

Beyond COVID-19: Future of Mobility for Goods

Deeshraf Elias, Podcast host, Deloitte Mobility Ecosystem Manager

Kenneth Lim, Chief Technology Officer, Maritime Port Authority, Singapore

Dawn Lim, Vice President and Head of Commercial and Professional Services, Economic Development Board, Singapore

Deeshraf Elias: Like with many other industries, the maritime industry is also going through digital transformation. Emerging technologies can help maritime organisations capture greater efficiency in operations, especially in the context of modern-day problems, such as increasing demand, or even the COVID-19 pandemic.

Digitalisation could be the key to future business success. However, how are ports evolving to adapt to these emerging technologies? And what is the blueprint to success for goods mobility in these volatile times? Today, we discuss the future of goods mobility, and the huge role technology will play.

Hi everyone! Welcome to another edition of our Future of Mobility series, bringing you the top voices from the sector - decision-makers, innovators and shapers pushing the envelope on future ideas for transportation and beyond. I'm your host Deeshraf and today we're joined by Kenneth Lim, Chief Technology Officer of the Maritime and Port Authority of Singapore, and Dawn Lim, Vice President and Head of Commercial and Professional Services at the Singapore Economic Development Board. Kenneth and Dawn, thank you for joining us today!

Dawn Lim: Thanks Deeshraf for having us.

Kenneth Lim: Thank you.



**MAKING AN
IMPACT THAT
MATTERS**
since 1845

Deeshraf Elias: Now, Dawn, I want to start off with you. For our overseas listeners who might not be too familiar, can you tell us more about EDB and its vision for Singapore as well as your role in it?

Dawn Lim: Sure, thanks Deeshraf for that introduction. So, very quickly, the EDB or the Singapore Economic Development Board, we're actually a government agency responsible for driving Singapore's economic growth. And we work hand-in-hand with the private sectors, with the regulators, universities, think tanks, and the broader ecosystem to develop strategies, (and) enhance Singapore's status as a key hub for global business innovation, as well as the place for talents to situate themselves and to grow. And our mission, really is to create that long-term sustainable economic growth for the country with vibrant business opportunities and good job opportunities for the people in Singapore and the people (who) choose to be in Singapore.

And how we work with companies is, a few ways, one, we try to be that one-stop shop, that interface, to navigate different parts of the Singapore ecosystem, (for example) if you're a business interested to establish yourself in Singapore (or) across a few key industries that Singapore believes we have the global advantage in. We also work with our partners to develop the strategies for the company's growth and transformation, whether it's in the region, whether it's globally, whether it's in specific functions or business activities and expertise.

Deeshraf Elias: And Kenneth, as the driving force behind Singapore's port and maritime development, and in your capacity as the CTO of MPA, how has the maritime industry evolved?



And can you share expansion plans going into the next decade?

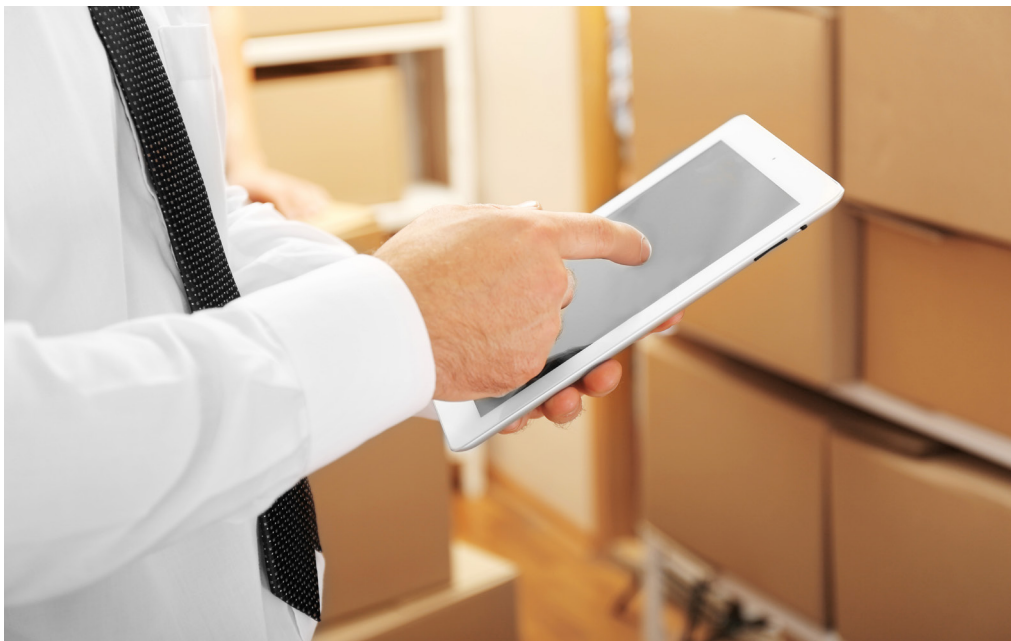
Kenneth Lim: Thank you. Let me start off by saying that, well, Singapore's port is located at the crossroad of the East-West trade route. And therefore, Singapore is a maritime gateway to the region and a key node in the global supply chain. As a global hub port and a major transshipment hub, we are connected to more than 600 ports in over 120 countries. You can imagine that mass connectivity there. We are also a leading international maritime centre, which is home to over 140 of the world's top international shipping groups, so you can see the richness of our maritime centre. For seven consecutive years, Singapore maintains our position as the most important shipping hub in the Asia Pacific region, ranking first with our advantage of geographical location, and also a strong shipping industry ecosystem (with) supportive government policies. And I think, this is really accomplished through three factors —

