeners, thank you for tuning in to this episode of ASEAN in Practice.

We look ad to bringing you more conversations with policy makers, scholars, and practitioners shaping Southeast Asia's regional future. Thank you and stay tuned.

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