

Digitalisation and Industry 4.0 Transformation for Logistics and Transport: Perspectives on Resilience, Innovation, and Sustainability

Tan Tai Kiat, CMILT

*Chief Operating Officer (COO), SingHealth Community Hospitals; COO,
Environmental Sustainability, SingHealth, Singapore*

PhD Candidate in Gerontology, Singapore University of Social Sciences

COVID-19 has forced changes in the world on how we do things. Digitalisation is another force changing industry at the same time, coupled with demographic changes. What happens when COVID-19 meets digitalisation and demography forces, and the impact on industry?

Ageing population is a global trend, and this causes labour shortage where digitalisation is deemed as an inevitable solution. Through automating processes and new technologies, scarce resources like labour can move up the value chain, a win-win move by equipping labour force with new skillsets. Indeed, COVID-19 has presented the opportunity to imagine possibilities in digitalisation and industry 4.0 transformation. I like to share three perspectives relating to resilience, innovation, and sustainability from my healthcare logistics and transport operations experiences.

Firstly, supply chain has been featured prominently in COVID-19, specifically supply chain resiliency. Fail-safe designs in value-streams mapping network of networks for redundancy enable new opportunities like alternative sources in new markets. As a result, this creates new digital information flow, as well as logistical and transport coordination demanding a more integrated yet agile approach. In military terms, this can be aptly expressed as the first, second and even third line of defence when the primary supply chain is disrupted but still safe to fail with secondary and tertiary supply chains overlapping resiliently.

Secondly, I have always imagined an innovative modularised automated logistics 'transformer robot' in hospital operations transporting goods and services, where we

can use technology to do more with less. COVID-19 has changed the work environment to one that requires safe distancing and work-from-home elements in place to minimise human-to-human transmission. Digitalisation becomes a real option now for work to continue; and really, the time is now to bring this imagination to reality. Picture a typical robotic vehicle chassis, commonly known as automated guided vehicle or autonomous mobile robot in hospital operations, which can be coupled with a modularised body for food trolley, linen basket, portering compartment, or even security equipment for patrol, depending on its need at that time. There are efficiency and productivity gains with this multi-purpose robot transporter innovation, and such digitalisation is scalable from hospital operations and relevant to industry.

Lastly, digitalisation should not be-all and end-all. Environmental sustainability is a crucial piece in this equation to lead digitalisation and industry 4.0 transformation. It is not a zero-sum game between digitalisation and environmental sustainability. In fact, one can imagine how we can combine digitalisation in logistics and transport, with environmental sustainability. One can even dream of the day we see solar panels on our fleet, feeding back renewable energy to power digitalisation. And one can draw a circular economy engineering supply chain with resilient just-in-time load, optimising logistics and transport requirement, and maximising environmental sustainability.

This is the move to sustain our global health and environment, through thoughtful digitalisation and industry 4.0 transformation in logistics and transport.