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EDITOR'S Note

Vihanga Weerasinghe
Chief Editor
Logistics Times
2021

Greetings!

Welcome to the 6th Edition of Logistics Times. I am deeply honored and gratified to make the Editor's note of yet another successful unveiling of Logistics Times. The content of the magazine is inclusive of interviews featuring distinguished personalities in the field of Logistics and scholarly articles of Lecturers, Postgraduates, and Undergraduates. This year's magazine is centered around the inquisitive and timely theme of 'Smart Supply Chain Management'. Thus, the articles of this publication shed light on compelling concerns of digitization and digitalization, along with its impact on port operations, 3PL services, ocean freight, air freight, and other auxiliary services. Logistics Times 2021 is a humble effort to venture through the global concept of Supply Chain 4.0 by also contextualizing it at a local level.

This year's magazine was compiled amidst numerous challenges imparted by the current pandemic situation. However, the entire Editorial Team accepted this challenge as an opportunity for improvement and strived to make the magazine a gleaming success. The journey we embarked on throughout, was a massive learning platform with many memories to cherish as well.

I make this a great opportunity to convey my heartfelt gratitude to the corporate partners for their unparalleled contribution to the magazine by sharing their immense knowledge, expertise, and experience, despite their tight schedules. I would also express my deepest gratitude to the Vice-Chancellor of General Sir John Kotelawala Defence University, Deputy Vice-Chancellors, Dean – Faculty of Management, Social Sciences and Humanities, Head of Department of Management and Finance, Dr. Kalpana Ambepitiya, Mr. AHS Sharic, Ms. Upeksha Walisundara and all the other lecturers of the Faculty of Management, Social Sciences, and Humanities for constantly guiding us, nurturing us and strengthening us to make this effort a tremendous success. I also wish to express my sincere gratification to our designer for making the magazine creative and vibrant, the Co-Editor, Anuki Fernandez, for being a strong pillar of strength throughout, the Photographers for their valuable and immense contribution, the Editorial Committee for being the backbone of this entire effort, the Executive Committee of the Technical Sciences and Management Society for being the supportive force throughout this journey, all the senior colleagues for valuable pieces of advice, support, and direction, all the authors, all the members of the Technical Sciences and Management Society, all the Undergraduates of the Department of Management and Finance, and everyone who was behind this journey to make Logistics Times 2021 a striking success.

General Sir John Kotelawala Defence University

General Sir John Kotelawala Defence University is one of the most reputed universities in Sri Lanka which produces well-educated graduates to the country while serving the motto of 'For the Motherland Forever'. Today, KDU has a unique recognition as the only defence university in the country which produces an eclectic blend of officer cadets, officers as well as civil undergraduates to serve the country.

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To be a university nationally and internationally known for its unique ability to engage both undergraduate and graduate students in distinctive and interdisciplinary defence related higher education that best serves the tri-services, the state sector and society at large.

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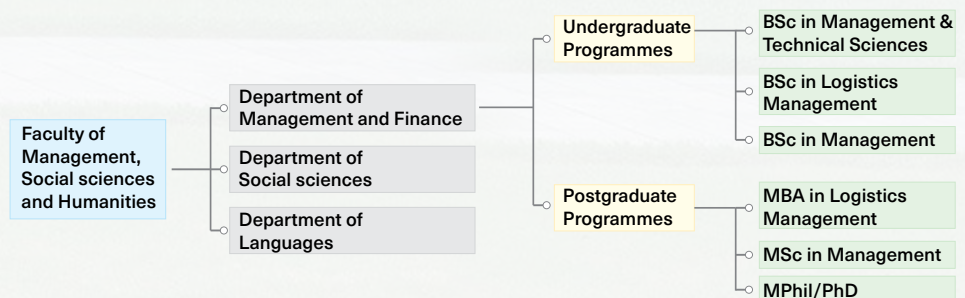
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▶ BSc in Logistics Management (3 years)

This course is designed to groom young day-scholars and officer cadets to be a strong candidate in the job market equipped with comprehensive and integrated knowledge related to Logistics Management. Logistics is a preliminary pillar of every organization, hence this course pave the way to multiple opportunities to the students. This course is open for the students of Physical Science, Biological Science, Technology and Commerce streams at GCE A/L and also for those who have completed London A/L.

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Industrial placement, where a student undertakes six months' period of training with an organization during the final semester, place an important role in preparing the students for a professional career. From the hands-on training, the students learn about the skills sets required, demand of the industry and work ethics. At the same time, it gives the student an opportunity to put into practice what he or she has learnt at university.

Course Assessments
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- Students who perform well will be entitled to enter the VC's list and Dean's list.

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CADETSHIP
- A citizen of Sri Lanka

- Between 18 – 22 years of age.

- Eligible to apply for university admission

- Satisfying the minimum physical standards

DAY SCHOLARS
- Being between 17-24 years of age.

- Having a credit pass or above for English language in GCE (O/L) or London O/Ls

- Having minimum of 3 simple passes (s) at the GCE (A/L) examination and being qualified for university admission, or possessing an equivalent qualification in London A/L (Cambridge or Edexcel) or any other foreign examination.

> "The most important thing is to make the technology inclusive - make the world change"
>
> -Jack Ma-

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Smart technologies are an integral part of the port value chains

Mr. Datta Gunasekara

Chief Specialist - Engineering, Hambantota International Port Group

Who is Datta Gunasekara and how was your career journey so far?

I'm the Engineering Specialist at Hambantota International Port and my career journey started at Sri Lanka Ports Authority. After graduation, I joined SLPA as an Engineer and in a career spanning three and a half decades, I came up the ladder, whilst gaining experience in the port industry and exposure to maritime trade. My career journey is a mixture of challenges as well as opportunities.

Hambantota port is a fast-gaining hub port in this region and is positioned to serve the East–West routes, what are the services extended by HIPG to its vast customer base?

Transshipment of automobiles, dry and liquid bulk handling are the key service areas so far. In the last year, the HIP handled a small volume of container cargo also. As a transshipment hub, the port provides a hub and spoke connectivity between regional ports and those in southeast Asia, the Middle

Interviewed by:
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Vinura Goonasekara

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Photographed by:
Apoorwa Nanayakkara

Port also managed to secure a strategic partnership with SINOPEC Fuel Oil Company for operation and management of the tank farm and through this partnership restored the fuel-oil handling and storage facilities.

East, Africa, and Europe. Port also handles a significant volume of cement raw materials for local industry, LPG for domestic and transshipment. Marine repairs are yet another service at the HIP and a number of local service providers have already based repair facilities in Hambantota. Among key projects at hand are operations in the Main Container Berth and the procurement program for equipment, IT and civil work is now underway.

In terms of vessel calls Hambantota ranks second among all local ports. In total volumes; Port crossed the 1-million-ton mark in 2019 and further improved the annual volume, despite a setback with the pandemic, seen in many other ports.

What are the plans adopted by the port to upgrade its infrastructure facilities along with Value Added Services and how does it strategically position Hambantota International Port in the field of logistics?

As I said before container operations in the main berth are the largest infrastructure upgrade in progress now. Port also managed to secure a strategic partnership with SINOPEC Fuel Oil Company for operation and management of the tank farm and through

this partnership restored the fuel-oil handling and storage facilities. Port also introduced a range of safe operating procedures, in line with international best practices for tank farm and oil jetty operations. With these physical improvements and management systems, the facility has earned a certification of a world-leading classification society.

On the utility front, HIP managed to complete a Primary Substation, a new bulk water connection, a Customs inspection facility for import vehicles. A private investor has undertaken construction of a belt conveyor system for cement raw materials and there will shortly be two Ship Unloaders also in operation.

Could you give us a brief overview of the newly launched marine Bunkering operations? How significant is this new initiative to HIPG and Sri Lanka in general?

Close proximity to main shipping lanes, ability to accommodate deep-draft vessels, storage facilities are key advantages HIP has. Marine fuel and LPG facilities are operational now and HIP. LNG is also gaining volumes in international markets and there

are some prospects for the HIP to develop new facilities and HIP can be an Energy Hub in maritime trade as well as local industry. This potential is further enhanced with the engagement of SINOPEC Co. to operate the storage facility. SINOPEC is one of the largest oil and gas producers in China and brings with it, market intelligence, experience, and expertise to run the business. Local bunker suppliers benefit from this tie-up and are able to supply large volumes at a competitive price.

On 19th November 2020: The Hambantota International Port Group (HIPG), signed a landmark agreement with China's premier tire manufacturing conglomerate, Shandong Haohua Tire Co., Ltd, to set up its South Asian Manufacturing plant. How will this contribute towards the overall development of logistics and supply chain operations in our country?

Shandong Haohua Tire Company is one of the world's leading rubber tyre manufacturers with reputed OEM brands in its portfolio. It has a large manufacturing base in Shanghai, PRC, manufactures both PCR and TBR radial tyres, and exports tyres to Europe, the Americas, ME, and the Asia Pacific. This industry is very vital for the HIP to generate domestic cargo volumes viz. raw material imports and product exports. It is equally vital for Southern Province and Sri Lanka at large for the accruing benefits. This industry is perhaps the single largest foreign investment (US $ 300 million) in the manufacturing sector in recent years. Our country will benefit from foreign investment, employment generation as well with foreign exchange earnings in exports. The tyres are manufactured to conform to a range of well-known, product certification and quality management systems, including DOT-USA, European ECE, and COP. So there will be added benefits with technology and skills transfer, with modern technology used in the manufacturing process.

Annual maintenance cost which is quite significant and business opportunity is equally significant for local service providers, viz. spare parts supply, transport services, raw material value addition as well as commercial/ financial services.

What is your opinion on the applicability of technological advancements in port operations?

Among all technologies, digital systems are well known for fast their obso-le-scence. Some manu-facturers are reluctant to provide long term warran-ties and customer support for their products, as the tech-nology advances fast and products become obsolete equally fast.

Ports are the land interface in maritime trade, which has grown rapidly in the last few decades. With increased competition in the trade, the liner shipping industry has evolved into mega-size vessels sailing on tight schedules and fixed window port calls. In this backdrop, Ports have the challenge to provide fast and efficient services at competitive rates. Over the years, cargo handling machinery has increased in key parameters viz. outreach, operating speeds, and improved in many operational features. Port information systems, operating systems too have evolved to support these challenging circumstances and contribute efficient operational activities and information sharing. None of these improvements are possible without advanced technology, applications of IT, AI. Over the years, manufacturers have been able to vastly improve the quality and reliability of a diverse range of components used in machinery and systems. As a result, technological advancement is a key driver in improved port performance.

Give us a brief description regarding "Smart Ports". How would smart technologies benefit HIP, to enable the digitalization of Port Services?

Smart technologies have many appli-cations in all aspects of the port industry ranging from port design, construction, operation, and management. GPS technologies are used for the precise location of accropods in breakwater construction and dynamic mooring systems (vessels). Unlike the practice some years ago ships, tug boats, and port crafts are equipped with digital sensors, various types of transducers, and are an integral part of propulsion and engine control. With growing concerns of air pollution associated with maritime transport, these controls are essential for optimum fuel usage and emission management. Port operations need well-coordinated action from cargo unloading, tracking, inventory management so on and so forth. With the diversity of cargo e.g. hazardous cargo, different origins and destinations, high cube and over-gauge containers, etc. terminals need a versatile database and controls to accurately link them to correct destinations and it needs versatile IT-based solutions. Apart from high-performance servers, port terminals need devices for data transfer e.g. HHT, VMT, AP, data switches, etc. On cargo clearing and business and finance, ports need to be integrated with other systems like Customs ASYCUDA, bank payment gateways at the top end while at operation level services e.g. shippers, clearing agents, truck drivers gate controls connect with apps enabled with smartphones. So, in totem smart technologies are an integral part of the port value chains.

What kind of 'smart port technology plans must be followed to a larger strategy that gives a clear view about where the value lies for all stakeholders?

There are no such criteria to select which smart port application best suits the transaction at hand. Nevertheless, the appropriate smart port applications should

be chosen to meet overall performance parameters which reflect cost and efficiency. Value for stakeholders is in factors like time to take your cargo to the port, cross-border clearance, port services, etc. Affordability and simplicity (user-friendly) also matter. There is a global initiative to benchmark the entire value chain on these criteria – i.e. "Ease of Doing Business".

As the fragmented parts of the port ecosystem become increasingly digitized, what kind of risks should be considered when it comes to compatibility and embracing future changes?

Among all technologies, digital systems are well known for fast their obsolescence. Some manufacturers are reluctant to provide long-term warranties and customer support for their products, as the technology advances fast and products become obsolete equally fast. I have seen a number of occasions where manufactures insist the customers upgrade their IT systems on the grounds customer support would lapse in a short time span. There are instances when end users had no alternative than to purchase and keep in stock a whole stock of spare parts, in such instances.

When you purchase large machinery or a craft, the manufacturer is often not the sub-system manufacturer. As an example, when you procure a crane, you buy it from the manufacturer who assembles the structure whilst subsystems like motors, controls are supplied by specialist sub-system manufacturers. To safeguard yourself, you have to act very carefully and ensure sub-system licenses, warranties, and long-term customer support through legally binding agreements.

Hambantota International Port is located in a strategically prominent destination, which makes it a hub of maritime logistics operations. How would you use advanced technologies to exploit the true potential of its natural location?

The strategic location of Hambantota has a variety of features. On the maritime front, it comes from a short deviation from major shipping routes and close proximity to countries in the Indian Subcontinent. You always notice all types of cargo vessels ranging from containers, oil tankers, bulk carriers, Ro-Ro vessels on these routes. Besides, our ports are centrally located in between maritime chokepoints in global supply chains viz. The Strait of Malacca, Gulf of Hormuz, Suez, and Cape and thereby are ideal transit points. Inland, Hambantota has an expressway connection at the doorstep. Coastal shipping will expand and a railway connection too will be extended to Hambantota in near future.

Furthermore, the expressway corridor can be used for gas pipelines between Colombo and Hambantota.

In this scenario, there are many avenues for the HIP to facilitate maritime logistics. Apart from port infrastructure to match even the latest classes of vessels, cargo storages, facilities like heavy lifting appliances, tug boats, bunker services. Besides, HIP hosts Maritime Center facilities for shipping agencies, logistics service providers as well as state agencies directly connected with the trade. Port Master Plan, we have allocated areas for marine services, value addition industries also.

The HIP has also provided space for some technically innovative solutions for the transport of dry-bulk cargo between the port and industries. The conveyor belt has the capacity to handle 2.4 million TPA and saves a minimum of 600 truck movements per day. Operated by electric power the saving of diesel emission emissions viz. CO, PM, and NOX are significant.

"Port Congestion" is a significant concern of any port in operation. How does HIP come into action to resolve this issue and what are your recommendations to address this through the adoption of smart technologies?

As you have correctly perceived smart technologies provide an effective platform to address the key challenging issues faced by hub ports. As you know, close proximity and short deviation from main shipping lines is not the sole criteria for Shipping Liners to select the ports they call at especially in transshipment trade. A host of other factors like costs, time, connectivity, operational efficiency, congestion or availability of berths, logistics facilities, navigational and safety records have a profound impact on the choice of hub ports among Liners. On the other hand, some terminals have consistently over-performed their capacity with efficiency generated from smart technology applications. In addition, throughput in Jaye Container Terminal of Colombo Port vastly improved with the introduction of a versatile Terminal Management System about a decade ago. Apart from the efficiency it generates, smart technologies provide fool-proof and tamper-proof operational processes. SLPA revenue from ground handling increased with the introduction of automated cargo clearance platforms, some time ago. HIP also has introduced a range of smart technology applications and has supported alleviating port congestion in a big way.

With more and more businesses migrating to novel digitalized applications and technologies, there is a looming risk of cyber-attacks. What are the security measures taken by the HIP to ignore these kinds of lags and risks?

Port IT systems have a wide and varied client base. Internally, it connects functional departments, operational functions, management, and administration. Externally it is interfaced with customs, service providers, banks, and sometimes even regulatory bodies. Effective cybersecurity measures are needed for data protection and protection against various other threats. The basic principle of cybersecurity is to different stakeholders concerning service area, network segregation, and password management. Whilst firewall protection is one measure, the development of cyber-security culture imparting awareness of threats and reporting systems helps in a big way to address it.

What is the impact of government policies on implementing smart technologies in port operations?

Let me highlight a few important policy areas and legislation put in place recently. Hambantota is one of the four multi-dimensional commercial cities and international centers for development identified in the National Policy Statement. In Hambantota periphery; Galle, Ratnapura, and Badulla are identified as national cities, while Matara and Buttala are connecting commercial cities, in the policy. Besides Colombo, Hambantota is the only center having an international port, airport, and expressway connection. It is the best-connected city to the hinterland. The policy statement also identifies the importance of rail connection extension to Hambantota. In terms of legislation the Hub Regulations: Hambantota Port is a free port for a range of port and port-related business activities e.g. logistic services – bonded warehouse and MCC operations, entrepot trade, off-shore business, etc.

Coming onto the specific question; Government Policy on smart technology as a business enabler, the Electronic Transactions Act 2006 and 2017 amendments have created the framework for electronic funds transfer. The services cover the private sector as well as the government sector. Thanks to these policies and legislation investors are keen to set up business ventures in

Hambantota Port and BOI has processed several approvals already. Having seen all these positive aspects, let me highlight closer cooperation and engagement between the public and private sector is vital to fulfilling the objectives of these steps.

What do you see as the cons of adopting technological advancements in Port operations, and what steps could be taken to mitigate such adverse effects?

Although there is a natural resistance to change over to technology tools, I haven't seen any disadvantages. However, some technologies take time to develop into reliable products and services. As an example, when AC inverter-driven crane drives came to market first, they had many inherent weaknesses. Otherwise, ac drives were more energy-efficient, adaptable, and fast responsive than conventional drives. It took at least a decade or more for tested and proven drives to come into the market. Early buyers were burdened with frequent breakdowns and high repair costs. Sometimes, there is a natural fear among cadres that certain midstream jobs would become redundant with increased applications of technology. The best way to manage this situation is capacity building with training and engage them productively in new systems.

How important is the knowledge on smart technologies to the young undergraduates who are about to enter the field of logistics? Could you give your insights on that, as the concluding remarks?

In my count at least five of your questions featured smart technologies and technological advancements in a few more. So, my assessment is that undergraduates are very keen on technological advancements. It is a good and encouraging sign, but I do have to stress that technology is not complementary to experience and exposure. With education and knowledge, you can easily grasp the operational framework, principles, and logic in the seaport and logistics chain. Technology has given user-friendly tools which help you to take routine decisions quickly. Technology advancement has also addressed gender imbalance in maritime trade to some extent and today more and more females find work-scope in port operations; which otherwise was a male-dominated industry. However, the industry's real issues are very difficult to model in an academic or training program. You have to experience it first-hand to gain competence. █

SMART PORTS

More than 80% of freight is transported using the sea transportation method. Hence, seaports can be known as one of the most significant logistics hubs for each territory. Ports are another global mechanism that is currently undergoing innovative and dynamic transformations, which is the main motive behind the creation of "Smart Ports". The Smart Port concept call for the use of technologies to transform the different public services at ports into interactive systems. Its purpose is to meet the needs of port users with a greater level of efficiency, transparency, and value.

FUN FACT
The global smart ports market is projected to reach 5.3 billion USD by 2024 and the Asia Pacific region is projected to be the largest market for smart ports by 2024. Countries such as China, Singapore, Japan, and Hong Kong are among the major countries that are considered as the main hubs requiring smart features in their port operations.

This concept revolves around two preliminary ideas that are as innovative as required in the new global and social context: efficiency and the use of resources. Moreover, there are additional benefits such as institutional transformation, increased commercial return, and digital transformation, etc. Certain experts believe that the ports which has adopted this technology shall be the only ones that will be able to survive in the future, due to being the only ones that can meet the ecological necessity and high-productivity demands while retaining certain sustained costs.

GLOBAL LOGISTICS SUPPLY CHAIN must continue adopting new methods

Mr. Shamal Perera

Director Operations – MSC Lanka
Regional Operations Manager - MSC Geneva

Who is Shamal Perera? Give us a brief overview of your career journey so far.

I am currently working as the Director Operations and Regional Operations Manager for MSC Geneva, which is the largest shipping line in the world, and the largest operator in Port of Colombo, in the Sri Lankan context. I have completed my Master of Business Administration (MBA) from the Cardiff Metropolitan University in the United

Kingdom and have been managing MSC Global business in Sri Lanka for the last 15 years. At present, I am holding the post of Chairman for Sri Lanka Association of Vessel Operators (SLAVO), representing foreign ship owners in Sri Lanka, giving leadership to many industry issues, and working towards the interest of the Shipping Principals. I have approximately 31 years (over three decades) of experience in the Shipping and Logistics

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Dinendra Kasthuriarachchi

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Dinendra Kasthuriarachchi
Aravindi Fernando

Photographed by:
Dilakshi Nanayakkara

industry and have been engaging in the local sphere and overseas. The international working experience in shipping has enabled me to be stationed at the head office of many internationally reputed shipping companies in various countries. I also have 25 years of experience in leading shipping companies in Sri Lanka (CMA CGM and MSC).

Presently, I am engaged in overall shipping activities; managing the MSC operation efficiently in this challenging environment by taking prompt decisions in all issues related to ships and operations at Port of Colombo and handling the single largest shipping operation through-put 2.4 million TEUs (boxes) per annum with over 20 MSC owned Ships per week, approximately just over 1000 MSC ships per annum calling in the Port of Colombo. As Director Operations, it has been a privilege for MSC Lanka Operations and Logistics team to win the "Best Shipping Line" award for three conservative years (the Year 2017, 2018, and 2019), by successfully managing significant volumes at Port of Colombo (35%) and breaking many historical records at the Port of Colombo namely, single largest operator who crossed the 2.0 million milestones in the Port of Colombo. Largest ship handled at PoC, highest moves handled per ship at PoC. We are the largest Line for handling ships at JCT (Government Terminal), the Largest Line handling the world's largest ships and fleet at CICT (Colombo International Container Terminal), and the largest operator at CICT. Moreover, we received the record of handling the highest local export volume out of Sri Lanka as the largest Shipping Line in terms of acquiring foreign currency being brought to Port of Colombo which is also ranked as the biggest contributor to the Sri Lanka economy.

On a personal achievement, I was awarded a certificate of appreciation, which is the highest ever international appreciation and recognition from the MSC Owners in Geneva, Switzerland, for the dedicated service offered to distress ship MSC Daniela in 2017 when she caught fire in Sri Lankan territorial waters, after which a successful salvage operation was conducted within 30 days. I was awarded a certificate with remarks "For his extraordinary courage and decisive action which proved vital to the successful salvage of our M/V MSC Daniela". I was awarded the certificate at the MSC Geneva Head Office in Switzerland by the Group Chairman of MSC, Captain

Gianluigi Aponte, Group President of MSC Mr. Diego Aponte, and Head of Operation Captain Raffaele Porzio. It was a proud moment in my shipping career as it is a rare opportunity and the best personal achievement to date.

Further, I have been appreciated in several instances by the MSC Geneva Head office due to various achievements and innovative options given – managing heavy project cargo handling by arranging multiple options and handling most challenging and dangerous cargo leakages in Colombo, under disaster management system. The successful managing and administering of prompt actions, protecting the safety of MSC Ships and Port of Colombo Terminals has been acknowledged, considering the preventive measures taken to curb environmental pollution while handling the dynamics of complex tasks. We handled MSC Cruise ships Operation successfully at Poc and also gave solutions to MSC ships sailing for scrap to India and Bangladesh through special operations, new methods to remove Lube Oil from ships sailing for scrap, and saving valuables. Another significant recognition was received from World Customs (WCO) which awarded the "Certificate of Merit" for the work done with Customs towards digitization and the promulgation of innovative ideas to enhance local Customs procedures during the COVID-19 period for the significant service rendered and for being an active member of the Task Force created by the Minister of Shipping to manage the crisis in Port and Trade during the initial stages of the COVID-19.

I have been conducting various webinars to create industry awareness and held a webinar for local Importers and exporters on equipment shortage and Reefer cargo handling procedures organized by the Export Development Board (EDB) of Sri Lanka which recorded the highest participation. I was also a willing participant in many TV interviews with the SLPA Chairman General Daya Ratnayake, and Customs Additional Director General Mr. Sunil Jayarathne, on industry matters which was popularized during the initial stages of COVID-19, where we worked together to find best solutions for Industry challenges.

What is MSC and how significant is it in the global industry?

Mediterranean Shipping Company (MSC) was founded by Captain Gianluigi Aponte, and has its headquarters in Geneva, Switzerland, since 1978. A world leader in container shipping, MSC has evolved from a one-vessel operation into a globally respected logistics business with 580 vessels. The privately-owned, MSC Group is a global business engaged in the transport and logistics sector. The Group encompasses a Cargo Division with MSC, Terminal Investment Limited (TiL), MEDLOG, and a Passenger Division led by MSC Cruises and complemented by Mediterranean passenger-ferries with Grandi Navi Veloci (GNV) and SNAV. MSC's wide range of operations covers 155 countries across five continents, where MSC provides timely delivery of goods and services to local communities, customers, and international business partners. The Company's international headquarters

technologies. How is this rapid phase of digitization affecting the ocean freight operations at MSC and what are the new technological trends adapted by the company to keep up with such trends?

Agreed, the world is moving forward despite the global pandemic as essentials, including food varieties must move from manufacturer to end-users. The global logistics supply chain must continue adopting new methods, online systems, and facilitate staff to work from any location including their homes. Furthermore, new working platforms created using new technologies such as webinars, zoom meetings, Microsoft Team meeting tools, etc., are mostly used to avoid extensive traveling and physical meetings. This is the new trend and way forward in the world in which new business opportunities are also created; especially in the field of technology. This is another solution to cut down travel

Over the years, MSC has invested in several initiatives, such as operational strategic alliances, and has further diversified its business-related activities. The Company has seen exponential growth in terms of both volume and fleet capacity, and now serves millions of customers globally, through a 365-days- a- year operation.

supervise a worldwide network of offices with each bearing responsibility for commercial and operational activities in their respective countries. Over the years, MSC has invested in several initiatives, such as operational strategic alliances, and has further diversified its business-related activities. The Company has seen exponential growth in terms of both volume and fleet capacity, and now serves millions of customers globally, through a 365-days-a- year operation. Today, its focus remains true to its roots, building and retaining long-term trusted partnerships with customers of all sizes and scales. MSC grew to become a leader in global container shipping. Alongside the success of the container shipping business, the Aponte family sought to diversify the MSC Group, launching highly successful cruises, company, passenger ferries, and investing in port terminal infrastructure. Today, the Group employs more than 70,000 people across the globe.

The world is moving forward rapidly by embracing new trends in advanced

costs and time wasted on roads due to heavy peak-time traffic when attending meetings physically.

MSC is a fast-growing global company that rapidly adopted this change. Taking advantage of new technology, implementation of numerous innovative decisions helped MSC to be superior in the shipping industry. The MSC Family culture and a close rapport with staff helped to face the pandemic successfully – moving forward with providing the best connectivity between suppliers and buyers. I believe that MSC with its clear understanding of its mercurial position in the shipping trade well-adjusted to the current global challenges, especially without having any impact on worldwide staff, Further, MSC's consistency in growing the business despite the current challenges is truly a remarkable achievement.

MSC is taking very impressive initiatives in decarbonization. Guide us through these processes and their probable outcomes.

The Group is investing extensively in the modernization of port and terminal infrastructure to develop innovative transportation solutions, further expand its hinterland services, and become even more cost-efficient and environmentally sound.

The MSC Group is continuously assessing the impact it may have on land, sea, and populations. The Group is investing extensively in the modernization of port and terminal infrastructure to develop innovative transportation solutions, further expand its hinterland services, and become even more cost-efficient and environmentally sound. For instance, capacity utilization, network optimization, and efficiency are integral parts of MSC's strategy to decrease CO_2 emissions per cargo-ton/miles (expressed in 'Energy Efficiency Operational Indicator', EEOI). To reduce the fuel consumption of its fleet, MSC is enhancing and modernizing vessels to achieve significant fuel reductions. For example, MSC estimates that container ship hull and propeller cleaning alone has resulted in a saving of 55,000 tons of fuel, with a consequent emissions reduction of 179 million kg CO_2. A comprehensive retrofit program is also underway to optimize vessel performance. The EEOI chart shown on the opposite page illustrates MSC's success in improving the efficiency of the cargo fleet. Compared to 2015, our EEOI has improved by 17.52%. In addition, we are investing in larger, more efficient, greener ships featuring the latest in low emissions technology. In October 2017, MSC placed an order for 11 new 23,000+ TEU vessels (Ultra Large Container Vessels – ULCVs), setting a record for the world's largest container capacity. These ULCVs are

already coming into service and will replace smaller vessels, driving further efficiency gains at MSC. The Cruise Division is also a leader in the development and deployment of environmental technology and operations including in the areas of wastewater treatment, solid waste management, and air emissions reduction.

How do you elaborate on the impact of COVID – 19 on the global shipping industry, and how are the companies bouncing back to normal operations, with the support of innovative technologies?

COVID-19 was an unprecedented event that changed the trajectory of the world similar to a tsunami that threatened to topple the Maritime industry. It was also a great equalizer as people realized their ships were affected and Ports around the globe were

During the initial stage of the COVID-19 pandemic spreading in China, the supply chain was badly affected as China had imposed a strict lockdown and banned the factories from manufacturing various products. This resulted in certain countries searching for alternative sources and countries preferring to obtain their products despite the cost benefits they received from China. Since China bounced back faster than expected and factories recommenced operations within a short time span, they opted to transport cargo via the sea routes and it grew exponentially as there were many restrictions on air cargo movement due to the closure of airports and the high costs imposed on air cargo flights. Hence a majority of cargo exports from China and other countries started moving in containers and the demand for containers and ship space had still not reduced. Many

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We started issuing Electronic Delivery Orders (EDO) first in Sri Lanka to issue EDO for import arrivals and provided online banking facilities to Customers. Besides, we have opened up extra cash collection centres in the Port and Container Depots reduced wharf visiting MSC office, facilitating convenient payment gateways for ease-of-business. Also, we started couriering the Original B/Ls to our Export Customers

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hard hit with land-based supply chains and logistics industries seriously disturbed. It spread rapidly during the subsequent months inhibiting travel between countries. This resulted in a 360° alternative approach on certain decisions already taken by shipping Lines which included cancelling new building orders and especially cancelling cruise ships orders, ship schedule reliability and adjusting schedules, exchanging ships for demand lanes withdrawing from lower demand lanes where countries were seriously affected. Similarly, many decisions taken within a short period based on the impact to the world were based on how ports were affected. We noticed that Europe was badly affected, spreading at a rapid pace to the USA which disturbed the supply chain. Even in the USA trucks were found short and the hire increased which resulted in the slow movement of the containers to inland depots and the subsequent delays in the empty box evacuation process.

countries faced serious delays in container transportation due to inland-based delivery points located in inland Depots, even empty boxes were isolated in many counties in such Depots and Ports as well. Ships were compelled to lay up which resulted in blank sailings due to lower volumes and ports were congested with slow operation as numerous labourers were affected with COVID-19. Cruise ships faced huge losses and delays in many ports due to bans imposed by ports that refused to accept cruise ships that had passengers tested positive. Some countries did not allow Cruise ships to call their ports even to supply essential food items due to the above reasons. Yet, we managed to provide bunkers under special approval to an MSC Cruise ship that was in dire straits in Colombo outer anchorage which enabled the ship to reach its destination.

MSC has taken many stringent measures to face the global challenges, becoming a key player in the shipping industry to operate

Accept challenges, never run away from problems as every problem has got many solutions. You must develop yourself to analyse problems correctly and find the best solution. You must be positive always if you are part of the shipping and logistics trade. Think differently and innovatively to come up with new ways of doing things much efficiently.

ships without disturbing the supply chain even with losses owing to delays faced in Ports and lesser cargo movements in the first and second quarter 2020 during the peak of the pandemic. We started issuing Electronic Delivery Orders (EDO) first in Sri Lanka to issue EDO for import arrivals and provided online banking facilities to Customers. Besides, we have opened up extra cash collection centres in the Port and Container Depots reduced wharf visiting MSC office, facilitating convenient payment gateways for ease-of-business. Also, we started couriering the Original B/Ls to our Export Customers which enabled them to collect original BL's without visiting the MSC office which was an innovative measure we introduced to provide an exceptional service to our customers. Further, we closely coordinated with the officials of the Sri Lanka Ports Authority and the higher management of two private Terminals and Customs to submit all the related documents through online processes. These were to be implemented using the email attached to minimize human interaction and avoid many

shipping agents visiting these locations. I wish to express my heartfelt gratitude to General Daya Ratnayake, Chairman Sri Lanka Ports Authority who established a Taskforce with industry leaders to manage various challenges which also included the clearance of import boxes stuck in Port and expediting the auction on Reefer cargo such as fruits and other frozen food items which prevented serious environmental damage caused by idling cargo. Also, Major General Ravipriya, Director General of Customs, and Additional Director General of Customs, Mr. Sunil Jayarathne was responsible for taking many initiatives to implement an online system in Customs which made Cargo clearance and the obtaining of Customs approvals on transshipment boxes much easier devoid of physical interaction with shipping line staff. These immediate changes were highly appreciated by overseas ship owners and many countries followed in the footsteps of Sri Lanka. I must say that we are proud to be part of the MSC family as we were given tremendous support from the MSC Geneva head office, with which

we managed to take innovative timely decisions which helped to overcome many obstacles, creating a smooth operation henceforth.

As a veteran in the field, what would your advice be to the young undergraduates who are passionate about pursuing careers in the shipping industry?

This is a good question and I always like to advise and share my experience with the younger generation on how to face the challenges in the new world and reach the pinnacle of success in the Shipping and Logistics industry. I used to conduct lectures and presentations upon invitation by institutes to the younger generation who are following Logistics degrees and training. They are our future and the success and continuity of the industry are in their hands. Therefore, it is imperative that we share our knowledge and expertise with the future generation.

As you are aware, MSC Lanka owns the largest Operations Centre in Sri Lanka. Handling over 20 ships per week despite the colossal challenges daily. Ideally, we should be having senior staff to manage the workload. But most of my staff at MSC Lanka are under 40 years of age as I have given them opportunity to the younger generation. I have recruited young energetic staff and train them. Also, I have given opportunities to undergraduates from KDU and other universities and granted them opportunities to learn with the world's best shipping line environment, face the pressure and apply theoretical knowledge to practical work. We have got five trainees. All young blood, who are enthusiastic, strong, and can train to accept multiple work and challenges.

We must train them to think out of the proverbial box in the shipping and logistics industry. You need to take tough decisions which can be costly if you do not take correct decisions at the correct time. Also, there are multiple issues for which you really need to think about positively and out of the box. If not, you cannot find the best solution for such problems. We never say "NO" to our Principals on their umpteenth, any requests as I have confidence that this young staff can make impossible, possible which we have been proved several times, since even I have received many appreciations from MSC Geneva head office for the exceptional work of our young staff.

So, my strong advice to the young generation is to accept challenges, never run away from problems as every problem has got many solutions. You must develop yourself to analyse problems correctly and find the best solution. You must be positive always if you are part of the shipping and logistics trade. Think differently and innovatively to come up with new ways of doing things much efficiently. But you must also start thinking positively then only will get such ideas and effective solutions.

It is evident that our younger generation is more productive and active. We must give them advice to avoid wasting their valuable time on social media using the mobile phone which I call an addiction. But social media can be used for learning, knowledge enhancement. Have a group of friends to develop friendships, but it should not be used 24 hours a day by sacrificing everything and sharing various videos and unwanted political clips in groups, and wasting good productive hours.

They must learn to discipline themselves and attend such groups. Sharing thoughts with friends could be done for a limited time per day after working hours. This discipline is very important as even when they grow, it is important to manage the time efficiently in every aspect of their life which is an important factor when working in an office to perform and achieve the best, in order to reach the highest positions. You need dedication and sacrifice in life to achieve your goals.

Finally, and most importantly, the younger generation needs to keep on improving their human values while engaging in every industry work, which is seriously lacking with the concept of changing the world. They should know to respect parents, teachers, seniors, or higher management in the corporate sector and be humble to learn from anyone – even from juniors. In the Shipping and Logistics industry, it is more important to have physical or practical work experience at ground level rather than sitting in an office. Hence if you selected logistics as your career path, must be a strong character willing to accept challenges and determined to be successful and find avenues to achieve success. In other terms, it is important to improve your knowledge by following the right education and at the same time it is vital to improve other areas to be a strong leader in the Logistics industry.

SMART SUPPLY CHAIN MANAGEMENT

Over the last decades, rapidly developing technologies have had a greater impact on every aspect of mankind. Further they have re-modeled the way people communicate with their environments. With smartphones, wearable devices, smart-watches, autonomous vehicles are readily available and they are being used to enhance the comfort of daily activities by handling issues 'SMARTLY'. Being 'smart' or 'intelligent' refers to human cognitive decision-making or information processing demonstrated by a machine or a program generally designed to perform specific functions in a human-like manner.

Smart Supply Chain Management is a relative and undefined concept. According to some authors Smart Supply Chain is defined as an up to date interconnected business system that extends from local, separated and single company applications to wide and systematic implementations in the supply chain. A smart supply chain is interconnected as all entities, IT systems, assets and products are connected and also it is characterized by "unprecedented levels of interaction with customers, suppliers, and IT systems in general, but also among other objects which are being monitored or even flowing through the supply chain" Smart supply chain is characterized by the usage of various and highly advanced Information and Communication Technologies (ICT) or Information, communication, and production technologies. It emphasizes the connection to manufacturing environment to improve the flow of information between IT systems, different objects and enterprises. On the other hand, the Smart supply chain is a combination of digital and physical worlds. It refers to the combination of using cyber-physical systems (CPS) and smart products and services. A Cyber-physical system is a physical and engineered system, that operations can be monitored, coordinated, controlled and integrated by a computing and communication system. This includes sensors, control processing units, actuators, and communication devices. An integral part of CPS is the Internet of Things (IoT) which is a set of physical devices such as products, machines, connected through a network with the capability of sharing information about themselves and their surroundings. The smart supply chain could be called as "automated" due to process flows being automated and intelligent making large-scale decisions relating to the perspective of the whole supply chain and especially having the ability to learn and make some decisions by itself, without human interference as well as to predict future scenarios.

Smart Supply Chain Management is based on the use of data obtained from production lines, warehouses logistic centers. To collect information in real-time IoT technologies, Global Positioning Systems (GPS), Radio Frequency Identification, sensors, indicators are essential. Even data obtained by social media can be analyzed. In the IoT context, attention is paid to the enormous possibilities of using mobile technologies,

ANDREW RATHNAYAKE
Undergraduate
General Sir John Kotelawala Defence University

mobile devices and other related services. The smart supply chain is based on the integration of smart factories and value chains. Through the information systems, Customers and Supply chain partners can be connected. Communication affects conflict resolution, mutual understanding, trust building, and influences the development of relationships. A cloud-based system, which is a platform for resource sharing and collaboration where the new solutions are based on this process regardless of the location.

The main purpose of Smart supply chain management, is to satisfy all the individual needs and deliver individualized products most efficiently and effectively. Processing huge amounts of data, better controlling of production and logistic operations by the demand reported by the customer will result in value addition through constantly introducing new products and services to the market. The feature of the Smart supply chain is not the only customization but "Mass individualization". Mass individualization is when customers are involved in designing the options of their product to fit their exact individual needs and desires.

Although there is no acceptable standard definition of a smart supply chain, several authors agree upon various characteristics of a smart supply chain. A smart supply chain is, instrumented, transparent, interconnected, integrated, intelligent, automated, resilient, responsive, traceable, innovative, and sustainable.