trust, transformation, and talents. Trust - well with good data reputation that we (have) build over time, we keep remaking ourselves and we keep transforming ourselves, so that gains the trust of our shipping colleagues who come to Singapore to establish or transact through Singapore. Transformation - while we constantly push for digital transformation in the industry to attain high productivity, improvement in process, optimisation (and) automation, our workforce can now take on higher-skilled jobs. In fact, talents, the third piece, is an important one because we continuously have this pipeline of future and ready talents to push (the) industry forward and we'd continue to build on that. So, in Singapore, you may know in 2018, we launched our Sea Transport Industry Transformation Map, ITM, in short. There is really a blueprint to chart the maritime of Singapore into the next phase of development; because you're asking me about what is the development plan, so this ITM, the chart, is the roadmap where we use, where we will work with

the industry stakeholders to drive innovation, productivity, and equip our maritime workforce with the necessary skills to take on a higher value job in the future. In particular, digitalisation plays an important role in this transformation journey. In June this year, you may know that we launched the Maritime Digitalisation Playbook. This is jointly developed with the Infocomm Media Development Authority of Singapore, IMDA, (and) our Singapore Shipping Association, SSA, to support our maritime companies, who are based in Singapore, (to) accelerate their digitalisation plans. How do we do it? We provide them with a practical toolkit to formulate their digitalisation roadmap, guide the execution of their digital plan and enable them to benefit from the maritime digital platform. So today, you know, some of the opportunities in digitalisation for port sectors include like AGVs, autonomous prime movers, automated cranes, and in shipping sectors, like 3D printing for ship parts and data analytics. So lastly, I may say that moving forward, we need to continue to invest in our capabilities, both as a hub port and IMC so that these complementary twin engines of growth will future-proof Singapore.

Deeshraf Elias: And Kenneth, circling back to the point that you mentioned earlier, we understand that in terms of future planning, MPA intends to consolidate all container ports into one "smart" mega port at Tuas from 2021 onwards. Can you elaborate more about the vision and the benefits of this "smart port" at Tuas?

Kenneth Lim: Well really, the first thing, the first point I want to make is that this development of the next generation Tuas port is actually a reflection of (the) Government's long-term commitment to growing Singapore's maritime



sector. Currently, our container terminals are located at the fringes of the city centre, and the plan was announced in 2012, to move and consolidate the container port operations in Tuas, which is the western end of Singapore. The vision is really to build a smart next generation port that increases productivity, optimise the land use, improve safety and security, and enhance sustainability. So, this consolidation of container port activities at Tuas will help us to achieve greater economies of scale and reduce inter-terminal haulage of containers. Because of the consolidation, you see, this helps container liners and cargo owners to save time and reduce operating costs. Now, when fully completed by 2040s, Tuas port will become the world's largest container terminal at a single location, capable of handling up to 65 million TEUs of cargo containers annually. Tuas port will also be

at the heart of a larger ecosystem, comprising complementary industries such as logistics and advanced manufacturing. This will enable Singapore to be more than just a container port, but the global port serving both shippers and shipping companies. Now, to complement this effort, is the move towards (a) more seamless and stronger port-to-ship interface, at the port of Singapore. In fact, the maritime industry is reaping these benefits of digital platforms such as the e-transaction portal, we call it the digitalPORT@SG. Today, more than 600 shipping companies submit, track and receive port clearance approvals for arrival and departure through the portal, saving the industry an estimated of 100,000 manhours per year. Now beyond the digitalPORT@SG, MPA goes further and advocates for digitalOCEANS, because a digital enabled shipping platform that works in

