

Executive Summary

Optimisation of production processes is the most prioritised issue in industrial factories. Such optimisation is quite feasible because it is easy to acquire all data on environment and boundary conditions that affect production. However, it is a challenge to extend optimisation beyond the factory processes, such as product delivery to consumers and retailers. This is because factories do not have enough information to predict product orders, latency, and incidents during delivery processes from factories to retailers. This causes a lot of uncertainties in optimising the entire production process. For example, more products must be stocked to cope with unexpected fluctuations in product orders, latency, and transportation incidents from factories to retailers. Longer lead time may be needed for product delivery. Larger stocks and longer lead time will inevitably increase cost and cause inefficiency.

Thus, constructing large-scale production systems by connecting a variety of facilities and stakeholders such as factories, deliveries, and retailers is always difficult due to uncertainties arising from the connections of many systems, and may result in the degradation of production efficiency.

Space and geospatial technology (SGT) had been developed as intelligence technology. Space infrastructure, such as satellite observation, positioning and tracking, and communications, helps in enabling more effective decision making by reducing uncertainties and risks through continuous monitoring and visualisation of contextual information on the real world such as people mobility and activity, vehicle traffic, weather, oceanographic condition, and disasters.

The potentials of space infrastructure are rapidly growing along with the successes of small-scale and low-cost satellites. In addition, data infrastructure for big data and artificial intelligent technologies enables rapid integration and analysis of real world dynamics with diverse data resources from satellite observation and positioning and tracking. SGT can also support decision makers to swiftly monitor and accurately predict the situation and changes of people and companies. SGT therefore enables safer and less risky decision-making and activities by providing the dynamic contextual information surrounding industries and people's lives.

In case of heavy rain disasters, rapid areal monitoring of flooded roads and traffic jams helps reduce service latency by changing transport types and routes. Once the

uncertainty in delivery is reduced, shorter production time and smaller stocks could be more easily achieved. Moreover, SGT helps record disaster responses as digital data. Such data makes it possible for artificial intelligence-based analysis to improve responses to future disasters.

SGT-based integration supports the development of large-scale production-delivery systems by integrating many enterprises over various industrial fields, thus reducing uncertainties caused by external factors. As a result, more products and services can be created and delivered in more efficient means.

In the Association of Southeast Asian Nations (ASEAN) region, where many and diverse organisations, enterprises, and people function over a large geographic area, it is very important to achieve ‘unbundling’. ‘Unbundling’ refers to a situation where many diverse communities and companies recognise their own unique roles and connect with each other in the region to produce unique and diverse products and services more efficiently and effectively. SGT should be a critical infrastructure of information sharing for the ‘unbundling’ of ASEAN.

On the other hand, ASEAN must prioritise people’s safety and quality of life. SGT also contributes to improving resilience in the ASEAN region, which is one of the most populated and disaster-prone areas in the world, by providing information for dissemination and navigation against disaster risks.

To proceed with SGT-based integration in ASEAN, the region needs to promote public-private partnership (PPP) on space infrastructure development and support the development of ground infrastructure. Another important factor is establishing data policies that facilitate transborder data transfer and wise use under proper management mechanisms. This report provides recommendations on strategies and frameworks on ASEAN’s data policy and space infrastructure development.