An assumption is made that a truck is carrying temperature-sensitive perishable goods. The truck is continuously monitoring the temperature and it is found out that the temperature is rising. The truck sends a data message to Pega Platform IoT LIVE! The data message is

The feature of the Smart supply chain is not the only customization but "Mass individualization". Mass individualization is when customers are involved in designing the options of their product to fit their exact individual needs and desires.

received in the Pega Platform IoT LIVE! It is found out that there are no recommendations in the Pega Platform. The truck continues to move forward and it enters a desert area. The temperature starts to rise uncontrollably. The truck sends a data message to the Pega Platform. Pega Platform receives this message and sends recommendations in return. APPLY ICE GEL PACKS! The truck applies gel packs on the goods but yet it is found out that the temperature keeps on increasing. Temperature goes further up. The truck sends a data message to the Pega Platform immediately. Pega Platform receives this message and sends recommendations in return. START A BACKUP REFRIGERATION UNIT! The truck starts a backup refrigeration unit and as a result that the temperature drops back to normal. A truck moves beyond the desert area. Refrigeration backup is withdrawn. The temperature seems to be very normal. But again the truck enters the desert area. The temperature rises beyond the normal limit. The truck sends a data message to the Pega Platform. The machine learning at Pega recommends applying for Eutectic Plates. The recommendation is received by the truck to apply for Eutectic Plates. The temperature gets back to normal. While traveling forward the temperature seems to rise further! The truck sends a data message to the Pega Platform again. The truck tracks the geographical location and creates a remediation shipment order, and orders a dry shipment form. The order is placed and the packs of Dry Ice are shipped from the closest distribution center, towards the truck. A protective pack of Dry Ice arrives from the closest distribution center. Temperature tends to be normal now. While everything is taking place, every event is recorded in BLOCKCHAIN. And this is "Smart Contract Powered Optimized Cold Chain" which is introduced by JKT's using Pega Platform which includes all types of modern technology gelled up with mutual relationships between the customers and the suppliers. It is concluded that the smart supply chains are: interconnected, automated, intelligent, instrumented, integrated, innovative, and concentrated on individual client's needs.

Core elements for smart supply chain development are Big Data implementation including IoT infrastructure, advanced analytics, adequate information system,

data mining and business intelligence, supply chain collaboration, process automation and improvement, supply chain integration and process and product innovations. Trust, between the members, is one of the crucial elements of the supply chain. This will lead to better communication and will affect the supply chain's performance. Smart supply chains should be featured not only by a high degree of trust among the supply chain members but also between systems of information and information technologies. A new issue worth considering in SSC is technology trust. It is required that human-human relationships are replaced with human-technology relationships. Supply chains will be more integrated and even greater will be the scope of the data exchanged. According to the McKinsey Global Institute Report, 2015, IoT market value in the world in 2025 will reach the level of 4 to 11 trillion USD. Designing and implementing a Smart supply chain is neither a short-term process nor an easy task. It requires a comprehensive strategy oriented to identifying the resources of the chain in terms of their interoperability and then implementing smart applications for their optimal use.

SSC is characterized by unlimited possibilities of effective and efficient information management overwhelming human perception and possibilities. The smart supply chain is fast and intelligently adapts with internal and externally generated disturbances, automatically balances supply and demand based on historical forecasts and predictive algorithms, and automatically optimizes the production of goods and services. However in the future Smart supply chains are to be more intelligent, more digital, capable to solve problems, self-managed, able to adapt with new conditions and tasks, self-learning, and modifying behavior. The structure of the Smart supply chain is to

be more dynamic and temporary. Consequently, Smart supply chain could be identified as,

1. **Initial phase** - with local applications such as e-sourcing or RFID tags implementation

2. **Early phase** - with the implementation of an isolated system for example an intelligent factory or service.

3. **Intermediate phase** - characterized by the implementation of smart solutions integrating processes in the whole supply chain (integrated, based on the high scope of the data exchange and high level of trust)

4. **Advanced phase** - characterized by digitalism, dynamics, and temporariness, with the ability to adapt with the needs of the market and resources used.

Some of the advantages in Smart supply chain management have better access to information and acquisition of information with better quality (defined as timeliness, availability, accuracy, internal connectivity, external connectivity, relevance, completeness, accessibility and frequency of information updating), it enables product tracking, prediction of eventual anomalies during production, gathering and analyzing data about demand, stock, and sales, Real-time monitoring, improvement of data accuracy, level reduction, prevent stock-outs, and avoid excess stocks. Real-time tracking of trucks and people leads to accurate and timely delivery, lower transport costs and increase safety and security of the chain of supply.

The barriers to smart supply chain implementation are insufficient skills, Cainophobia (fear of change), and immature technologies and knowledge. 🗊

TECHNOLOGY
is the best solution

Mr. Ted Muttiah

Chief Commercial Officer - South Asia Gateway Terminals

Who is Ted Muttiah and how would you describe your journey so far?

I've been in the maritime industry for close to 40 years now. Having started in Sri Lanka in 1982, as a management trainee at Mackinnon Mackenzie shipping, I then went overseas and continued my career with different shipping lines and terminals, and culminated with the recent appointment as CEO for an international terminal operator based in the Philippines. However, I am happy to be back in my birth country to give something back to it. That's essentially my

career journey of 40 years in shipping lines and terminal operations in about 9 countries.

Give your opinion about the evolution of SAGT towards being an organization that empowers Sri Lanka's maritime hub aspirations and that sets the benchmark for terminal operations efficiency at the Port of Colombo?

SAGT was the first private-public partnership venture in Sri Lanka. It remains a flagship venture for the board of investment, since 1999. Ever since then there have been

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many other types of partnerships, apart from the ones in the maritime sector. We didn't set out necessarily to say that we are going to set the benchmark. I think it was just as you say, the evolution of best practices that came about because it gave a combination of factors, it allowed Sri Lankan talent to actually set benchmarks on the world stage. Not so long ago, we were ranked No 1 in terminal performance in South Asia and No 4 in the world for R-size of terminals. That's a quite significant accomplishment. But we didn't set out to do that necessarily. Instead, we just set out to do the very best we could, and as we got better and better and we realized that the potential of what we can do is unlimited. I think we are still doing some interesting things without being realized, which we will achieve very soon as well. The international shareholders brought to us some expertise from overseas and we were able to embrace that and take it forward. So it's just a case of getting the exposure and taking advantage of the opportunities.

store so that they receive the transparency they are looking for. The precursor to the Tradelens type of platform is Digitization. Digitization is the electronic form of a paper document. Digitalization is stringing those electronic documents together end to end to make it seamless so that there should be no need to do transactions. If you think about the present context, with digitalization before COVID-19, we can travel frequently. You just have to go online, make the booking, make the payment, get the e-ticket, and just travel with a thumbprint verification. In this process, everything is automated, without even a single piece of paper. We, already in some industries, are into this concept of digitalization. But in the maritime sector all over the world, we are dragged by our feet to come into the real world. Talking about Tradelens where we are heading to is that you can sit at your home and book your cargo, after which your package will be delivered to your doorstep. This is already a practice in certain parts of the world.

The precursor to the Tradelens type of platform is Digitization. Digitization is the electronic form of a paper document. Digitalization is stringing those electronic documents together end to end to make it seamless so that there should be no need to do transactions.

SAGT is the first Sri Lankan terminal to join hands with TradeLens to digitize the supply chain network. Give us a brief overview of this venture

For sure. We were delighted to be the first. It's not that we set out to be the first, but it made sense that we actually participated in Trade lens. There is another group that also does similar work. But Tradelens was primarily driven by Maersk shipping solutions which happen to be one of our shareholders. But the reason that we are participating is that ultimately there is one big ecosystem called an "equal system". Ecosystems like Tradelens will be only successful with more people participating. You must have importers, exporters, government entities, customs, shipping lines, and the whole from end to end. The idea of Tradelens is that an importer can look at his purchase order at the origin to the delivery to his warehouse or even in fact to his

How does the "E Clearance" process at SAGT operate, and what are the benefits it delivers to the customers?

The E-Clearance process is also called "EDA" (Electronic Delivery Advice) or otherwise known as the "Gate pass". It's probably not my place to say how well it's running but I can tell you that it's quite effective in terms of smooth transmission. Today the trucker can print his own Delivery Advice, with the help of this EDA system. The effectiveness of that should be somebody else's to comment. But from our perspective, it is running very smoothly and we don't get complaints. Concerning the turnaround time, from the time that the job is picked up, it will only take less than 10 minutes to issue the Gate Pass. Whereas, in the past, they will be all lined up for hours and the situation becomes much chaotic when the crowd gets aggressive after long hours of waiting. However, with the automatic system in place today, once when the documents

are scanned and sent through the digitized platform, the process smoothly continues. The system is planned to upgrade to a level where the customer will be able to print the e-ticket or the e-gate pass sitting leisurely at home. To sum it up, the effectiveness of the E clearance from our standpoint is that the turn time of the job could be reduced to less than 10 minutes.

SAGT is a company that strongly believes in the importance of adopting cutting-edge technology to stay ahead in the maritime industry. Apart from the new venture with TradeLens and E clearance facilities, what are the other technology-enabled innovations used at SAGT?

It's Integrated. Except for the Gate Pass, when performing a job through digitization or digitalization, there is an integrated sequential process. A shipping line who's a customer to give the delivery order online. Then when the system verifies it, we issue

the delivery order. This is because even though the container belongs to us, being the shipping line, the cargo belongs to a freight forwarder, and the ultimate end user is the customer. A freight forwarder is typically called "asset-light". They don't have warehouses, trucking nor many employees. The next thing is customs and government regulations. That is the process of clearance. We have some work yet to do, even though we have digitized it. We have to go to digitalization, which is the automatic transmission of this prevailing system, and it is also a part of the ecosystem of Tradelens.

Our biggest choke point now is the gate area. Every day from 4 o'clock to midnight the gate is chock blocked. Therefore, we have to implement some controls to mitigate that situation, as our next step. If I talk about import containers. We can handle 30-40 trucks at any given time. We are transiting to this system where you book it every 15

minutes, the truck is coming in and we'll handle them. The beauty is that when you book a container, I know 24 hours ahead of time, that you are coming for this container. Thus, I will place it overnight when things are quiet and clear, and I will have it all lined up and ready. This is what we are looking for in the gate automation process. The other one is when the truck comes in, the RFID where you read the truck registration, connects immediately and it will tell what to be handled. We are also doing the "Prime Route". It is a software system that tells the trucks when a container is coming off the ship. It will read the RFID on containers and will automatically tell you from the advanced manifest you receive, that the container will go to a particular place or a location. Therefore, it will tell the driver where he has to deliver the goods and the best route to take them. This is also similar to ship loading. Another thing we

solution because it doesn't get tired. So the first challenge is the human challenge, which we cannot ignore. To resolve this, we need to upskill the human resources we have. Today we are doing a lot of businesses where people are much more skillful for the same job from 15 years ago. From where the SAGT started off, we have come a long way in terms of evolving technology and embracing the best practice. However, one of the biggest challenges has been the emotional push back. The fact that we are bringing females in today is also significant. Maybe 5-10 years ago they were an unglamorous part of the economy, due to the perception that they lack skills, capacity, and capabilities. But now their role has become very vital with how much they contribute to the economy. So the challenges are numerous. To sum up the most significant of them all, the first one is the human factor and the second one is

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To sum up the most significant of them all, the first one is the human factor and the second one is that it has to be integrated with the industry-wide platform. Thus we need to have a common portal at the port level, to increase transparency so that everyone understands these challenges.

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are on is the semi-automation of cranes. The system will tell where the cranes should go using sensors. These are all bits and pieces of incremental initiatives that ultimately will plug into the ecosystem.

Amidst the numerous technology-enabled services adopted by SAGT, what are the key challenges faced by the company when implementing them and what strategies are taken to overcome such barriers?

One of the first things we come across when technology comes in is that everyone will say that I will lose my job. So there is that emotional concern we have to address, from the human side of it. As a precaution, the person driving a truck today may have to upskill himself to know how to understand technology. Technology is here because at some stage you can have high performance. After all, as a human, you cannot perform the job to the exact ideal level due to fatigue, problems at home, etc. If you really want to take that away, technology is the best

that it has to be integrated with the industry-wide platform. Thus we need to have a common portal at the port level, to increase transparency so that everyone understands these challenges.

In the sustainability report of SAGT, it is mentioned that the company's Sustainability Management Framework is a dynamic process that will continuously improve based on the emerging global and industry trends. How would you justify this statement from a technological perspective?

Well, I have already given some examples. We now have the RTG rubber tire gantries and they are operated by a hybrid of electricity and some fuel. It means one day we will go for electricity and the other day we will go for fuel. If we take our carbon footprint, the biggest cost of energy is electricity, because those big gantry cranes are operated by electricity. Electricity is the cleanest fuel, so we are using it in most of our operations.

What we are trying to do is to pull down dirty fuel to cleaner fuel.

How have technological innovations influenced the global maritime industry, and how has it become a game-changer post-COVID-19?

The biggest change was big ships. Shipping lines are going to bigger ships because it costs them less to operate. After all, their slot cost is going to be low. Only a limited number of ports are capable of handling big ships. They operate in the Hub and Spoke method. The Hub is the place where everything comes to one place and the Spoke is the one that feeds to the hub. So the big ships will come to the hub and the smaller ships will be feeding to the big ship.

As Sri Lanka's first Public-Private Partnership container terminal, SAGT recently deployed container safety cages. Could you give us more insights into this venture and its significance to SAGT?

When a ship comes in, people from our terminal go onboard the ship and lash those containers to keep them secure. Safety cages are where you are in an environment like a container, in a safe area, and perform your work without accidents.

Before we wind up the interview, as the CCO of a company that molds leaders and innovators, what kind of advice would you give to the emerging entrepreneurs and undergraduates who are about to enter into the business world?

Entrepreneurship cannot be taught. Generally speaking, it is the ability to see a gap in a market and exploit it. Entrepreneurs are not afraid of risks but they are confident. Entrepreneurs by nature are not good at administration. But in our education system, we produce very good administrates. So the advice I give to anybody is to be what you want to be and be the best you can be. You have to put yourself out and go out of the comfort zone to reach your ultimate goals. ▪

DIGITAL TWINS

Digital Twin technology is one of the most important industries 4.0 currently available. Digital Twins give you insights into all aspects of your production line and manufacturing process. These insights to make better decisions, plus the decision-making process can be automated with the dynamic recalibration of equipment, production lines, processes, and systems.

FUN FACT

The global digital twin market size was valued at USD 3.1 billion in 2020 and is projected to reach USD 48.2 billion by 2026. Increasing demand for digital twins in the healthcare and pharmaceutical industries due to the outbreak of the COVID-19 pandemic, the changing face of maintenance, and the growing adoption of digital twin solutions to cope up with the COVID-19 pandemic are the key factors driving the growth of the digital twin market.

Digital Twins provide engineers with virtual tools that allow them to look at, explore, and assess physical assets, processes, and systems. With this ability, it is possible to get an accurate view of what is happening now, as well as what will happen in the future.

DIGITIZATION
is inevitable in our industry

Mr. Mahesh Kurukulasuriya
Chief Commercial Officer - McLarens Group

Who is Mahesh Kurukulasuriya? Take us through your career journey so far

To start off, I'm an accountant by profession. I did my studies in the field of Management Accounting pursuing CIMA. It's by chance and not choice that I got into the shipping industry. I started off my career working for MAS as a Management Trainee, then joined MAERSK as a part of their Global Management Trainee program in Denmark, which was my entry into the shipping industry. I worked at AP Moller MAERSK for 9 years in Sri Lanka and in Singapore. This was mainly in the liner shipping sector where I per-

formed various roles. Subsequently, I joined GAC Sri Lanka; one of the subsidiaries of McLarens Group as a Director and in 2019 was appointed to the main board of McLarens as Chief Commercial Officer.

As a well-established organization in the shipping industry of Sri Lanka, what is the contribution of McLarens to the field of Logistics?

McLarens Group is a 75-year-old family-owned company, which was founded as a coal trading company by a Scotsman. This is how the "McLarens" Group got its name.

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sidering the Group, McLarens pioneered the off-Port ship supply operations in Galle. Similarly, we were the pioneers in providing support services to the oil and gas exploration projects that took place in Sri Lanka., We are the absolute market leader when it comes to the non-containerized business, providing husbandry, ship chandling, bunkering, hull cleaning, and maritime insurance services. I would say that our ability to expand into non-conventional areas of maritime logistics, which are not fully explored by other Sri Lankan companies, is our key success.

Since you mentioned the services related to the shipping industry. Could you explain the term "Contract Logistics"?

Contract logistics is essentially supply chain management. There are many warehousing and supply chain requirements that are done more on a spot basis, but not on a need basis; where we as a service provider would provide services to a particular client in a particular moment of time. But if you look at a more sustainable business model, customers' requirements are usually quite stable and long term i.e. what is required from the supply chain in the long-term is known. The true efficiencies in the supply chain would come with long-term partnerships i.e. when you work with a client very closely for a longer duration, both parties would understand each other. That's where Contract Logistics comes into action. It is where warehousing, transportation, and clearance are bundled into a solution when working with a partner for a very long time.

The partnership of McLarens with the GAC Group, elevates the position of the company as a market leader in the provision of shipping and marine services. How does the company benefit from this partnership and how is it expected to affect the futuristic operations of the company?

As a Group and a holding company, we have many Joint Ventures with international companies, which has been a key success factor for our growth. We always believe in synergizing our strengths as a local conglomerate, with our foreign multinational partners. GAC is a Swedish partner that we have been working with for the last 30 years and their main strength is 'Ship Agency and Ancillary Services'. With multiple ports, shipping trades, and products in the world, it is important for ship owners and ship managers to have a trusted partner to take care of the day-to-day requirements locally. That's

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> When it comes to shipping, even though we are well established in the conventional container business, our core value proposition is the diversity of our product offering.

The company was later acquired by late Mr. Hubert De Silva, father of the current Chairman Mr. Rohan De Silva and grandfather of Ms. Shehara De Silva, the current Group Managing Director. Our core business is Maritime and Logistics services; however, we have diversified over the years into several other verticals which include manufacturing and distribution, leisure, property and strategic investment, petroleum and energy. The main driver of McLarens is our family-like culture and values. We trust and believe in our teams, provide our services with a personal touch along with flexibility in operations. When it comes to shipping, even though we are well established in the conventional container business, our core value proposition is the diversity of our product offering. When con-

where GAC comes into play, where they support our foreign principles for whatever activities they need to do in a country. Partnering with GAC has helped us expand our range of services and move into new areas such as; maritime insurance, warehousing, logistics, or ship chandling. GAC which already has a wide product portfolio globally, introduced its range of services to Sri Lanka with our partnership. If you look at GAC's position in Sri Lanka today, it holds about 30% of the market share in conventional cargo agency operations. They also hold a similar market share of the offshore supply services market at Galle. Thus, GAC has indeed been instrumental in developing Sri Lanka as a maritime services destination.

McLarens operates a state-of-the-art Integrated Logistics Facility under the brand name "SPECTRA". Give us an overview of this facility and the cutting edge technology used in it

"Spectra" is a joint venture between the GAC-McLarens group and Hemas. Its core business activities are providing warehousing, distribution, container depot, and transportation facilities which are linked to local intermodal supply-chain-related activities. If you look at Sri Lanka, we are strategically located on the route of one of the busiest shipping lanes in the world. However, if you look at our presence and development in the logistics and SCM sector, it is quite limited, mainly centered around export-related industries like garments or tea. With disposable incomes of the average Sri Lankan on the rise, and the demand for foreign brands and foreign products increasing along with that, we saw the opportunity to venture into this area,.. Further, we felt like we could synergize and service our in-house products by partnering with Hemas which is one of the largest pharmaceutical and FMCG distributors in Sri Lanka. McLarens is one of the largest contributors to the container throughput of the Port of Colombo. Therefore, we needed a container depot service that would support this. That's how the whole Spectra plan was put into action. However, our ultimate objective as a venture is to become the preferred logistics service provider in Sri Lanka.

Digitization of supply chain operations is a compelling concern globally. Similarly, McLarens is also venturing into the digitization of its current services. How

would you comment on the progress of the company in embracing these disruptive technologies, especially with the outbreak of the COVID-19 pandemic?

I think COVID-19 sort of forced us to move towards digitization of operations, which is contradictory to the conventional business model previously operated in Sri Lanka. Before the pandemic, companies were considering these as options to enhance their corporate value proposition. However, COVID-19 restrictions forced all of us to look at these options as a "must-have". That was the first shift that happened in all the businesses. Let me give you a classic example. As a country, we have been wanting to have an electronic delivery order system with Sri Lankan authorities for over 20 years. However, the adversity that was brought upon due to the pandemic restricting people going to port to clear cargo, created the environment to fast-track this process

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COVID-19 sort of slowly brought us close to the digitization of remote operations, which is contradictory to conventional business. Before the pandemic companies were considering these as options to elevate their corporate value. However, COVID-19 restrictions forced all of us to look at these options as a "must-have".

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and made it happen. I think digitization is inevitable in our industry and companies. I firmly believe companies who don't adopt and accept this will soon lose market share and eventually go out of business. As a group, we are actively pursuing digitization of our processes. In addition, as part of our R & D / business development efforts we are also focused on how we can look at business opportunities in this digital space, as well as how to embrace digital technology to improve our efficiency as an organization.

Integrating logistics and supply chain operations with cutting-edge technology undoubtedly involve massive investments. What aspects are the returns of these investments expected to cover and how impactful is it to the organization?

I don't necessarily see that development of technologies comes with a heavy investment. It's based on what you want to do. I think any company no matter how big they are, there are plenty of opportunities to upgrade themselves in terms of technology, even without making massive investments.

Well, it's all about perspective. As a company, if you want to invest and start from the ground zero it might appear to be a huge investment. But as a country, we need to be aware of our strengths and weaknesses. There are so many developments that have already taken place in the world that we still haven't adopted in Sri Lanka. Our global partners already have these technologies which we can easily adopt. We can benefit from the synergy of such partnerships. Therefore, I don't necessarily think that development of technologies come with a heavy investment. It's based on what you want to do. I think any company no matter how small, would have the means to upgrade themselves in terms of technology, without making massive investments, if the right corporate culture is embraced.

How do innovation and novel technology help achieve efficiency and sustainability in the business/service sectors in which McLarens Function?

It serves two main purposes. Technologies allow you to be more efficient. Obviously, your unit cost of a product needs to be competitive in the market, since supply chain operations are always a cost to a client. Minimizing that cost increases the profitability. Thus, we need to be using all accessible technologies to make ourselves efficient. On the other hand, adopting technologies enables you to create a niche. Today, all companies are looking at how they can improve their processes and at the same time add value to their clients. So, in that sense, adopting such technologies will increase their business volumes and their bottom line as well. Sustainability for me is very simple; it is how an organization can be in existence in the long run. You need to prepare yourself for the long journey. So, if you are being competitive, allowing your clients to be efficient by adding value to their product portfolio, enables your clients to be sustainable. That will enable your business to be sustained as a result.

In your capacity as the Chief Commercial Officer how do you facilitate these transitions and transformations in the company?

As I said earlier, one of our group's core values and strengths is us working as one family. Since many of our companies act as independent business units, there's a lot of

synergizing that we could do. Due to the fact that we as a Group operate across several business segments across the maritime sector, we are able to fully observe the impact of the introduction of new technology and processes and compare and assess results.. Having initiated the process, we are now witnessing how optimizing these synergies in-house has helped improve our overall business performance.

McLarens was recognized as one of the best workplaces in Sri Lanka for 5 consecutive years. What strategies foster this continuously evolving healthy culture and how does it feel to be a part of all these achievements?

We are happy to announce that we were recognized as one of the Hall of Fame companies by the Great Places To Work institute. I think, again it goes back to our company values. You don't necessarily create a culture in a company to win awards. That's a result of what you do. Unless you firmly believe that you want to be a part of that culture and it is good enough, it will not work. As we continue to strive to be an employer of choice, we are committed to providing employees with a work environment free of discrimination and harassment. We believe that diversity and inclusion at work is instrumental in our success. It is important to give some recognition and be self-aware of where we are. We need to make sure our colleagues feel that they belong to this company. That can only happen if you are sincere with them. That is the core of the company, because we are in the service industry, and people are your biggest asset. We do this by offering staff the flexibility they need to thrive in the opportunities we give them. We foster a trust-based work culture that encourages self-motivated individuals to perform to their optimum. Our HR policy is designed and practiced to make sure "zero tolerance" management practices on any type of harassment. That's the secret behind our company, and it is also supported by our shareholders and the family culture.

With Efficiency and Productivity being the constant buzz words in logistics, in which areas do you think Sri Lanka as a strategically located country can improve to help grow shipping logistics?

I think achieving efficiency will in turn bring about productivity. We should be mindful that this is a global industry. Since the distance between marketplaces is getting smaller, the geographical location no longer becomes the key determining factor for Sri Lanka in securing business. So, the only way to keep Sri Lanka ahead, is to make it a competitive location by ensuring service levels and efficiencies for clients. That is where we need to improve. When considering talent and personal skills, I would benchmark Sri Lanka at a very high level. However, our processes, especially when it comes to the non-containerized environment, need a lot of improvement. The efficiency of our logistics industry will depend on several factors such as the policy consistency in shipping and ports related activity, improving our "Ease of doing business" shift in our workforce culture from a unionized labour to performance based culture, streamlining processes and adopting technology at regulatory bodies such as SLPA and Customs, at the same time, companies need to benchmark themselves with global players than simply relying on our location.

As concluding remarks, what are the words of wisdom that you would like to extend to the young undergraduates?

As a country, one of the key weaknesses that we had before was the lack of educational institutes to support the maritime and logistics sector. It was always taken as a notion that maritime and logistics is not a preferred industry for the younger generation. However, I am happy to see the developments that are currently happening. My advice as somebody who came into the industry by chance is that it's a long journey. Especially in this industry; experience and exposure count. For anyone who is very young and impatient to see themselves progressing in the career very fast, I would say; success is determined by being a true professional and to do that in an industry that is progressing fast within a short period, you would need to gain expose into a variety of areas in the maritime and logistics industry. As an example, if you want to be a true professional you should be aware of operations, customer service, sales, and any other aspect in the field. If you can't link the experiences gained such as; supply chain or logistics operations, then your path would be quite limited. However, within a very short time, if you can expose yourself to multiple industries vertically, I think that's success. I think patience, exposure, and awareness of future trends lead this path. For example, now I'm 39 years old and I've been in the industry for 16 years. I've done close to 12 different job roles and I personally feel that's where the success came, for me. That's the advice I can give from my personal experience.

SMART SUPPLY CHAIN MANAGEMENT

BE A SUSTAINABLE GAME CHANGER, SUPPLY CHAIN AWAITS YOU!

MANAGEMENT

CONTROL

PROFIT

ANALYSIS

TRACKING

PLAN

TTM

PROCUREMENT

LOGISTIC

SECURITY

DISTIBUTION

AYODYA EDIRISINGHE
Undergraduate
General Sir John Kotelawala Defence University

Supply Chain Management has undergone a tremendous revolution over time, from Supply Chain 2.0 which was a manual, paper-based Supply Chain to Supply Chain 4.0 which is currently on the highest maturity level of digitalization. With Supply Chain 4.0, all the Supply Chain activities have become more fast, flexible, accurate, and efficient. Internet of Things (IoT), Artificial Intelligence (AI), Robotics, Blockchain Technology, Warehouse Automation, and Last-mile delivery,-are some emerging industry trends, with the implementation of Supply Chain 4.0 Technology advancement. This has made an advanced influence on Supply Chain activities. It proves that the more people emphasize on Industry Automation, the smarter the Supply Chain Management becomes.

Internet of Things (IoT) is an application which is used as an efficient tool in improving the model in Supply Chain Management. For example, UAE-based fleet managing startups use this model to monitor fleet performance and fuel consumption. One best example from Sri Lankan Context is Expolanka Holdings, where Technology-driven applications are used to manage their Transportation activities. Every delivery vehicle is fitted with a GPA system, Video Cameras, where the control office can entirely monitor which vehicle delivers from where to where, at what time, current location and many more at any time. Rather than using the traditional way of monitoring and measuring performance, using these types of modern industry trends, saves more time, more energy, more labor cost. With the integration of Artificial Intelligence and Robotics, it has made a tremendous influence on the digitalization of Supply Chain Management. Though the capital investment of implementation is higher than a manual, paper-based system, it reduces manual errors and enhances the speed of the process. Blockchain is a model with a peer-to-peer network that enhances the transparency of all Logistics transactions. To include a few; Warehousing, Banking & Finance, Agriculture, Retail. With the elimination of intermediaries and other manual processes between these transactions, it reduces cost relating to Intermediaries, Search and Negotiations. In addition, this Blockchain Technology has been able to eliminate the Bullwhip Effect of Supply Chain as functioning as a Decentralized immutable database. For example, earlier when there was a slight change in customer demand, an amplified sign was received by the supplier, due to the long Supply Chain. This was a problem where it cannot be eliminated by hundred percent. But Blockchain Technology will be able to eliminate this problem with its decentralized immutable network. Hence, this is an industry trend that has an advanced effect on firms' Operation Efficiencies, Performances, and Competitive Advantage.

Warehousing is another important aspect of the Supply Chain, where various methods are used, to enhance its operations smartly. Though the JIT (Just in Time) system

is an older concept under Inventory Management, still most of the Manufacturing companies are looking at that as an important cost-cutting tool where the Warehousing cost is the second largest portion of Supply Chain costs. The world reputed car manufacturer; Toyota Company, Dell, HP, McDonald's, ZARA, Nike are some of the best successful companies who are practicing the JIT system. To implement this system successfully, Technology-driven smart applications are very much important to avoid delays from Suppliers. Keeping a good Network and Collaboration with the suppliers is a very much important aspect of the JIT system in order to smoothly run the manufacturing process, such as TQM (Total Quality Management) and Kanban. In addition, fast, efficient, and accurate Data recording systems, Demand Forecasting methods are very much crucial in operating the JIT system. Warehouse Automation is also another important trend for which most of the industries are looking, because of its advantages. Just In Time (JIT), Economic Order Quantity (EOQ), Enterprise Resource Planning (ERP), Electronic Data Interchange (EDI) are some models which introduced, to run the Inventory and Warehouse management process smoothly and increase the resilience over demand fluctuations. But with time, to enhance the service quality, accuracy, speed, and efficiency of those activities, adopt smart models of Warehouse Operations such as Robotic Pallet movers, Autonomous Mobile Robots, Automated Guided Vehicles, Pick by Vision, Pick by Voice systems, RFID (Radio Frequency Identification) devices. It improves efficiency, reduces Labor and Insurance costs, enhances the accuracy of Counting, Shipping, and keeping records, reduces Wastage, eliminates Human errors, and improves Safety for workers by reducing Health and Safety hazards from Slips and Trips, Forklift operations and Stacking. The best example of Warehouse automation is Amazon Company, one of the best business model Innovators in the World. They use Roomba-shaped Drives/Robots, Robot Arms, for Put-away, Loading, Unloading, Storing, Stacking, Track & Trace and other Warehouse activities. Warehouse Automation is not only a process enhancement, but also it opens the path for new job opportunities, revenue earnings; Such as service providers for Material Handling Solutions, Warehouse Management Software developments, Sensors and control providers and many more.

Another new industry trend that has emerged with the Technology advancements in the Last-Mile Delivery system, which is very much important, in order to achieve customer satisfaction and practicing e-commerce. The best example is the Amazon Prime Air service, where Drones are used to safely deliver the parcel to the particular customer and this Smart new method enables to reduce traffic congestions to some extent, and also the Supply Chain becomes more Smarter and helps to gain a competitive advantage with the best quality and reliable service. This is an ideal method of delivery, with the prevailing situation the World is experiencing. Because

One best example from Sri Lankan Context is Expolanka Holdings, where Technology-driven applications are used to manage their Transportation activities. Every delivery vehicle is fitted with a GPA system, Video Cameras, where the control office can entirely monitor which vehicle delivers from where to where, at what time, current location and many more at any time.

rather than using Drones to deliver, when a delivery person delivers the goods, it increases touch points and Social Distance or some other Safety Regulations between customer and delivery person could not be properly maintained. Not only the Drone Delivery system but also with the advancement of Technology, Driverless Autonomous Trucking systems are emerging as they move forward with the best, strategic, and agile approach to cost-cutting, as Transportation cost is the major portion of Supply Chain costs and to achieve a competitive advantage with reducing labor cost and inefficiencies of Workforce. According to the American Tracking Association (ATA), in 2015, 90% of the Annual Labor Turnover ratio was being experienced by Tracking Companies in the USA and also, the labor may not be efficient 24/7. But with the implementation of the Autonomous Trucking system, it was able to reduce increments in final product price, achieve Competitive Advantage by enhancing efficiencies to their optimum level, and generate revenue by reducing labor and other related cost components.

Port operations is another vast area that is very much important in International Trade in the Global Supply Chain. More the world adopts Port and Ship Automation, it saves more time, money, and many more in International Trade. With the rise of Smart Industry Trends, Ports and Terminals are also integrating with Smart Technology and Digitalization. For example, as China is one of the Best Operators and Commercial Powerhouses in the Maritime Industry, operates Automated Ports such as Ningbo-Zhoushan, Qingdao, and Yangshan ports. Also they have integrated Automated Rail Mounted Gantry Cranes (ARMGs), Automated Guided Vehicles (AGVs) with AI and 5G Technologies. Not only China but also Rotterdam Port in the Netherland, Victoria International Container Terminal in Australia, Port

of Los Angeles in the US are some major Automated Ports in the World and also there are more than 40 semi and fully Automated Ports and Terminals in the World by 2021. With the Port Automation it has replaced a cluster of labourers by placing one labourer in the Control Tower. Not only it reduces labour cost but also it reduces manual errors, increases Terminal Productivity, increases efficiency and safety, minimizes Carbon Emission to some extent, etc. Self-Driving ships, also known as Autonomous ships, are emerging with the Technology advancement in the Shipping sector, where it saves more Time and Money in Terminal activities, it reduces accidents during the voyage, reduces Port Congestions, and many more. According to the Allianz Global Corporate and Specialty (AGCS) report, most of the Maritime accidents are caused by human errors. Hence with the use of advanced technology it can give more and more advantages.

Through the facts mentioned above, emphatically it says that the advanced Technology makes the Supply Chain Smarter. But there is an unseen hindrance in this Smart Supply Chain that we should look into. If not, it may

Jobs under threat from Automation by 2030 in selected countries

COUNTRY	Japan	Germany	United States	China	India	Global
Jobs under threat from Automation	26%	24%	23%	16%	9%	15%

Source: McKinsey Global Institute

discourage the development in certain areas in Supply Chain. The main obstruction is a loss of traditional, human powered jobs. Though Technology leads to Smarter Supply Chain, it displaces jobs and caused for De-Skilling the People. According to McKinsey Global Institute, compared to work hours in 2016, 40 million workers will be displaced by 2030.

May it lead to more labour union protests and strikes over the implementation of certain Technology-driven Operations? But with proper Human Resource Management, it could be able to manage labour disputes in the future, to some extent. For example, a manufacturing company where it uses human labour, Robotic Technology is going to be implemented in the production line. Rather than terminating the workforce, company Management can assign them to another job that is related to the Technology implementations by giving proper Knowledge and Training. Such as Computer Programming, Information System Analyzing, Mobile Application Developing, Telecommunication

Line Installing, Website Developing and many more. Another aspect where it obstructs the implementation of Technology in the Supply Chain is the Cyber Security problems. Cyber Crimes are more disruptive over the Supply Chain and other business transactions. There may be a probability of being hacked, phishing attacks, and many more. It may cause disruptions over the Administration, Finance, and Reputation of the company as well. With these types of issues associated with the implementation of Technology in the Supply Chain, the decision-makers of the companies may hesitate to step forward with the emerging Technology. As a famous quote states, "Trust in Allah. But tie your Camel". Thus one should become a Good Cyber Citizen, Tech-Savvy, Web Wise, and being proactive with proper Risk Management and reactive with proper Crisis Management, increase resilience over the Technology related risks. By following the Sustainable, Strategic approach, one could achieve their ultimate goal, where a Sustainable and Smart Supply Chain Management is bestowed.

DIGITAL FITNESS
will be a prerequisite
for SUCCESS

Mr. Saminda Deshapriya
Director/CEO – Logicare Private Limited

You started your career as a Data Entry Operator at Ceylon Tea Brokers PLC, and gradually worked your way up to the Director/Chief Operating Officer at the same company. Now you are the Director/CEO at Logicare. What was your experience like to step into the logistics industry, from a different line of work?

I have a passion of tackling tough problems and following them until I receive a satisfactory conclusion and I always love to work in challenging environments as I get bored with routine tasks. This led me to work in multiple fields of operations and logistics that were challenging and had new learning opportunities. So, when Ceylon Tea Brokers decided to diversify its revenue portfolio and move into Logistics, I took the challenge and became the Director/CEO of Logicare Private Limited which is also called as the logistics arm of the CTB Group. The thirst I have for new knowledge is also one of the key reasons that I decided to work in the logistics industry. Because,

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in a 3PL company you get to work with a large number of clients in various industry verticals, so you learn something new every day. I also pursued my studies in Logistics & Supply chain management knowing that experience and education go hand in hand in achieving success in my chosen path. I graduated as MSc in Logistics and Supply Chain Management from Birmingham City University, UK with a Distinction and became the "Student of the Year 2017/18 - Faculty of Computing, Engineering and Built Environment".

Working under pressure to fulfil deliverables has given me the confidence, expertise and knowledge of systems and processes in the logistics industry and provided both micro-level insights as well as a broad view of logistics operations. So, since I embarked

Logicare is equipped as one of the best one-stop logistics facilitators with a strong ability to serve various industry verticals. We offer technology-driven digital supply chain platforms for our clients to maximize customer value and gain a competitive advantage in the marketplace.

The logistics industry in Sri Lanka is very competitive and there are so many well established 3PL players as well as many small-scale logistics companies. However, most of them were focusing more on physical infrastructure over emerging technologies which can improve capacity utilization whilst optimizing operational expenses. We understood a vacuum for technology driven logistics players in the market and we decided to leverage heavily on logistics and supply chain related technologies. Hence,

With state-of-the-art infrastructure, modern equipment, cutting edge technology and a team of experts; Logicare is equipped as one of the best one-stop logistics facilitators with a strong ability to serve various industry verticals. We offer technology-driven digital supply chain platforms for our clients to maximize customer value and gain a competitive advantage in the marketplace.

on my career in the year 2006 until today, I have had the privilege of garnering extensive work experience in a wide variety of industries with a special emphasis on the logistics, supply chain, operations management, project management, change management and digital transformation.

What is Logicare and how does it stand out from other companies in the field of logistics, by being a digital supply chain platform?

Logicare operates as a total supply chain solutions provider which specializes in providing logistics and other supply chain-related services to clients based on their unique requirements. We offer a wide range of services from warehousing, transportation, value added services, On-Site management, yard storage, last-mile delivery for e-commerce and supply chain consultancy services. With state-of-the-art infrastructure, modern equipment, cutting edge technology and a team of experts;

from inception we operated as a technology partner for our clients with an appetite for logistics in order to position ourselves in the market. So, our USP (Unique Selling Proposition) is our ability to offer technology driven logistics solutions which are highly customizable and scalable, and which can cater to any industry vertical.

That's why within a period of two years, Logicare has managed to partner with leading companies in Sri Lanka as well as top MNC's as their strategic supply chain solutions provider covering various industry verticals such as FMCG, apparel, stationery, Pay TV, electrics, beverages, fashion retail and e-commerce.

As a startup what were the challenges you faced in establishing your presence in the logistics industry while facing challenges created by the COVID-19 pandemic?

Being a startup is always challenging. Everything was built from scratch. From

building a state-of-the-art warehousing complex to finding the right combination of technologies and human expertise was not an easy task. We commenced our commercial operations in mid-2019. As a new entrant to the market, Logicare's dynamism to generate big ideas with an agile mindset to passionately deliver results with resilience, we managed to achieve a considerable growth in a brief period of time and managed to attract customers from various industry verticals.

Eight months from inception we had to face an unexpected challenge, the global pandemic!

2020 has been a year like no other for the logistics industry and created immense challenges for all stakeholders. Operational constraints due to strict control measures taken to reduce the spread of COVID-19 lead to labour shortages, congestion, and delivery delays during the period. Logistics companies had to adapt to these challenges and provide a safer, less congested work environment for employees due to the increased health and safety concerns. However, since we had already invested in automated warehouse processes and advanced software technology platforms, we adapted to this new normal quite fast.

We at Logicare dedicated a significant portion of our resources throughout the year 2020 to helping new and existing customers survive and thrive under the threat of a devastating global pandemic. With our broad service portfolio, agile technology platforms, unwavering commitment of our employees and service providers, we found ourselves in a unique position to help our customers adapt to the challenges the pandemic brought forth. So, regardless of the pandemic situation, we were able to expand our presence in the market and attract new customers from various industry verticals throughout the year 2020. Further, we also managed to capitalize on new opportunities created during the pandemic such as the increased demand for online fulfillment and last mile delivery. That's from where our newest venture "LogiNext" was born.

