The highs of Low Earth Orbit

DR SHARLENE THIAGARAJAH
TM Research & Development CEO

- Malaysia is already testing three emerging technologies to enhance coverage
- The sky is not the limit but the launchpad for a truly connected world

IN a world where dropped calls and dead zones have become the ultimate nemesis, the quest for seamless communication led researchers and engineers to a groundbreaking innovation — satellite Direct-To-Cell technology. This technology allows regular off-the shelf smartphones to receive telecommunication signals that are being transmitted by Low Earth Orbit (LEO) satellites without any additional expensive hardware.

Elon Musk brought this to light with his recent tweet — "This post was made from a normal mobile phone straight to a SpaceX satellite, with no special equipment in between." By using a simple device that was able to connect to a satellite floating around in space, Musk could tell us what he was thinking thousands of miles away.

In turn, I began thinking of how something of this sort could benefit Malaysia. Zero connectivity pain points, boost to economic and industrial growth, and connectivity to the most remote of places. And the best part is that this technology could help with conservation efforts to collect, monitor and track our forests and its wildlife.

Malaysia, in fact, is already testing three emerging technologies to enhance coverage. Minister of Communications Fahmi Fadzil said Direct-To-Cell service is one of them, as it allows us to establish communication channels without relying on standard transmission towers. Does this mean we will no longer need to move around, holding our phones in the air, shouting, "Can you hear me?"

Where is Malaysia today?

Let's consider the type of network we already have in place today, with 96% of broadband 4G coverage reported in 2022. Malaysia is said to be leading South-East Asia in terms of 5G network performance with its first rollout launched in December 2021.

Last year, the government announced it will shift from a Single Wholesale Network to a Dual Network Model. So as our citizens await the second unveiling of the 5G network, let's talk about why it is important particularly for LEO.

Connectivity means everything. LEO satellites orbit at altitudes of less than 2,000km above Earth's surface so they circle the planet many times a day, providing steady coverage for even the most rural parts of Malaysia.

Good news for the 3% of the population in areas currently off the grid with no need for expensive, specialised devices or terrestrial base stations. Welcome to the era where the sky is not the limit but the launchpad for a truly connected world!

Secondly, LEO can play a crucial role in monitoring assets and collecting data for various industries by providing real-time, imagery and data coverage. Imagine real-time tracking of ships where you can see the accurate location for safety purposes. Or imagery and data on crop health, soil conditions and moisture levels.

The oil and gas industry is a vital part of our economy. What if we used LEO to seamlessly monitor pipelines for leaks or corrosions? How much money, time and effort would be saved.

Not to mention the potential impact on the economy, especially in ecotourism. With the data and better communication, LEO can provide options for wildlife tracking, habitat monitoring and even pollution tracking! Probably a more important one is the conservation of protected forest and sea life. There are so many opportunities to turn this into an attraction for tourists and conservation enthusiasts.

Will there be a demand for it, or are we happy cruising the way we are right now? Other countries like the United States have taken a lead in deploying LEO satellites from companies like StarLink and OneWeb.

They are not the only ones. The Japan Aerospace Exploration Agency has developed the Super Low Altitude Test Satellite set to enhance earth observation capabilities.

Determined not to fall too far behind the US, China too, has launched multiple satellites into LEO, including the Tiangong space station meant for scientific research and telecommunications. Even India has demonstrated its first satellite-based gigabit internet service through Reliance Jio.

Roles to play

As a research company, TM R&D indeed has a role to play. By studying this innovative technology, we can come up with use cases that prove operational excellence using LEO.

Can we look into one of the most important things — the safety of people — during natural disasters?

What about smart cities? As Johor Baru moves quickly into becoming a smart city, we can study the different ways LEO can assist in traffic management, energy efficiency and urban planning.

I often say our data sovereignty must be protected. One of the things that we need to study and explore is the technology's data and digital sovereignty, reduce dependability on foreign infrastructure while supporting national frameworks. If we gear up to discover what else LEO can do for our nation, research and findings must be held dear and used only for the benefit of the people.

In reality, it is still early days. Malaysia has time to find its footing in making use of this new technology. Why, or should we even embrace LEO? By investigating and investing in this technology now, Malaysia can position itself at the forefront of a transformative era, ensuring that its economy, society, and environment reap the benefits of advancements.

I would like to think embracing LEO satellites means Malaysia can reach for the stars — not just the ones in the sky, but towards bringing basic connectivity to all corners of Malaysia, spurring economic progress and digital inclusiveness!