Singapore, or just a few countries is insufficient. That's why the global supply chain thrives on the global connectivity and there needs to be a global collaboration on digitalisation for the benefits to be multiplied. So, this vision is to link the different maritime single-window and maritime transport platforms of the world, through the use of API or what we call the application programming interface (to) open our common data standards. (This is) so that shipping companies do not need to submit hard copies or repeat data entries for port clearance, as well as other regulatory digital services at a global level. And in fact, we have just signed a MOU recently, with five other port authorities and trade platform providers. Now, to support the realisation of Tuas port ecosystem, there needs to be also innovation activities. So, to do that, we have three Centres of Excellence set up by MPA, SMI, and various universities in the area of maritime, (including) energy and sustainable development in NTU, Centre for Next Generation Ports in NUS and Centre of Excellence in Maritime Safety at the Singapore Polytechnic. These centres of research will help to position our Tuas port in a much more efficient way.

Deeshraf Elias: That's great, Kenneth. Now, I wanted to pick on the point where you mentioned about digitalisation and innovations. So, what are some of these technologies that MPA has been leveraging on and are looking to introduce, could you share some examples?

Kenneth Lim: Definitely. Now, MPA works closely with the industry to examine how innovative technology can be adopted for future use, so maybe, let me cite some examples. One, is blockchain technology. For instance, we are working with other Government agencies, (such as) IMDA, (the) Singapore Customs and

(from) the industry, the Singapore Shipping Association, to trial the digitalisation of the bill of lading or the electronic bill of lading and the development of interoperable standards. These bills currently need to be physically transferred and processed so MPA has also explored the use of blockchain for specific certificates required by multiple parties in the ship registration process. Second area, maybe, is about 5G trials that are (conducted) around our maritime drone estate. Now, M1 and Airbus, (who are) supported by IMDA and MPA, will also be conducting the flight trials within the Singapore maritime drone estate, located at the Marina South Pier for about a year from June 2020. While we can still use the 4G or LTE network, drones are already part of MPA's port operation, (used) for surveillance, incident response and management. A 5G network will enable real time, higher speed connectivity, and it will enhance the potential of drone operations for a wider range of applications, such as the vessel hull inspection, legal discharge, for instance, detection, search and rescue situation awareness, or shore-to-ship delivery. Now, these use of technologies and autonomous systems including drones (can) improve productivity and safety of our human operators as well as the environment. So, some of these are examples for you.

Deeshraf Elias: Thanks a lot, Kenneth. That's very insightful. And I wanted to ask Dawn, now, based on what Kenneth has discussed, it seems that a hallmark on the future of goods mobility is increasing connectivity, integration and automation amongst others. So, as the agency that's responsible for the long-term strategies that enhance Singapore's position as a global centre for business and innovation, I wanted to hear from you, how has EDB been supporting

these initiatives and can you share with our listeners some examples?

Dawn Lim: Sure, thanks Deeshraf. So, you know, the EDB is involved in quite a few different master plans as part of our industry developments for Singapore. And in particular for goods mobility, I think we're looking at two parts of the bigger picture. One is the mobility master plan and the other one is the logistics transformation map, and both of them come together to enhance our urban logistics networks and our connectivity networks, particularly for goods mobility. And our challenge is to achieve the highest possible public shared and active transport mode share without increasing land take and manpower. And specifically, for goods, it's obviously to move freight in the most resource efficient manner. There are a couple of things then, that fit very well with what we're trying to do with the broader logistics industry as well. In the areas of "smart" logistics, we're looking at autonomy, intelligence, electrification, and even sharing. And Kenneth talked about drones earlier, right, and even in the case of parcel deliveries in Singapore, we are working with different partners in One North district to trial drones for last mile parcel deliveries. And these (initiatives) will fundamentally change the way we allocate resources, the way our workforce is organised, to be more efficient (and) more productive. We're also working very closely with different mobility players who innovate and (are) investing in different R&D (for) mobility solutions. So, for example, just last year, Bolloré opened its innovation centre, B.Lab, in Singapore, and this B.Lab, the intent is to co-innovate with Bolloré customers and partners on various mobility solutions, which includes robotics, digital and sustainability. And the lab will also partner with