"LogiNext" is a new initiative of Logicare which is a platform that provides last-mile delivery services and integrated logistics solutions to online merchants. What was the drive behind this initiative and how does technology come into action when operationalizing LogiNext?

Global e-commerce sales have seen a steady growth over the past few years and spiked in 2020 due to stay-at-home orders and concerns over exposure to COVID-19 which prevented shoppers from visiting retail locations. We decided to leverage on this growing trend and launched LogiNext, an online fulfillment and last mile delivery platform that is available to retailers to enhance their online shopping experience for customers. LogiNext assists online merchants to manage and grow their businesses while offering integrated logistics solutions ranging from order fulfillment, last-mile delivery to return management.

Same-day delivery is a game changer because it combines the immediate product availability of bricks-and-mortar stores with the convenience of ordering from home. Online retailers are expected to benefit from

> Our technology platform which we use for last mile delivery includes all the features route optimization, capacity planning, navigation, live tracking and real-time delivery information which is required to deliver a package fast and safely.

reduced delivery time, as the demand is expected to increase significantly given the compelling value proposition of same-day delivery for consumers.

LogiNext's world class technology platform can be seamlessly integrated for input and output of data with any ERP system or e-commerce application which assists in fast, accurate and efficient fulfillment process whilst enabling end-to-end visibility from order to delivery to all stakeholders. Our technology platform which we use for last mile delivery includes all the features route optimization, capacity planning, navigation, live tracking and real-time delivery information which is required to deliver a package fast and safely.

Having already partnered with some of the fastest-growing e-commerce retailers who are looking to increase customer satisfaction through order accuracy and speed of delivery, LogiNext's vision is to become the leader in e-commerce order fulfillment and last-mile delivery in Sri Lanka.

How is technology reshaping the field of logistics and supply chain?

We are in the middle of a significant transformation altering traditional ways of working thanks to "Industry 4.0 - Fourth Industrial Revolution" which started with the digitization of manufacturing. This transition is so compelling and in the field of logistics and supply chain it is being called "Supply Chain 4.0". Supply Chain 4.0 includes the application of Internet of Things (IoT), Advanced Robotics, Big Data, Automation and creating seamless Supply Chain Networks to significantly improve performance and customer satisfaction.

Control Towers are becoming more popular day by day in global supply chains. Supply chain control tower is a platform which integrates information systems of all the supply chain partners and logistics providers in the supply chain network and enables them to work together in real-time to serve the end customer more efficiently and at a lower cost. It allows supply chain leaders to monitor, manage, plan and execute decisions across their companies and with their partners. It proactively alerts potential problems, their route cause and contributing factors, and makes recommendations via AI to solve those problems quickly and efficiently.

Technologies such as Robotic Process Automation (RPA) assists the logistics and supply chain industry in completely automating time-consuming, manual repetitive tasks in organizations which are prone to human error. Robotic Process Automation (RPA) is a technology which allows configuration of a "robot" to emulate and integrate the actions of a human interacting within digital systems to execute a business process.

RPA robots can log into applications, move files and folders, copy and paste data, fill in forms, extract structured and semi-structured data from documents, scrape browsers, and more.

Technology is changing every aspect of Logistics & Supply Chain and this disruption requires companies to rethink the way they design their supply chain. Besides the need to adapt, supply chains also have the opportunity to reach the next horizon of operational effectiveness, to leverage emerging digital business models, and transform the company into a digital supply chain. Therefore, 'Digital fitness' will be a prerequisite for success: the winners will be those who understand how to exploit a whole range of new technologies. Those who don't, risk obsolescence.

With the disruption of normal routines and standard business practices due to COVID-19, organizations are now looking for emerging digital technologies to ensure they're better prepared for the future. It is important to note that advanced logistics technologies and automation capabilities were developed even before the pandemic. However, COVID-19 forced enterprises to accelerate their own digital journeys without further choice. It's been a wakeup call for those who were focusing more on physical infrastructure over emerging technologies which can increase capacity utilization whilst optimizing operational expenses.

Traditionally, logistics companies only focused on a few technologies such as Warehouse Management Systems (WMS), Transport Management Systems (TMS) and Enterprise Resource Planning Systems (ERP) in isolation without considering the benefits of integrating many technologies together to generate enterprise-wide solutions. However, today the game changers are those who understand how to exploit a whole range of new technologies, from data analytics, artificial intelligence, automation to platform solutions. Since there are so many technologies on offer defining a clear digital strategy that's integrated into one's business strategy will be critical for logistics companies prior to investing in new technology.

How does Logicare offer more optimized and resilient logistics and supply chain solutions to its clients by integrating a range of technologies?

We leverage on one single technology platform "Logicare - Supply Chain" which integrates a range of advanced technologies from WMS, TMS, ERP, Power BI, PowerApps, Robotic Process Automation (RPA) and Microsoft Azure to provide our valued clients with suitable, advanced and sustainable logistics and supply chain solutions.

Modern distribution center operations must have perfect inventory, optimized processes and motivated workforces to boost productivity and reduce operating costs. With our industry-leading Warehouse Management System (WMS), "HighJump" we quickly and efficiently track everything received at our premises, managed and are dispatched from our distribution center.. "HighJump" is a WMS that was built specifically to handle multi-client logistics operations and it assists us in managing every aspect of our warehousing business whilst our customers gain visibility into their inventory in real time. Our AI driven Transport Management System (TMS) enables us effectively managing our Transport and Last-Mile Delivery operations with dynamic route planning, capacity planning and resource optimization. To make the right decision, it is important to have the visibility of data in the right format, at the right time. By right format, I mean something which is easily understandable, and which creates hidden value. We use Power BI Dashboards to assist our clients

> With the disruption of normal routines and standard business practices due to COVID-19, organizations are now looking for emerging digital technologies to ensure they're better prepared for the future.

in making informed decisions by converting historical and real-time data of their operations to actionable insights. We use Robotic Process Automation (RPA) tools such as UiPath to automate time-consuming, manual repetitive tasks of our client's operations and our internal business processes. More importantly our technological platform can seamlessly integrate with any ERP or Supply Chain Software available in today's marketplace.

Supply chain agility is a major concern in the field of Logistics and Supply Chain. What is the role of data analytics in ensuring that?

In simple terms supply chain agility is how fast you can adapt to the changes taking place in the world around you. So, companies need to respond to short-term changes in demand or supply quickly and should be able to handle any external disruptions smoothly. In my view agility is not about changing, it's about what's next? So, what could happen in the external environment? It could be another pandemic, natural disaster, tariff increase, exchange rate fluctuation or major change in the consumer behavior.

Companies who can adapt fast to external environmental changes by predicting the future through predictive analysis are the

Collectively known as Big Data, this wealth of information serves very little purpose unless it is utilized. Unfortunately, only about 10% to 15% of modern supply chain data is used effectively.

people who will survive. Previously we had technological tools to analyze quantitative data. But now we have advanced technologies to analyze qualitative data and convert the results into quantitative data. This has a huge impact when analyzing complex scenarios like consumer behavior. Customers' social media interactions could give insightful information about future demand towards a product or understand trends in demand.

There is no other industry which has placed such high importance on data and analytics in the next five years than transportation and logistics. There are vast opportunities here to improve performance and serve our customers better. Logistics providers are a part of a digitally integrated value chain and they can benefit from significantly improved forecasting to scale warehousing and transpiration capacity up or down and plan routes in distribution and last mile logistics.

We can now leverage supply chain analytics to execute key decisions. Data analytics help us to understand the past and also to

predict the future with greater accuracy while avoiding potential disruptions which are more frequent in complex global supply chains. Global supply chains are changing rapidly therefore, supply chain leaders have mandated a data-driven future. So, if we want to be competitive and agile, we have to leverage data and analytics.

Massive amounts of data are generated throughout supply chain networks daily. How could such data be effectively utilized in ensuring resilient supply chain networks?

With the rise of Cloud Technologies, Internet of Things (IOT), the use of connected devices and various Business Intelligence and Data Analytical tools most organizations in the world are now rich with a wealth of information which can be analyzed systematically to reveal patterns, trends and relationships. Supply chains are going digital and now data is being created from a wide range of sources, and we are flooded with data. This is the trend called Big Data – more and more data pouring into information systems that need to store and structure.

The global retail sector alone currently creates about 40 terabytes of data each hour which is not just data but are demand signals of consumers. According to the World Economic Forum (WEF), by 2020 accumulated digital universe of data would amount to 44 zettabytes which is an increase of 10 times compared to 4.4 zettabytes in 2013. By 2025, it's expected that 463 Exabyte of data will be created each day globally – that's the equivalent of 212,765,957 DVDs per day. Collectively known as Big Data, this wealth of information serves very little purpose unless it is utilized. Unfortunately, only about 10% to 15% of modern supply chain data is used effectively. Supply Chain resilience can be achieved only if data drives the supply chain decisions. This means taking action based on the data generated from the supply chain to address predicted and unpredicted events. But if we are still using traditional systems which keep data siloed and compartmentalized, it is not feasible to build resilient supply chain decisions.

The fact of the matter is, even in today's digital world, most supply chain managers don't have a broad view of what is happening in their global operations. This is because most of the global supply chain information is spread out across disparate and siloed technology systems or processes. In many cases, these systems are external systems owned by third-party logistics providers. When the information is decentralized, even simple questions are hard to answer. It takes too long to get answers and even then, the information is generally not complete and perhaps inaccurate. Without access to timely and complete information, businesses are essentially flying blind.

With all this data, companies should select correct technology platforms (data warehouses and analytical tools) to store, structure and filter data in ways that allow us to create actionable insights. Data science is an essential capability that companies should develop in-house if not at least seek for external expertise. You can't manage, what you can't see!

Therefore, we need to harness all of the bits and bytes of digital data and make it useful for your supply chain, in order to become more resilient.

Do you think maintaining a research and development section in Logicare is important? Do you think it is worth enough to invest in Research and Development?
Yes. R & D is very important, not only for the logistics industry, for any industry. I think that is one thing that we lack as a country as well. So, as an industry and also as a country we should heavily focus on R & D. In my point of view, a considerable amount of our time, effort and funds needs to be allocated for research and development activities and it will create an organization which focuses on continuous improvement and a culture of innovation and creativity.

Digital ecosystems provide a digital foundation for new business models and address adapting existing business models to future multisided businesses which connects demand and supply.

When the competitive environment is changing rapidly and traditional 'ways to play' are fundamentally changing as it puts a company's culture to the test. So, the logistics companies need to be ready for this change, and the successful companies will be those with agile and flexible cultures that make it easier for people to work together across internal boundaries. We need to put our culture to work.

In terms of Logicare, we invest heavily on R&D and our team is continuously working on emerging digital technologies to create more advanced and future ready logistics solutions to our clients. We also focus on developing new services and solutions which would create new demand, instead of following the current demand. Our innovative culture which enables our employees to try new things and learn from failures has paved the way to become one of the most technologically advanced 3PL companies in Sri Lanka.

What type of challenges and risks that logistics industry might face in the future?

Increased price competition, new market entrants, new technologies, ever evolving customer expectations, new business models and also the impact of the current pandemic are the key disruptors to the industry at the moment. More importantly, the 'asset light' digital business models which are platforms just focused on matching demand and supply, which are often driven by start-ups, would continue to disrupt the logistics and transport sector in the next few years.

Although we all expect an economic recovery, its size, shape and timing still remain in question and is therefore important to make cost-efficient moves, fast. So, similar to most industries, the logistics industry is also currently confronting an immense change, which creates both risks and opportunities. Although the core needs of most customers have changed very little, customer expectations are increasing significantly. Therefore, businesses have to move their goods faster, more flexibly, and with more transparency at a lower cost. As a result, the logistics companies are under severe pressure to deliver better service at a lower price. However, companies across industries have a case to shift from cost-focused logistics functions to embrace more adaptive solutions for an uncertain decade ahead.

In future, can a logistics company meet the growing expectations of customers, remain profitable and generate growth?

It is possible. But it's not going to be simple or easy. In order to be competitive, logistics companies need to focus on cost efficiency, asset utilization and productivity and innovative business models.

How healthy is the digital ecosystem that is increasingly embraced in logistics and supply chains globally, and tell us your thoughts about the true potential?

Digital ecosystems provide a digital foundation for new business models and address adapting existing business models to future multisided businesses which connects demand and supply. For example Uber, Airbnb and Amazon connect drivers and passengers, hotel owners and guests, merchants and customers. With the development of digital ecosystems traditional logistics companies like FedEx and UPS will be heavily impacted by the likes of Amazon and Alibaba as they are developing their own logistics networks around their online retail platforms. The Covid-19 pandemic has accelerated the digital transformation in the logistics industry and have encouraged a lot of new tech savvy logistics startups offering last mile delivery services to online retailers.

Blockchain enabled digital ecosystems provide transparency, auditability, tracking and exchange information between partners in their respective value chain, to solve many of the traditional problems in the logistics and supply chain, including tracking, fraud detection, contract management and cash management. Rise of ecommerce platforms has enabled SMEs and social entrepreneurs to access both local and global markets and create a better reach for their products. More importantly, digital ecosystems have enabled data driven decision making for supply chain partners and logistics providers which would lead to more resilient supply chains.

As concluding remarks, how important is it for young undergraduates to broaden their skill set to suit the futuristic jobs that will drive the field of logistics?

The future of work is going to be very different from what it is now. In the next five years, Artificial Intelligence, Mass 3D Printing, Machine Learning, Robotics, Biotechnology, Virtual Reality, Chatbots, Deep Learning, Drones, Augmented Reality and Smart Objects, will be deeply rooted in our everyday lives. So, these technology developments will transform the job market in the next five years and some of the current job roles would be redundant. According to the World Economic Forum (WEF), skills gaps continue to be high as in-demand skills across jobs change in the next five years and 40% of existing workforce will require reskilling and upskilling. According to WEF, the job role of Logistics and Supply Chain Specialists is still being identified as in high demand. However, employees would look for new skill sets

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such as active learning, complex problem-solving, analytical thinking and technology use, monitoring & control in logistics and supply chain professionals.

So, my advice to young graduates, you need to have a growth mindset where you have the desire and the confidence that you can learn anything. Traditional education systems are struggling to keep up with the skills demanded by future jobs. But there are so many online and offline courses readily available. Follow a Masters in Logistics and Supply Chain. Follow online short courses. Platforms like "LinkedIn Learning, Coursera and Udemy" offer millions of online courses which are inexpensive, flexible and rich in content.

How can you stay relevant? The digital skills gap is ever growing. So, train yourself. Take your education into your own hands! ◾
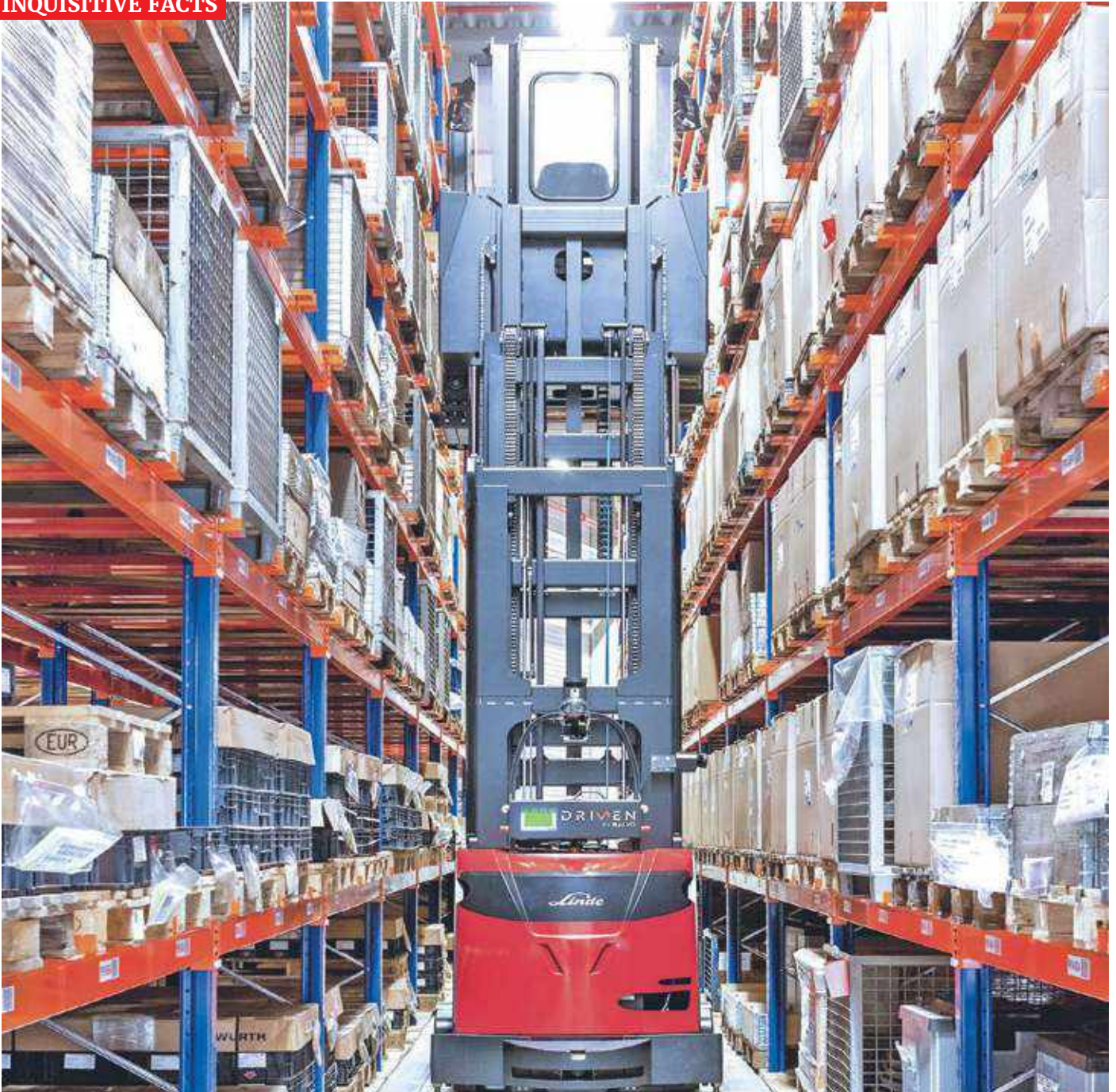
VNA SOLUTIONS
(Very Narrow Aisle Solutions)

VNA is a warehousing design that makes the aisle narrow as possible while utilizing tall racking systems for material storage to increase efficiency. This is an ideal design for both picking and pallet handling operations.

FUN FACT

Did you know that aisles can be narrow as 6 feet, which in turn means that around 40% - 50% of the available area can be dedicated to storage facilities.

VNA is a very effective method of increasing storage with a given area. This solution allows access to all the pallets and costs effective. Today, modern truck designs and forks allow for aisles as narrow as 65 inches without the need for a guidance system. If you have limited space and you cannot or don't want to move to a more spacious warehouse, this solution will be ideal for your business.

"The Digital Supply Chain is characterized by real time, end to end electronic connectivity across your entire extended Supply Chain. With this electronic connectivity you will have all information at your fingertips about what is going on anywhere in your Supply Chain. And it is this connectivity which will put you in the best possible position to deal with any crisis or any eventuality."

-Mike Mortson-

FUNCTIONS OF SMART SUPPLY CHAIN MANAGEMENT
AND ROLE PLAYED IN COVID- 19 PANDEMIC

PANCHALI RATHNAYAKE
Undergraduate
CINEC Campus, Malabe

As conventional supply chains are getting more and more sophisticated with more sensor-embedded artifacts and improved connectivity, smart decision-making, and automation technologies, the modern smart supply chain provides unparalleled opportunity to cut costs and increase performance. The different forms of end-to-end logistics and supply chain management in the sense of Industry 4.0, the Internet of Things (IoT), cyber-physical networks, digital technologies, sophisticated data processing, and (semi-) autonomous decisions allowed by Artificial Intelligence (AI) are concerned with Logistics 4.0 and Supply Chain Management 4.0 or smart supply chain management.

Digitalization is expected to lead the growth of 4PL suppliers and disruption, as shifting logistics relationships and technology-driven capabilities enable new players to join the 4PL market. With the multiple intermediate phases and components of the supply chain and intelligent and effective movement through all these various steps, logistics is bringing everything from A to Z in a holistic way and attaching to it the element of autonomy. In all possible logistics chains and environments, from driverless transport to intelligent containers, smart warehousing, smart ports, smart shelves to human sharing and information are exchanged. In this sense, Blockchain is also a big game-changer as the list is long with myriad use cases for distributed ledger technology in transport, smart ports, cross-border maritime transportation, and retail. The complexity of smart supply chain management is vast. It can strengthen any function of the supply chain, from stock forecasting to demand and supply management. Smart supply chain management, correctly implemented, will revolutionize strategic decision-making, delivering a fully scalable and streamlined environment.

Mitigating confusion is the main factor behind the implementation of technological advances in supply chain management. Companies use a combination of after-the-fact spreadsheets and Enterprise Resource Planning (ERP) observations as the basis for supply chain decision making, equivalent to landing an aircraft based on information about previous landings rather than reliable, real-time data from radars. With manual techniques, monitoring the movement of every object through several shops and warehouses is rarely feasible. If the availability of a Stock Keeping Unit (SKU) has changed between the moment it was monitored and the moment an employee checks a spreadsheet, one can never be sure. And also, with manual methods, it is difficult to monitor the detailed details about individual objects within a specific SKU. For example, at a warehouse, a warehouse worker knows they have 1000 packs of perishable products. The production date for each pack is, however, unclear, so it is difficult to identify which of them should first be sold.

When not deployed in all activities, smart technology is inefficient. All potential data points, ranging from warehouse management to client relationship management, should be added to the transportation management system. Data collection can be supported in many ways, including Bluetooth-enabled smartphones, Radio Frequency Identification (RFID), automatic scanners, and robotics. Small to medium-sized shippers will look fearfully at the growing use and introduction of smart supply chain technology.

The acquisition costs can seem large for beginners, and remaining competitive can seem unlikely. The growth of third-party logistics suppliers (3PLs) is also changing the game. However, in favor of becoming more than just a logistics supplier, a growing number of 3PLs are abandoning tradition. They also developed software-as-a-service (SaaS) systems that can easily substitute intuitive. In the meantime, the data obtained by the 3PL from the implementation of a cost-effective as-a-service transportation management (TMSaaS) system, such as the Cerasis Rater, will offer insights into operations that were not previously available which is a smarter technology for current enterprise resource planning (ERP) technologies. Cyber security could be an afterthought in introducing emerging technologies. However, on both the system's servers and inside the cloud, dedicated TMS applications and their parent organizations have also taken action to build a safe ecosystem through sophisticated cyber security initiatives. Consequently, shippers should concurrently strengthen cyber security.

Industrial Internet of Things helps to achieve better insight into the supply chain processes by evaluating the data collected from sensors and/or RFID tags. For example, a supply chain management system may provide warehouse staff with real-time positions or locations, the status of the inventory, and etc. data by analyzing the data from RFID tags attached to inventory products and sensors mounted in a smart warehouse. At the same time, the Industrial IoT lays a stable base for supply chain process automation with advanced data science techniques. An IoT-based supply chain management system, for example, will estimate the amount of inventory expected for the upcoming manufacturing period, prescribe the ideal replenishment date, and even submit a replenishment order to a supplier automatically.

Smart supply chain infrastructure can be both self-organizing and self-optimizing, and real-time data from linked sensors around the plant can be combined with data on individual consumer needs. A smart machine can anticipate a potential operating bottleneck resulting from an incident and this can be used to simplify the process and avoid waste from the surplus output by pre-empting this form of event. This will make for leaner production and operating performance since most

suppliers also store high-risk repair components, extra costs and energy, and even precious manufacturing space may also be taken up by this. To track the status of all running equipment in a plant intelligent analytical tools can be very useful there. This will be communicated to the plant managers if particular machinery is not working at an acceptable stage and can easily arrange new replacement parts. Besides, an easy approach to achieve greater productivity is to integrate the intelligent supply chain into this method. The average lifetime of the system will be increased if the equipment would reliably identify and track operating faults with the system and then adapt accordingly. Due to rising consumer demands and customer preferences, supply chain openness has developed an increasing issue for suppliers. In catering to eco-conscious customers, transparency in the supply chain can be very effective, and keeping a clear IoT supply chain can assist to avoid delays that might place processes in the supply chain at risk.

Smart supply chain infrastructure can be both self-organizing and self-optimizing, and real-time data from linked sensors around the plant can be combined with data on individual consumer needs.

Cost reduction is more important because, improved supply visibility and process status digital collaboration for inventory reductions, increases the balance between supply and demand, and facilitates predictive maintenance and real-time process interventions. In combination, greater resource efficiency and end-to-end cost reduction are promoted. An unparalleled degree of precision helps some companies reduce baseline operating costs by more than 15% and free up time and resources for growth.

But, as business enterprises snap their fingers and upgrade their supply chains, it is not as easy. One major challenge is the huge amount of knowledge needed to optimize digital supply chain systems. Although 90% of manufacturers accept that Industry 4.0 will change their operating environment, fewer than half are prepared to take steps to integrate it, citing process concerns and the large amount of data required. By using existing data sets, companies can realize radical efficiencies. Artificial intelligence and machine learning can close the gap, helping companies analyze and understand mountains of data to maximize efficiency, solve complex organizational problems, and gradually move from a reactive and preventive to a predictive and prescriptive approach.

As the entire process remains subject to strict supervision and regulatory enforcement, continuous monitoring and accountability will be essential. This problem can be solved very well by real-time tracking of cold chain logistics service providers bringing these vaccinations to the specified locations.

Machine learning skills also free executives from dealing with daily mundane challenges, allowing them to focus more on planning and strategizing for the supply chain. As explained by many reputed scholars, machine learning can also boost forecast accuracy by up to 20 percent, potentially leading to a 5 percent reduction in inventory costs and a sales increase of up to 3 percent.

The key to successfully outsmarting the pandemic could be real-time tracking and monitoring of shipments to help shipment carriers avoid COVID-19 hotspots and deliver shipments, with limited variance from planned delivery times. To propose an optimized route to drivers, government-owned track-and-trace applications can be combined with existing smart solutions. Blockchain-led custody management during the shipment journey will ensure "COVID-19 secure" delivery of the shipments as a bonus. This can become the foundation for a forward-looking and sustainable concept that can help to reimagine a post-COVID-19, wealthier, safer environment. A smart logistics solution such as this will allow a company to see beyond the intricacies involved in their products' supply chain journey. As scientists and researchers around the world aim to produce a breakthrough vaccine, ensuring that these vaccines are administered in the right conditions, in the right places, and at the right times is an important part of the path towards a cure.

As the entire process remains subject to strict supervision and regulatory enforcement, continuous monitoring and accountability will be essential. This problem can be solved very well by real-time tracking of cold chain logistics service providers bringing these vaccinations to the specified locations. For many of our main services to keep running, the pandemic has demonstrated how reliant we are still on manual processes. In our digital world, autonomy and IoT are the only two most disruptive innovations, so private couriers, buses, trains, lorries, and van drivers should not be forced to place themselves at risk when offering a service such as hand-delivering parcels to our doorsteps.

While we could be going through the worst, to minimize the likelihood of a third wave, protective measures such as social distancing and minimal in-person interaction will need to be enforced for the near future. There is a need for breakthrough technologies to expedite and accelerate the introduction of autonomous applications and processes to be both technically feasible and economically viable. All of the excellent options for this are last-mile distribution, supply chain logistics, and freight. However, for systems dependent on camera or LIDAR technology, particularly in poor/low light or adverse weather conditions, significant safety concerns remain. The widespread implementation of smart logistics, smart transport, or smart distribution systems is just not feasible until this is resolved. �
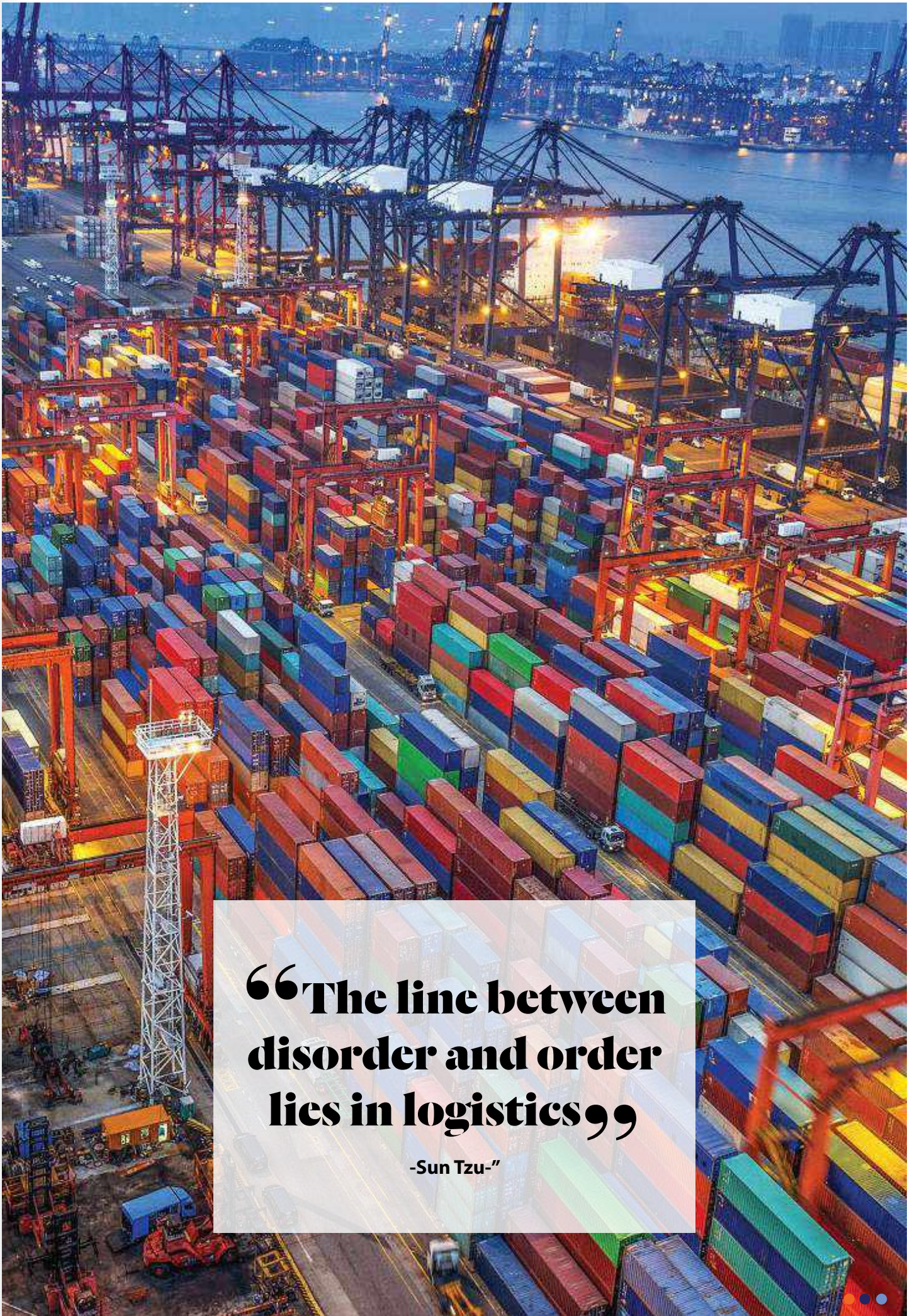
"The line between disorder and order lies in logistics"

-Sun Tzu-"

Logistics operations of the SRI LANKA NAVY ARE DIGITALIZED

Commodore RACN Ratnayake
(NRS 0591)

USP, PSC, MBA(LM), BA(DS), LLMC

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Please tell us about yourself and the journey so far?

I studied at Mahanama College, Colombo and then I joined the Sri Lanka Navy in 1988 through the Kotelawala Defence University. I belong to the 6th intake of KDU. After the completion of my degree, I joined the Naval and Maritime Academy for my Sub Lieutenant technical course, and thereafter I attended International Junior Officer Logistics Course at HMS Raleigh UK. I did my specialization in India INS Hamla where I got my Master's Degree in Logistics Management. Then I did my staff course at Naval War College USA, Rhode Island, and thereafter I did some courses and at present, I'm a research scholar at KDU.

I have been serving SLN as Logistics Officer and have performed duties as secretaries, stores officers, procurement officers, supply officers onboard, Deputy Director at many logistics disciplines in SCM. Before I was appointed as Director Pay and Pension, I served the Northern Naval Area in KKS as a Commodore Superintendent logistics, and even before I was the Director Naval Victualling and Clothing, and at present, I'm the Director of Naval Pay and Pension.

What is the contribution of the Naval logistics branch to the rest of the operations at Sri Lanka Navy?

If you take logistics as a definition, it starts way back in ancient war times. For easy reference, I'll divide it into four phases which are; the pre-modern army, the modern army, after the industrial revolution, and the informational age. In pre-modern days, war is very easy. There is no logistics process where it was set. The logistics all depended on Just In Time and the modern armies do foraging or local procurement where they march along the terrain and whenever they find a place where food is available they do forage or they do purchase because they didn't have a large store that we have now. So if we go to the era of pre-modern armies the definition starts from there. According to Napoleon's definition, real knowledge of

supply and movement factors must be the basis of every leader's plan: only then can he know and when to take the risk with those factors and battles of the war. This definition was further developed by Marshall and he states that logistics becomes the core of generalship to get military forces into the theatre of war into superior strength. So it's defined differently if we go to the oxford dictionary. Logistics is the organization of supply stores, quarters necessary to

supply troop moments, and expeditions. In the recent definition, Kane in 2000 defined logistics; if war is politics the art of possible logistics is the corresponding side." Since If you toss a coin where the head is the war the other side of the coin is the logistics."

At present, the navy is a unit victorious force in the war against terrorism, which had four phases. After the culmination of the protracted war, the Navy was assigned with

different duties. Most importantly the nation-building duties. Then thereafter supporting the government to secure the law and order and supporting the public during natural calamities and other than that we have our prime role, which is safeguarding our seas, search and rescue operations, disaster relief operations, salvage, supporting and rescue operations for distress at sea and mostly ensuring the economic interests of our Territorial Waters, Contiguous Zone, and Extended Economic Zone. SLN has a fleet, ships are patrolling around the legitimate waters and the logistics branch is the backbone of all these operations because we are the supporting force. As mentioned earlier SLN has a prime role, to safeguard our territorial integrity, our economic concerns, political concerns, social concerns. So all

> That we have our prime role, which is safeguarding our seas, search and rescue operations, disaster relief operations, salvage, supporting and rescue operations for distress at sea and mostly ensuring the economic interests of our Territorial Waters, Contiguous Zone, and Extended Economic Zone.

such concerns towards the country mostly influence through the sea, we have to refute those, that's our prime role. Other than that we have natural calamities which the navy has to support. And if there is pollution in the waters, the navy would be the first to go over there. So there are salvage operations and you have witnessed this during the past years. Operations other than that war are very different at present.

How does the Victualling system at the Sri Lanka navy operate and what precautions are taken to ensure the smooth flow of all related activities?

The Victualling system of the Sri Lanka navy can be divided into two as pre-tender and post-tender. Pre-tender work is very centralized and post-tender work is decentralized. Pre-tender work is common to the Sri Lanka Army, Navy, and Airforce. The tri forces forward the requirements to

the Ministry of Defence considering the past consumption and the requirements. Navy strength is a number and it is a constant unless there is a requirement to recruit more people into the services. The way of feeding people according to the culture, taste, and Working environment is also a constant. Sri Lanka navy maintains a common menu for all sailors where it maintains for fifteen days and it is circulated during the month and the year. The Ministry of Defence calls for competitive tenders through the National competitive bidding process and the most responsive and suitable suppliers are selected to supply the victualling items for the Amy, Navy, and Air force for the respective financial year and it is when post-tender work starts. When the awarding of contracts is informed to the Commander of the Navy it is then passed to the Director Victualling and Clothing of the SLN for administration, and he passes it to the seven commands of SLN where all other establishments and ships are under the seven commands. There are two types of supplies for the supply of fresh provisions and dry provisions. So SLN has 210 plus dry provisions and 190 plus fresh provisions which are available for consumption. Thereafter according to the menu and the strength of the supplier the order is made with the contractors. After contracts are signed the Treasury decides the amount of Ration Allowance for personnel which is common to the tri forces. The ration allowance is a bit high for officers and low for sailors. Since the stipulated ration allowance, menu per person, and the number of individuals are known and unless you are in a mission people should be fed accordingly and at the end of the month, the victualling accounts are forwarded to the Director Naval Victualling and Clothing where the balancing of the administration of accounts takes place.

The SLN is maintaining central stores at each command for the smooth flow of distribution among demanding units. Each naval command has appointed an Area Victualling Clothing Officer and he has stores. The SLN victualling system depends on two concepts, just in case and just in time. Just in time is applied in the victualling system. If you are a supplier of fresh items, you are given 24 hours of advance notice and a dry provisions supplier is given a notice of 48 hours to supply the victualling items to the stores. So in practice, it is Just in Time concepts for the two types of provisions.

Due to reliability issues of suppliers, scarcity of that particular item, and the transportation problems and behavioral problems we stock dry provisions for one month's stock in our stores. So the area Victualling and Clothing Officer maintain the stocks at stores also the bases are allowed to store two weeks of stocks. The fresh provisions are delivered daily. Performance appraisals of the contractors are also conducted monthly basis where they are categorized according to performance in different levels and the same is forwarded to the Ministry of Defence for necessary action and recording purposes. The accounting system that is present too helps in the smooth functioning. The Area Commanders, his principal Staff Officers, and the Commanding Officers at different levels tactical, operational or strategic levels carrying out inspections and ensuring a smooth run. The grapevine method of communicating is also used to evaluate to ensure the proper functioning of the operations.

COVID 19 pandemic imparted many challenges to the entire global community. However, it also showcased the utmost importance of logistics and supply chain activities. How important was the logistics branch to keep the supply chains in Sri Lanka moving during the pandemics?

SL Navy's budget is almost 61 billion rupees and it is divided into different sections. There are two sections as recurrent and capital expenditure. Whichever expenditure it is the acquisition of service or good is involved. Purchases start with rising demand from the tactical, operational, and strategic levels. This is followed by the pull and push theory. The requirement from the tactical level is considered to be a pull (just in time) while if it is from the strategic level it is considered to be a push (just in case). Items can be acquired according to the delegation of authorities depending on the level and cost and requirement. As the strategic level has a bird's eye view of what SLN is going to do next, and therefore, the senior command plan the acquisition of the items to maintain the capabilities that are required to be available in the tactical and operational level and the operation ability of SLN fleet. However, the Navy does not manufacture the requirements we are supposed to have, therefore we need to get it through someone else such as suppliers, local agents, principal agents, regional agents, proprietors, retail shops, etc. SLN uses highly sophisticated technological equipment on board ships such as highly capable engines, generators, auxiliary machines, weapon systems and navigational equipment, etc. none of which is manufactured in Sri Lanka. Thus the items need to be imported from overseas. This is when the challenges of logistics during the pandemic come to play. During the pandemic, almost all of the manufacturers stopped manufacturing items due to the issues with supply and demand. With the demand reduction, restrictions related to world transportation through air, sea, and land, loss of jobs, restricted operations, compression in the economy, and closing down of companies; companies did not manufacture items according to the demand that existed previously. But being an organization like SLN we do our operations even in the pandemic situation and the SLN cannot be closed down. Our running

hours are not of concern due to various issues like drug trafficking, illegal fishing, human smuggling, disasters, etc. and SLN works around the clock which leads to machines getting deteriorated and wear and tear. Maintenance and repair of these machines require lubricants, fuel, and spare parts that are imported items from overseas. Communication is also a problem due to isolation. Because of that during COVID-19, the largest challenge we had was operating even with restrictions. The efficiency, personal relationships, timeliness, and communication were of utmost importance during this situation. Some officers who were infected with COVID-19 had to work

and store them to a particular place for distribution. But today when ships are plying thousands of nautical miles away from the country we have to ensure the logistics for them. When ships sail for the mission they may come back after two, three weeks, or even a month. So at present, our challenges are different and our questions are always, how? Where? When? what? to support them, or up to which extent can we support them? What quantity is needed to sustain our troops?

Then the next challenge we face is the time duration. Earlier we had sufficient time to plan, control, and direct our logistics

Logistics need to be more responsive, more flexible and should be very fast. Therefore, problems arise as to how we are going to store our stocks. Having thought of anticipatory logistics for speculation or are we going to observe just in time and make our logistics system more lean and agile.

even at isolation centers due to this reason. And that much of commitment as extended by the logisticians. Even with these challenges, we had to ensure the minimization of waste, adhering to the prescribed guidelines, ensuring economic effort, transparency, and accountability of work, whilst ensuring the highest efficiency and effectiveness. When you come to the feeding of personnel that are also effectively executed by SLN logisticians even with so much of restriction in the country as well as overseas.

What are the challenges faced by the Sri Lanka Navy and how are the advanced technologic and specialized vessels utilized to optimize the logistics operations?

At present in the emerging challenges, all military components are stationed in different places. So the forward bases are the main concepts that are why the aircraft carriers, frigates, and big ships came into the effect. Sri Lanka navy has advanced offshore vessels and our inventory of fleet is getting a little bit higher and much-sophisticated technology is being used at present. Our requirements are different because those days when fighting against terrorism we had the ability to send stocks

but now time duration is limited. Suppose there's a particular vessel in disaster, three-four thousand nautical miles away from the country, where it is our responsibility to undertake rescue and salvage. Then we have to respond quickly so then the time has become short, because of that, logistics need to be more responsive, more flexible and should be very fast. Therefore, problems arise as to how we are going to store our stocks. Having thought of anticipatory logistics for speculation or are we going to observe just in time and make our logistics system more lean and agile.

And the other challenge that our missions are now varied. The SLN is not acting or responding for the operations alone; we are now integrating with other agencies. The Navy has to work with several governments, private authorities' littoral countries around if in a salvage operation, maritime pollution, or on search and rescue operations. Therefore, the interoperability of logistics is most important because we have to support each other and coordination is most vital when facing future challenges. Why this is much important as SLN has to execute operations other than the war. Which means responding to natural calamities, nation-building efforts, UN missions, etc.

The next challenge is advanced technology. Technology is updating day by day. So to the logistics system, it is a big challenge because if you purchase a ship, if you purchase a system it is going to be obsolete shortly. So in a country like Sri Lanka, we have to take those technologies for years or maybe decades. So during that time sustaining that particular technology in this volatile environment is very difficult, because technology is getting updated. But for us, updating that technology is a costly affair because certain items are not in production as such maintaining that technology is a challenge.

Integrating logistics with the commercial world is another challenge. Though logistics started with the militaries; scientific researchers in the Second World War, the invention of the container by the Americans on the eve of the Vietnam War, the barcoding, influenced the business world to take lessons from the military and develop these theories in the military to suit the business world. The theories that were written by Sun Tzu and Clausewitz are being used by the commercial world and they are practicing today. So logistics itself is going to be a bit of a task to the military because though we taught to the business world, now we are learning from the business world. Working with the commercial world is a task for the military officers because the technologies are different, systems and processes are different. Further ERP's has come to act where the commercial world is now interconnected and woven in the system. So the military personnel and logisticians need to be far more educated today because though commercial people think about their profits, militaries concern with life.

Another challenge that I want to highlight is waste. SLN functions with the funds provided by the taxpayers. So each cent we spend on our operations is accountable and the responsibility of logisticians. Our process has 3 distinct categories. Which are transformation, flow, and value. The transformation includes all inputs and outputs. Whichever good or service we consume is for the efficient execution of our task. Flow representing the process, procedures, and ships, craft, and machines we used. The value represents how effective SLN is for the citizens of this country. Any waste in these three categories to be eliminated as much as possible then cost representing our output shall be minimized. As such our taxpayers would be happy with their payment.

What are your recommendations to further digitalize logistics operations in the Sri Lanka Navy?

The logistics operations of the Sri Lanka Navy are digitalized to a very high extent. SLN first to digitalize the pay system out of the 3 services. In 2006 we started an integrated logistics management system, which is an Enterprise Resource Planning system (ERP) and this process is now working very efficiently in the Navy. Almost all the 7 storing yards are being connected and the logistics system connects the tactical, operational, and strategic levels. In parallel, SLN digitalized personal directorate – HRIS system and operations at naval hospitals. SLN is attempting to ensure a paperless environmental process. The digitalized system of SLN has a 60 – 70 % success rate. SLN has an IT directorate and officers and sailors of that directorate working tirelessly to achieve the highest standards in the process of digitizing.

The first Navy-built Seawater reverse osmosis plant was opened on board a naval ship as a project from the Naval social responsibility. How significant is this cornerstone to the Sri Lanka Navy?

of operating faraway missions. The speed of the ship is reliant on the weight of the ship. If we can reduce the number of freshwater gallons, where the particular number of freshwater we can be consumed for drinking and cooking purposes, while the purified freshwater can be used for other purposes it would increase the efficiency of ships. As water is not a scarce resource during missions in the sea, it is a good initiative that will benefit many ships in the future.

On 10th March 2021, Many Navy-constructed facilities at General Sir John Kotelawala Defence University were declared open. Could you venture us through this remarkable occasion?

KDU is not an institution that is new to the SLN or far away from us, it is rather an establishment interwoven to us as it is the organization where our cadets are being brought up for service. The Commander of the Navy is also a member of the board of management and thus it is our duty to extend our labor and technological support for the improvement of KDU. Today SLN is undertaking many projects under social responsibility concerning the health sector, religious sector, and other areas as well.

The logistics operations of the Sri Lanka Navy are digitalized to a very high extent. SLN first to digitalize the pay system out of the 3 services. In 2006 we started an integrated logistics management system, which is an Enterprise Resource Planning system (ERP) and this process is now working very efficiently in the Navy. Almost all the 7 storing yards are being connected and the logistics system connects the tactical, operational, and strategic levels.

Reverse Osmosis plant is not a novel mechanism for SLN, we had our RO plant in the northern naval area based in Karainagar almost 35 years back. Also, SLN is undertaking to provide RO plants for people in need of fresh water in the country due to various kidney issues. Well, water is cleaned with reverse osmosis as well. Very recently we brought down and installed Reverse Osmosis plants in ships and it is currently in operation. The ships also can store fresh water and in the future, such abilities give an extra advantage concerning the capability

The Vice-Chancellor of KDU requested SLN support to expedite the work at KDU in this pandemic situation. Value and cost play a major role in the budget allocations.

Tangible and intangible factors affect the value of an item. The cost is what the consumers are prepared to pay for an item. Relating the same theory into this situation the project of constructing facilities at KDU has a material cost and a labor cost. The VC wisely cut down the labor cost with the help of SLN. In this operation, in the logistics

bird's eye, the labor cost is a sunk cost. And accordingly, the responsibility of both KDU and SLN has been fulfilled.

As concluding remarks, how would envision the bright future of the Sri Lanka Navy?

I do not think I'm a person to be envisioning the future of the Navy as there as so many senior offices around but from my experience after serving in the Sri Lanka Navy for 33 years, the basic theory 'Man behind machine' has a lot to do with the future of SLN, Navy is behind the machines always. We are procuring different vital equipment and technologies for our operation but if our human resource isn't efficient enough there is no purpose for the machines. In the logistics bird's eye to be an efficient and effective Naval force, we have to be more concerned about the human aspects. The leadership of SLN starts from the newly recruited individuals to the Admiral. This means everyone is executing certain leadership in which knowledge and experience are highly important. To acquire knowledge, we have a system of training to be continued on par with the trends and

technological development. Knowledge on the other hand is to be disseminated to each individual. Continuous improvement is mandatory for SLN as we experience high technology in SLN. As such repositioning of experience is a very important factor. The people who served in the war against terrorism from the 1980s to the 19th of May 2009 are gradually evaporating from the system now. The experiences they had are draining out and new experiences are being restored. But we need to take that experience and reposition the experience into the individuals as history is repeating. "Once the dissemination of knowledge and reposting of experience is established you make a complete person who is competent to take decisions behind the machine and also takes the role of leadership". There are so many experts and consultants who advocate how to develop the navy, material successors and higher technologies and more platforms, theories and strategies are available but all these depend on the human resource. And if these measures are our concerns we will have a bright navy that will serve more efficiently and bravely safeguarding the interest of our motherland.

IMPLICATIONS FOR DEVELOPING A SMART CULTURE AND WAY FORWARD IN LOCAL SUPPLY CHAIN DOMAIN

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(while belt)

Conversion is always considered as one of the irritating endeavors for humans. The history of mankind witnessed that humans have made struggle, disagreement, or delays to change from their accustomed behaviors. Sailing through some rough seas humans have embarked into the digitalization era. After the third industrial evaluation in 1970, humans were leaning more on electronic and IT solutions to fulfill their requirements in high frequency. There is a human generation called Generation 'X' which is more inclined towards information technology. However, inequality of resource distribution has always been the case for most of the nations to restrict them for this adoption. It seems that any nation that fails or delays the adoption of the so-called SMART concept would have to face natural death as predicted by philosophers. The SMART concept is enriching day by day adding many tools. Basically, it is coming under the well-known Internet of Things (IoT) concept. Tools like Big Data, cloud computing, ERP systems, Artificial intelligence (AI), sensors, automation systems, Augmented Reality, UAVs, RFID, Blockchain, GPS are commonly used in the world today.

Having said that the proposal made by the previous government to offer personal tablets to Advanced Level students was heavily ridiculed by opposition parties in the political arena. In light of that local supply chain practitioners also have found huge difficulties to adapt to the SMART system while other countries have gone so far. Therefore, understanding the real needs and difficulties is of utmost importance for the local supply chain management (SCM) to be par with the international parameters and to achieve the organizational goals.

SMART Supply Chain Management; is it needed for us?

It is a well-known fact that SCM is encompassing all the activities from raw material extraction up to the physical item delivery to the customers. All the supply chain (SC) activities are flowing through a huge landscape, many states, many nationalities, and many logistic hubs. The SMART concept has five fundamentals such as; Instrumented, Interconnected, Intelligent, Automated and Innovative. Naturally, few undeniable requirements are aroused for conversion to the SMART application which is termed as Digital Supply Chain (DSC).

It is a well-known fact that SCM is encompassed with all the activities from raw material extraction up to the physical item delivery to the customers. These activities are flowing through a huge landscape, many states, many nationalities, and many logistic hubs. Naturally, few undeniable requirements are aroused to tempt the conversion to SMART applications; The supply chain is a naturally complex network type by nature, and connecting the upstream and downstream stakeholders is a difficult task. Secondly, to view the material flow through SC in

order to ensure if it follows the set plan. Top supply chain management always requires the present position of the material. Therefore, SMART tools provide the ideal solution. Thirdly, SMART applications are always capable of enhancing the efficiency of warehouses. If the top management wants to reduce the stock holding cost by introducing the lean concepts, SMART tools are having several solutions, in line with the lean principles. Finally, to connect with customers to gather information about demand, preference and behavior is the real challenge. SMART application and tools are the most applicable to cater to this requirement as well.

Despite tedious labor-intensive market surveys, analyzing the market trends and customer behaviors through artificial intelligence tools and big data concepts could also be executed by SMART concepts. They also help to digitally synchronize different logistics requirements together

Contribution to SCM

Having understood the inability of the traditional system to cater to the requirement with a huge quantum of demand, complexity, multiple parties involvement, and need of flexibility and speed; The SMART concept ideally replaces the traditional manual system in multiple aspects. It contributes to making vital decisions without human involvement through automation/ remote sensing/ AI. The SMART system provides necessary alerts and calculation review requirements (Lead-time, demand progress) without human involvement. It also connects SC stakeholders through ERP systems, rather than the traditional linear systems. There are three main types of integration that can be done through an ERP system. They include; Horizontal Integration (Connectivity of related firms), Vertical Integration (Self-organized system within the firm) and End to end engineering integration (Continues the development process). Despite tedious labor-intensive market surveys, analyzing the market trends and customer behaviors through artificial intelligence tools and big data concepts could also be executed by SMART concepts. They also help to digitally synchronize different logistics requirements together (Transportation with warehousing, market demand with the production process). SMART concept denies

the traditional office work concept and facilitates work from facility and flexible working hours approach since physical attendee of human is not required until he is capable of connecting to the system.

Linking with Theory

When the requirement of the SMART concept is analyzed, the strategic positioning matrix is the classic example to elaborate the advantages.
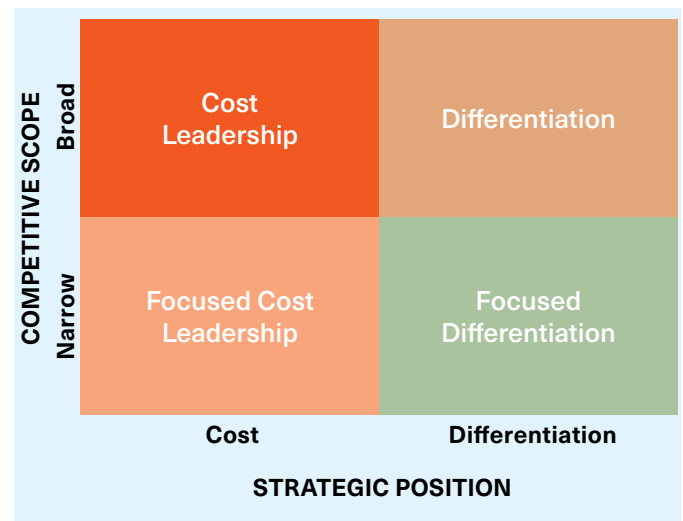
Figure 1: Strategic Positioning module.

Figure 1 explains that any company's main objective is to acquire a competitive advantage over the other. The company can adopt several strategies in pursuing the aim. If the company wants to reduce the overall cost or take the lead from the differentiation from quality, they would have to improve the efficiency of the business operating while reducing the cost. Jerzy and King, (2018) have elaborated that one of the main solutions is to turn the business operation into a smart concept.

The implication of adopting the SMART concept in local SCM

Being an island nation, Sri Lanka is engaging in global business. Though Sri Lanka is having a high rate of literacy, computer literacy is not at a satisfactory level to meet the industrial SCM requirement. Though many people are using the SMART mobile phone and having social media accounts (Facebook, WhatsApp, Viber), the majority of people are incapable of converting the business data into valuable information and forwarding it to the next stakeholders in the SC. The figure 2 and 3 illustrate the standard of computer literacy in Sri Lanka.

Highlights

Computer Literacy
Rate 30.8%

22.0% of households owned desktop or laptop computer.

Urban sector shows more literated on both computer and digital litercy.

More than one out of four person (aged 5-69) computer literated.

More than two out of five person (aged 5-69) digital literated.

Digital Literacy
Rate 46.0%

- Computer Literacy
- Digital Literacy

Computer literacy and Digital literacy by Sector

Figure 2: Computer literacy and digital literacy by sector | Source: Department of Census and Statistic (2019)
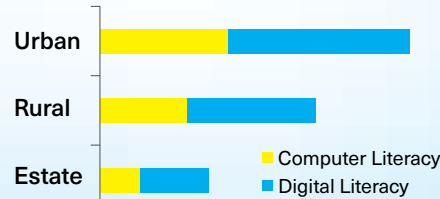
Gender, Sector, Age group	Desktop/ Laptop	Smart phone	Tablet computer	Mobile phone
Sri Lanka By Sex	**24.1**	**72.2**	**2.0**	**1.7**
Male	13.3	39.2	1.1	0.9
Female	10.7	33.0	0.9	0.7
Sector				
Urban	8.3	19.8	0.6	0.3
Rural	15.7	51.1	1.4	1.4
Estate	0.1	1.3	0.0	0.0
By Age group (years)				
5-9	0.3	1.5	0.0	0.0
10 - 14	1.5	3.9	0.2	0.1
15 - 19	3.4	10.1	0.2	0.3
20 - 24	3.7	11.8	0.3	0.3
25 - 29	3.4	10.5	0.3	0.2
30 - 34	2.7	8.7	0.3	0.2
35 - 39	2.3	8.0	0.2	0.2
40 - 49	3.7	10.5	0.3	0.2
50 - 59	2.1	5.2	0.1	0.1
60 - 69	0.8	2.0	0.1	0.1

Figure 3: The usage of the IT-related items
Source: Department of Census and Statistic (2019)

In the global context, demand forecasting is carried out through ERP and AI systems. However, most of the entrepreneurs are afraid to invest in automation and ERP due to the unpredictable ROI.

When the application of automation techniques is concerned, Sri Lankan logistics standard is at an average level. Very lesser number of companies are utilizing automation techniques for their SCM requirement. As an example, demand forecasting is one of the functions which most SC managers consider as a huge burden. In the global context, demand forecasting is carried out through ERP and AI systems. However, most of the entrepreneurs are afraid to invest in automation and ERP due to the unpredictable ROI.

Training is one of the key issues which is overwhelming all the setbacks of the SMART application in SC. It is noted that the Information technology subject has been introduced to the School syllabus recently. If the government wants to embed the SMART concepts into Sri Lankan culture, they would have to invest in education a lot. As per the World Bank data, there are 9826 schools and on average, one teacher has to manage 21-student classes. In such a situation, having a teacher for IT is a demanding task.

Robotic technology is a key feature of the SMART concept. On many occasions, this technology has been used for repetitive and risky work in the production

processes. It is observed that the integration of robotic technology into the SC is still at the R&D level. Utilizing satellite technologies to the business operations with GPS facility for location finding is one of the popular SMART tools. Even though many countries have been utilizing outer space at maximum level, Sri Lanka is still unable to launch its satellite to orbit. We are continuing to obtain the facility from other countries' satellites. We are helpless if the service providers fail. The warehousing function is one of the key functions which decides the flexibility and speed of SC. However, a very lesser amount of automated warehouses are available at the industrial level which is handled by a few diversified companies. However, the government sector has not even thought about converting the warehouses into SMART warehouses. Enterprise resource plan (ERP) is the progressive trend for logistic applications. Most ERP applications have been restricted to only their internal logistic functions. Few organizations are running the full ERP systems. Lack of ERP skill of the employees, poor change management, and troubleshooting are main issues which are restricting enchantment of the efficiency of the ERP system. When all the ERP systems in the local context are analysed, the following weakness can be observed; Lack of connectivity to the other functions in the supply chain. For example, warehousing ERP systems have been restricted only to warehouse management. Ideally, information available in the system could be connected to procurement, transportation, auditing, and production departments. Hence, isolation will not help to achieve the enhancement of efficiency. Secondly, SCM consists of main flows such as material, information, and financial flow. In the Sri Lankan context, the SMART concept predominantly uses only the information flow in the logistic field. Inadequate infrastructure and government policies are some of the worrying factors. Most of the devices and communication equipment are imported. Government support to new inventors is not adequate. There is no proper mechanism to conduct the new SMART inventions at an industrial level, which could otherwise be easily introduced in the key logistic hubs like airports, harbors, customs, and production lines. Local data fee is another key issue that is restricting the connectivity of the stakeholders in the SC. Comparatively, it falls in a higher range in Sri Lanka, when compared to other South Asian countries. The industrial level link between each other is another significant factor for the effective application of the SMART concepts in the supply chain. There are raw material extractors, farmers, producers, retailers, transporters, warehouse management, finance, and human resource elements working together in a single supply chain. Most of them work in isolation, sticking to their respective manual rules and regulations. For example, if you are operating as the supply chain manager in rubber-related products, you have to build and maintain the system network with farmers, collectors, retailers, transport parties, sellers, and other business-related agencies by using the SMART application.
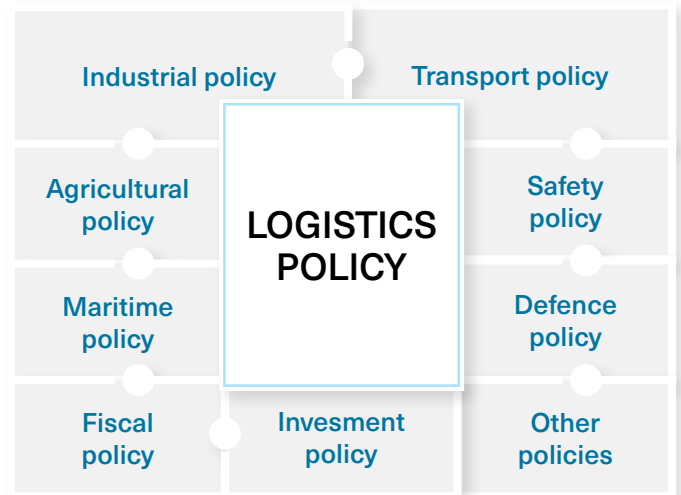

Figure 4: Connection of logistic policy with government policy.

Way Forward with SMART.

Having understood the implications of establishing a SMART culture in the local supply chain domain, responsibilities have to be shared among the different parties for the implementation. From the government level, decisions have to be made to change the manual system to SMART applications in the respective government agencies, providing required infrastructure such as reduction of data charge, tax reduction for SMART devices and software and facilities for local inventors. The model concept explained by Jerzey and Kinga can be used for formulating a logistic policy as such.

Introducing a dedicated and customized learning system at the university level for the SCM applications on utilizing the SMART concepts. Handling smart devices as per the logistic requirement, generating and interpreting SC information for the subsequent level and application of SMART technology with right attitude and ethics have to be included in that curriculum. Establishing a consortium-type organization with respect to the SMART applications in the field of SCM. Most of the common logistics issues can be sorted out through the particular organization, especially on how the SMART concept is applied within a common industrial platform. Special tax concession could also be provided to the communication service providers. Recently the government has introduced a special data package for the government school teachers to conduct online lectures. Most of the ground level harbor and warehouse supervisors, transport managers, raw material collectors could also be provided with internet connection with appropriate devices to get connected to the common SC network. The requirement of establishing a dedicated SMART university is the compelling need for the future. This particular institute will be responsible to carry out a survey of requirements and produce the SMART tool and methods which are applicable in the Sri Lankan context.

Blockchain GROWTH will help us

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Please Tell us about yourself.

My primary education was at Asoka Vidyalaya, Colombo and secondary education at Ananda College, Colombo. Thereafter I acquired my first degree from the University of Kelaniya in Physical Science and subsequently joined the corporate world. During that time, I was also reading for my Postgraduate in Marketing. Early in my career, I ended up attracted to the field of storage and material handling. I liked the industry because of the dynamism it offered. One solution cannot be offered to two customers. You always have to imagine, anticipate and develop new solutions every day. In 2006, I left employment, aspired to be an entrepreneur and set up TWS Lanka Pvt Ltd. During the past 15 years I have expanded my knowledge in the field of Logistics & Supply Chain while acquiring a Masters in Logistics & Supply Chain Management from Birmingham City University

UK. The past 5 years have seen the organization grow from a local solution provider to an international operator.

TWS is the second-largest intra-logistic solutions provider in Sri Lanka. Could you venture us through this term "Intra-Logistics Solutions"?

For TWS Intra-logistics is, how efficiently our solutions help our clients manage their cargo within the warehouse facility from the time of receipt until they are dispatched.

How do Intra-Logistics Solutions contribute to the smooth functioning of the field of logistics?

The field of logistics remains important as consumers require goods/services to be delivered to their doorstep, irrespective of the type of product. Each product transfers through the supply chain before it reaches the consumer. Warehouses play a pivotal role in maintaining a smooth flow of products through each element of the supply chain especially in volatile market conditions. Let us assume that you habitually buy a mobile phone every two years, and in 2021 decide to change the pattern to every year. It means that your change in buying behavior introduces a spike in the demand

What is inclusive of the product portfolio of TWS and what is the target market that the company taps into?

TWS was built to be the single most sort-after organization when it comes to warehousing equipment. TWS stands for Total Warehousing Solutions. Our product portfolio has been carefully selected to make sure that we offer the best-in-class solutions to our customers. Since we do not manufacture any of these products, what makes TWS cut across the others is the solutions that we develop. Our strategic partnerships allow us to offer our customers, a complete and a unique solution like no other. In terms of warehousing, there are 04 pillars which include storage efficiency, dock efficiency, material handling efficiency and Data Management. The storage racking systems determine what type of efficient storage we can provide to our customers. The material handling equipment in integration with the racking system will also determine how efficiently the footprint of the warehouse can be utilized. The loading docks will determine how fast you can move a product in and out of the warehouse. The data management systems will ensure error free operation within the

A key mechanism that allows you to suppress this volatility is warehouse efficiency. If you have an efficient warehouse, you can create a significant improvement in cargo throughput. So intra-logistics plays a vital role in the sphere of Logistics & Supply Chain.

forecasted by the manufacturer. When a group of customers change their demand pattern, there is volatility in the supply chain. Warehouses allow manufacturers to reasonably arrest volatility in the supply chain. Thus, intra-logistics plays an important role. Imagine, if you cannot move your product efficiently from the warehouse to the next supply chain element, as such changes in demand creates chaos in the supply chain. A key mechanism that allows you to suppress this volatility is warehouse efficiency. If you have an efficient warehouse, you can create a significant improvement in cargo throughput. So intra-logistics plays a vital role in the sphere of Logistics & Supply Chain.

warehouse. If you cannot provide a solid solution across these four pillars, you cannot have a bottleneck-free warehouse. All our manufacturing partners are within the top ten positions of their global rankings. Given our strong partnerships clubbed with experience, technology, and a large product portfolio help us meet any client requirement.

Our clients include third-party logistics providers, tea exporters and brokers, paper & packaging industry, FMCG, Cold storage industry, etc. To sum it up, our clients are those organization that have large volumes and require equipment to run heavy-duty shifts.

What are the latest technological innovations that TWS has embraced, in upgrading its product portfolio, and what are your opinions about the demand for such new technologies in Sri Lanka?

I think the biggest innovation that TWS has brought to the industry of warehousing in Sri Lanka is the articulated VNA solution. In the past, capacity of a warehouse was determined by the operating aisles and the width of the material handling equipment. In 2011, we launched the "Aisle-Master". What we saw is that we could get customers to store at least 20-25% more capacity in the same warehouse by just changing from a conventional Reach Truck to an Aisle-Master, simply due to the reduction in aisle width between 1.8 meters to 2.2 meters. This became a great hit in Sri Lanka as well as other markets that we are operating, since every client wants to achieve the maximum storage capacity within the facility. Construction is expensive. If you construct a warehouse with a storage capacity of 10,000 pallet positions using a conventional reach truck, by changing it to an Aisle-Master, you will be able to increase your capacity to 12,500 pallet positions. Another great benefit is that the Aisle Master run on solid rubber tires. Thus, eliminating the requirement of expensive floor construction in comparison

Smart supply chain from an intra-logistics point of view is about bringing technologies together to mitigate the inefficiencies we currently have in warehouse operations

As a company that is primarily based on providing warehousing solutions, how impactful are the emerging concepts such as smart supply chain management, to the core operations of TWS?

The smart supply chain from an intra-logistics point of view is about bringing technologies together to mitigate the inefficiencies we currently have in warehouse operations. Thanks to our strong partnerships we are at present able to offer smart intra-logistics solutions to our customers with the integration of Warehouse Managements Systems, Warehouse Control Systems, IoT and Machine Learning. In fact we are capable of offering fully automated warehousing solutions.

to super flat floors required for VNA installations. Over the years the Aisle-Master has been extremely popular in Sri Lanka. I am happy to say we have over 75% market share for Aisle Master in the AVNA equipment class. The clients keep their trust in us while the benefit to them has been exponential.

Cold supply chains became a trending topic globally, with the transportation and distribution of the COVID-19 vaccine. Since TWS is one of the preferred vendors for cold storage racking and related Material Handling Equipment in Sri Lanka, could you give us a brief overview of the cold storage industry in Sri Lanka, and the importance of high-tech add-ons to

optimize the functionality of such cold stores?

The cold storage industry in Sri Lanka has high potential for growth. Space optimization is pivotal in cold storage warehousing.

Cold supply chains are the most challenging supply chains to manage. The biggest challenge is to ensure that the products' core temperature does not fall below the desired tolerance level. Be it Covid-19 vaccine or Ice cream, the internal properties of the product will alter if the cold chain is broken during transportation & logistics. This gives rise to the high-tech add-ons where manufacturers are looking for IoT devices to monitor the products' core temperature during transportation on a real time basis. Without these new technologies we will not be in position to identify quality variations on delivery to destination due to a breakdown of the cold chain.

What are the latest High-tech Warehousing Solutions available globally, especially post COVID-19 to facilitate contactless deliveries, and how compatible are these to Sri Lanka?

Prior to COVID 19 we looked at automated warehouses as a means to reduce the threshold on warehouse operations by spreading it through 24 hours with minimum human interaction. Post-COVID 19, due to social distancing, the demand for automated warehousing has increased. At the same time, we must understand when it comes to automated warehousing, you are looking at a standardized load unit that is perfectly shaped, as the system will sense its dimensional accuracy prior to entering the storage system. These systems have a potential to grow as many organizations are trying to spread a single shift operation over 24 hours while adopting to minimum human resources navigating through this pandemic.

There is another challenge that comes through COVID-19. As many try to reduce the number of contact points, market is shifting to online purchases. When you look at e-commerce, the order volumes will become less while the variety of the basket will be increasing. When these e-commerce orders are received at the warehouse, the picking solutions or the order processing becomes very elaborate as we need to pick each product from large stacks. Traditionally, ground locations are used for picking in large warehouses and we call it "man to goods".

The future is going to be "Goods to Man". It is an evolution that is going to enhance demand for automated warehousing. In this situation, can we eliminate having people? No. We still need to have somebody who has the ability to make logical decisions. But can we reduce the number of people at a time? Yes. Automated equipment don't get tired, So you can run the entire process throughout 24 hours.

Another area is logistical cargo visibility and red-tape (approval) visibility to stakeholders. Logistical visibility may be improved through IoT integration to shipping containers and unit loads while red-tape visibility can be improved through new platforms such as Blockchain.

With the continuous growth or IoT, AI, WCS & 5G data connectivity we could imagine the average Sri Lanka forklift operator working on his equipment from home. This change in the landscape opens up a whole new realm of opportunity for the labour market where location-based jobs will be a thing of the

be extremely streamlined and efficient. It is imperative to note that the success of integration of technologies rest in a seamless platform.

On a different note, if autonomous driving becomes a norm, there will be a lot more coming into play. History shows that from the horse carriage into the motor car, it took 10 years to completely wipe out the visibility of horse carriages. So autonomous driving may happen in our lifetime as well. One of the biggest challenges in transportation today in Sri Lanka is the cost. This is because, operating time to idle time is approximately 1:7. Through autonomous driving if the above ratio can be improved, the cost of transportation can be reduced significantly. Improving the visibility of cargo will help the Customs trace and track the cargo.

Could you explain a bit about the necessity of improving infrastructure in Sri Lanka?

Physical infrastructure development such as allocation of logistics hubs, road / rail network connectivity through highways to ports and airports are essential to the growth of the supply chain industry.

IT infrastructure such as communication platforms between Government to Government, Government to Business, Government to Customer and Business to Customer should be sustainably improved.

All efforts in the areas of infrastructure development should lead to improving Sri Lanka's Logistics Performance Index year on year.

As concluding remarks, how would you envision the future of the company, when looked at through a technological perspective?

For an organization to progress, it should accept and adapt to emerging trends and offer solutions within those trends. That's how an organization can progress. For TWS as I've said before we are partnering with industry leaders and with a great team of experts. I am quite confident that we will have the required knowledge and the technical know-how to leverage the organization in a much more technologically advanced era. Our solutions are based on what is available. Every day researchers are developing new technologies. To sum it up, through the eyes of technology at TWS, we are geared to handling tomorrow's technology. ⬛

One of the biggest challenges in transportation today in Sri Lanka is the cost. This is because operating time to idle time is approximately 1:7.

past. Furthermore, this will allow individuals to work in multiple organizations on an on-call basis, reducing overall fixed cost to organizations and being able to reach quality human resources for the desired job, creating better work-life integration.

Since you talked about Blockchain in supply chain and cargo visibility, how can RFID and IoT components relate to Blockchain to increase visibility?

Introduction of IoT devices such as RFID will improve digital cargo visibility in the supply chain. If cargo visibility is integrated with national / international regulatory approval process required for smooth transition of the supply chain via technologies such as Blockchain, the overall process of logistics and transportation across boarders will

BLOCKCHAIN

Blockchain Technology was first outlined by Stuart Haber and W. Scott Stornetta in 1991 who wanted to implement a system where timestamps could not be tampered with. Blockchains became popular with the launch of Bitcoin in January 2009. Even though blockchain seems complicated, the core concept is quite simple. Simply, a blockchain is a type of database. The key difference between a typical database and a blockchain is the way the data is structured. A blockchain collects information together in groups or blocks which have certain storage capacities to hold sets of information and when filled the blocks are chained into previously filled blocks forming a chain of blocks with data known as the "Blockchain". All the new information that follows the freshly added block is compiled into a newly formed block that will then also be added to the chain once filled.

FUN FACT

By the end of 2024, it's expected that corporations will spend $20 billion per year on blockchain technical services. Such rapid market growth is explained by the increasing demand for this technology across all industries, from financial services, through consumer and industrial goods, all the way to media, telecom, transport, healthcare, and public services. Also, more than 20 countries have adopted or at least researched the concept of a national cryptocurrency.

Blockchains are mostly used to store cryptocurrency transaction histories such as Bitcoin and other operations such as legal contracts such as smart contracts and product inventories can be stored. Blockchain forms the bedrock for cryptocurrencies like Bitcoin. By spreading its operations across a network of computers, blockchain allows Bitcoin and other cryptocurrencies to operate without the need for a central authority. Moreover, this not only reduces the risk but also eliminates many of the process and transaction fees. But there can be several challenges when it comes to the adoption of this technology.

THE ROLE OF BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAIN 4.0

ANJU ILLANGASEKARA
Lecturer

Department of Management & Finance
Faculty of Management, Social Sciences and Humanities
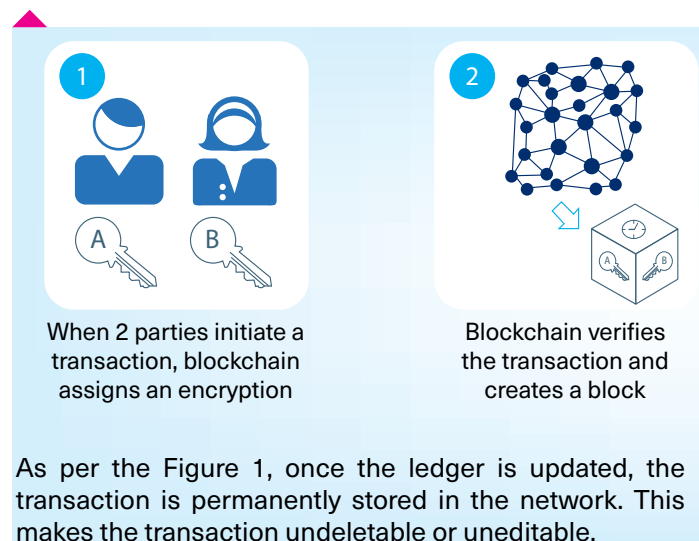General Sir John Kothelawala Defence University

Advances in digital technology are having a huge impact on the world around us and leading to big changes in customer behaviour. Today, customers are more vigilant about their surroundings. They respond to social media trends and like to engage in digital arenas due to their ease of use. However, many supply chains cannot keep up with this. That is because they are structured traditionally and sequentially. In the continuously changing world, businesses must take risks, consider change management and adapt to the latest technological phases in play.

If you have ever heard of the terms 'cryptocurrency', 'digital money', 'digital currency', the first word that comes to mind is 'Bitcoins'. Blockchain is the technology that was invented to run bitcoin transactions. While that was its original purpose, blockchain is capable of so much more.

Understanding the Blockchain Technology

Blockchain is an internet-based technology with encrypted ledgers that can programme to validate, record and track anything of value. The ledger system is not an entirely new paradigm. The concept is derived from the traditional book-keeping that records transactions over a period of time. The traditional ledger is owned by one party whilst the ledger in blockchain is distributed among its network of stakeholders. For example, it provides the platform to create, distribute and record the entire bitcoin transactions linked through computer networks all around the world. All transactions are encrypted, establishing higher security than the banks. This eliminates the cost of transferring money from one account to another. According to McKinsey & Company (2017) the term, "blockchain" is derived from the "blocks" of validated and permanent transactions and the chronological order of how they are linked together. The Figure 1 indicates how blockchain transactions are created.

Figure 1: A Blockchain Transaction
Source: McKinsey & Company (2017)

When 2 parties initiate a transaction, blockchain assigns an encryption

Blockchain verifies the transaction and creates a block

As per the Figure 1, once the ledger is updated, the transaction is permanently stored in the network. This makes the transaction undeletable or uneditable.

Hash

3602470b25278c5f3ead34cfc6ae607adc111196
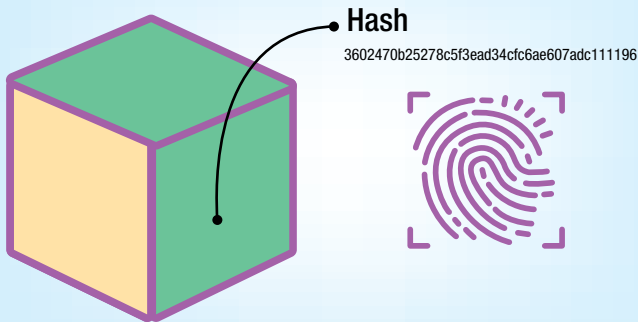
Figure 2: Hash
Source: Simply Explained (2017)

As per Figure 2, the encryption assigned at the initial stage is also known as a hash which is unique just like a fingerprint. If someone wants to change data inside the block, the hash will also change, enabling the user to detect the changes.

Hash of previous block

Creates the chain
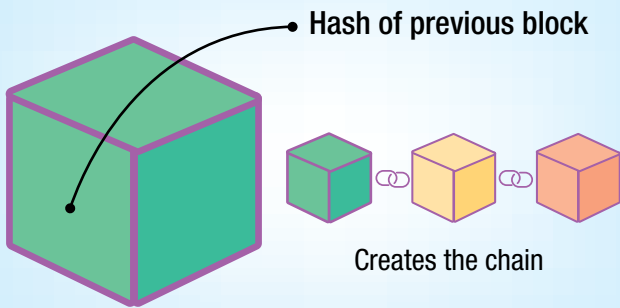
Figure 3: Hash of the Previous Block
Source: Simply Explained (2017)

As per Figure 3 and 4, the data of the transaction is stored in blocks that are linked to previous blocks with data from another transaction. Imagine, a hacker wants to manipulate data in a certain block. For that, the hacker must manipulate data in all previous blocks linked to that (thousands, if not millions of previous blocks). It is almost impossible to do.

Hash:	1Z8F	Hash:	6BQ1	Hash:	3H4Q
Previous hash: 0000		Previous hash: 1Z8F		Previous hash: 6BQ1	
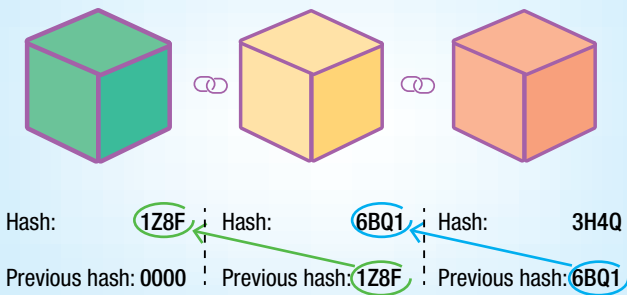
Figure 4: How Previous Blocks Are Linked
Source: Simply Explained (2017)

Usually, when an individual performs a transaction online (for example: buying a smartphone back cover through eBay) a third party is needed as the intermediary to perform it. Mostly, the third party is the bank. However, blockchain technology does not need an intermediary to perform a transaction, thus eliminating the need for a bank.

3
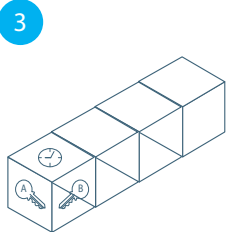
The new block is appended to the blockchain

4
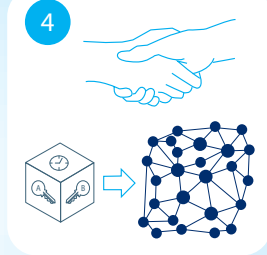
The blockchain transaction is now complete and the ledger is updated

In the present context where supply chain management is heading towards a smart supply chain, digitalization and supply chain 4.0, blockchain technology plays a sophisticated role.