some of the local universities to develop young talents in the field of urban logistics solutions. So, all in (all), you know, we are working across the board in the different fields in (the) ecosystem, with companies directly, on how to be more efficient, more integrative and more connected in goods mobility. And (we are) also designing sandboxes with different partners so that we can push the boundaries of what goods mobility will look like in Singapore, in time to come.

Deeshraf Elias: Thanks, Dawn. And I wanted to pick on that point that you mentioned about working with mobility players and the ecosystem itself. So how should the private and the public sector collaborate to accelerate digitalisation and connectivity in goods mobility? And if I may expand on that question, who should take the lead- the public or the private sector?

Dawn Lim: Yeah, that's a multimillion-dollar question, Deeshraf. And I think COVID-19 actually has brought (digitalisation) to the fore, it's a strong reminder that everybody has a shared responsibility on the digitalisation journey. The private sector has their role to play and the public sector has (their) role to play. It's no longer just good to have for everyone, and in our view, I think the private sector has the advantage of taking the lead on the technology front. And, you know, I mentioned earlier on some of the drone technologies, for example, but also for example, in areas like, sensor networks, or R&D in different mobility areas, (we have) companies like Continental, Grab, SWAT, these are all mobility players in various ways. They are investing in R&D and the technology push, a big part of it needs to come from the private sector because they're invested, day in and day out. On the public sector front though, our role is to step in to convene different



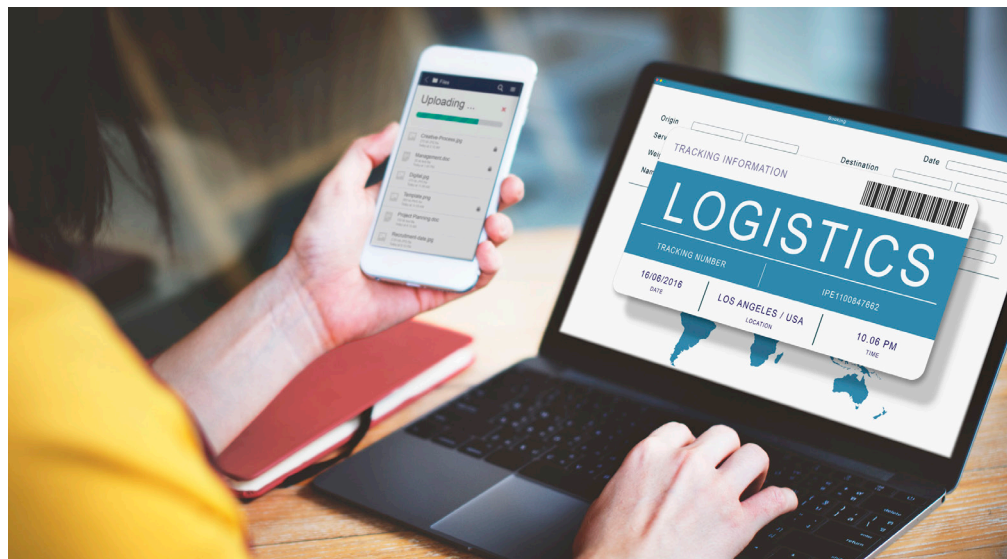
stakeholders around a problem statement, where the individual players may not have found commonality or come together on their own. We also have the ability to design sandboxes for pilots and prototypes, and in fact, even share some of the initial risks if necessary, where the positive externalities are high. And so, being an innovation friendly place and opening public spaces for innovation test beds, is actually a very important role for the public sector to play, in driving the acceleration of digitalisation. And added to that are very positive, forward-looking regulatory frameworks that will complement some of this digitalisation that we're trying to push. (That) will be important as well, because there's no point in putting out drones, if the regulatory frameworks don't allow the safe usage and the safe deployment of drones, for example. I would add one more thing in that, I thought about (the) journey (between) working with the private sector and the companies on (driving) digitalisation. We found that, while many companies acknowledged the need for

digitalisation, I think many are not sure where to begin, right? And this actually spans (across) the full gamut, from small-medium sized enterprise all the way to the big companies. And one of the initiatives that we rolled out about two years ago was the Smart Industry Readiness Index, or commonly known as SIRI, but not the Apple Siri, this is the Singapore SIRI. It's (a) self-diagnostic tool that comes with a prioritisation matrix and we've got different business partners as part of this partnership (and) this consortium, to work with the companies on where you might be on that digitalisation journey vis-à-vis everybody else in your industry, right? And, what might you then prioritise next, to start investing, and how then would (you) use that as a benchmark (for) your journey forward? And (with) that, has given a platform, a base for which different companies can then now have a conversation about how do they get on this digitalisation journey.

Deeshraf Elias: Fantastic. On that note, the discussion that we've been having, you know, the

adoption of new technologies and digitalisation, we know that it brings along its own set of risks. So, Dawn, if I can expand from what you've just mentioned, how then should the ecosystem players deal with the issue of cyber risks and cyber security?

Dawn Lim: Actually, on this particular point, Kenneth and I will have a common interest. Because obviously, one of the biggest cyber threats in the shipping industry, it was not too long ago, (and that really) hit the headlines. And it really, you know, opened up the vulnerabilities of having an interconnected world. And for us, cybersecurity has to move away from something (known as) just a preventative measure, to being a key enabler, core strategic investment and core strategy for the business going forward. It's not just a peripheral consideration, not just a good to have anymore. And I think our frame is that we are all going to be hit by security risk hacks (or) attacks in some form or other, on a daily basis. The question is, how prepared are we to handle (these cyber security attacks) when it happens? And I wanted to share a really good example from DHL, where they (have) established their global cybersecurity Center of Excellence in Singapore and it's the first of its kind for the firm globally. And through this Center of Excellence, they are developing very critical security capabilities, which you would not have thought previously, that air express, a freight forwarder or logistics player would have invested in, but (this also) includes vulnerability management, advanced threat protection (and) cyber threat intelligence. There's an analytics platform that looks at (and) uses machine learning and AI to analyse security threats, and they've even appointed a Chief Information Security Officer to oversee this set of security growth strategy. And I think this is a very good



example of how cybersecurity has now become core, central to the company's business strategy in order to be successful (and) in order to grow.

Deeshraf Elias: Alright, and Kenneth what about you? What are your thoughts on this? How should the ecosystem players deal with the issue of cyber risks and cybersecurity?

Kenneth Lim: Yes, and I totally agree with Dawn that these cybersecurity capabilities need to be built as part of the whole organisation, down to every single one bearing responsibility. In fact, we acknowledge that, while digitalisation is key for maritime sector to stay ahead, to kind of overcome technological disruptions and ultimately thrive, but with such digital connectivity, threats to cybersecurity will (surface), as we (have) said, (it is) not a matter of what if but when right? But maybe, (from) how MPA adopts, we adopt a two-prong approach in managing cybersecurity risks. One, is of course, early detection, monitoring and analysis.

And second one is, of course, quick respond to ensure prompt recovery of services. So, as Dawn mentioned, we set up a 24/7 dedicated maritime cybersecurity ops center, to counter potential cyber-attacks on maritime critical information infrastructure. And MPA also builds key data linkages between this center and our Port Operation Control Center, in order to respond to cyber incidents in a more timely and holistic manner. So, I think it is important that cybersecurity is treated with great importance and focus in the whole organisation.

Deeshraf Elias: All right, and Kenneth, I wanted to expand on that. Today we see many organisations from various industries adopting cutting edge technologies and so, what should leaders from maritime organisations prioritise in order to ensure a seamless integration of technologies into the industry?