Blockchain Technology and Supply Chain Management

Even in the present context, the world's supply chain operates without blockchain technology. However, in the era of digitalization, the technology behind the success of bitcoins is an interesting topic among researchers and professionals in the IT and supply chain fields. Hence, the industry giants as well as start-ups began investing in their research and development on blockchain technology. As of now, there are plenty of blockchain-based projects explored and established by the world of supply chain. For example:

- Walmart ran a pilot project to trace pork in China and production chain in the USA, to verify the transactions and the efficiency and accuracy of record keeping.

- Maersk and IBM have worked on a system that enables customers to view the flow of goods in the supply chain including containers in transit, customs clearance status and view the bill of lading.

- Ship Chain, a USA company, built a platform using blockchain enabling its users to receive notifications on container whereabouts and estimated arrival time etc.

- Accenture, an Irish consulting company, has developed a blockchain-based system to replace the traditional bill of lading that will lead to huge cost reduction benefits and minimize complexities in interactions and communications among stakeholders.

- Provenance, a UK start-up company, has allowed its retailers to document the entire supply chain of their products from the origin to the end increasing the transparency in the retail industry.

- Food Guardians, a Switzerland company, enables to track and trace the life cycle of food helping food to be kept fresher for a long period.

- In 2018, Koopman Logistics, a Netherlands automotive company, became the first company to deliver automobiles via a completely paperless transaction process.

Supply Chain Value Addition via Blockchain Technology

In general, the global supply chains are highly complex with various business models, stakeholders with conflicting interests and dynamic changes in market trends. In such an environment, the adoption of blockchain technology will assist to reduce the complexities. It can be harnessed in the following ways.

- Increase efficiency by replacing slowly driven manual processes: the possibility to remove paperwork and documentation can benefit in speeding up the transactions and accelerating the flow of goods in the supply chain.

- Automation of logistics-related services: the possibility to establish direct relationships with the participants in the value chain and extend transparency in insurance, legal and settlement services.

- Increasing trace, tracing and supply chain visibility: the possibility to trace freight movements from their origin to the destination enables a complete end to end supply chain solution to the end consumer.

- Cost reduction in IT-related transactions, cost of intermediaries, cost related to paperwork and documentation ultimately lead to an overall reduction in operational cost of a company.

- The emergence of new business models: remember when the smartphone began a revolution in the digital era. Nowadays, performing an online business transaction is hands away. Similarly, blockchain could revolutionize the present business models.

Blockchain Adoption in Sri Lanka

Despite the lack of awareness and "blockchain" still sounding like an alien term in the Sri Lankan context, it is in a developing stage. Government authorities, private companies and start-ups have also started their research and projects on the blockchain. On official grounds, the Central Bank of Sri Lanka launched an open invitation to software development companies in Sri Lanka to take part in a project of national importance. The main objective of the movement is to increase the demand for digitalized financial services and to establish a less-cash society.

From private sector initiatives, Sampath Bank was the first to develop a blockchain-based banking solution by introducing the "igift" app that enables the users to gift money to anyone in their contact list. Following its initiatives, Commercial Bank joined RippleNet, a global payment network for financial institutions enabling them to perform remittances via a blockchain-based system. The system provides the ability to perform transactions in real-time. It has removed steps used in the regular process and has added an anti-fraud feature making it difficult to hack.

HSBC launched a supply chain financing platform for Sri Lankan exporters to make early payments to their suppliers helping them to reduce cost and eliminate manual errors. Additionally, the users can decide payment options, increase liquidity and estimate future cash flow by utilizing various data formats. South Asia Gateway Terminals (SAGT) became the first terminal in Sri Lanka to use blockchain technology using the digital platform developed by Maersk and IBM companies.
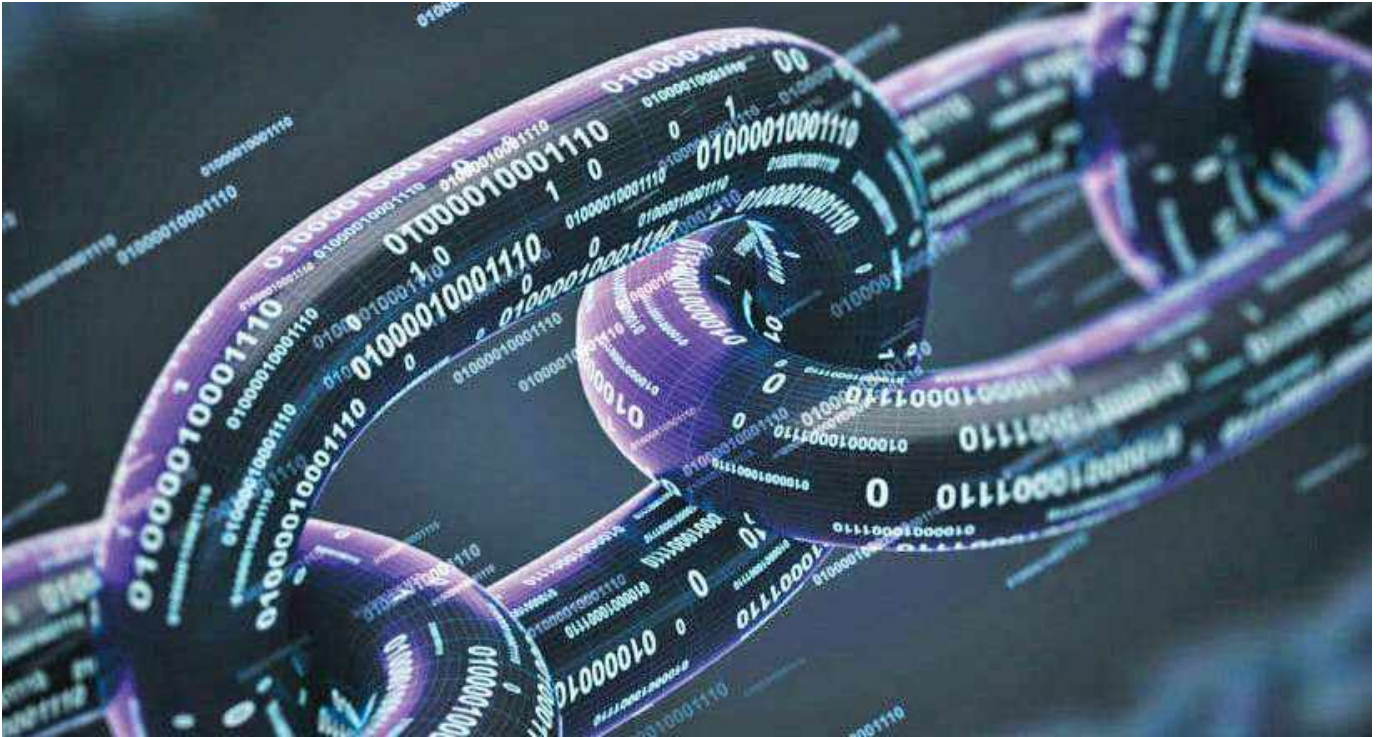
The traditional paper-based documentation and time-consuming procedures will be transformed into a digitalized platform through this initiative enabling customers towards ease of doing businesses.

Key Challenges of the Blockchain Technology

Blockchain has not yet reached its full maturity. Its potential will further improve with untouched areas in the world of supply chain with new business models or enhances existing ones. However, as an emerging technology, there are certain challenges that it must overcome before mainstream adoption.

- Gaining industry adoption: this is similar to the concept of social media platforms such as Facebook and Instagram. The value of the platform increases as the number of users increases. As the number of stakeholder participation increases, blockchain will become an industry practice. This is considered to be the most critical challenge.

- Establishing standards and governance of blockchain: due to the increasing competition among firms, one would try to supersede or disrupt certain practices. This will cause issues to the development of blockchain as a national movement considering the bigger picture. As a result, the first alliance emerged as the Blockchain in Transport Alliance (BiTA) in the logistics industry.

- Resistant to change management and market acceptability: supply chain operations are still carried out across the globe without blockchain and some business leaders are satisfied with the current flow of work. It's a common practice among human beings to wait till another party commits to something, then observe its end result before taking a decision for oneself. Since blockchain is a growing concept many business leaders are reluctant to invest their money and time on it.

- Corruption: adoption of a system that prevents hacking, theft and fraud will cause a conflict of interest with parties who think otherwise.

Conclusion

In the present context where supply chain management is heading towards a smart supply chain, digitalization and supply chain 4.0 blockchain technology play a sophisticated role among many concepts. However, concerning its way forward, it requires further technological development and the collaboration of stakeholders. Very recently, a Sri Lankan start-up called Tracified has received funds from a venture capital firm in Japan helping them to finance their project, which is a blockchain-based platform that allows sellers to prove the quality of their products to their target market. The initiatives taken by the financial and banking sector are a welcoming approach for spreading awareness about the capabilities of blockchain technology. However, in the Sri Lankan context, it is still at an infant stage. More and more research and development must be carried out with a focus on knowledge building and educating on blockchain technology. ⬛

WEIGHBRIDGE AUTOMATION SYSTEMS

The primary method of automating a weighbridge is to switch to an unmanned system. An Unmanned weighbridge -also known as a driver-operated weighbridge – is a weighbridge where the input, identification, and data are handled by the vehicle driver rather than a dedicated weighbridge operator. Automated weighbridge Systems are designed to manage and track the critical information at the time of weighing without the need of an operator.

FUN FACT

Automated weighbridge system eliminates the need for weighbridge operators. Weighing operations are instead performed by the truck driver and can be done 24/7. There is a fully integrated IoT-based central management system in order to monitor.

Automated weighbridge systems are applicable across all industries, from waste management to construction, offering the benefits of lowered operating costs and increased labor efficiency.

Routine jobs are done by smart technologies

Mr. Yasith Wijerathne

Head of Outbound Logistics - INSEE Cement (Lanka) Ltd

Please give us a brief introduction about you. What inspired you to choose this line of work as your career?

My name is Yasith Neranjan Wijayarathne, and currently, I'm working as the Head of Outbound Logistics at INSEE cement. I entered the logistics industry since my basic degree is related to this field, from the University of Moratuwa. I joined here as the Shift Superintendent-Port Operations 10 years ago. After several promotions, I came to this level. I worked in almost 5 management levels within these 10 years. I have handled warehouse operations,

transport operations, port operations, and plant dispatch operations as well. I also have some experience working in other regional countries as well. I worked as the team leader in a logistics footprint review project in Indonesia for two months, and also have exposure to certain fly ash operations conducted in India. I have experience in the trading business in Singapore and certain manufacturing experience in Thailand and Cambodia. This is my first job. I joined here as a fresh graduate and was promoted to this level. I am a member of the Chartered Institute of Logistics and Transportation. In addition

Interviewed by:
Anuki Fernandez
Hansi Perera

Transcribed by:
Hansi Perera

Photographed by:
Dilakshi Nanayakkara

to that, I have my MBA from the University of Colombo. Throughout this journey, I realized that I'm in the right industry where I have a lot of opportunities to grab.

What is the role of INSEE Cement as Sri Lanka's sole cement manufacturer who provides class-level cement and construction material in the industry?

As you correctly mentioned, we are the only fully integrated cement manufacturer in Sri Lanka. Because of that, we have a responsibility to provide the best quality cement for long-lasting building construction in Sri Lanka. With that responsibility, we are

through cement. As a Sri Lankan entity, we can provide cement on the same day or within 1 to 2 days after manufacturing. The quality of cement depends on the number of days taken for the manufacturing process. Generally, it is best before use is 30 days. When it comes to imported cement, it takes about a few weeks to come to Sri Lanka. However, since we are a local manufacturer we can provide fresh cement to the market with higher quality. Moreover, we can maintain the consistency of the quality because we produce cement locally whilst all other importers change the cement sourcing location as per the material

> When it comes to outbound logistics, we monitor our fleet through RFID and use GPS for outside plant operations. Each and every touchpoint inside plants have been automated with active and passive RFID technology. GPS is used with Geo-fencing to monitor outside operations.

providing cement to the local market. As the leading premium cement brand in Sri Lanka, we provide the best quality cement to our customers under "Sansatha" and "Mahaveli Merine" brand names. We have proven our quality, service, and capability by contributing to many major scale construction projects in Sri Lanka, such as the Hambantota and Colombo south ports, expressways, Lotus Tower, Port City, etc. Other than that, many of the large, medium, or even small-scale manufacturing projects are using our cement. From that, we can say that we are doing a national level service. We produce our cement in Sri Lanka and sell within Sri Lanka. But from time to time when it is required we export cement to the Maldives as well.

According to your opinion, what differentiates INSEE from other companies in this competitive cement and construction material industry?

When it comes to our business, we mainly cater to the building material industry,

availability when they import from time to time. As a result, their quality and color could be changed from source to source. Consistent quality is one of the main competencies we have; which other players don't have, simply because of the aforementioned fact. The next best competency is the freshness of our cement. We send cement to the market within 1-2 days which other players can't match. We have an integrated plant in Puttalam, where we produce clinker as well. For additional requirements, we import clinker mainly from our mother company and few other sources as well. With the pandemic situation, our demand declined to a certain extent. Even though there was lagging in the transportation of shipments, we had enough clinker which was produced by the Puttalam plant during the lockdown. So, we didn't have to face many challenges during the period.

Logistics 4.0 has affected almost all industries. How does INSEE strategically

embrace these new industry trends by bridging the gap between business strategies and smart innovative technologies?

INSEE is a company that utilizes the newest technologies throughout the supply chain. When it comes to outbound logistics, we monitor our fleet through RFID (Radio Frequency Identification) within the plants and use GPS (Global Positioning System) for outside operations. Each and every touchpoint inside plants have been covered with active and passive RFID technology. GPS is used with Geo-fencing to monitor outside road transport operations. More than 200 heavy vehicle fleet operations are managed and monitored by one person in a shift, in the dispatch planning and monitoring center. POD (Proof of Delivery) is updated in the system by using a barcode system.

Currently, we are also working on parallel smart solutions such as Weighbridge automation, Signing on glass, E-documentation, and Automated Dispatch Planning. This automated dispatch planning process will use artificial intelligence which connects GPS and RFID technology with the data in SAP [SAP is the backbones ERP system at INSEE. It makes decisions on optimum assigning of vehicle fleet based on customer ETA, distances, customer priority level, road traffic, driver resting, GPS position, RFID tracking, the status of vehicle queue in a plant, and past data records in the system. We're still in the process of testing the above-mentioned projects. Within a few months, we will be able to implement those technologies in our company. To sum it up, we are in the process of replacing all routine work or jobs with AI and smart technologies.

What are the current technologies that INSEE has adapted in the their warehouses and how does the company leverage the aforementioned smart technologies in the warehousing and distribution operations to secure a competitive edge in the industry?

When it comes to our warehouses, they are different from other FMCG warehousing operations. We have several brands (limited SKUs) and having unique characteristics due to the nature of the industry. Therefore, tracking and sorting is not a huge challenge for us. Hence, we're only using the RFID system to monitor customer and interunit distribution truck movement monitoring. Stock movements are monitored through

We have numerous virtual warehouses attached to different plants and different distribution points to increase truck utilization. But since we go through this process with the strong back support of the SAP system and our Transport Management System, disruptions in inventory management or order fulfillment will not occur in our operations.

the SAP system. We give the full visibility of distribution operation to our intermediate customers and B2B customers through automated SMS and emails. We are in the process of developing a customized app to place orders and track the shipment by customers themselves

According to your view, could the increase in virtual warehouses in the supply chain cause disruptions in inventory management in the cement manufacturing industry?

At INSEE, we use virtual warehouses with the strong back support of the Transport management system and SAP system. We have virtual warehouses and we utilize our assets strategically. When there are no customer orders, trucks will be available and the packing plant gets idle. Thus, we are loading those vehicles and send to our virtual warehouses located in different markets. For that, we create virtual orders and load those trucks and send them to the market without assigning a customer. Once they reach the market, when a customer order is received, we assign that order to the customer and release them into the market. Therefore, we have numerous virtual warehouses attached to different plants and different distribution points to increase their inventory levels. We are in the process of introducing and installation of communication devices in all hardware shops linked with "Easy Cash", to monitor their inventory levels. Once a customer purchases cement, the hardware shops can enter the number of bags into the device. As soon as they enter that detail, they receive money through Easy Cash via mobile phones as per the number of bags they sold. With that information, we can track the demand as well as the inventory level in the market. So we can schedule our deliveries accordingly. We're still in the process of developing the aforementioned system. May be in the future, we will be able to implement this system in the market.

How did the COVID-19 pandemic affect the cement manufacturing industry, especially when it comes to port clearance, and how could such inefficiencies be mitigated by adopting a tech-based smart system?

As a company, we do not remove people from their routine jobs but we're releasing them and directing them towards innovation, research, and improvement. Their time is allocated to researches and innovations while their routine jobs are done by smart technologies.

asset utilization and reduce lead time. Since we go through this process with the strong back support of the SAP system and Transport Management System, disruptions in inventory management or order fulfillment have not become a challenge in our operations. However, the industries which don't have such strong back support by intelligent systems may face disruptions in inventory management and order fulfillment when using the virtual warehouse.

What are the other major problems that can be encountered when maintaining a virtual warehouse management system and other smart technologies in the cement manufacturing industry, and what are the possible precautions?

In our industry, the IT literacy and the knowledge of technology, of our intermediate customers and the channel partners such as retail and hardware shops are limited. Hence, we are facing some difficulties when monitoring endpoint product availability and

We continued our product distribution operation with the relevant approvals, even during COVID lockdown. We could manage island-wide logistics operations, while plugged in from our homes. We have never given any space to allow stock out of cement in any market. Daily S&OP meetings were conducted between cross-functional teams virtually. We mainly came up with our systems to plug and run, where we could operate the system from home, such that, tracking, signing, transport arrangement, and everything else could be arranged virtually. Our system supports all those activities. Thus, it was not a big challenge for us even though there were some dynamics in the market.

There can be pros as well as cons with the rise of smart technologies. Technological unemployment is one of them. How does INSEE act regarding this matter?

If we can do the same production with a less number of people, that is the productivity improvement in a corporate sector. Even at a country level, if fewer people are involved in producing one good, our people can work to produce some other product. County wise it is a production increase and GDP will go up. As a company, we try to remove people from routine jobs and assign them for innovation, research, improvement, and changes. People's time is used for improvements, innovations & researches while their routine jobs are done by smart technologies. It is a major requirement since the labor cost is increasing day by day and the world is becoming more challenging. Therefore, reducing human labor can also bring positive benefits for the companies as well as the country.

Please give us your words of wisdom for the undergraduates who strive to pursue their careers in this industry.

Next line, Logistics is a fast-growing industry globally. When it comes to Sri Lanka, it is the highest growing industry when considering the locational advantage we have as a country, as it is in the right middle of the East-West shipping route. In the future, we can be the number one logistics hub in the world.

Therefore, if you have the right knowledge with the correct attitudes and commitments, you're the people who can change the country to the aforementioned level. People with the right knowledge and attitudes can change the cooperate footprints along with the country's future. 🔲
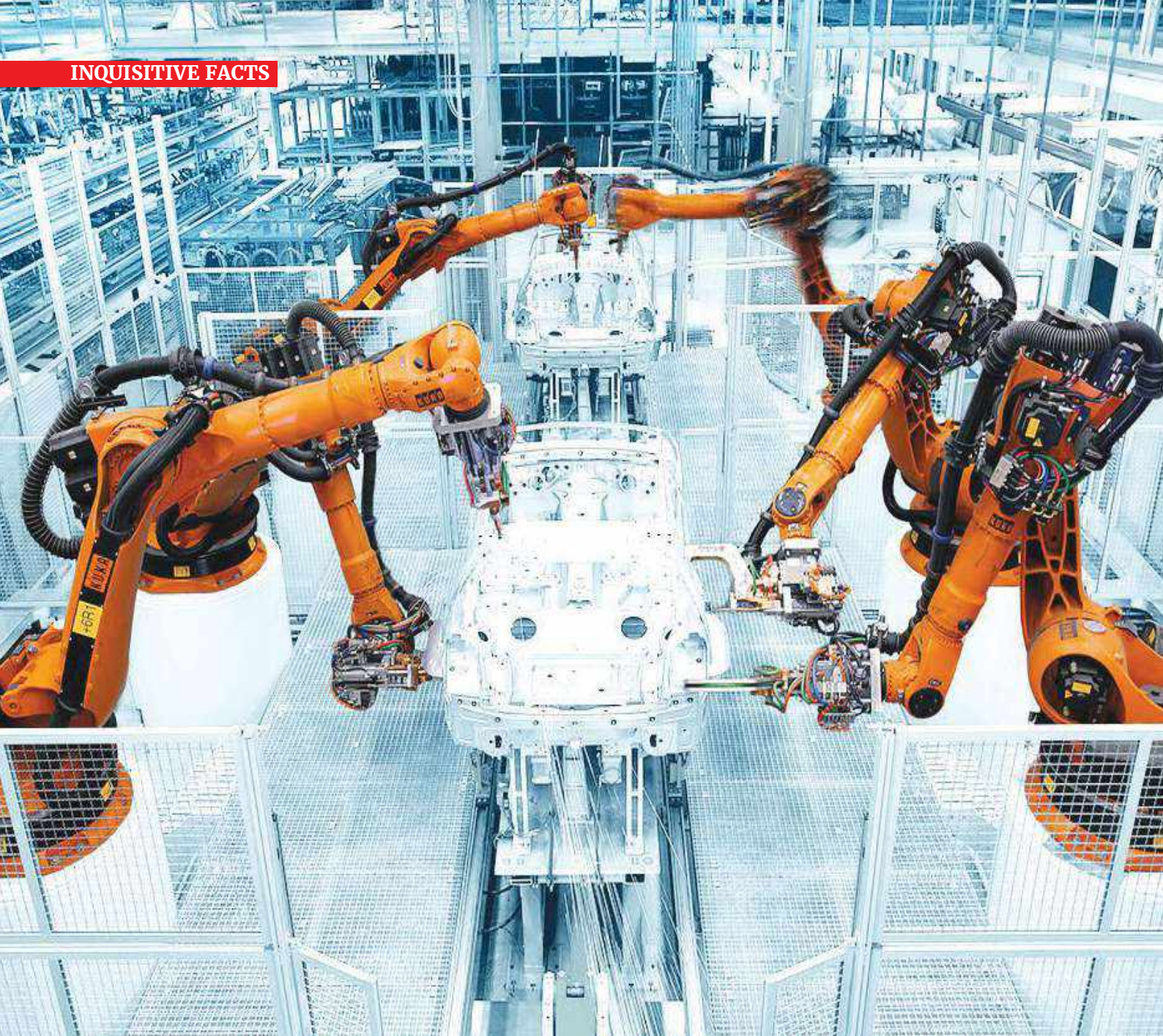
SMART FACTORIES

Smart manufacturing is a broad concept and is not something that can be implemented in a production process directly. With the Fourth Industrial Revolution, or Industry 4.0, the overhaul of new manufacturing processes has begun, innovative processes will continue to blend with digitized manufacturing to form what is being called "Smart Factories".

FUN FACT

The global market for factory automation is expected to increase at an annual compound growth rate of 8.8 percent from 2018 to 2025, reaching over 368 billion U.S. dollars by 2025. Moreover, according to the statistics, the projected global smart manufacturing market size on selected segments such as industrial equipments, healthcare, food and agriculture, etc. will be 479.01 billion US dollars by 2023.

It is a combination of various technologies and solutions which collectively if implemented in a manufacturing ecosystem, is termed as "smart manufacturing". These technologies and solutions are known as "enablers," which help in optimizing the entire manufacturing process and thus increase overall profits. Some of the prominent enablers in the current market scenario include Artificial intelligence, Blockchain in manufacturing, Industrial IoT, Robotics, Condition monitoring, and Cybersecurity, etc.

"Deep learning will revolutionize supply chain automation."

-Dave Waters-

'FULLY AUTOMATED' IS THE FUTURE

Mr. Udeni Perera

Senior Manager Worldwide Cargo Operations –
Sri Lankan Cargo

Interviewed by:
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Photographed by:
Dilakshi Nanayakkara
Thambaru Waduge

Tell us who Udeni Perera is, and how you got into this line of work.

I studied at St. Joseph Vaz College, Wennappuwa and immediately commenced my career at SriLankan Airlines after my Advanced Level examination in 1989 as a Cargo Assistant. While employed I was selected to the University of Sri Jayewardenepura for enrolling to a B.com degree which I was able to follow through to completion while on a day-night roster.

After the completion of the degree, I was able to successfully apply to an executive position in handling third-party freighter operations with an Antonov aircraft for SriLankan Cargo and later took on the role of a Freighter Operations Manager. The third-party freighter operations maintained during the period 2000 to 2007 catered to the wide body aircraft capacity demand in the region with operations to India, Pakistan and Bangladesh uplifting point-to-

point as well as network traffic. Once the UL network gradually expanded the wide body capacity to these points through the operation of the passenger aircraft fleet, the requirement for wide body capacity was internally met and the airline discontinued third party operations. My next role was then expanded to the role of a Business Development Manager at the Cargo Sales & Marketing Division for the airline. The year 2013 resulted in a key milestone in my career, tafter being appointed as the Area Manager to Southern China based in Guangzhou for passenger and cargo operations, enabling me to expand my experience in the airline industry. The Guangzhou region was the best cargo market for UL at the time. The flights that were once operated via Bangkok in supporting the route were converted to direct operations to Guangzhou from Colombo. My next role was as a County Manager for Maharashtra based in Mumbai for passenger, cargo and airport operations. Then finally I was able to come back to where I first started my career at Cargo as the Senior Manager Cargo Worldwide Operations in 2018 for managing the ground handling operations as the sole handler in Sri Lanka and all destinations throughout the UL network.

Can you tell us about Sri Lankan Cargo, its fleet and the routes it serves?

SriLankan Airlines presently maintains a fleet of 24 Airbus passenger aircraft with 12 wide-body and 12 narrow-body aircraft. From a cargo perspective, wide body aircraft allow the carriage of the pallets and containers whereas narrow-body aircraft have a smaller area to load cargo and baggage through manual bulk loading.

The SriLankan Airlines network currently serves over 26 destinations in Europe, Far East, Middle East and the Indian Sub-Continent since the onset of the pandemic, a schedule largely catering to the cargo demand due to the decline in passenger loads with international border restrictions. The destinations network consists of **European** destinations such as London, Frankfurt, and Milan, **Middle East** destinations Dubai, Kuwait, Riyadh, Doha, Bahrain, Muscat, the **Far East** destinations Singapore, Hong Kong, Tokyo, Shanghai, Guangzhou and Seoul and **Indian subcontinent** destinations Chennai, Mumbai, Karachi, Lahore, Dhaka, and Maldives.

SriLankan Airlines was the only international airline to maintain uninterrupted operations to the Island nation Maldives in providing the much required relief goods, food supplies and medical requirements since the onset of the pandemic. The main cargo markets are Colombo, Hong Kong, Tokyo, Shanghai, Guangzhou, Singapore, London, Frankfurt, Milan, Mumbai and Chennai.

How do the operations at Sri Lankan Cargo contribute to the logistics sector of Sri Lanka and how prominent is its resemblance?

Sri Lankan Airlines contributes to the supply chain in two main ways. As the national carrier, the airline provides a supply chain connection to and from SriLanka through the direct connectivity and active support for Sri Lankan exports. The airline is also the sole ground handler for all airlines operating to the nation. As the fastest mode of transport, air cargo plays a vital role in global trade, primarily for time sensitive and perishable cargo. The main commodities for air cargo can largely be categorized as general cargo and special cargo which includes perishables, valuables, dangerous goods, live animals etc. The majority of the cargo imports and exports presently

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Sri Lankan Airlines contributes to the supply chain in two main ways. Since we are a national carrier, we are providing a supply chain connection both in and out SriLanka. We are also the sole ground handler in Sri Lanka to handle many other Airlines coming to Sri Lanka.

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occur at the Bandaranaike international Airport. Sri Lanka is a key exporter for perishables such as seafood, fruits & vegetables and live animals as well as general cargo exports such as garments and garment raw materials for productions, all facilitated through the SriLankan Airlines and other international carriers operating to and from Sri Lanka. The airline therefore, maintains certified ground handling standards at the cargo handling terminals in order to ensure the goods handled maintain

the desired levels of quality for sensitive cargo in enabling the country to compete in the global market as well as in attracting other airline movements in developing Sri Lanka as a transshipment hub.

Venture us through the term "transshipment cargo" and its importance

At Sri Lankan Airlines a majority of its uplift involves the connectivity to the network which is known as a "transshipment cargo". For example, cargo from London, will continue in to Sydney via Colombo. So, London flights carry it to Colombo which is then transferred on to the Sydney flight much like a connecting passenger. Likewise, nearly 50 to 60 tons of cargo per day are being transferred from country to country using Sri Lanka as a hub. Sri Lanka aims to develop the Mattala Rajapaksa Airport as a key transit hub for international carriers due to the logistics convenience Sri Lanka offers in terms of its strategic location.

orders to the customers. SriLankan Airlines intends to invest to acquire new technology and new cargo handling system thereby enhancing the level of automation and digitalization in the entire process.

Sri Lankan Cargo has adapted an advanced automated cargo tracking system called "Skychain". Could you give us a brief overview of this operation, along with other technology enabled services utilized and extended by the company?

As I mentioned to you earlier the system we are using to handle cargo is "Skychain" and we are an airline as well as a handler. Skychain is used for both the purposes mentioned above. As an airline, we want to sell our product to the market. Therefore, we use this as our sales reservation system. The other part is handling of cargo operated by us. Whenever an agent or a shipper wants to transport a shipment they will make a reservation on the skychain system.

Currently, we use semi-automated. We are using machines, for example, X-ray machines to X-ray the cargo, forklifts, and tractors. Moreover, we are using a system, where the customer can track and trace their cargo and through which we can do our handling by manifesting and releasing the orders to the customers.

Air Cargo operations are increasingly embracing high-tech advancements in order to deliver a productive service. What are the pros and cons of these developments and how relatable are these advancements to the Sri Lankan context?

As a country, we are not 100% adhered to this high-tech capacity of handling cargo. Having said there is a certain degree of digitalization in the cargo handling process. SriLankan Airlines presently utilizes the Skychain system for cargo reservations and ground handling operations. When it comes to handling, there are three types namely, completely manual, semi-automated, and fully automated. Fully automated futuristic, which I will be mentioning later. Currently, the BIA Cargo terminals are classified as semi-automated due to the use of machines such as the X-ray machines and cargo systems enabling the tracking of customer cargo and through which we can do our handling by manifesting and releasing the

Then a declaration form is prepared and the cargo is handed over at the cargo terminal. Once it is booked it will appear in the FBL or the freight booking list of the particular airline. The acceptance of the cargo would be based on the FBL and a manifest would depart the flight from the reservation and handling system.

The skychain system is our main cargo tracking system and this is integrated into the SriLankan Airlines accounting system call oracle system where it links and passes data for accounting purposes. In promoting a paperless environment, the system is further linked to the customs Asycuda system, an interface that goes through a system called CCN where the consignee is able to clear the cargo electronically.

When it comes to air cargo, safety is priority. So we have to have the perfect weighing system to weigh the shipment

to send a safe aircraft out of the country. Therefore, we have weighing scales that have also been integrated into the system. When a shipment comes for acceptance, our staff need to search through the bookings. Without any booking, we never accept cargo for air carriage. So the Skychain is also integrated and linked to the weighing system through a local party. This is how the Skychain is connected for our cargo weighing system.

We have also developed a mobile app using the Skychain system. The app allows the tracking and tracing of your cargo. The app further allows the calculation of the cargo delivery charges, you can put your date and see how much you have to pay at the counters. We have another plan to develop this app to another stage where the customer has access to more information whenever they need to get them.

How impactful was the COVID-19 pandemic to the cargo operations of the company? How has the company integrated the lessons learnt, with the post pandemic operations?

It was the hardest time the airline went through and is still going through. I can remember there were about 2-3 weeks with no operations. With travel restrictions during the pandemic, people were still expecting goods to move to facilitate trade. For example, with the pandemic; vegetables and fruits were delivered to our doorsteps. This is the supply chain. Likewise, we saw there was an exaggerated demand and opportunities. This is where we started our business activities during the pandemic. SriLankan Airlines used our aircrafts for dedicated transportation of cargo to the rest of the world. We started operations to a wide range of destinations all over the world. As a handler, we have so many staff and we must involve in many daily interactions

within the organization with external parties as well. With the Covid-19 pandemic we had to handle cargo and satisfy the customer demands while adhering to the health restrictions such as having a gap of one meter and using masks and gloves etc. We found 3 cases of Covid-19 within Sri Lankan Cargo and thus had to isolate a whole team leading to the operation to be a question mark. People had to work overtime and on a volunteer basis. Now with almost one year gone, we have applied few strategic plans. SriLankan Cargo converted our rosters to 24-hour work times and did necessary roster changes to make sure that the contactability of staff with outsiders were kept at a minimum level especially concerning transportation. We managed to give a very pleasant working environment even with a 24-hour roster with manageable workload and by giving the staff several days off after the shift.

We saw this pandemic as an opportunity to transport cargo and earned the much required revenue for the company. The airline has slowly recommenced operations and expanded it to over 26 destinations. While Covid-19 is an obstacle, with a lot of planning and the dedication of our employees we managed to handle that. Even now we are applying all sorts of precautions and with all these difficulties, we have learned as a handler and given our 100% commitment for our country to carryout Air export and Air import.

Could you tell us about the passenger aircraft that was converted into a cargo freighter?

The airline industry has 2 types of aircraft, one is "passenger aircraft", wherein the upper deck passengers are carried and the lower deck carries cargo and baggage. The other is, "cargo freighters" that are designed to carry only cargo and we call them dedicated freighters. When the pandemic came in there were no passengers to travel but there was a high demand for transportation of goods, especially PPE. IATA gave special approval to load cargo on the seats too and some airlines including UL removed the seats and loaded the cargo in the passenger cabin. This is how we converted one of our passenger A330-200 aircraft to a converted freighter and it has a capacity of carrying about 5 to 6 tons of cargo on the upper cabin. The

difference between the dedicated freighter and the converted freighter is that a dedicated freighter can carry a significant amount of payload in a palletized manner on them.

How does Sri Lankan Airlines contribute to the distribution and transportation of the COVID-19 vaccine?

We set up a special procedure, a team, and met all the authorities such as the health authority, airport aviation, and customs. The first shipment handled was a donation from India brought by Indian Airlines as it was a government-to-government came as a donation. The vaccines arrived on a gel ice pack and as it is highly sensitive cargo we delivered it from under the aircraft itself. Two lorries were brought from the Ministry of Health and the President himself was present to accept the vaccine from the High Commissioner of India. Soon after the arrival of the flight we unloaded it and straightaway handed it over to the relevant authorities. After that, we got another shipment from India where we got pre clearance from Sri Lanka Customs and immediately handed it over to the clearing party. Then another shipment of around 2.5 lakhs of vaccines arrived through Emirates, and the same procedure was repeated. On the 31st of March, we received a large shipment of vaccines from China through a specially operated flight of Sri Lankan Airlines where his excellency the President arrived to accept it. As it was an official handing over from the Chinese government. The shipment was also immediately offloaded and vaccines were loaded to 10 cooler trucks by using 4-5 forklifts and was handed over to the authorities. Up to date we have handled about 4 shipments smoothly.

Did the recent Suez Canal blockage create a short term opportunity for the global air freight industry? If so, how did Sri Lankan cargo respond to that?

This issue did not impact our markets. However the rates saw a slight increase during the period due to a connectivity backlog. It had an impact on sea freights but the disruption that occurred for a few days did not have a significant impact on Sri Lanka. Our normal demand was there, and we catered to that, but I did not see any other extra demand that came up due to this situation.

How do you envision the future of Sri Lankan Cargo, when looked at in a technological perspective?

As Sri Lankan Cargo, now we are looking at two main areas. First, currently we are using the skychain system that is 10 years old and we have identified that we need considerable improvements in our systems. Therefore, we are in the process of evaluating 4 new systems to select one of them to suit our current requirements. It will improve of both our cargo sales and cargo operations. We also handle post-office mails at Sri Lankan Cargo, and we plan on incorporating a part of the new system to handle post office mail too. Currently, we handle post office mail manually. Second is that Currently we have 2 terminals, terminal 4 where we store imported cargo, and terminal 5 where we handle our export cargo. With the Easter Sunday bomb attack and the Covid-19 pandemic, the demand diminished, we foresee an increase in demand in the future. Hence, we have already started the project of building a new cargo terminal that would be completed in 1.5 years with an area of about 10,000 square meters and another terminal, 500sq meters to handle dry fish. We plan on putting an electronic system called ASR (Automated storing and Retrieving system) where the cargo will be stored electronically and when it comes for delivery the goods will retrieve automatically by the system. At the same time, we do our handling manually where the checker would mark the goods on a piece of paper and enter it into the system. We plan on conducting this process with the use of a handheld device.

As a veteran in the field, what are your words of wisdom to the young undergraduates who are passionate about pursuing careers in the air freight industry?

The international freight industry has two main areas, namely air freight and sea freight where only a limited amount of cargo is carried through air freight and the rest is transported through sea freight. This area of logistics will never die. Even with the pandemic situation, the freight industry showed major improvements as almost all day-to-day needs of people were fulfilled with transportation though supply chain management. "Airfreight is an industry that gives a lifeline to people''. For example, it is not practical for vaccines and injections to be brought by ships. The vaccines from China were brought down with less-than-24hr as airfreight. Freight business is a link with the health sector and many more sectors. We bring down radioactive material that is required for cancer patients every week from Mumbai to Colombo and we clear it immediately before the radiation wears off. We also send blood samples that cannot be tested in Sri Lanka, to Singapore. Lot of medicines are transported by Air. Further, exporting Valuable cargo such as Gem and Jewelries. Urgent garments are delivered worldwide, along with Perishable cargo such as fruits, vegetables, fish and live fish will be transported by air due to the nature of the goods. The airfreight industry is a never-dying industry and therefore invest your time to study it as there are plenty of opportunities in the market.

CONCEPT OF INDUSTRY 4.0 AND ITS APPLICATIONS IN SMART SUPPLY CHAIN MANAGEMENT

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In the contemporary world, the complexity in the global supply chain is multiplied with the flow of information, with a data-driven approach providing visibility from end to end for monitoring the flow of information, services, and goods from procurement to manufacturing and delivery to the end consumer. Other factors such as good relations with suppliers, effective cost control, having effective logistics flow, and most importantly, adopting technology into routine functions make a big impact on a surviving industry at present. Industry 4.0 or the Fourth Industrial Revolution is the ongoing processes of automation of traditional manufacturing and industrial mechanisms, using modern technology based on information and technology. The internet of things (IoT) and large-scale machine-to-machine communication is integrated for improved communication, increased automation, and self-monitoring of processes, and the production of smart machines that can analyze ongoing situations and diagnose issues without the need for human involvement.

The phrase Fourth Industrial Revolution or industry 4.0 was first introduced by a team of scientists developing a technological strategy for the siemens corporation based in Germany. Chairman of the World Economic Forum, Klaus Schwab, introduced the phrase to a wider audience in 2015 via an article published in the World Economic Forum Annual Meeting 2016 in Switzerland. In this fourth industrial revolution phase, technologies emphasize advances in communication and connectivity in components of supply chain management to enhance their efficiency. This era is marked by breakthroughs in emerging technologies in fields such as robotics, artificial intelligence, the industrial internet of things, decentralized consensus, wireless technologies and fully autonomous vehicles.