Kenneth Lim: Yes, and I have to agree with Dawn again. She cited this theory, and I think

that is a very important one, because for one, an understanding of an organisation, (its) digital maturity, would be very important. It's almost like you know, before you take on a health fitness program, you know you have to go through yourself and do a health check to know where you are, how healthy and what kind of muscles you're going to grow or what kind of weight you're going to lose. So, this is important, this is also where maritime, we also did what we call the Digitalisation Acceleration Index, together with IMDA, which is sector wide, to allow our sectors, maritime companies to kind of benchmark their (digital) maturity level. And then (beyond) that maturity level, the Maritime Digitalisation Playbook comes into play. Because knowing where you are heading and where you are now (with digital maturity), it helps the companies to understand the landscape and provide (organisations with) examples of technology use cases, and the potential impacts. (With this), the company leaders can now choose, (on whether) to prioritise the limited resources on customer engagements, (or) is it more important to look at the operation excellence, (or even) to look at the safety or data analytics aspects? So, there are different dimensions in which a company's leader needs to look at, but importantly, (it) is to have that conversation be conducted at the senior management level or even at the board level, to chart out a roadmap for the company so that this becomes a plan, in which they can execute and they know that they are having the end in mind. Another resource that we have is the Sea Transport Industry Digital Plan, and this, as Dawn mentioned, is, you know, organisations, whether small, medium or large, you need to be able to be ready for this digitalisation. The Sea Transport IDP is really provided (for) the SMEs, agencies, harbor crowd, and soon-to-be bunkering. We will (provide a) step-by-step guide

on the digital solutions they can adopt, so, these are more off the shelf (digitalisation solutions) that (they) can quickly adopt, and at each stage of their growth. They can also tap on, of course, some funding support from the government to offset some of the adoption costs, so, I think these are some of the ways in which a company can now focus. Especially during this COVID time, due to the resource constraints and budget constraints, it is important to have a roadmap and focus on the right areas to excel.

Deeshraf Elias: Thanks Kenneth, and it's very timely that you brought up the topic of COVID-19, because I wanted to move the conversation towards that right now. And I wanted to really understand from the both of you, how has the COVID-19 situation affected the implementation of new innovations and digitalisation initiatives? Dawn, maybe we'll start off with you. How has your agency been working with logistics players, for example, in addressing this?

Dawn Lim: And actually, what we've seen is that COVID-19 has accelerated investments in the plans, innovation, and digitalisation. And where the EDB has worked (on), with the rest of the industry at large to keep things going during COVID-19, (are) a couple of things. So, one, is in ensuring that there's continued trade flow, right, so when the world shut down, actually, earlier part of the year, there's a huge part of Singapore's air cargo capacity that's actually reliant on passenger belly hold and obviously, when the flight networks all shut down, it had a huge impact on our cargo flow, but that was not going to keep us back. And we ensured that through Singapore Airlines, through other players like FedEx, DHL and UPS, (we) secure direct air links in Singapore and 60 other cities

globally for cargo (services). And so this makes sure that, actually, all the stuff that we've ordered on e-commerce continues to be able to arrive. But (at) that point, we're looking at critical medical supplies, (such as) PPE (and) masks, things that were critical for the frontline, and that was important, that logistics flow and trade links continue operating. We've also worked with Singapore Airlines, obviously, (since) it is our national carrier, to maintain a minimum air connectivity, to ensure critical passenger flight routes are maintained. And now you're seeing that, starting to recover in some manner slowly. And when the borders were first closed earlier in the year, right, we worked very closely with the third-party logistics players to help ensure that the workers that they needed, the employees that they needed, that were crossing the border, for example, with Malaysia, (they) were still able to come in to work. And (we) work with the different agencies to ensure the uninterrupted flow of cargo vehicles, right across the border, because there are a lot of trades that come between Singapore (and) Malaysia, on our bridges, and a lot of it is, is obviously food supplies (and) daily supplies, but also a lot of the exports coming from our manufacturing facilities also come through those bridges. So, it was important for us to ensure that, that connectivity and what was being effected on the ground was still smooth flowing, as far as we could.

Deeshraf Elias: And Kenneth, what about you? How has your agency been working in ensuring goods continue to flow to and from Singapore?

Kenneth Lim: Yeah, they're like Dawn mentioned, right, COVID really kind of disrupted the whole supply chain. So, in a few layers, is how we kind of approach this issue. First, we made the port of Singapore remain open, you



know, amidst the COVID outbreak, because it's a global hub port and (as) the leading international maritime center, we must ensure that our cargo operations and the provision of essential maritime services continue. So, in fact, the sea cargo sector has remained relatively resilient during this time. This includes, really a whole range of maritime services like bunkering, shipbroking, ship management (and) legal advisory, they were not disrupted. So, I think that was the first step that we (took) to ensure the safety and the resilience of the port. Secondly, we forge partnerships with other like-minded ports, who are committed to keep their ports open to seaborne trade, to facilitate the flow of essential supplies to people around the world, that is very important. So, we kind of share the practices, what we do and in fact, we have a joint declaration with 50 other port

authorities. Then the third area that we work on is new booking models, because these are important to be adopted in maritime due to the safe distancing measures, right. So, for instance, this includes like remote ship inspections and surveys. Instead of people going on board the ship to inspect, now, (we) do it remotely. We (also) do telehealth solutions for our seafarers, so, instead of arranging doctors to go on board, (the) clinic assessment can be done via real-time videos and using endpoint devices. These are just examples in which new working models need to be adapted. But moving forward, I think we foresee greater digitalisation and automation in the area of maritime operations, (to build) resiliency. These are examples in which we need to use greater digitalisation to overcome and be ready for future disruptions.

Deeshraf Elias: Thanks Kenneth and building on the points that you just mentioned, besides the setbacks and hardships caused by COVID-19, just as both of you mentioned, a crisis can also become a catalyst for change. So, I wanted to ask the both of you and perhaps we will start with you first, Dawn, do you have any final advice for organisations and leaders in goods mobility, seeking to emerge stronger after the pandemic?

Dawn Lim: As we'd like to say, don't waste a good crisis, right, and I feel like that's sort of been tended around quite a bit and we still stand by that. Think maybe three areas that you know, (we) highly encourage companies in goods mobility to continue to invest in, even as we get through this current pandemic, the first one is to embrace digitalisation. And you know, Deeshraf, we spent quite a bit of today's podcast talking about digitisation in various forms, and COVID-19, really has fast tracked the criticality and the importance of being digitally enabled from the baseline all the way to the top. And with remote working here to stay in some



shape or form at least, there is that importance of making sure that the systems, the processes (and) the handovers between different players in the system is smooth. And the benefits of these digital net walls are very clear; I think we can all see the future. So, it's really about making sure that nobody gets left behind, as part of this. The second piece (of advice) is around innovation. And you know, in Singapore, we talk a lot about innovation, right. And again, you know, in a post COVID-19 world, there will be a lot of new ways, new modus operandi, it's not the same world that we left behind at the start of 2020. And whether it's about strengthening your supply chain resilience in preparation of future crisis, developing new solutions, changing business models, and in some cases, even just baseline transformation (to) be more competitive. I mean, now is the time to do it, now is the time to push the envelope in order not to be displaced. And at the broader government (level), we really encourage companies to push the boundaries

on innovation, because that's the only way that a knowledge driven economy like Singapore will continue to be competitive (and) continue to stay relevant, and (to) link those two points, (it) is about focusing on training and capability development, right, it is important to continue to invest in people. Yes, automation will come, yes, digitalisation will make us more effective and productive in many layers of the work we do. But at the end of the day, you always still need good people (and) good talent, right. And it is important then, to invest in that capability training today, particularly in the growth areas that we spoke about in cyber security, in big data analysis, AI (and) machine learning, because all these will contribute to seeing more sophisticated supply chain management, more sophisticated, integrated mobility solutions and without investing in those skill sets now, companies are actually risking being left behind when they come out of this pandemic.

Deeshraf Elias: Thanks, Dawn. I definitely agree with all of the points that you mentioned. Kenneth, what about you? Do you have any final advice for organisations and leaders looking to emerge stronger after the pandemic?

Kenneth Lim: Well, I think I agree also with Dawn's points, that was all very relevant and useful. Maybe I'll just add one point, which is the culture. Leaders need to now start to look at COVID situation as an opportunity to maybe, change the culture, you know, within a company, in (terms of) looking at innovation and digitalisation. You know, in the past, maybe many organisations, (they) think that well, (without) digitalisation, business is as usual. You know, (their) partners are still working, doing business without this kind of like (digitalisation), (and so they) put on hold some of the digitalisation plans. But I think the culture now, (it) needs to be more adaptable and (they need to) embrace these innovations. Maybe the people on the ground, for safety and for better operations, they have wonderful ideas and leaders needs to hear these ideas, about how the operations may be changed. As Dawn mentioned, the new business model, (where) they work with their partners, their suppliers (and) their customers, that actually requires a lot of leadership change as well.