Industry 4.0 is having four design principles that are important for perfect flow of information and processes. The first principle is "Interconnection" which can be defined as the ability of machines, devices, sensing equipment, or the sensors and eventually people to connect and share information with each component via the IoT. The IoT is the network of physical objects which are embedded with technology to exchange data with other devices and systems over the Internet. The second principle is "Information transparency" which makes transparent interconnectivity for the management level to collect data and information from specific points in the product manufacturing process and the logistics and to identify key areas which can be further improved. In industry 4.0, it ensures that the providing information is comprehensive enough to make decisions. "Technical assistance" is the third principle of industry 4.0 which is involved with technological facility systems to assist humans for processes such as decision making and problem-solving. Autonomous vehicles in the logistics sector and the usage of robotics in the manufacturing processes, enhance efficiency and do tasks which

Airbus has launched a digital manufacturing initiative known as "Factory of the Future'' to stream-line production and operations capacity. The company has implemented sensors to tools and machines and given workers wearable technologies such as "Smart Glasses'' designed to reduce errors and to increase the safety of employees.
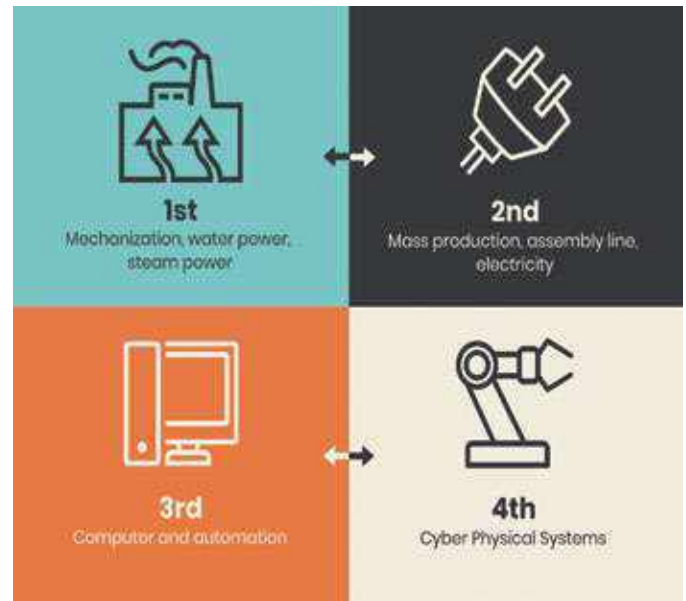
are difficult or unsafe for humans. The fourth principle of Industry 4.0 is "Decentralized decisions" which is the ability of cyber-physical systems to make decisions according to the situations and to perform their tasks autonomously as possible. These systems are coded to transfer the details which are interfering or conflicting, to higher decision-making authorities. The Fourth Industrial Revolution consists of many components when looking closely into our society and current digital trends. To understand how extensive these components are, here are some contributing digital technologies as examples. Mobile devices connected via Wi-Fi networks such as Palm-Tops usage is extending towards the employees involved in the production. The real-time updates about the production line make it easier for decision-makers to make the most appropriate decision. Internet of Things (IoT) platforms are the most popular among Industry 4.0 with their various usage. Practical usage of IoT can be identified in several major factories worldwide. "Factory of the future" of Airbus was implemented in 2016. Assembling a commercial airplane is involved with millions of parts and thousands of working procedures. If there is any mistake within any of these procedures or in a single part, may cost hundreds of human lives. To ease up this complexity, Airbus has launched a digital manufacturing initiative known as "Factory of the Future'' to streamline production and operations capacity. The company has implemented sensors to tools and machines and given workers wearable technologies such as "Smart Glasses'' designed to reduce errors and to increase the safety of employees. As per the census of Airbus in 2017, in one procedure known as cabin seat making, the wearable "Smart Glasses'' enabled a 500% improvement in productivity. In 2015, Bosh launched a "Track and Trace" program according to the results of researches, that workers would spend a considerable amount of time searching for appropriate tools, in this case, Bosch developed a program based on location detection technol-

ogies, equipped with sensors to its tools to track them down. As the resolution of tracking becomes more precise, the company is planning to upgrade the system to guide assembly operations. These location detection technologies based on IoT platforms applied in Industry 4.0 can be found largely in the logistics sector. MAERSK, the Danish shipping corporation has embraced IoT to keep tracking its assets and optimize fuel consumption in logistics, shipping thousands and thousands of containers to almost 120 countries across the world. This "Intelligent logistics'' technology has proven to be especially effective for refrigerated containers. Another aspect of implementing this program was because the company spends more than USD 1 Billion per annum for transporting empty shipping containers. MAERSK has installed sensors and data analytics applications to show how to store them and to locate them. There are other technologies such as "Advanced human-machine interfaces" which are mostly involved with robotics in manufacturing processes and logistics. Augmented reality and multilevel customer interaction make it easier for the customers to have an idea about the product or service in real-time, before making the purchase.

Mainly these technologies which are applicable in Industry 4.0 can be summarized into four major components. The first one is Cyber-Physical systems which are the systems of collaborating computational entities which are connected to the surrounding physical environment. Real-time data processing services are included in this category. Industry 4.0 networks a wide range of new technologies to create value. Using these systems that monitor physical processes, a virtual copy of the physical world can be designed. Characteristics of cyber-physical systems include the ability to make decentralized decisions independently. The second major component is the Internet of Things (IoT). Connected appliances in Industry 4.0, wireless inventory trackers,
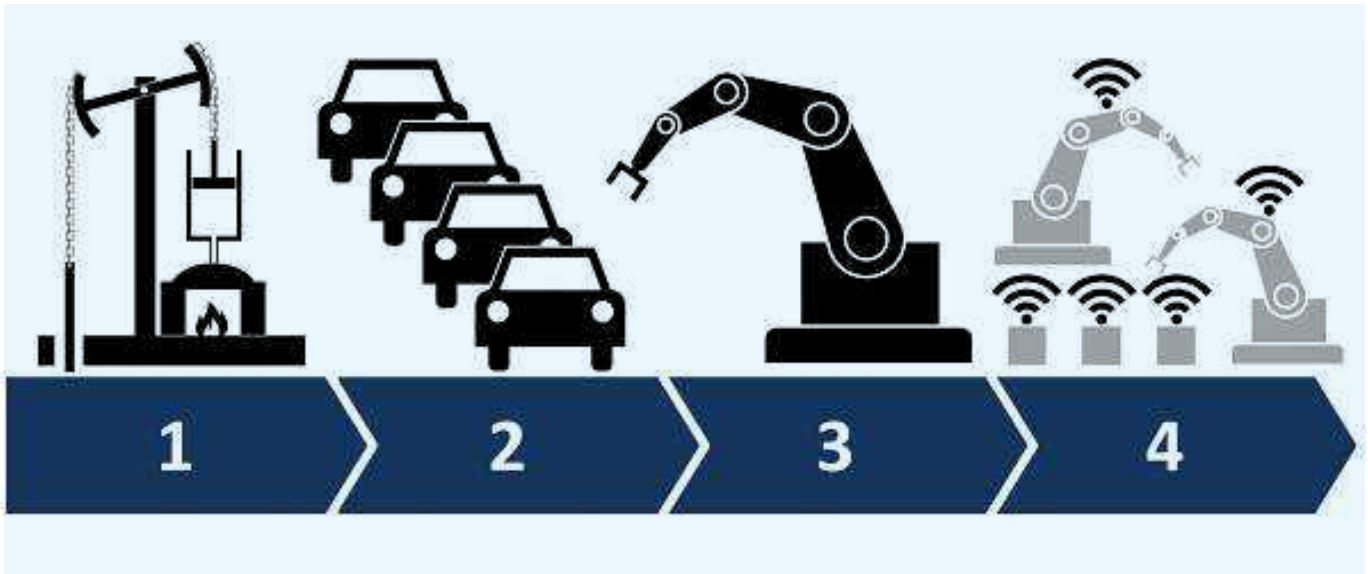
The value created in Industry 4.0, can be relied upon electronic identification, in which smart manufacturing requires set technologies to be incorporated in the manufacturing process and logistics. Two main trends can be identified as the most influential ones such as the concept of "Smart Factory" and "Predictive maintenance".

smart factory equipment can be identified in this category. Cognitive computing and on-demand availability of computer system resources are the next two categories. These cognitive computing facilities give precise information on the processes to make the perfect decisions. The value created in Industry 4.0, can be relied upon electronic identification, in which smart manufacturing requires set technologies to be incorporated in the manufacturing process and logistics. Two main trends can be identified as the most influential ones such as the concept of "Smart Factory" and "Predictive maintenance". In the concept of a smart factory, cyber-physical systems monitor physical processes creating a virtual copy of the physical world and make decentralized decisions. Over IoT, these systems communicate and cooperate with each one of the units and with humans in the decision-making level as well as the employees. The trend of "Predictive maintenance" which can identify issues with maintenance allows machine-owning companies to perform cost-effective maintenance and determine whether there is an ongoing issue that can cause a mechanical failure before the machine fails or gets damaged. For example, a company headquarters which is situated in the Colombo urban area could understand if a piece of equipment in their wear-house in Kandy is running at abnormal temperature. Then the headquarters can decide whether or not it should be shut down and be repaired.

As it is for any new step to be implemented acquiring the statuses of industry 4.0 is having challenges to work on, which can be categorized into four categories of Economic, social, political, and organizational challenges. From an economic perspective, high economic costs involved with new structures and procedure formations as the process of installing high-tech devices may cost millions and it is followed by the adaption to new business models in manufacturing and logistics. The investment in acquiring Industry 4.0 goals, within the first few years may show unclear economic benefits. Challenges in the social scene are followed by the loss of a considerable amount of jobs due to automatic processes and IT-controlled processes, especially for blue-collar workers. In the political aspect lack of regulation, standards, and forms of certifications and Unclear legal issues and data security are among major challenges for cooperation that is ready to adopt Industry 4.0 into their processes, especially in the South Asian region. In the Organizational view, lack of adequate skill-sets of current employees to expedite the transition towards a fourth industrial revolution followed with IT security issues can be overcome with the studies and researches on current Industry 4.0 applications and with gaining relevant expertise. The benefits of adopting Industry 4.0 are far more than the risk-taking. Improved productivity, improved efficiency in both manufacturing and logistics with improved flexibility and agility may cause highly on overall benefit. ■

"In today's era of volatility, there is no other way but to re-invent. The only sustainable advantage you can have over others is agility, that's it. Because nothing else is sustainable, everything else you create, somebody else will replicate."

-Jeff Bezos-

SUPPLY CHAIN 4.0 requires us to be absolutely information savvy

Mr. Sanjeeva Abeygoonawardena

Group Management Committee - Hayleys Advantis Limited

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Who is Mr. Sanjeeva Abeygoonewardena? How did you choose this field as your career?

My candid answer is, I ended up as a logistician by accident. I was aspiring to be an architect. After I left school I was invited to represent a few organisations at the mercantile rugby sevens. I had a few options such as John Keells and a few other companies who were on the lookout for young talent. I ended up joining Hayleys, simply because they offered a very attractive role for me. My father's persistence to get me to join the logistics and shipping industry was also a factor that drove me in this direction.

From thereon I came into this position. At first it was not very easy since a career in logistics was never something I imagined I'd find myself in, not even in my wildest dreams. But then, I managed to blend in with the team and thoroughly enjoyed the challenges that came my way. I enjoyed working in the company where I started my career, which was one of the shipping units attached to the Hayleys Advantis Group. I consider that as my first university, which gave me a challenging exposure to learn the ropes in logistics.

Working for a company with foreign principals and a multinational presence certainly opened my mind to international trade and helped me better understand our role as an enabler in making global trade run in a smooth manner. At that young age, it was certainly interesting to meet clients and learn about how we contribute towards their success. Learning the purpose behind what we did, was a driving factor towards my success as a logistician.

What is the role of Hayleys Advantis in the field of Logistics?

Hayleys Advantis initially commenced its journey as the shipping division of Hayleys

PLC. But the current Chairman of Hayleys PLC Mr. Mohan Pandithage, who was then the Managing Director of Hayleys Advantis Limited, had a vision to create a separate logistics pillar for Hayleys and went on to transform this company to be the leader in logistics in Sri Lanka.

What started off as a Shipping operation representing international shipping lines, has today grown and expanded to cover every aspect of logistics covering air, land and sea. We offer everything from shipping, freight forwarding, 3PL, marine services, oil & gas logistics, container depot services, free zone logistics, project logistics, domestic delivery etc. We currently own and manage the largest fleet of privately held seagoing assets, and we have even expanded towards the field of construction. So from our humble beginnings in 1958 we have certainly comealongwayandwearenowwellrecognized as a trend setter in the field of logistics

> We understood that the role of logistics was changing. To be in line with the game changing role logistics will play in the future, we ensured that we invested in the right people and the right technology.

and construction and a power house in the industry.

Hayleys Advantis is said to manage activities under an 'Integrated Management System'. How are the company operations integrated with technology and innovation under the above concept, in order to reach optimal performance?

I think about five years ago, we understood that the role of logistics was changing. To be in line with the game changing role logistics will play in the future, we ensured

One of the good things that came out of this pandemic was that it gave us all time to pace ourselves and better strategize for the future. So that's where we are at right now. We are studying how to digitize cargo, what platforms can be used to enable consumers to book space online and how to get integrated space.

that we invested in the right people and the right technology. With our presence marked in every aspect of logistics the central management of Advantis understands the essence of what is required in terms of synergizing and collaborating to bring the best out of our teams, in order to deliver exceptional services to our customers. In this process, we started gathering data from across the group to help us understand areas where we needed to improve and we started to centrally govern and manage this data with the support of IT platforms. A broad based technology roadmap has been set in motion and it's an on-going process, with some studies still continuing.

How does "Hayleys Aviation Supply Services" operate and what is the contribution of technological advancements in operationalizing this?

Hayleys Aviation services was acquired by Hayleys Advantis just about one and a half years ago. As you know the aviation industry is one where staying abreast with the latest technology can be a make or break factor.

As of now with the current pandemic situation the passenger airline work has seen slow progress but the cargo segment has seen significant growth. One of the good things that came out of this pandemic was that it gave us all time to pace ourselves and better strategize for the future. So that's where we are at right now. We are studying how to digitize cargo, what platforms can be used to enable consumers to book space online and how to get integrated space. We are still at the preliminary stages of these improvements.

Hayleys Advantis represent the world's largest air express freight services company; FedEx in Sri Lanka, and you work very closely with this venture since you are the Director at Mountain Hawk Express (Pvt) Ltd, which is the licensee of FedEx in Sri Lanka and Maldives. What is that experience like to work hand in hand with such a global giant, and how does its express freight operations benefit from technological developments?

As I mentioned before, working for a multinational is a complete game changer in my opinion and it's something I would encourage all students to consider, as it builds an adaptive mind-set and helps a person grow and embrace best practices.

When I joined FedEx as a CEO I didn't understand how FedEx impacts the world and I couldn't understand their business motive. Then I came across a story where the founder/chairman of FedEx, speaks of the FedEx journey, where the company is and how the next 20 years is going to completely revolutionize how we do business. That article started to linger in my thought. It was all about e-commerce and how the world was changing with the information age. It spoke of how there will be more entrepreneurs, how we are going to cater to the SME sector, how SME businesses are important and how FedEx fulfils and empowers global trade. Even though this is a broad topic, if I put it into perspective it helped me better understand our purpose or why we do business.

Understanding one's purpose can be a huge game changer in one's career. When

you really think about logistics, it's what keeps the world moving. It's what connects the manufacturers or producers with the consumers. It's what enables global trade to take place. We play a huge role in keeping the world's supply chain moving and companies like FedEx play the role of a vital cog on a global scale. They train their staff to better understand the purpose behind what they do and why they do it. There is a mantra behind it called the "Purple Promise".

Processes were another area which FedEx gave high importance to. They had a process for pretty much everything from people management to identifying top talent to identifying under-performers and the list goes on. Processes of this nature are absolutely necessary to manage a global giant of this size and stature and to ensure the level service delivered in Sri Lanka meets the same standards that are set anywhere else in the world.

Sometimes we think it's all about who leads the organization. But it's never about who leads the organization. A leader can make an impact but I think the beauty of some big brands is that there are standard processes in place, so that when you take the leader-ship role or when you leave the organization, the business still runs smoothly. If you have a leader who is very progressive, who believes in people, who is very smart and very productive that only adds to the brand value. That was one of the key highlights that I learnt from FedEx.

I still learn a lot from FedEx because they are very progressive in the way they think, if not they won't be one of the leading air express transportation companies in the world. They have over 680 aircraft which makes them the second largest airline in the world. Just imagine the time and effort that goes into managing these air crafts. Everything is about time and everything is measured and they always try to see how you can do less with the help of technology. FedEx is one of the top 20 leading tech companies in the world, which goes to show how they leverage on technology to improve their processes each day.

The COVID 19 pandemic created a boom in e-commerce transactions and it sure made logistics the most wanted activity globally. How did Hayleys Advantis come up with tech-related services to facilitate

Understanding one's purpose can be a huge game changer in one's career. When you really think about logistics, it's what keeps the world moving. It's what connects the manufacturers or producers with the consumers. It's what enables global trade to take place.

these e-commerce platforms and how successful are those ventures?

COVID-19 certainly was an eye-opener for all of us. It pushed us towards a digital transformation which otherwise could have taken years to plan and execute. This goes to show that these capabilities are truly within us, but we are sometimes overcautious in taking steps towards change and transformation.

When it came to the first lockdown in SL, we were truly thrown into the deep-end. As a logistics company we had to ensure that our clients i.e. retailers, FMCG companies etc. could reach their customers or the end consumers across the island. We had to go full throttle from the beginning and I can say that the sheer grit and dedication of our teams is what got us through the initial lockdown.

> If we are to discuss the challenges of supply chain 4.0 one of the main factors we have to consider is our digital shyness. As Sri Lankans we have this notion that our information has to be kept within our bounds to ensure that our competition cannot get their hands on it. Because of this rather than preventing your competition from getting ahead, you may actually be preventing your growth in this digital era.

Our domestic delivery unit Citypak launched its own software for last mile delivery and even started offering a cash-on-delivery option. Meanwhile FedEx offered a software integration, which connected the FedEx delivery software with online retail platforms for international sales. This allowed SMEs to grow not just on a local scale but on a global scale. We also made some structural changes at Advantis to support our end-to-end service provision to clients where our integrated logistics services were better packaged to give a better user experience. Here the end-to-end services of warehousing & 3PL, fulfilment, last-mile delivery, cross border trade, international freight management and customs house brokerage were all strategically integrated to ensure the customers could have a transparent solution end-to-end.

All these improved delivery timelines and overall end consumer satisfaction which is what our clients are also looking to ensure. So at the end of the day, these tech transformations enabled us to ensure that our clients could deliver their promises to their customers.

Global supply chains are embracing modern technology very rapidly. Why do you think that supply chains are looking for this transformation and how would you envision the future of logistics?

As I mentioned before, transparency is a key factor and technology platforms enable the level of transparency which consumers are now looking for. Each step of the supply chain needs to be documented in a way that the consumer can monitor, because today's consumer needs to know exactly where his/her package is at all times.

At the same time consumers are extremely conscious of the cost of logistics. While we offer such monitoring, we can't jack up the price of logistics either. It has to be maintained at the right price point to entice the consumer.

So technology such as AI and blockchain will enable the provision of such transparent solutions at a fraction of the cost it used to be. Blockchain offers an end-to-end solution for companies that want to run leaner, more organized and more efficient operations. It will enable greater visibility across the supply chain and some companies are already leveraging on this.

One of the most important factors in logistics is the infrastructure strength. But

in today's context it's not enough to just have assets on ground. For e.g. companies such as FedEx are thriving today, not just because they have the largest fleet of cargo aircraft, but also because they have ensured that the assets on ground are integrated via technology to offer seamless connectivity.

This is where the future of logistics is heading. There are companies which are aggregating their assets in the space of logistics and giving that experience to the consumers. That's going to be the game changer in the future.

Throughout the interview we talked about the positive end of smart supply chain management. Conversely, what are the potential challenges of supply chain 4.0 and how could they be mitigated?

Supply chain 4.0 requires us to be absolutely information savvy. It refers to a digital age where anything and everything in a supply chain is driven by data and information. If we are to discuss the challenges of supply chain 4.0 one of the main factors we have to consider is our digital shyness. As Sri Lankans we have this notion that our information has to be kept within our bounds to ensure that our competition cannot get their hands on it. Because of this rather than preventing your competition from getting ahead, you may actually be preventing your growth in this digital era. I don't mean that all sensitive information needs to be shared. But in order for blockchain to work, we do need to be more transparent with our information.

Overall I believe a lot more needs to be invested in terms of bringing our technology up to date in order to capture the data required for supply chain 4.0 to be fully operationalized.

Hayleys Advantis is implementing and supporting different initiatives, especially to mould the young undergraduates and fresh professionals. How important are these initiatives and what is your advice to such young enthusiasts?

I wholeheartedly believe that logistics is the next frontier. In my opinion logistics is what makes the world function the way it does today. The profession of a logistician is gaining far more traction nowadays and it has brought about a lot more interest amongst the younger generations to build a career in the field of logistics.
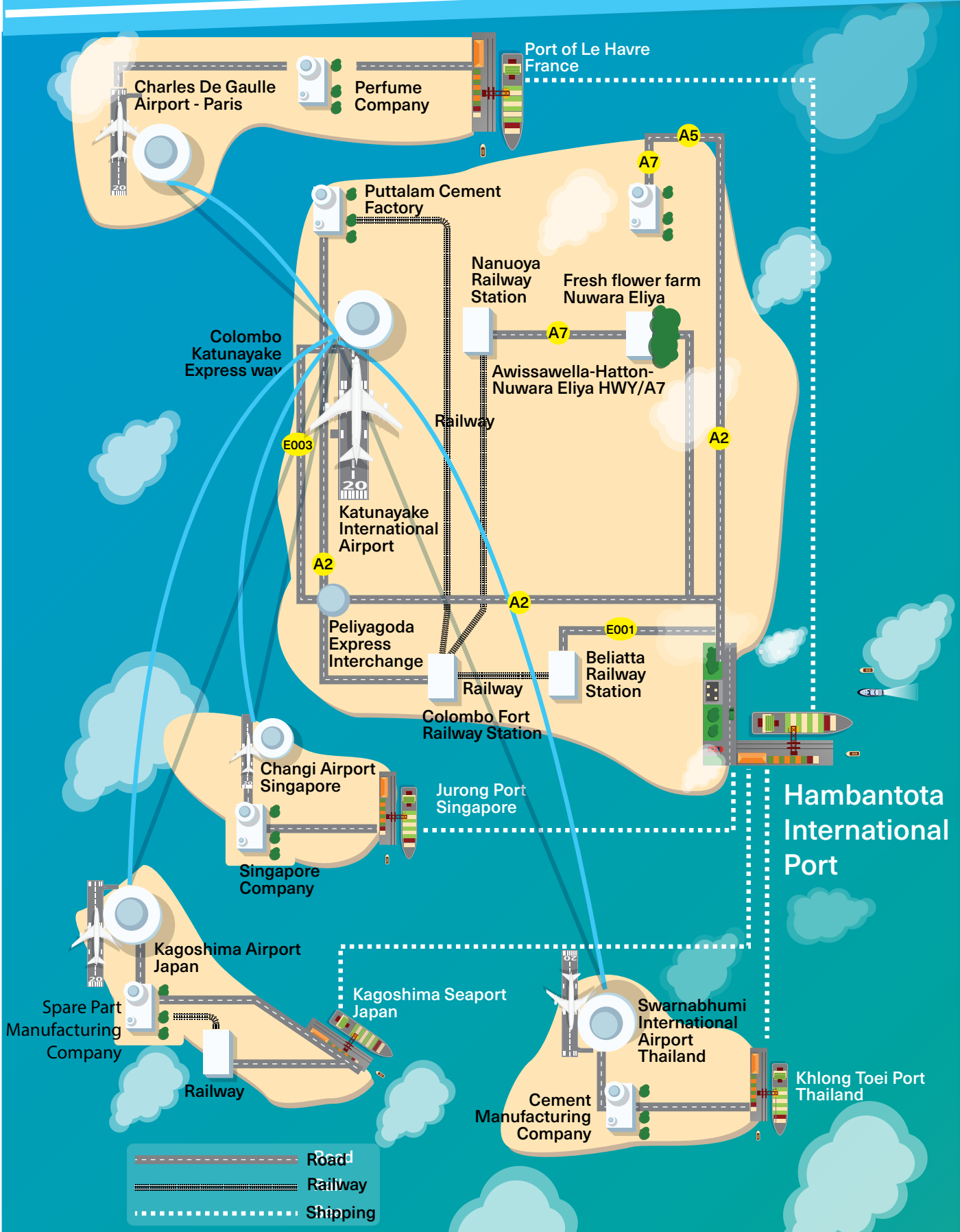
At Advantis we are constantly working towards building industry capacity. This is not something we do just for our new recruits, but we conduct programmes to undergraduates at identified universities and other institutes. Our intention is to ensure that those who choose the field of logistics are better prepared to face the demands a logistician is expected to deliver once they enter the industry be it at Advantis or any other company. Apart from these capacity building programmes, we also run internship programmes, which help future logisticians learn more about how the company operates and what they can expect once they enter the industry.

At the same time through the National Export Strategy, Advantis was working towards lobbying for the introduction of a logistics subject for ALs. This will help us gain an interest from the younger population even before they enter universities. We also have some strategic programmes such as partnerships with universities and industry bodies, through which we invest in the development of future logisticians. In one such programme, we ran a case study competition in collaboration with the KDU a few years ago.

So I believe it's really important for students to engage with these programmes as much as possible so that you gain more experience and build your network before you enter the corporate world. It's important to understand the role logistics plays in keeping the world moving. At the same time it's necessary to understand the importance of logistics as a Sri Lankan, because of our strategic location in the east west shipping route.

For young undergraduates, I would say, think about what I mentioned before. Some of the progressive countries have long term plans for forty or fifty years, whereas we only have plans for four or five years. There's a lot you can do if you have a proper plan. What I see from youngsters today is that they are more aware of where we are heading and what's important for society. We've got great assets and amazing potential in our country. It's just a matter of putting these together. If you have the drive and the will to see it through, you can lead this country to much greater heights than where it is today. So I hope each and every one of you will put your best foot forward to represent Sri Lanka and take it to global heights. L

LOGISTICS MAZE CHALLENGE

Charles De Gaulle Airport - Paris

Perfume Company

Port of Le Havre France

Puttalam Cement Factory

A5

A7

Nanuoya Railway Station

Fresh flower farm Nuwara Eliya

Colombo Katunayake Express way

Awissawella-Hatton-Nuwara Eliya HWY/A7

A7

A2

E003

Railway

Katunayake International Airport

A2

Peliyagoda Express Interchange

A2

E001

Beliatta Railway Station

Railway

Colombo Fort Railway Station

Hambantota International Port

Changi Airport Singapore

Jurong Port Singapore

Singapore Company

Kagoshima Airport Japan

Kagoshima Seaport Japan

Swarnabhumi International Airport Thailand

Spare Part Manufacturing Company

Khlong Toei Port Thailand

Railway

Cement Manufacturing Company

Road
Railway
Shipping

Test your logical reasoning, problem solving skills,

patience and determination as you try to discover the most efficient and productive way to transport the bulk of cargo from the origin to the destination. Enjoy the Logistics Maze Challenge!

Logistics is the management of the flow of things between the point of origin and the point of destination to meet the requirements of the customers and the businesses according to the **7 Rights,** which are; getting the **Right** product, in the **Right** quantity, in the **Right** condition, at the **Right** place, at the **Right** time, to the **Right** customer, at the **Right** Place.

How to Play:

The maze consists of 4 types of transportation methods; sea, air, road and rail. Find the best route for the given cases from the maze to transport the given cargo from one place to another. Use the given hints to find the routes. You can use one or several transportation methods for each case.

Strategy to win:

Thinking skills and your knowledge regarding Logistics and transportation is the key to the success of this game. Study the given hints carefully, focus more on the nature of the cargo, geographical location of the origin and destination, and the time constraints.

Case 1

A fresh flower farm is exporting fresh flowers from Nuwara Eliya to a reputed perfume company in Paris. Company X has projected that the total number of hours that should be taken for the transportation of flowers should be less than 72 hours.

HINT: Focus more on the time and the merchantable quality of the flowers when reaching the destination.

Case 2

A reputed cement factory is importing clinker from a cement manufacturing company from Thailand to their cement manufacturing factory in Puttalam. With the rising demand, the company has decided to manufacture more cement to supply the demand of the customers. Hence, the company is expecting the cargo shipment as soon as possible.

HINT: Focus more on the volume of the bulk of cargo rather than the value, and the time.

Case 3

A reputed manufacturing firm is facing a critical situation because of the breakdown of few machines. The mechanics of the company state that few small equipment are needed to fix the machines. The company decided to import some machines from a reputed Japanese spare parts company as soon as possible since the production process cannot be continued without the machines.

HINT: Focus more on the urgency and the volume of the cargo.

CORPORATE ETIQUETTE

01. THE FIRST IMPRESSION

The first impression is a crucial factor today in this corporate world, and these useful tips will polish yours.
1. **Be on time**
2. **Be courteous and attentive**
3. **Present yourself appropriately**
4. **Have a winning smile**
5. **Be open and confident**
6. **Be positive**

02. THE IMPORTANCE OF BODY LANGUAGE

Eye Contact –
Look directly to show your confidence and attention.

Posture -
Stand or sit upright, with your shoulders back and your arms unfolded by your side or in front of you. Your head should be upright and level.

Shaking Hands -
A handshake should be firm but brief. Always keep eye contact and smile. Avoid sweaty palms.

03. BUSINESS COMMUNICATION ETIQUETTE

Show genuine interest -
Keep eye contact and make an effort to truly listen and respond to what others are saying, without getting distracted.

Don't walk into someone's office unannounced –
First, knock on the door or say hello. If it's open, ask if it's a good time to talk.

Arrive on Time -
In the business world, it is best to observe the old rule, "Five minutes early is late.". Thus, allow yourself enough time to arrive promptly.

04. BUSINESS CARD ETIQUETTE

Your card should be clear, easy to read, and simple.

Carry your cards in a decent holder or have few cards in your pocket. Never stick your cards in your wallet with money.

Business cards are exchanged at the start or end of the meeting.

Presenting your card -
Hand your business card with discretion. Don't give your business card with your fingers covering the details. Hold the top corners of the card using both hands, or your right hand with the details facing the recipient. Look at the recipient and smile while handing the card.

Receiving a business card -
Don't ask for business cards in front of a group of people; do it privately. When receiving a business card, receive the calling card the way it is presented to you. If the individual is using both hands, receive it with both your hands

You may always dress with finesse and offer a remarkable shake hand.

05. EMAIL ETIQUETTE

Use standard fonts and formatting - Keep your fonts, sizes, and colors classic

Include a clear subject line - Title your email in a way that the recipient immediately knows what the message is about before opening it.

Use professional greetings - Choose a salutation that is appropriate for the relationship you have with the recipient.

Double-check attachments: Let the recipient know in the body of your email that you have attached a document. It's also good etiquette to compress or zip the attachment so it takes up less space in their inbox. You may also want to consider uploading them to the cloud and giving the recipient the link to download at their convenience. Double-check the attachments before sending the email.

"Data is becoming the new raw material of businesses"

-Craig Mundle-

Technologies interplay to optimize our workforce

Mr. LeRoy Ebert
Chief Growth Officer - EFL 3PL & Global Freeport

Interviewed by:
Helani Fonseka
Vihanga Weerasinghe
Supun Muthukuda

Transcribed by:
Dilakshi Nanayakkara

Photographed by:
Supun Muthukuda

Who is LeRoy Ebert? How did you begin your career and what was the aspiration behind your success?

I despise the phrase 'grow up', because when you 'grow up' you are thought to become boring, you tend to stop learning, and you stop enjoying yourself and having fun. I am a person who likes to explore and do new things and try to more or less not 'grow up' which has helped me greatly. I'm not a fan of formal education although I have done my MBA, ACS, and am part of the Chartered Institute of Marketing. I did these mainly to fill the societal requirements. I'm a person who is book smart so I know what will work and what won't but I am also street smart, I think on my feet. When I come across a problem, I like to understand and then solve that problem. I first started at IDM doing computer studies, selling internet connections. That was also where I did my ACS and then proceeded to teach a bit of IT subjects. When aspirations set in, I wanted a car while I was at IDM, and the quickest way to get one was to become a medical representative at the time. So I joined Baurs and then got a car. I then

moved through the pharmaceutical industry and joined GSK where much of my sales coaching and development took place. I did my CIM while I was at GSK and then I realized that there is more to marketing. So, I took a step back and joined an Assistant Marketing Manager position at the Parfumarie; a relatively small company with limited brands. It was a good exposure but mostly I needed that title. Around 1 year and three months later while I was there, a position as Brand Manager for Adidas opened at Hameedias. I joined there and that is where I started really getting into marketing. At Hameedias, I managed the Adidas brand. I then got into the Hameedia brand and learned a lot about retailing and setting up e-commerce. From there I joined Hayleys Advantis where I stayed for around 5 years and that is where I got the introduction and establishment into supply chain management and logistics. 5 years from there I got the opportunity to come to EFL and through that invitation, I became the first Chief Growth Officer in the logistics industry. Summing it all and taking a look back, I have interests and insights into IT, Pharma, retail, fashion and supply chain across SME, large, local conglomerates as well as MNC's which helps me to understand organization culture and decision making across various types of organizations.

What is the role of EFL 3PL, and how does the company differentiate itself in the very competitive field of logistics, through 3PL solutions?

We stand out from the others in the industry by positioning ourselves to utilize technology in order to cater to specific and complex supply chain requirements of our customers. Not everyone will require our services as we follow a "Money for Value"

strategy, meaning we charge money to offer superior value, agility, and accuracy and take pride in achieving service excellence, While other players are striving to operate in the "Value for Money" segment while banking on scale and economies. There is no right or wrong, both strategies have their place. It's just that we like to be unique and specialize and do stuff that others find it challenging to execute. While the market segment for our type of service offerings sounds to be a niche, we see increased awareness and interest by a wider audience which has helped us to grow faster than the industry.

As indicated in the Annual Report for the year 2019/2020, despite the pandemic, EFL is making steady progress in the digitalization of its 3PL services. What is your role as the Chief Growth Officer, to promote this transition?

The company has many sectors. My area of focus and interest is towards the 3PL, Freeport, and e-commerce sectors. As the CGO, I'm entrusted with overseeing the Business Development as well as the innovation team. While the entire team across the organization is a key part and plays a key role in the digitalization journey, someone has to put the digital road map together and drive it forward and that part has been entrusted on me. By doing so we

We follow a Money for Value strategy, meaning we charge money to offer superior value, agility, and accuracy and take pride in achieving service excellence.

> We have a technological roadmap focusing on efficiency, accuracy, and sustainability and these initiatives have been aligned with what our clients expect today as well as in the future.

allow our clients and business partners to be part of a progressive organization and thereby help transform their supply chains. The key reason for our success and momentum is the leadership given to us by the senior leadership of the Expolanka group, as well as the executive committee of EFL 3PL. Being a part of the ExCo, the director gives strong leadership and help fast track decision making, while my colleague who is very strong in operations and execution gives leadership across multiple sites to meet and exceed clients operational needs, leaving me with the responsibility of conceptualizing the future, growing the business and working on novel projects that will disrupt existing business models.

How does your company align its 3PL services to keep up with the rapidly evolving technological advancements?

We utilize technology to provide optimum solutions to customers. As an example, we greatly utilize IoT for temperature, humidity control units, transport solutions, etc. So clients can remotely monitor the performance in real-time. We have a technological roadmap focusing on efficiency, accuracy, and sustainability and these initiatives have been aligned with what our clients expect today as well as in the future. To deliver the pillars in our

growth plan, certain technology is required. Therefore, technology should be invested upon as it is needed for the growth plan to be executed. Once we have our technological road map in place, we then work with the head of systems and innovations to identify the optimum technology that should be used to do a certain task, whether it should be built from the ground up or if you can go for a SaaS platform or else if a system is required at all.

What are the strategies that EFL has taken to harness smart solutions within the organization, to achieve a competitive edge in the field?

We find gaps in the market areas and services that are not offered by the market and then identify and approach clients who require that service but may have not found the optimal solution. Soon this gap becomes a necessity. We have a growth plan which allows us to capture the market by pinpointing these areas that we should focus on. There are 4 such areas and they are very important to the existing stakeholders/customers, and when provided, a significant difference in lead time and cost savings, etc. can be witnessed. Adding on to that, to deliver these areas, we need the right technology/solutions.

Also, as a company, we are structured differently, we have innovation managers,

data scientists, etc. and we work collaboratively with partners and teams from other companies. The teams from other companies, report to us and we run those as projects. By doing so we have fewer grievances to handle and having many companies working for you in parallel allows many projects to be done simultaneously as well. Hence we work faster compared to others. We specialize in creating and managing value networks while the industry still believes in value chains.

How could smart concepts in the supply chain be more humanely related to the workforce at EFL? And how could the workforce be up-skilled to match the true potential of smart 3PL services?

When it comes to the workforce it is not only IoT that is utilized but also the platform that we use. We use a workforce management system called "I-force", which helps utilize time efficiently. We were able to reduce the daily wage of staff by 8%, just by eliminating waste which increased the accuracy of records. The system not only allows you to track your cost but also allows smart cost rostering. The following day's roster can be planned efficiently in accordance with the stipulated compliance and guidelines. Hence the rosters utilize smart algorithms and planning. All of our facilities have also been made smarter in terms of tracking and tracing COVID-19. We installed thermal cameras at the entrance which notifies if someone's temperature is high and even if someone is not wearing a mask. This allowed us to control the spread from an early stage. All these technologies interplay to optimize our workforce. There are much more like data dashboards, RPA etc. However, above is only a summary of the vast improvements made over and above deploying one of the best WMS in the world.

One of the key drives of your company is Sustainability. How do you relate the digitalization of 3PL services at EFL, to the sustainability of the company?

Our brand value under sustainability is consciousness. EFL is the 48th largest freight forwarder in the world and the 26th largest air freight forwarder. Some of the projects we have done include conducting reforestation to bring the natural native fauna back to the Bundala wetland, as it is threatened by the spread of two invasive plants. We at EFL like to do a lot for the staff and the people. During the beginning of the pandemic, we arranged welfare packs that lasted a month, and all Directors, General Managers, and Managers personally delivered these packs. We also created a welfare foundation where everyone from junior level staff to even contract labor staff was allocated a certain amount of money for welfare activities. Treating everyone equally and providing employee welfare has been shown to increase motivation, retention, and productivity. You should always strive to do good. Further, a significant portion of the energy utilized for our operations is generated via renewal energy. We are the only 3PL in the country to have a LEED Gold Certified Fulfillment center. What we are also happy about are the 250+ trees that we are growing and nurturing across all of our sites, thus helping to create a more pleasant environment across our sites for our staff and clients.

How do you interpret the impact of the "Smart Supply Chain" on the global 3PL sector, especially with the evolving of the "New Normal" concept?

All this technology coming in calls for many regulations are needed to be established. In Sri Lanka, innovations will be more system-driven than physical-driven as the payback is

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Find a company that fosters technology from which you can learn and find a boss that will groom you and challenge you.

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less for the latter. Unless technology comes at a very low price or till the price of labor skyrockets, this trend will remain. On the other hand, a great deal of progression will be seen system-wise with AI coming to play but mechanical automation such as robotics, apart from conveyors, etc. will not be common in Sri Lanka just yet.

As the closing remarks, how would you extend your words of wisdom to the young enthusiasts, who are about to enter the digitally disrupted business world?

Find a company that fosters technology from which you can learn and find a boss that will groom you and challenge you. Your 1st boss will help shape your career and the right organizational culture will set the stage for you to thrive. 🅛

COVID-19, THE SUPPLY CHAIN INDUSTRY AND TECHNOLOGY;

THE WAY FORWARD IN SMART SUPPLY CHAIN MANAGEMENT

OSHALA MARY VIDUSHI PERERA
Undergraduate
General Sir John Kotelawala Defence University

With automation, robotics, and artificial intelligence taking center stage of many industries across the world and personal assistants such as 'Siri', 'Google assistant' and 'Alexa' gaining popularity over the past decade, this era has paved way for many technological advancements globally. Over the past few decades, the industry of supply chain has shifted drastically to be technologically driven, especially with the impact of Covid-19. Discussions and debates surrounding the optimization of the supply chain industry traditionally primarily revolved around the efficiency of cost throughout the processes of procurement, transportation, and warehousing. However, with the recent covid-19 pandemic and its significant impact on the majority of the industries and livelihoods on a global basis, a heightened level of awareness regarding the fragility of the traditional supply chain management practices has been brought to light. The covid-19 virus wreaked havoc causing significant inventory surpluses in several industries and severe scarcities in others prompting customers to panic buy, which in turn resulted in empty store shelves of items that were deemed as essential. The complete lockdown China went into, led to severe factory and supply chain disruptions globally, affecting products ranging from finished goods such as electrical equipment, machinery, textile, consumer items, and medicine

Vulnerability prompted organizations to factor in adaptability, resilience, and sustainability into their plans and calculations, to realize the criticality of a holistic approach that takes into account a wide array of perspectives, and to recognize the importance of technology in increasing the efficiency of the supply chain.

to raw materials such as fabric and chemicals. The unbalanced container shipping fleets and obstructions to the flow of cargo through country borders due to curfew and quarantine measures posed a key risk in the process of recovery from the negative impact of covid-19 on supply chains and the economy of many countries. Covid-19 affected both the supply and the demand for goods, leading it to have an impact on even the business comparatively resilient supply chains. This state of vulnerability prompted organizations to

factor in adaptability, resilience, and sustainability into their plans and calculations, to realize the criticality of a holistic approach that takes into account a wide array of perspectives, and to recognize the importance of technology in increasing the efficiency of the supply chain. Accordingly, at present sustainability and transparency of the supply chain are considered to be major drivers in the process of optimization.

2020 was an year of massive change, leading to the question; what is the way forward? The lockdown and curfew imposed by the governments forced individuals to rely on technology to ensure their day-to-day needs and wants were met. Hence ways and means of effective communication and management based on technology, even within a remote working environment were discovered and numerous technologies that altered the traditional processes across the supply chain, emerged; bringing about an era of supply chain 4.0. Supply chain management traditionally primarily revolved around the "7 rights" of logistics. This refers to having the right product in the right measure at the right period at the right location for the right rate of price in the right condition to the right customer. However, with supply chain 4.0 coming into life, the international data corporation highlighted the importance of the "five C's" in the management of the supply chain. This refers to being connected, collaborative, cyber-aware, cognitively empowered, and equipped with comprehensive analytics. Being connected refers to the capability to access as much data as required with the integration of all data sources. This includes unstructured data from platforms of

Contactless delivery and payment is another widely executed procedure post-covid-19 to ensure social distance and reduce the risk of contamination.

social media, data from the internet of things (IoT), and structured data through tools such as ERPs. Being collaborative refers to cloud-based systems that enable the alliance across and between multiple enterprises. Cyber awareness as the name suggests highlights the criticality of safeguarding the systems of the organizations from intrusions and hacking. The artificial intelligence systems cognitively enable businesses to function effectively and efficiently without human intervention due to their swift and comprehensive analytical capabilities. With the significant volatility in the demand and supply due to covid-19 as well as issues in transportation and warehousing, companies struggled to find a common ground between the prices of the products and the cost incurred and thus focused on ways and means to maintain stable and reasonable prices without sustaining a loss. Organizations that planned to have their supply chain automated in the next decade, had to work towards implementing technological measures as soon as possible to ensure survival in the industry. This is as automation of processes

such as manufacturing increases efficiency and uniformity while also decreasing the overall cost of production. Retailers ranging from small businesses to multi-nationals implemented strategies of the digital supply chain to manage and mitigate the disruptions that occurred due to the pandemic. Digital selling facilitated easy access to products of need creating a balance between the demand and supply of goods to a certain extent. It also facilitates the customization of products. Contactless delivery and payment is another widely executed procedure post-covid-19 to ensure social distance and reduce the risk of contamination. Cashless B2B and B2C transactions such as credit and debit card payments and options such as "contactless delivery – leave at the doorstep" that is enabled by technology have a key role in both controlling the spread of the pandemic and the survival of the supply chain industry. These measures led to a decline in the panic buying behavior that was observed in the first few weeks after covid-19 was declared as a pandemic, bringing about a sense of control in the supply chain industry. It also paved the way for the successful continuance of the processes of the supply chain within the restrictions enforced. While the concept of digital selling is not necessarily novel, the popularity and usage showed a

intelligence and technological systems as well as uncertainties regarding the lack of skilled labor in Sri Lanka and finding solutions for them. The distortions in the trends in demands are another one of the key problems faced by the supply chain industry. Sanitary items such as sanitizers, disinfectants, soap, face masks, medication, and personal protective equipment showed a significant increase in demand. Conversely, products such as apparel showed a decline in demand. Strengthening the backup plans of the organization and planning for imminent disruptions through accurate tracking and management of data and information would assist in surviving through a crisis. High tech equipment and supply 4.0 facilitate a glimpse at the near future with automated warehousing robots, predictive shipping, drones for stocking and delivery, tracking of shipment with a click of a button, and machines that provide feedback concerning manufacturing. However, in this era of technology, it is also of utmost importance to recognize the wealth of humans, especially during harsh conditions. Appreciating stakeholders and guaranteeing their safety and wellbeing is crucial in successfully managing an organization and a supply chain. And accordingly, it is important to look at stakeholders as assets and treat them as such while also embracing technological advancements.

High tech equipment and supply 4.0 facilitate a glimpse at the near future with automated warehousing robots, predictive shipping, drones for stocking and delivery, tracking of shipment with a click of a button, and machines that provide feedback concerning manufacturing.

dramatic acceleration with the pandemic situation. The convenience of methods such as the online ordering of essential items and medication also led to it being the preferred method of shopping even after the curfew and lockdown were lifted. While most won't fully eliminate in-store shopping from their lifestyle, heightened use of e-commerce was evident motivating retailers to adjust their procurement, inventory, and distribution accordingly. As a result of the crippling impact, the closing down of China had on supply chains all over the world, an increasing number of businesses have also been aggressively rethinking the need to spread risk since the beginning of last year, rather than relying solely on one country. Localization of supply chain activities and branching out of supply bases presents countries like Sri Lanka an incredible opportunity to boost their export sales and industries and also provides developing countries with an opportunity to be self-sufficient. This, however, relies on discussions on the industrial power, the high energy prices, high prices for artificial

The economic instability caused by the covid-19 pandemic revealed many flaws in the supply chain industry and created queries about the pros and cons of globalization and international trade. The way for ward in supply chain management includes identifying these flaws, implementing measures such as diversification of supply bases, contactless delivery, and payment, digital selling, and automation as solutions to the identified flaws. It also includes the adoption of artificial intelligence, IoT, and robotics which are a result of supply chain 4.0, to further ensure efficiency, low cost, and accuracy. Being aware and vigilant of what the future may hold concerning the supply chain industry, technology and crises are also of utmost importance in the survival of businesses and individuals. Therefore, in conclusion, industries, businesses, and stakeholders must learn a lesson from the past, find appropriate solutions at present, be open to change with the changes, and take precautions to minimize and prevent adversities in the future. ◾

PAPERLESS WAREHOUSING

Traditionally companies often use a paper-based system for their warehouse, but this has started to change due to novel technological developments. With the desire to cut down on waste, general inefficiencies, and overall be more productive and sustainable, more companies are starting to move to a paperless warehouse system to meet these objectives. Paperless provides a user-friendly interface that gives a clear picture of inventory management, product movement, tracking, and traceability.

FUN FACT
Did you know that Paperless warehouses save 161 hours per month from annual order entry and 45% of the warehouses are already using paperless-based processes for Omnichannel improvement.

Paperless processing allows the company to remove its reliance on manual operations and get real-time information updates directly to their system. Moreover, the Paperless concept drives best practices and assist in getting rid of warehouse blind spots and increase visibility and transparency. Moreover, paperless systems allow the company to manage the complex flow of goods between multiple warehouse locations.

DIGITALIZING SUPPLY CHAINS FOR A MODERN WORLD
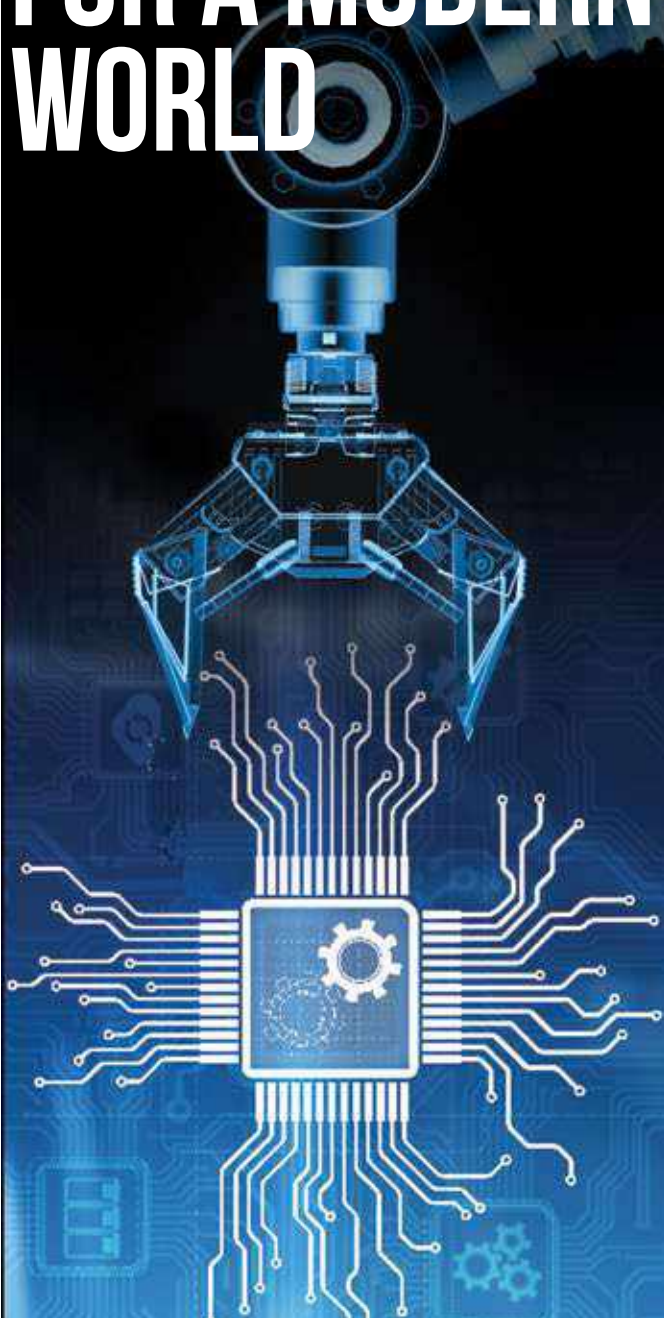
The supply chain is a key procedure that needs to be understood by the companies since it's the combination of actions that will break or make the companies, especially in the modern world as the consumers are willing to have their goods in the blink of an eye on their doorstep. Defining the supply chain is quite crucial as it covers a vast area in the business world. The supply chain is the complete process of producing and selling the goods with a commercial value, including every single step from manufacturing, distributing, and selling the commercial goods. Managing the supply chain efficiently and successfully is essential to any company or a field to satisfy their customers while competing with the competitors in their field. The supply chain is not just about creating the most effective and efficient process possible, it's all about managing and mitigating risks and ensuring that the supply chain runs smoothly in every single place. In the modern world, consumers are expecting to receive their order or the goods sooner than ever before with modernizing the marketplace with the digital connections than the traditional retail business, whereas it will ensure the revolutionized supply chain to process and fulfill the needs of the consumers. In the process of the supply chain, there are countless risks and possibilities in every step of the procedure of handing over the goods to the customers.

This digitalized platform will help to minimize and mitigate those risks as the customers can track their products on their own. Minimizing the delays, optimizing the time, minimizing the inventory holding time will be beneficial for the system as all the stages will make a huge impact on the utilization of the supply chain process. In this growing global market, it's really difficult to satisfy customers as there are so many competitors out there in the globalized market. With the help of digitalized supply chains, suppliers can be optimized and have an end-to-end connected supply chain that has the capability to drive the companies forward in this competitive system. In the digitalized supply chain, some of the features are very important in achieving success, real-time supply chain planning is one of the utmost key features that a company should follow. By identifying the technological aspects and software solutions where the supply chain can improve their efficiency while reducing the cost, it will also improve the reporting and strategic planning of the company. Even though it's through the digital platform, maintaining healthy customer and supplier relationships is a very smart idea to ensure success in the digitalized supply chain as it's a significant phase that can break or make the company in the modern world.

At present, with the COVID-19 situation, most of the businesses all over the world are uncertain as the sales of most companies are downhearted due to the prevailing situation. With this pandemic situation, the world has recognized the need for digitalized supply

Ashadi Nelusha Subasinghe
Undergraduate
General Sir John Kothelawala Defence University

chain activities than the traditional supply chain, as it's more convenient with the new normal situation. In this COVID-19 situation, the traditional supply chain has been very difficult as the acute restrictions and lockdowns all over the world have progressed. Drastically changing the existing supply chain is not as easy as it may sound, thereby with the assistance of robots, a smart supply chain, and a secure supply chain will be used to balance the customer demand with cost-efficiency. Through this COVID-19 situation, most of the buyers seek to have a more diversified supplier base with more flexibility, while being more cost-efficient in the supply chain all over the world. COVID-19 has opened up the eyes of the world to have advanced artificial intelligence and new technology to the supply chain and business all over the world, minimizing the physical contact of the people, satisfying the customers while presenting new opportunities and supply chain innovations. Furthermore, this new normal will make up

Captivating the supply chain operations to the next level with techno-logical advancement will assist to have operational efficiency by improving the pricing systems and the operating costs of the manu-facturers where the sales can be increased to have a maximum profit gain to the business in this digitalized process.

the advanced supply chain to create a positive impact on the modern business world to solve the supply and demand problems necessarily.

In recent years the biggest buzzwords in the industry are always about undertaking some form of digitaliza-tion. How does the world adjust to the digitalization of the supply chain? Digitalization is a process that is of-ten joined by digitalization and digital transformation in the business practices while this digitalization is helpful in converting information and products such as photos and records into digital format. This can be used to up-grade and enhance the supply chain process, cutting off paperwork and mostly the face-to-face interactions, which can be particularly used to support COVID-19 situations as well. This digitalized technology will bring up some innovative techniques which have never been seen before, and which is intended for a complete trans-formation of operations in the supply chain network and other bigger benefits. In addition, the advancements that the supply chain can take from this digitalization process are cost-benefit and the speed benefit. Capti-vating the supply chain operations to the next level with technological advancement will assist to have opera-tional efficiency by improving the pricing systems and

the operating costs of the manufacturers where the sales can be increased to have a maximum profit gain to the business in this digitalized process. This technolog-ical platform of the supply chain enables the companies to have new requirements of the customers which will bring up the customers to have a new taste of their prod-uct consumption.

In recent years, tech-centric terms like the internet of things (IoT), artificial intelligence, and big data are impacting the supply chain of organizations in an advanced positive manner to improve the efficiency and customer-focused mode than the manual supply chain procedure. For this great sketch of digitalization, following are some main areas to help the real value of the supply chain to be in the digitalized direction.

1. Leverage track and trace technologies:

Track and trace technology is a compulsory direction that organizations can look into when moving to the positive path of the digitalized supply chain. It's simply all about tracking the orders from their loading to receiving them at the doorstep of the customer. This system is very accurate as the verification risk is very low as by the management capability of the orders, and the track
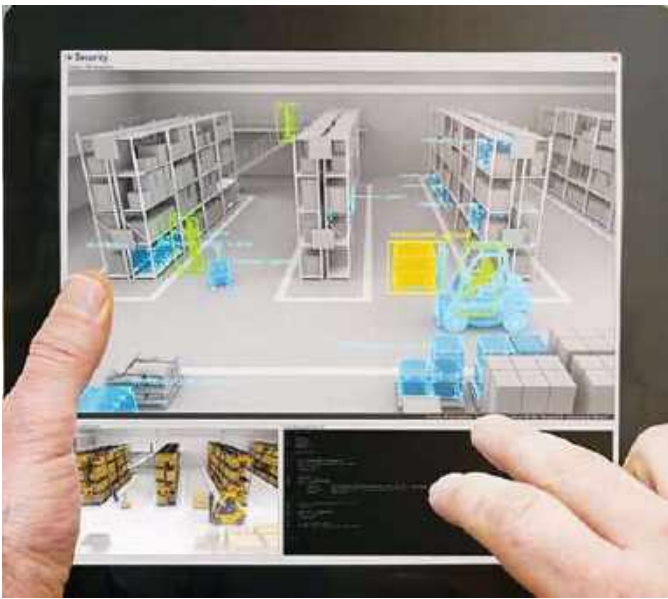
A smart supply chain is an excessive impression to sketch the world to the next technological era. All these artificial intelligence, big data, internet of things are essential concepts in this tech-centric modern period.

and traceability will help all the business partners from the supplier to the customer and can have a clear idea about having goods or cargoes in an ultimate level with a responsive and documented way. This system will enhance the power of tracking the orders digitally than the inefficient manual system. Thereby when moving an organization into the digitalized world the track and tracing technology is a pre-step as suppliers and customers have transparent communication between their transactions. Along with this technological impact, an organization can be more accurate with their customer relationships while earning more profits than the outdated way.

2. Fetching RFID, Bluetooth system, and 3D printers to the work:

In this logistics and transportation network, the digitalized technology like RFID which are radio frequency identification, Bluetooth technologies are being frequently used to inventory and track movement of items in indoor factories and warehouses. The 3D printer sys-

tem is a readable sensor tag that can be attached to cargoes and it can measure the temperature and the humidity conditions of the shipping cargoes in the supply chain. In maritime logistics, digital systems like GSM which is a global system for mobile communication and satellite tracking have assisted to have a visible end-to-end supply chain and logistics in the transportation network. This system is very effective in the transparency of the connection which is necessary to fulfill the customers' satisfaction. Even though these systems are costly for the organizations in Sri Lanka, these systems will open up organizations to the modern world in a second.

3. Having robots in warehouses:

The idea of robots is not a new scenario to the world as of now. But in the supply chain having robots in the warehouses working side by side with the people sounds like a great concept to this modern world as the operations in the supply chain will be more utilized and revolutionized in the organization. These automation solutions will be more cost-effective than in the past and this implantation of automation will reduce the number of workers in the warehouses while it improves the efficiency of the supply chain fruitfully. Most of the time organizations have options like robots, which are costlier than manpower. However, the good news is that automated robot solutions are now available at the lower capital investment and it can be further improved as needed. This will reduce the initial investment to buy the robots while the work of supply chain will be more effective than ever in the past. Having automated robots in a warehouse will be a favorable situation to enter the digitalized, smart world to run a smart supply chain all over the world.

Digitalizing an organization by utilizing these methods will not be an easygoing task since it just desires a high investment, but when moving forward to the modern world these are some technical aspects that need to fulfill when progressing to the smart supply chain. Digitalizing the supply chain springs more favorable effects in the functional modern world. Having more effective, transparent, and customer-focused relationships will enhance the ability of the organization to move forward in this business-minded world. A smart supply chain is an excessive impression to sketch the world to the next technological era. All these artificial intelligence, big data, internet of things are essential concepts in this tech-centric modern period. Therefore digitalizing the supply chain in organizations all over the world is a great opportunity to earn utility through the technology. A smart supply chain is more inclined towards the technological aspects, but the manpower and the intelligence of the humans are more powerful than anything else in the world. Therefore astutely handling the digitalized world depends on all humans. Thus this revolutionized supply chain and the modern world technology will help in achieving the utmost goal of humans in this digitalized world.

"The Covid-19 pandemic will fundamentally redefine how industrial companies approach their supply chains and will further advance the digital transformation of manufacturing."

-Tony Uphoff-
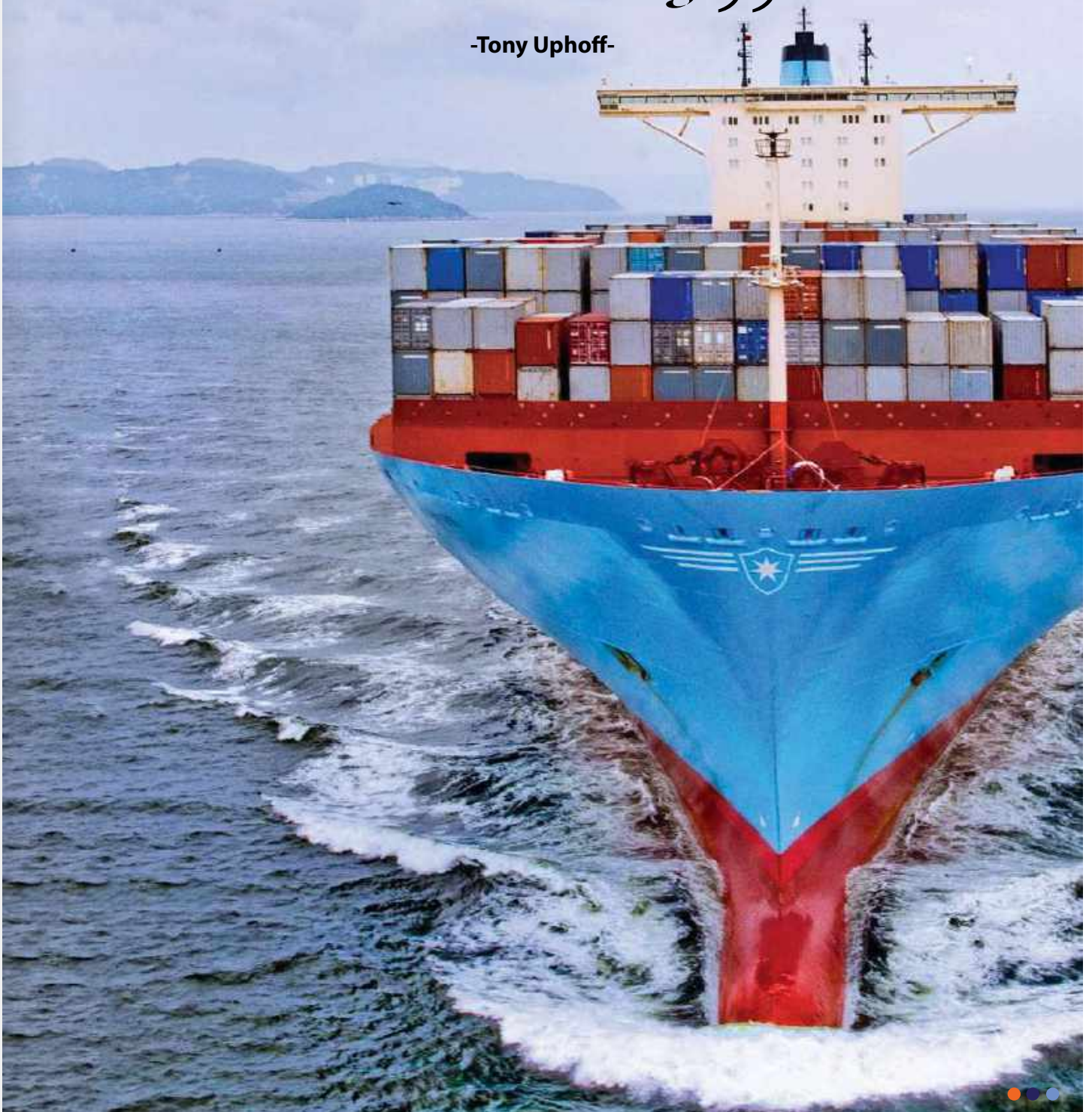
DIGITALIZED environment across the value chain to ensure end–to–end VISIBILITY

Mr. Sathiyenthra Panchadcharam

Vice President – Supply Chain
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Mr. Sathiyenthra could please give us a brief introduction about you and your career journey so far?

I'm a chemical engineer and a product of the University of Moratuwa. My career started with Ritzbury Lanka, a subsidiary of Munchee biscuits, as a Production Executive. After 4 years, I got an opportunity to join Nestle Lanka Supply Chain division. At that time, I did not have any clue about supply chain Function. But still thought of taking a risk. For the last 20 years in Nestle, I got the opportunity to grow and contribute to all the functions in the supply chain; I have worked in Demand Planning, Supply Planning, Procurement, Customer service, Supply Chain Finance & Control, and Logistics. I also got an opportunity to work in India for three years as the Head of Packaging for the South Asian region. Now, I'm the Vice President of Supply Chain at Nestle Sri Lanka.

As the largest food and beverage company in the world, how do you think Nestle contributes to the Sri Lankan community?

Being a force for good in this new reality is more important than ever, and we're proud to be a company whose values align with those of our consumers. We have identified three interconnected areas where we can have the most impact: the individuals and families who place their trust in our products and brands, the communities where we operate, and the planet. We want our products to not just be good for our consumers and our families, but good for the community and good for the planet.

More than 90% of the products we sell in Sri Lanka are manufactured at our state-of-the-art factory in Pannala, made by Sri Lankans for Sri Lankans In addition to making our products tastier and healthier, We are currently one of Sri Lanka's largest buyers of fresh milk and one of the world's largest coconut milk powder exporters, sustaining the livelihoods of Sri Lankan families through our business. We're making bold and ambitious commitments to conti-nuously improve and enhance our positive impact on the planet.

As a food company it is very important that Nestle has access to better logistics in order to deliver the products on time to the end consumer. How does the Sri Lankan logistics industry act as an auxiliary service in this aspect?

In my point of view, while we have seen very good improvement in the past in the logistics in Sri Lanka, there's always a potential for further improvement. Logistics plays a very important role in moving the materials across the value chain. We must find ways of ensuring efficient warehousing and transportation, while also improving on the speed at which we can respond to consumer demand. Agility and efficiency are two important parameters and there is always potential to improve. In my view, logistics industries can focus on two enablers to improve further. Digitalization and Automation will help you to be agile while you are efficient. Build capability of the logistics experts especially in the area of understanding the overall supply chain and the role so that Logistics can play an important role in overall supply chain strategy execution.

During the recent and prevailing COVID-19 pandemic, as a multinational food company, how did Nestle handle the logistics aspects of your supplies?

When the COVID impact first surfaced, it was a new experience for us. We did not know what was ahead. People stopped going outside and stayed inside their homes. Along with this lifestyle change, the consumption patterns also changed, which led to a change in the demand. On top of that, there were disruptions in port operations across the world. Some of the suppliers were in the lockdown areas and their supply channels got disrupted. Transportation was a bit of a challenge because there were restrictions. Basically, during the pandemic time, there were challenges across the value chain. Our priority was ensuring the safety of our people in the operations across the value chain.

To answer your question, in my view we were able to successfully manage these challenges because our supply chain was well integrated with internal functions and external partners. The supply chain is all about how well we are integrated internally and externally and how well we coordinate and work together as a team. The supply chain is not just about the supply chain department. It's about the factory, sales, marketing, finance, HR and at the end of the day all about Everybody working together. Initially, when the pandemic hit us, our focus was on two areas. Maximize every extra unit of sales while managing the cost. So at that point, we immediately got together as a team, reviewed and understood what's happening in every part of the value chain, and strategized what we needed to do. We grasped the big picture and we decided what our key priorities are and how they should be managed.

Then after a certain period, we started understanding the new reality and we decided on certain strategic directions. It was a different playground, so we had to play the game differently. One of the areas we saw as an opportunity was to accelerate digitalization because most of our staff and employees were working from home. We were on a digital journey anyway, but

Pandemic experiences propelled us to super accelerate it. We realized that we could not manage information through excel in some places we were using anymore and we need to have a digitalized environment across the value chain to ensure end-to-end visibility. So we started to look at opportunities to digitalize across the value chain. There were opportunities to further simplify the system and implement digital solutions. Meanwhile, we also strategized where we needed to build up inventory and where we could cut down the inventory. Before the pandemic, we focused on accuracy in everything for example accuracy in demand and accuracy of production, etc. During the COVID period, we couldn't maintain accuracy, since the future was not equal to the past. So we decided accuracy has to be replaced with agility. Most of the time weak signals will reveal the unknown coming ahead and if we read the weak signals correctly to understand the context we can take proactive action. When you are acting you need to understand the end-to-end value chain and the implications of different areas so that

the company adapt to those circumstances related to the entity's learning curve?

After the global supply chain got disturbed post-COVID-19, and there were few areas that we are working on. The first is building up inventory. Pre-covid Supply chain was focused on Just in Time, to cut down unnecessary inventory. However, after the pandemic, we felt that we needed to build up inventory at the right place in the value chain, because of major transportation, warehousing, and port disruptions happening on a global scale. So considering all these disruptions, we quickly assessed the potential delays and we built those delays onto our inventory policy. The second thing we did was digitalization to track material movement. Concerns were raised regarding the importance of tracking shipments from the supplier, up to the warehouse, to determine the exact location, date of arrival, and the condition of shipment, with the aid of real-time data. Tracking systems as such requires digitalization, with a systematic information flow. We saw that logistics companies and shipping lines were offering a digital solution,

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If we read the weak signals well, it will culminate in to strong signal which enables us to take proactive actions with a control tower approach. Control tower enables to make the right decisions considering end to end supply chain

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you could make the right decisions. It also helped us to take a control-tower approach, where many supply chain experts in different areas got together every day and held discussions. Before COVID 19, the procurement department, logistics department, and planning department conducted their reviews separately. Then every week all the departments' HODs together had the review with me. However, during the pandemic, we cannot afford to take decisions in an isolated manner. So all the departments' HODs and key members met every day to assess the full value chain and took decisions in a coordinated manner.

What are the new learning outcomes that the conglomerate experienced during the tough times with regard to product movements across the globe, and how did

to understand the status of our shipments from supplier to our warehouse. As for the third, I think that the other important part of the supply chain during this time is coordination at different levels. We were reviewing our materials in three buckets. The first is to determine the critical items missing for the upcoming week. In order to do so, we had a review weekly. This process was extensively focused on the operational front. Secondly, there was a need to determine the materials, shipments, and location of the goods for the next two months. Furthermore, the possible challenges to the shipments are also analyzed to take required corrective actions. Then there was another team focusing on the long term. They had the tasks to identify which materials are depending on a single vendor, which region are they coming from, what are the risks

in that region, the necessity to develop an alternative supply, and the necessity to have a local supplier as an alternative option.

With regard to the above question, what are the real-time applications that nestle used to collect the data?

We do not use our own applications. There are shipping lines and logistics companies that provide digital solutions. We saw that opportunity and we started partnering with them so that we can understand material movements across the global supply chain.

In the global context, (specifically, focusing on the much-developed countries) to what extent have they embraced smart logistics and supply tactics that help for faster more efficient movement of products among the supply chain participants?

There are a lot of things people are talking about, such as Artificial Intelligence being used in planning, Blockchain being used in tracking, the Internet of things, and so on. In advanced countries, these systems are being well utilized. If you have a Basic

will come down over the period because when there are more users, there will be economies of scale. So we will get there and it's a never-ending journey. Finally, we need to understand whatever we do have to fit into the overall supply strategy that supports business strategy.

In the same scope, Mr. Sathiyenthra could please brief us about the extent to which the local supply chain has embraced the smart supply chain and logistics techniques?

I would say today local companies are evolving and from the early stages of collecting data to converting them to information. We are moving to systems where you can drill down to understand the real issues. We have evolved to systems generating BI reports through which you can visualize and create dashboards instead of conventional methods. Companies are using AI in a limited scope. I believe we will evolve more in the coming years and reach up to the full utilization of real-time data, Artificial Intelligence, blockchain, etc.

In the past, supply chain focus was on accuracy, which included accurate demand , dispatches and, etc. Post-Covid, agility has replaced accuracy. Today, we need highly responsive supply chain to meet customer demands.

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system, it can give you only information. But a bit more advanced system helps you to analyze and understand the root cause. Currently, developed countries are using systems not only to help you to identify problems and give you the "solution". The system analyzes the data and tells you what you need to do or suggest solutions. We are on a journey to reach that point, but the challenge is a high investment. When considering Sri Lanka's market size, the smart system we can bring in and how much we can move forward depends on the return on investment. Today there are planning systems where we do not need planners. We only need people who can manage the data flow, manage the quality of master data and interpret the results. The system Plans for you. To get these systems, you have to invest a lot. In my perspective, it's a journey. The cost of these new systems

As an avid supply chain professional who has twenty-plus years of experience in the field of supply planning, what do you think are the main barriers that the local logistics industry is facing when moving towards smart supply chain techniques?

For me, it is a journey and we need to build a business case for smart supply chain systems. It's a journey where we have to keep on learning, build skills and change our mindsets. For example, autonomous trucks are going to be a reality in the US in the future. There will be 50%-70% job cuts in truck driving due to self-driving technology in the US. So that's how the world is moving on. This type of technology required high investment. So I will not say there are barriers. It's all about learning, building capability, understanding, and embracing the changes. In years to

come, the cost of these new technologies will come down and we will find a way to build business cases for investing in smart supply chain technologies.

As an industry expert with hands-on experience regarding the field of Supply Planning, and Logistics what is your advice to young undergraduates who are passionate about pursuing careers within the novel digitized supply chain and logistics spectrum?

I have only 3 pieces of advice. One, you need to build capability on the end to end supply chain. Many people don't have a full understanding of the Supply chain. People might be working in warehousing, planning, procurement, air freight industry, the sea freight industry, and logistics companies. But whether you understand the end-to-end supply chain is a question. If we understand the supply chain and the entire value chain works, along with where your role fits in, you can add more value to the organization you are employed in and also to the supply

experience of how different functions in the supply chain work. That will help you to become a strong supply chain leader.

Secondly, I always believe in leadership development. Currently, a lot of students don't focus on leadership development. Leadership in my view is 80% mindset and 20% skills. Students focus more on skills and miss the important part that is their mindset. I always tell my team, not to focus on career progress but on personal development. When you grow yourself, opportunities will come to you. But first, you have to build capabilities. Another important thing that many youngsters neglect is to have a coach or a mentor. If you want to achieve something, reach out to 2-3 people who have already achieved them and ask them what they did differently to achieve what they have achieved. Ask them for a coaching session. Coaching and mentoring have not much developed in Sri Lanka yet. But if you take developed countries, it is popular among young people. People have coaches

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For young graduates my advice is to focus on the following three things. Build your leadership skills, challenge your assumptions about yourself and others and build your capability to understand the supply chain end-to-end.

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chain where many businesses are connected. It will also help you to move around your career, rather than being stuck in only your area of expertise. Due to my 20 plus years of experience in the end-to-end supply chain, skill development, and the end-to-end supply chain view of my team members, we were able to successfully manage during difficult COVID times.

If a warehouse expert is only concerned about warehousing and if a procurement expert is only concerned about procurement, then you cannot unlock your supply chain's full potential. So for young people, what I will emphasize is that when you start your career, don't focus too much on vertically growing up. Move between 3-4 different departments during the first 6 to 8 years of career. Then you will understand how the supply chain works, due to the hands-on

for different areas such as fitness, career, and even money management. In my perspective, that's leveraging others' knowledge. People will always be happy to support you, provided you ask them. If you don't ask, nobody will know that you need help.

The third point I always say is to challenge your assumptions. COVID has taught us the same. The Sales data numbers were not accurate during a pandemic. So we decided that we need to challenge the assumption that we need to be very accurate in the supply chain every time. Instead, we decided to change the assumption that we need to build agility to replace accuracy. So challenge yourself since your assumptions about yourself are restricting you. By changing your assumptions about yourself and others, you can see a bigger area for you to envision. **L**

THE TRANSFORMATION OF TRADITIONAL SUPPLY CHAIN MANAGEMENT TO SMART SUPPLY CHAIN MANAGEMENT
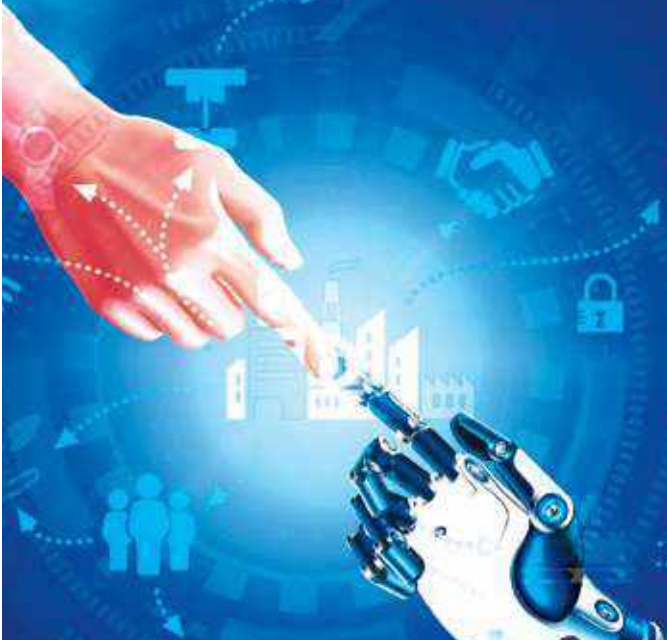
Ruvini Ruberu
Procurement Manager
Pee Bee Management Services (Pvt) Ltd

Without question, 2020 will be remembered as an iconic year. The industries and supply chain have been continuously affected by various types of Natural disasters as well as manmade disasters throughout history. There have been numerous outbreaks of highly infectious diseases such as Covid-19 which caused global catastrophe not only for human lives but economic activities such as manufacturing, supply chain, logistics, and other sectors. The pandemic has adversely impacted the Automobile, Tourism, Aviation, Oil, Construction, Telecom, food, and Health sectors (Cascella M et al, 2020). The rapid spreading of the virus needs to be curbed before the further transition, therefore countries have taken steps to keep travel bans and total lockdown situations in place to protect the community as well as to keep the economy stable.

The players on the logistics and supply chain platforms had and are having an exhilarating time. Supply chain operations under normal circumstances are also exciting and this has been accelerated by the present Covid-19 situation. To make the process more efficient, a lot of innovations have to emerge. The industry must safeguard its supply chain. With this aim, a lot of digital accelerations need to be created which will lead to more

> With supply chain disruption during post covid arena, people have started to think out of the box disregarding restrictions in place for commercial activities. People have opened their eyes and started doing things in an innovative manner

resilience in procurement functions despite lack of good practices and experience. The procurement process now plays a pivotal role in this commercial landscape to strengthen the industry by mitigating the risk and being flexible and visible for an effective supply chain.

Till late 2019, the Sri Lankan economy mostly practiced Traditional Supply Chain Management (TSCM) along with Tender procedures. Even though the world supply chain is growing rapidly, Sri Lankans remains on the traditional mechanism; especially in the government sector. With supply chain disruption during post covid arena, people have started to think out of the box disregarding restrictions in place for commercial activities. People have opened their eyes and started doing things in an innovative manner and some organizations are forced to follow new practices to sustain their business around the world. The TSCM

has completely changed with Covid – 19 because of the mandatory requirements of physical distancing and limited gatherings in addition to the 'work from the home concept' and the community has absorbed the change since they need to protect their lives and loved ones while accomplishing the targets and adhering to the responsibilities. Nevertheless, organizations are still trying hard to enhance their level of effectiveness and efficiency in their supply chain process by maintaining the lean lines in the process.

The major stakeholder of the SCM process is the freight forwarding, and courier service providers. The people who travel to work for their clients and take care of the business are now working through online transactions in the digital environment. When it comes to the import and export process, the original documents play a crucial role because they are required to clear the consignments on time. With the pandemic situation, a limited number of flights operate globally resulting in a two to three weeks delay to bring down a set of original documents from our neighboring country, India. The organizations that are strictly depending on original documents have now shifted to shipping guarantees and bank guarantees. This has caused

organizations, the government must take actions to make the transaction platform a better, secure, user-friendly, and comfortable place to conduct businesses while reducing the interest charges and cash merging rates. The bankers and institutes should take necessary actions to encourage customers to do their transactions via e-banking. Non-store shopping has a long history that spreads to the early 1980s, but quality, durability, and reliability make the customer assailable vulnerable. These agents should also get together and work as a group to search the requirements of their requesters throughout the world and find ways to provide better prices and better quality.