Deeshraf Elias: And now I want to wrap up the discussion, I've been having such a great conversation and great insights from the both of you. Now Dawn, I wanted to ask you something a bit more personal here. What are you most excited about when it comes to the possibilities that may arise from digitalisation of the goods mobility in the near future?

Dawn Lim: You know, I thought quite hard about this, right. And, you know, it's really about the crystal ball (of) the future. And I was just thinking, can you imagine a Singapore where we never see a driver at a vehicle, ever again, especially for cargoes, for example, or even a Singapore where you never see goods vehicles on the road again. And that, fundamentally shifts all the planning parameters that we have for Singapore's urban mobility, (and) also our entire city planning networks. And, you know, we are actually thinking about an underground, inter-estate goods mover system, but think about all the integration that needs to happen, both from the physical infrastructures, (and) also on the systems and software infrastructures. How do we plan how the goods will move underground, right? And on top of that, we're already looking at autonomous vehicles in transportation. There are investments (pumped) into the autonomous vehicles, for cargoes, obviously, because the weight load is much higher (and) there needs to be a lot more technology advancements that need to happen, and to be able to do that at scale. But that, to me is the way to go forward, given the demographic profile of Singapore, given the resource constraints of Singapore.

These innovations, and if we're able to do it at scale, it will fundamentally change the way Singapore operates, it will change the way that Singapore is perceived, and how we can bring that to the rest of the world.

Deeshraf Elias: Kenneth, moving to you as well, what are you most excited about for the future of the maritime industry?

Kenneth Lim: Well, I would say that, I would think that I'm excited about the opportunities for our future generation of maritime colleagues. Because, I would say that as Dawn mentioned, you know, many of these technologies are also happening in the maritime, whether it is autonomous vessels, for better safety, you know, (for) crews on board, or IoT. The shipping, and the maritime industry are evolving in such a way that they are now more automated (and) more safe, so, it kind of opens up the opportunities for new talents, for newer generation of colleagues coming into the maritime. And with that, with new ideas and innovations, they can really come into the maritime, integrate maritime into the supply chain, making it even (more) seamless, making supply chain more green and



sustainable, because the whole decarbonisation effort is actually a very big agenda in the maritime, besides digitalisation. So, I'm just excited to see, maybe new faces, (and) more talents in the maritime.

Deeshraf Elias: Well, that's all the time we have for this episode. I want to thank both Kenneth and Dawn for their interesting perspectives on the future of goods mobility and how technology

will play a paramount role. In the meantime, if you want to comment on this podcast or the topics covered, you can send us an email at seapodcast@deloitte.com. That's spelt S-E-A podcast @ deloitte.com. Also, don't forget to subscribe to our podcast to get the latest episodes – we are available on Apple Podcast, Google Podcast, Spotify, Soundcloud and Stitcher. I am Deeshraf and until next time.

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities (collectively, the "Deloitte organization"). DTTL (also referred to as "Deloitte Global") and each of its member firms and related entities are legally separate and independent entities, which cannot obligate or bind each other in respect of third parties. DTTL and each DTTL member firm and related entity is liable only for its own acts and omissions, and not those of each other. DTTL does not provide services to clients. Please see www.deloitte.com/about to learn more.

Deloitte Asia Pacific Limited is a company limited by guarantee and a member firm of DTTL. Members of Deloitte Asia Pacific Limited and their related entities, each of which are separate and independent legal entities, provide services from more than 100 cities across the region, including Auckland, Bangkok, Beijing, Hanoi, Hong Kong, Jakarta, Kuala Lumpur, Manila, Melbourne, Osaka, Seoul, Shanghai, Singapore, Sydney, Taipei and Tokyo.

This communication contains general information only, and none of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms or their related entities (collectively, the "Deloitte organization") is, by means of this communication, rendering professional advice or services. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser.

No representations, warranties or undertakings (express or implied) are given as to the accuracy or completeness of the information in this communication, and none of DTTL, its member firms, related entities, employees or agents shall be liable or responsible for any loss or damage whatsoever arising directly or indirectly in connection with any person relying on this communication. DTTL and each of its member firms, and their related entities, are legally separate and independent entities.