Another biggest obstacle faced by the business organizations or importers and exporters is that they are not getting their goods on time. The main reason for this is due to low-level business as the number of vessels on operation has drastically come down in addition to an equipment shortage, high freight cost, the congestions at ports that the vessels are bypassing. Therefore, it is questionable whether the organizations can maintain the 'Just In Time' concept in a practical context. According to John Piatek, in the webinar "2021 outlook for supply chain and procurement leaders'
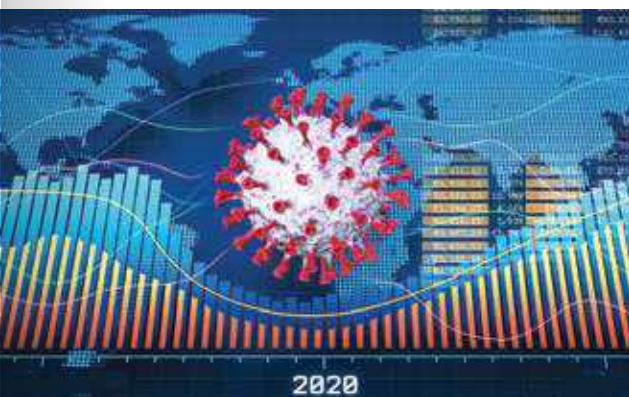
Alternatively, the companies can build a strong business relationship with the suppliers that share the company information system or the Enterprise Resources Planning (ERP) system which provides more visibility to the supply chain process.

extra expenditure to importers. However, it is still better than paying an enormous number of demurrages for SLPA and shipping lines. The government must initiate special rates on guarantees and special margins which will influence businessmen to utilize the facility instead of discouraging imports. A considerable number of freights forwarding and courier companies have started to transfer money for their Document chargers via online transfers and instead of the original delivery order, they have started to send the scan copy of the DO through email.

The digital transaction is the talk in the town as community and organizations tend to purchase online and transfer funds via e-transfers and Credit or Debit cards. According to the bankers, the percentage of e-banking has tremendously gone up. Hence, to further encourage the community and business

which was conducted on 24th February 2021, there is no need for overstock or maintaining substantial stock levels to conduct uninterrupted supply, but a strong supplier network, collaboration, reliable set of suppliers, accurate demand planning and forecasting are essential requirements. When organizations want to start a competition among the suppliers to obtain a better price for acceptable quality, new suppliers who do not have much experience of performance should not be added. Customers need to build larger stocks without blocking the company cash flow or coherent demand planning. In integrated Supply Chain Management, the customer has allowed the supplier to access their database, therefore the suppliers get an opportunity to understand the stock levels of the customer which helps the supplier to efficiently plan the production and logistics activities to meet the demands of the customer.

To maintain a smooth agile supply chain process, collaboration, communication, trust, technology & infrastructures are necessary factors. However, most organizations are reluctant to do any capital investment or to involve massive system modifications at this vulnerable time.

In this unpredictable situation, analyzing demand is a difficult task in the procurement planning process because the demand fluctuates rapidly. To face this unforeseeable moment, most of the organization accumulate an enormous amount of raw material and packaging materials. In this circumstance, the organizations block their money on these materials in addition to spending on hiring storing facilities as they need to consider the shelf life and the preservatives to maintain the usable condition of the products. The perishable items which require special environmental conditions cost a massive amount of money. Finally, all those inefficiencies have to be borne by the general community. People who feel the panic to start purchasing and storing more stock make the supply chain get exhausted. Therefore, the industries have to rapidly increase their production to cater to this artificial demand. Alternatively, the companies can build a strong business relationship with the suppliers that share the company information system or the Enterprise Resources Planning (ERP) system which provides more visibility to the supply chain process.

In today's competitive business world, in order to obtain a better business deal, competitors get together and work as a team to control the market so they can increase the volume and demand while keeping the competitive price and better quality. The customers combine or group their orders. For instance, when bringing Less than a Container Load (LCL), they make it a Full Container Load (FCL) and bargain for better freight rates as well as to increase the number of containers. With this concept, the importers or purchasers are in a stronger position with better bargaining power. The service providers such as shared services have emerged with this new culture of amalgamation. The collaboration and the transparency in the process of the supply chain have created a strong relationship among the players in the supply chain process and this will nurture the productive and visible business relationship which is badly needed to overcome the threats in the supply chain and minimize the global disruption.

To maintain a smooth agile supply chain process, collaboration, communication, trust, technology & infrastructures are necessary factors. However, most organizations are reluctant to do any capital investment or to involve massive system modifications at this vulnerable time. Further, most business leaders have shifted their focus in strategic discussions to day-to-day matters such as keeping their employees safe and maintaining the health guidelines just to survive in this typhoon, but tough decisions and choices lie ahead of them such as both the Supplier and customer being aware of when and where to add value to the products and services to ensure uniqueness that will support them to be in the competitive market. As claimed by GEP outlook 2021, in every corner of the world, stakes are higher than ever, therefore, the need for an effective and efficient supply chain and the leadership of the procurement is in great demand.

Supply chain processes WILL GET SMARTER & FURTHER AUTOMATED

Dr. Saroshi Dubash
Director - Abans Group

Could you please give us a brief about your career and the career journey so far?

When I first started here 30 years ago, I was put in charge of wharf expenses by my parents as it is a family business. From there on I went forward to doing inputs plus import purchases and inventories. I then did warehousing. We later wanted to diversify and then I became in charge of the whole logistics division of Abans Limited. As it was going well and since we were getting good rates, we decided to have an Abans logistics company which was more focused on non-asset-based items dealing with the freight and wharf, here, I was in charge of hiring people and getting the logistics done. We started with a company called CCD which has most of the warehouses, container yards, and all the items that are land assets. That's how I do many things such as the IT for the company as well but now I mainly take care of the administration while my brother does marketing and sales.

Interviewed by:
Anuki Fernandez
Vinura Goonasekara

Transcribed by:
Dilakshi Nanayakkara

Photographed by:
Dilakshi Nanayakkara

Abans Logistics is established with the vision of optimizing the client's global logistics needs. In your opinion as to the Group Director, how does Abans Logistics contribute to their clients?

Abans Logistics and Crown City Developers form the logistic sector of Abans. Both combine to cater to most verticals within the supply chain covering freight forwarding, warehousing, container yards, cold chains, customs brokerage, haulage, distribution including the last-mile delivery, public bonds, and other value-added services such as inventory control and consolidation of services. Crown City Developers is an in-house logistics arm that grew organically to cater to external customers. Abans logistics was later established to take freight forwarding and brokerage which are predominantly non-asset-based activities, forward. Hence, our clientele has evolved over the years allowing us to have many customers and we provide services to cater to all their requirements as we have conta-iner yards. We recently obtained a public bond, and we service our current customers while also obtaining new customers.

As a reputed logistics service provider in Sri Lanka, it is crucial to maintain the standards of the logistics services provided. Give us an overview regarding the standards that are maintained by Abans Logistics to give the best service to the clients?

We are an ISO and OHSAH certified company. Our logistics sector is located in Kadolkele, Seeduwa, which is very close to both the airport and port and it adheres to the most stringent environments and suitability standards. Our roofs generate approximately 1 MW of electricity with ample room for expansion and all facilities are equipped with rainwater harvesting capabilities with enough sump capacity to not only adhere to the safety requirements of the Fire Department but also to cater to our water requirements for the year.

We have various initiatives where we are exploiting such opportunities and testing available technologies before adaptation. For the moment we are scanning VA and QR coding along with a limited amount of RFID usage at warehouse levels.

This is important as I believe that there will be water-related issues in the future. Furthermore, we conduct our business with the utmost respect to national and international laws of standards that govern various verticals we operate in. We also value the safety of our employees, customers, and society at large and conduct our business accordingly. We are continuously training and hiring qualified personnel and we expose them to the best practices while above all being socially conscious in our driving ethos.

When it comes to Warehousing and Distribution, Abans Logistics employs a wide array of automated technologies to optimize and improve the efficiency of the operations. Could you please brief us on the technologies used within the premises and the impact brought in through those technologies?

Our own warehouses are purpose-built to confirm the most stringent standards. They are racked pending on the operational requirements and are supported by electricity-operated material handling equipment. We also offer warehousing services through a few leased facilities. We have intricate supply chain management which tracks cargo from PO to reserves logistics stage. Thus, all vertical operations within the supply chain are covered and connected. This is an in-house developed system hence modifications or customizations can be accommodated with ease. Another advantage is that we can develop mobile applications to suit various needs. This is all done in-house. Although there has been an attempt at digitalization and digitalization prior to COVID-19, the pandemic has fast-forwarded those initiatives and as a mean of survival and staying ahead of the curve, interconnectivity, reliability, visibility, and having real-time data for decision-making are some of its salient but rather vital features of embracing technology.

During the global pandemic COVID - 19, the global logistics field had to face a major decline due to the inability of movement as per the health guidelines. How did Abans Logistics face these circumstances? What new techniques were adapted to sustain the movements through the supply chain?

We had a real hard time due to Covid-19. Both Abans Logistics and Crown City Developers operated during both lockdowns adhering to government regulations and prior approvals from respective authorities. We adhered to strict implementation of only getting the bare minimal carder to the operations whilst carrying out random PCR tests on our employees. Having embraced technology from early on we also managed to switch our mode of operation to work from home for even some of the more crucial tasks. Of course, we had some constraints such as getting vital documents to clear cargo due to restricted hours of banking and

entering of any information and only process what adds value to the existing information through a click of a button. With the advent of e-delivery orders and E-bills of lading, supply chain processes will get smarter and further automated. Although we don't use blockchain technology at the moment, the integrity of our information is secured and traceable. Real-time information on status, costs, and even location of goods can be considered as rather sophisticated, but we haven't even begun with our potential to automate and use AI to augment human involvement which at the moment has unlimited scope for. We have various initiatives where we are exploiting such opportunities and testing available technologies before adaptation. For the moment we are scanning VA and QR coding along with a limited amount of RFID usage at warehouse levels. Our product ranges handle at the moment does not warrant automated storage and retrieval

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One must be mindful about the fact that the features come at a cost and if the user of the ultimate customer is willing to pay a premium for such facilities which are not operation critical. One must choose between operational critical technologies versus just attractive ones.

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regulatory bodies which were tested to their limits when going into sudden shutdowns which neither us nor they had ever encountered nor have planned for. Overall, we did operate through our serving and discerning customers to ensure that their supply chain suffered limited disruptions however delays caused by the vessels and aircraft did occur but those were acceptable due to the situation of the global pandemic. Despite that, we didn't get any major complaints from customers.

With the dawn of the digital era, the logistics scope is widened into the areas of "Smart Supply Chain mechanisms" To what extent and how Abans Logistics has adapted the new mechanisms of "Smart Supply Chain"?

We have an integrated IT system for the entire supply chain which is more or less automated. For example, there is no re-

system but if such requirements arise for the customer, we can go ahead and provide it.

How did you increase the IT literacy of the employees?

We have a special training division which is especially aimed at training in IT. Most of our IT at the moment is customized but we're going in for an ERP system starting with the accounts division and then will be opening into operations, I believe that will take a couple of years. We are firm believers that training is very important, so our own IT professionals provide the training and also from our training Department.

What are the major challenges faced by Abans Logistics in the process of adapting to changes of Smart Logistics and how does the entity as a leading logistics service provider of the country address and manage those challenges?

The challenge is to identify the correct technology that suits our budgetary requirements. One must be mindful about the fact that the features come at a cost and if the user of the ultimate customer is willing to pay a premium for such facilities which are not operation critical. One must choose between operational critical technologies versus just attractive ones. In terms of buying in or adapting, we haven't experienced any major obstacles or challenges.

As an industry expert with hands-on experience, what is your advice to young undergraduates who are passionate about pursuing careers within the novel digitized supply chain and logistics spectrum?

What I would like to say is, don't depend solely on your qualifications but also strive to get good experience without only being focused on the salary, especially at the beginning of your career. Try to enter a large firm and learn everything you can from there. As a second stage, you can look to other places to find things to gain and join organizations like CILT so that you can network and get a good idea of what role you would like to take.

On a concluding note, what do you think will be the future of logistics, and to what extent will it develop?

Well, logistics has a very high potential to develop and if the government gives more facilities and encouragement to build a good logistics base here, I believe Sri Lanka is very uniquely positioned because of its geographical location to have a splendid logistics hub. This logistics hub should not only revolve around Colombo but also include Trincomalee and Hambantota. Since we are a small country, we need to combine and cooperate with other countries to develop a good logistics base here as they also have superior logistics systems.

ARTIFICIALLY INTELLIGENT ROBOTS: TOWARDS A NEW ERA OF SUPPLY CHAIN MANAGEMENT

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In an era where "Siri" and "Alexa" are becoming increasingly integral to our day to day lives, organizations too heavily depend on artificial intelligence and robot technologies in various capacities. Artificial intelligence (AI) gives a machine the capability of problem solving and learning similarly to humans, while robots are programmable machines designed to carry out a particular task. In the modern world, more emphasis is given on artificially intelligent robots with the two concepts combined: brain of AI and the body of a robot. AI helps in making robots more intelligent and are being deployed in many business functions including supply chain activities.

Supply chain management consists of all activities from sourcing of raw materials all the way to delivering the end products to the consumers and plays a major role in business organizations. It represents tremendous efforts taken by the organizations in managing their supply chain activities in the most efficient and effective way possible. All the activities including planning, obtaining information, sourcing materials, warehousing, production, logistics and even return of goods need to be well taken care of for smooth organizational activities as well as to create a competitive edge. Therefore, the utilization of latest technologies to improve the organizations' supply chain performance has become a vital component of business survival and development.

Supply chain activities have been moved into a whole new direction along with the advanced technological developments. Over time organizations have been investing in new technologies to address various elements of the supply chain. Toyota introduced a ground-breaking mechanism of Just-in-time (JIT) manufacturing which is also known as Toyota Production System (TPS) enabling to minimize inventory cost. It was built upon the concept of making only "what is needed, when it is needed, and in the amount needed". Over the years many Enterprise Resource Planning Systems (ERP) were in place to manage various functions of supply chain management.

The latest development in technologies have facilitated the use of autonomous robots in managing supply chain activities. These are devices that have been programmed to perform a particular task with little or no human intervention. Integrating robots in the manufacturing floor is not a brand-new concept. Robots were used in carrying out routine tasks which involved complex programming, where the service of robots were much limited in manufacturing operations. Organizations could enhance productivity while reducing labor cost and achieve the ability to work around the clock. Moreover, by deploying robots, employee safety can be improved in high hazardous contexts. This resulted in acceleration of robot density across the world speeding up operations.

Artificially intelligent robots tend to be more advanced and sophisticated and are able to work alongside with

people. The term "cobot" was coined by professors in Northwestern University in United States to refer to the robots that collaborate with humans. Hence, there is significant improvement in employing autonomous robots in supply chain activities in various industries showing a strong presence not merely in manufacturing but also in final assembly and warehousing. Retail giants such as Amazon and Walmart heavily deploy robots in their warehouses to stock shelves and to keep track of inventory levels. Such improvements facilitate the reduction in operational costs and improve productivity and the quality of operations.

> Artificially intelligent robots tend to be more advanced and sophisticated and are able to work alongside with people. The term "cobot" was coined by professors in Northwestern University in United States to refer to the robots that collaborate with humans.

Organizations go far beyond than deploying artificially intelligent robots in manufacturing activities merely to enhance productivity. Branded supply chain management is one such area as to how the organizations manage their supply chain will have a significant impact on the brand. Building an innovative, transparent and competitive brand is not only focused on its logo or tagline. It is also about ensuring that the supply chain delivers on the promises

of ensuring the transparency and upholding of values. It was not so long ago that giant brands such as Nike were largely accused of its sweatshops. As much as the product, the story behind it also matters. Therefore, organizations focus on embedding advanced technologies and increase customer awareness to enhance brand loyalty. Therefore, productivity is not the prime driver of investing in artificial intelligence. It is also about how the organizations improve its interactions with the customers.

Smart technologies have enabled the entities to manage supply chains while tapping the customer-touch points with a revolutionizing experience for the customers. This is where a customer comes in contact with the brand before, during or after the purchase of a product. Customers don't simply buy a good or service, they buy an experience. A supply chain should be uniquely placed in identifying customers' needs and driving better customer experience. Certain restaurants use the service of robots in the kitchen to assist with meal preparations. However, rather than restricting the services of robots to the back-office operations as such, some restaurants across the globe utilize robots as waiters to deliver food and interact with the guests. There are even coffee shops that deploy robot arms in making as well as serving coffee to customers. Such technological advancements in the customer touch-points will bring a whole new experience to customers and brand engagement in a different platform, enabling such organizations to create competitive edge over their rivals.

With advanced artificial intelligence embedded, it will allow the artificially intelligent robots to be more responsive. The robot Nadine at the Nanyang Technological University (NTU) in Singapore is a classic example of this. Nadine is a female humanoid social robot serving as a receptionist in NTU. This robot is said to have a realistic human appear-

ance with advanced features. Humanoid receptionist robots are not limited to Nadine, and there are many other organizations that deploy robot receptionists to deal with customers, around the world. Humanoid robots also play an increasing role in the hospitality and tourism industry. Henna Hotel located in Nagasaki, Japan is considered to be the first robot-staffed hotel connecting the tourism sector with the AI era. Artificially intelligent robots in the front desk offer a new experience to the travelers and tourists, which was later adopted by many other hotels in different parts of the world.

Use of robots in customer touch points became increasingly useful during COVID-19 pandemic. When the requirement arose for minimum human contacts, robots played a significant role in customer touch points. Robots were in place in retail operations. More importantly robots demonstrated their crucial necessity in the healthcare sector which became a game changer

experience of the supply chain and it is evident that late delivery can disappoint, whereas an expedited delivery can delight customers. In an era where online shopping is extensively used, one to one delivery has become an essential part of the supply chain. Accordingly, drone technology will also play a vital role in getting connected with the customers in terms of delivering the products.

Technological developments such as AI have also created a revolution in agricultural supply chains, as it enables more convenient and precise monitoring of soil conditions, mineral content and improves the efficiency and effectiveness of using herbicide. Manual tasks such as picking and packing of fruits are done by robots which has helped to reduce the impact of labor shortages and improved the productivity. Drones equipped with AI are able to capture aerial images of large-scale plantations which help identify pest issues and diseases in plants more easily.

> **Use of robots in customer touch points became increasingly useful during COVID-19 pandemic. When the requirement arose for minimum human contacts, robots played a significant role in customer touch points.**
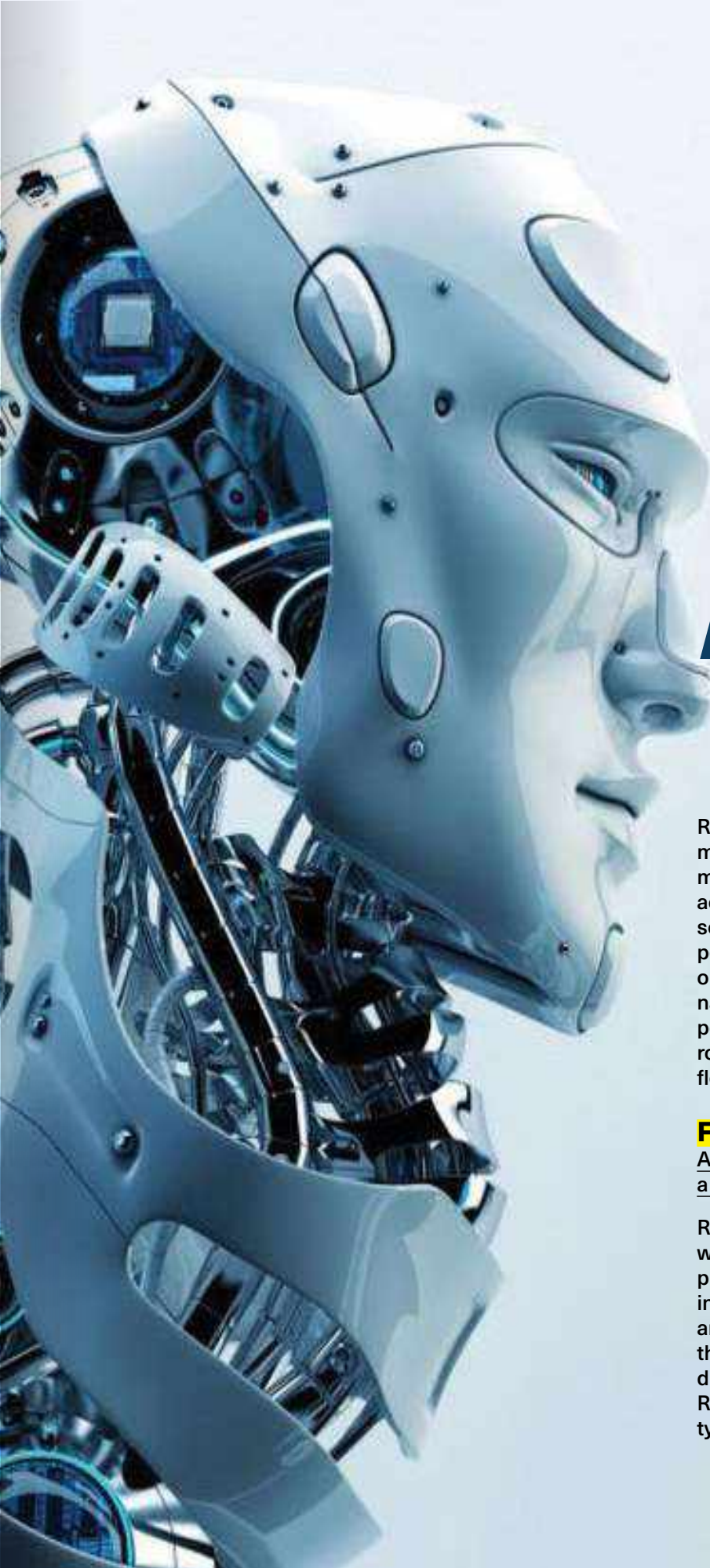
in treating patients. Robots were used in hospitals to deliver items to patients as well as to check temperature and measure blood pressure, without endangering the medical staff.

Drones are another improvement in technology which draws the attention of organizations. The use of drones in manufacturing, warehousing and distribution facilities is expected to rise tremendously in the coming years. This is extensively used within the organizational premises specially in transforming inventory across the processes. Yet the regulatory and legislative aspect remains as a hurdle in commercial drone operations in outbound logistics activities. However, high end organizations such as Amazon, Google, DHL and Walmart are heavily investing in drone technology. Drones are also said to be more environmentally friendly than delivery trucks. Customers are influenced by their

Therefore, AI and robot technologies have many identified advantages as discussed above. Nevertheless, there are significant challenges to organizations adopting such advanced technologies into their operations. The cost aspect, fear of changes, cultural barriers, limited talent, cyber security issues and lack of strategies in place are some commonly identified barriers. However, coping up with such technological changes is inevitable for modern organizations and AI is crucial in transforming supply chain management to follow customer driven policies as well as achieve competitive advantage to ensure business continuity in future. ⊡

ROBOTICS PROCESS AUTOMATION (RPA)

Robotic Process Automation is a software that makes it simple to build, install, control, and manage software robots that imitate human actions interacting with digital systems and software. Just like humans, software robots can perform activities such as understanding what's on the screen, complete the right keystrokes, navigate systems, identify and extract data and perform a wide range of operations. Software robots can do all the operations faster and more flexibly than humans.

FUN FACT
Among global executives, 63% states that RPA is a major component in digital transformation.

Robotic process automation streamlines workflows, which makes organizations more profitable, flexible, and responsive. It also increases employee satisfaction, engagement, and productivity by removing mundane tasks from their workdays. RPA is not the same as AI but a different application, but the combination of both RPA and AI could craft novel possibilities for any type of business.

The global market for industrial robots is projected to grow steadily between 2019 and 2027. In 2019, the size of the market was estimated at almost 40 billion U.S. dollars, with some 2.7 million units of industrial robots in operation worldwide. In 2027, the market size is forecast to surpass 100 billion U.S. dollars.

We strongly believe in new technology

Mr. Sarath Eldeniya
General Manager Logistics - MAS Intimates

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Who is Sarath Eldeniya? Can you give us a small outline of your journey so far?

I am the general manager of MAS Intimates Logistic department. I am head of the complete import/export and transport operations related to Unichela (Pvt) Ltd & MAS Intimates (Pvt) Ltd, Sri Lanka. There are 11 production facilities in Sri Lanka & 6 overseas among which MAS intimates the trading arm of those facilities. I am heading the total logistic operation of those facilities. Therefore, my responsibilities are to have a smooth flow of in-bound & out-bound material & finished product movement to satisfy plants & customer requirements.

Give us a brief overview of MAS and the story behind its gleaming success.

MAS is I say the biggest conglomerate in the country in the textile industry and it was started in 1987 by 3 brothers as a small factory called Unichela. But today that has been expanded to the biggest in the garment industry. Today we have 53 manufacturing facilities in 17 countries. So, we recently moved to the African region considering trade benefits that we could offer to our customers. I believe the success of MAS is the people, the innovations, and different

ways of thinking. I think the Chairman and the leadership team mainly focus on taking care of people. When you focus on people, in return people think about the company. They have got the freedom to give their maximum to the company and the Chairman's vision is to have that innovative team develop and work differently in the garment industry. If I go back a few years into the garment industry, I think you will agree that when the free zones concept was introduced in the country from Katunayake, there was no reputation for the garment industry. Especially the people who were working in the garment industry were treated as lower grade people. But today I believe they are equally challenging in all other industries and this was started by Mahesh Amalean and the other 2 brothers. So, we must give that respect to them. Their vision has taken the garment industry to a different level. They always want to engage and give opportunities to the younger generation along with the people who are thinking differently. We strongly believe in new technology. So, if you come to MAS you can see it's a combination of all those things. Started from people, it goes to a different level due to the utilization of technology and innovations.

I believe the success of MAS is the people, the innovations, and different ways of thinking. I think the Chairman and the leadership team mainly focus on taking care of people. When you focus on people, in return people think about the company. They have got the freedom to give their maximum to the company and the Chairman's vision is to have that innovative team develop and work differently in the garment industry.

How impactful is the logistics function at MAS to its core business activities which is apparel production?

Yes, if you go back to 2016-2017, we had an internal logistics team who took care of logistics activities in the company & some of the activities were outsourced. But with this "Hellman MAS" joint venture we are trying to take those activities back into the company and have a strong logistics operation to support MAS as well as others. Currently, you can see there are many logistics providers in the country. E.g., ExpoLanka, Advantis even Hellman in Sri Lanka. And they are engaged in different types of logistics services. However, we are trying to be one of the competitors in that industry. So we partnered with a

giant in the logistics industry. Hence, we are very strong, we believe that the infrastructure we have will support us to reach our goal.

Give us an overview of how smart technologies are utilized to ensure a smooth supply chain operation at MAS.

I can give you a few examples of that. MAS is as I mentioned before, always believes in new technology. There is an exhibition every year to share new innovative products introduced by employees among other teams which encourage them also to think differently. The company gives the opportunity for employees to introduce whatever innovations they came up with. Also, the company

is looking at automation projects, and their goal is to develop new units to support our production and even find new ways of developing our machines. We also have special products that we develop through that unit. So, we have separate innovation and automation departments. The innovation department is developing the product and the automation department focuses on developing the machinery. With the combination of those two departments, we were able to develop new transformations in the company such as robotics, etc. Even if you go to a plant, we have automated robots we built in-house, to carry our materials through the line. When you feed data to the machines, the robots go and pick materials and deliver them to a respective line. We have gone up to that level. We don't stop in one milestone as such. We always try continuously developing.

The new joint venture, "Hellman Supply Chain" (HMSC) which was established by linking both Hellmann Worldwide Logistics and MAS Holdings was specifically created to combine Hellman's contract logistics business in Sri Lanka and in-house logistics activities of MAS. What tempted MAS to shift to a joint venture of this sort and how will it drive the future supply chain operations in the company?

Yes, in 2018 we identified Logistics as one of the pillars of the company. We wanted to join a party that has Logistics experience and we wanted to have a strong Logistics supplier to support us to take our pillar to a top-level. Then we identified Hellman, which is an expert firm, specializes in 4PL operation. Even in the country, they have larger warehouses that support the automobile industry and electronic industry. So, we thought of getting their support to develop our logistics and entered into a joint venture partnership with them. We started with warehousing and some modifications were done to cater to our customer requirements. But today, they are gradually moving to the freight industry and 4PL industry as well. Basically, to sum it up, since we wanted to become the number one logistics service provider in the country, we entered into this joint venture agreement.

With the new normal situation and the "working from home" concept, the links between the supplier, the business, and customers were highly interrupted. This resulted in a vast increase in the utilization

> But with this "Hellman MAS" joint venture we are trying to take those activities back into the company and have a strong logistics operation to support MAS as well as others.
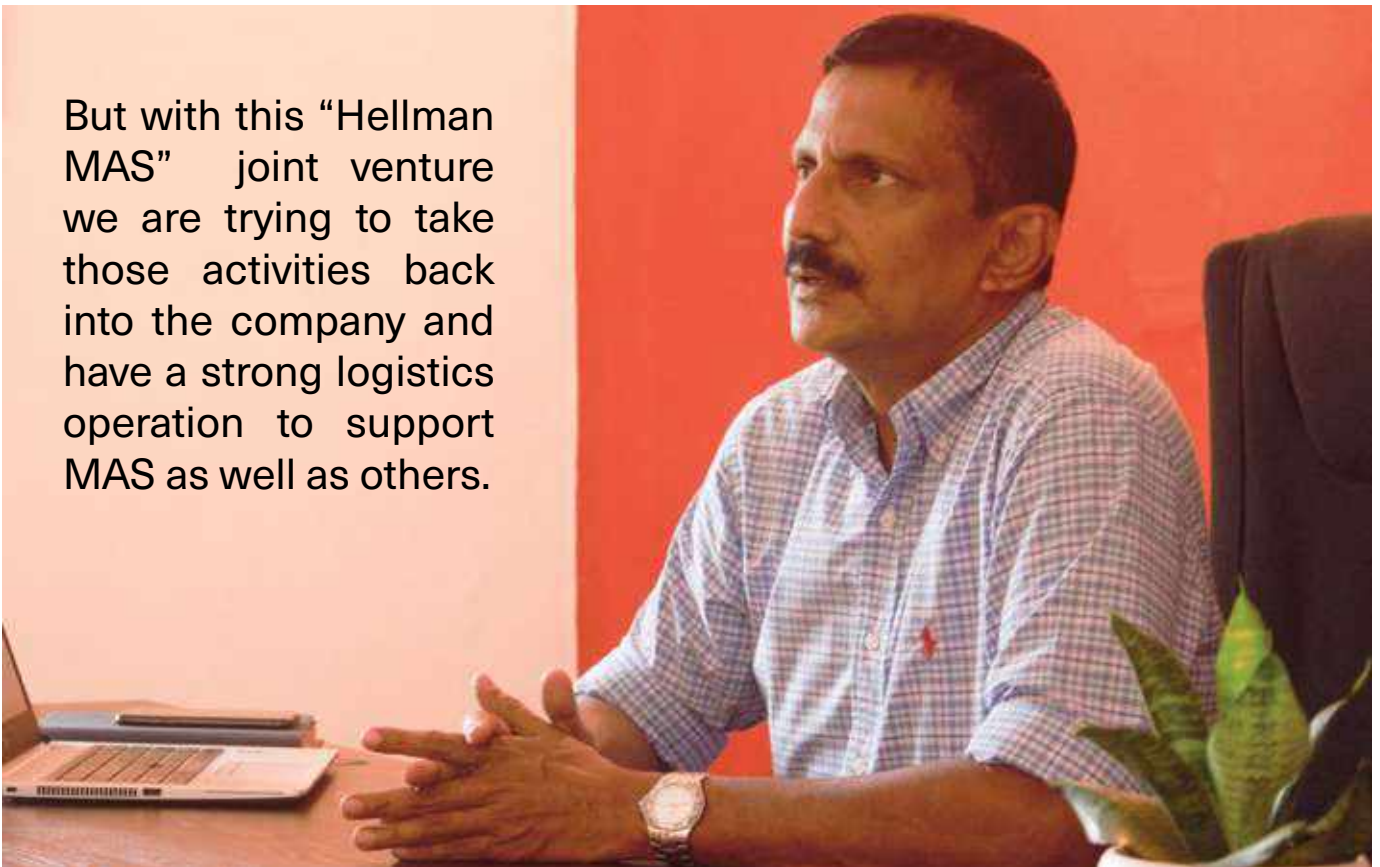
of digital technologies in the supply chain. How did the apparel supply chain at MAS adapt to these digital technologies and updates?

Yes, it was challenging, and there are pluses and minuses both. We can't say that it very smoothly moved on. We were used to working with people and meeting people, prior to the pandemic. With the COVID-19 outbreak, we had to move to various online platforms that speeded up many projects. A good example is that we started working on several projects with Sri Lanka customs and BOI to automate their processes through online platforms, which was delayed for years due to different reasons. However, this pandemic situation helped us to speed up that process. Currently, we are in a situation where we manage most of our work online. But when it comes to working with people, it was challenging in the beginning. But it has become a norm for us today. Now we are very used to working through online platforms, having team calls, and using different software to interconnect with people. I think now if I say, "Initially it was challenging, but currently we have got used to it", it would be most accurate. The company records during the lockdown period went down, like

the hit faced by every industry. However, we are gradually growing now, since we started using technology, to interconnect with suppliers, service providers, and government institutes in order to optimize the efficiency of the company.

How was the apparel supply chain at MAS affected due to COVID 19, what were the steps taken by MAS to overcome such?

I am not sure whether we control the situation completely. The reason is that there are a lot of challenges currently with the COVID situation. The main impact we have today is freight. All the airlines started increasing their rates to cover up the losses they made within the lockdown periods. If you come to the ocean trade situation, we are facing a huge challenge currently due to capacity. There is no equipment available, there are capacity issues, and we are trying to accommodate customer's requirements. Therefore, we are trying to find different ways of working today. As an example, we have a factory in Bangladesh, and we have a majority supplier base in India. We usually use 3 types of transportation, sea freight, air freight, and road transport, to move our goods, depending on the location where

we have our raw material manufacturing units. However, today we have converted all the shipments to road transport because air freight is costly and sea freight is unpredictable due to issues such as the availability of vessels. Similarly, we have converted a majority of our raw material to air freight because we need to give that commitment to the customer, even though some customers accept the part of that cost, but some do not. Our number one focus is customer satisfaction. We must keep our word at the time we accepted the order and agreed to deliver. Thus, we are trying to cater somehow. But still, challenges are prevailing, since the freight market is not stable, with rates changing day by day. Earlier we had a process every year, to select forwarders and finalize rates, which we cannot practice today. Hence, we go for spot rates. For each shipment, we call for quotations, which is challenging. But with that, we have managed to maintain the freight rates to some extent.

MAS has in operation a fully fledged plan to mitigate the spread of the COVID 19 pandemic in its factory premises, could you give us a brief overview on that? Like employees and how you all mitigate the virus inside the factory premises?

Our HR department has done a greater job there. We separately made teams in plants to make sure there are no patients. If we identify a single patient, we immediately take action without waiting till the government comes and finds all these people who got involved. The company itself starts that process to isolate those people and make sure that our employees are secured. Today if you go to any of our factory premises, we have these security practices and we are trying to follow the guidelines as instructed by the Health Department. I think with all these in place, we successfully managed that situation. If you come to our plant day-by-day, we have a system to get updates. If you ask me the statistics, I can tell you because we are getting daily updates from the HR department. They have separate units for this process, in each and every plant. They collect the information and share it with the central team, and distribute it among the respective leaders to make sure that everyone is aware of the situation. Even though the number of infected people increased some time ago, it has drastically reduced now, with the measures taken by the company.

According to your opinion, what will be the outlook of the apparel supply chain in the future with the adoption of smart technologies?

Even though developed countries have a lot of technologies, our country has not gone to that level yet. Even if it is to get an approval, there is a lot of paperwork that should be gone through. However, certain

activities such as E- Channel facilities have been developed in Sri Lanka as well. Earlier customers developed their products and reached us. But today, we develop the products and sell them to the customer, which I think is the new trend. Rather than waiting for the customers to come back to us and place orders, we are developing our products to suit the future demands of the customers. I think that is where the market is moving, mainly from the perspective of online business. Thus, it is very easy to communicate all these new developments to the customer. Therefore, I think the garment/ textile industry must go to that level rather than depending. You must create a demand for your product.

Supply chain visibility and transparency are crucial when it comes to working with customers or else especially in the apparel industry since failing to meet the customer's expectations may lead to huge compensations and losses. Give us an overview of how MAS manages the customers to ensure smooth supply chain operation?

If you go to the beginning of the garment industry, both buyers and sellers did not share information with each other. But today, the world is different. Each and every customer wants visibility as you mentioned. Even we want visibility with our freight forwarders. We don't allow freight forwarders to work alone and isolated. Currently, at MAS we have developed all our systems to capture information. We have so many tracking systems that we have aligned with our freight forwarders and even with customers. Earlier I explained that the garment industry must go to a different level. This is what we are working to be. When you start production, I think that visibility goes to the customer today, unlike earlier days. The customer knows the process from what materials we imported till the finished good is produced. We are inter-connected through systems. They have their systems, and we have our systems, the two systems are integrated so we know whatever information available in their systems. Now we sometimes plan our production based on customer demand rather than waiting for their request to come. We know what the demand in the market is and we reach their market through our systems.

The trade conflicts between the US and China have affected most of the global

Don't try to use your education to become a manager. Use your education to work hard and give the maximum to the job you are doing.

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trade landscape. As a conglomerate in the apparel industry, did MAS get affected by trade competitions?

Our main market is still the USA. I don't know how long it will take for China to take over, the current volume of the USA. But I can see gradually they are placing orders directly to China because earlier all the orders moved to the USA and from there, they were exported to China. However, today China has started directly importing those products. The USA still imports similar volumes that were derived but still, it remains the main market. Their competition is going on but that did not affect the garment industry on a massive scale. China is growing but it will take time for them to take the place of the USA.

As concluding remarks, what is the advice you would like to extend to our young graduates who will be employed in the workplaces impacted by the new normal post-COVID 19?

My advice to all the University students is that you must train to give your maximum commitment to your job since our industry is very competitive. If you think that your education is enough, that is a big "No". Don't try to use your education to become a manager. Use your education to work hard and give the maximum to the job you are doing. Similarly, technology is very important in the current context. Understand how you can communicate with each other properly because today most organizations expect people to understand the market situations and the current challenges. Wherever you go start from the beginning, learn everything that will shape your knowledge in addition to formal education. Education will support you to go further. You will proceed step by step up the ladder based on your commitment, but not based on your qualifications. Qualifications are just to get a job. But to grow, you need to give your maximum commitment to the organization. ▪

"AUTOMATION" THE FUTURE OF SUPPLY CHAIN

NIPUNI WICKRAMANAYAKE
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General Sir John Kothelawala Defence University

If you ever ask me to define the word "supply chain" in the simplest way possible, I will say supply chain is a network between an organization and its suppliers to produce and distribute a specific product or a service. When considering all the entities and many steps involved in a supply chain, no one will ever say that supply chains are simple. All the steps between the process of moving and transforming raw material into finished goods as well as the process of distributing those final products and services to the end-user, belong to the supply chain. Other than that, supply chains have many stakeholders. For instance as producers, vendors, warehouses, transportation companies, distribution centers, and retailers are included in a supply chain, and it is more and more complicated.

Due to this complicated nature and continuously changing business environment, supply chains always face many difficulties. Preventing them or dealing with them before they arise would be the ideal way of handling them. But sometimes it can be hard for organizations. Now that we live in a world where everything happens with a simple touch of fingertip, customers expect quick and accurate delivery with quality services more than ever. This means that organizations need to provide faster shipping, more personalized order fulfillment and 24/7 customer services to maintain a competitive edge. Since this fluctuating customer demand is only expected to rise, organizations find this as the biggest challenge that they face.

With the COVID-19 pandemic, the global market has been quite chaotic. Therefore, operations of supply chains have become much more difficult on a worldwide scale. The future of the international market also has become uncertain. Supply chains must have the ability to change direction quickly and to adapt to changing global requirements. Other than keeping up with the complex global market, choosing the right channels can be identified as another obstacle supply chains are encountered with. Choosing the best order and delivery channel is not an easy task when there are countless options available. A supply chain must have the ability to organize orders coming from a wide range of channels without slowing down. Thus organizations need to be completely up-to-date with how organizations' supply chain works to find the best possible channel to serve operation's needs.

As we are living in a digital age where everything is very competitive, it can be said that the supply chain is not just a way to keep track of products but also a way to gain a competitive edge in the market. As consumer and client bases continue to grow at rapid rates and the demand for more flexible, accurate, and agile supply chain logistics are on the rise. Organizations need to adapt their supply chains with more complex and larger methods of information and product transportation, in order to optimize their workflows. Due to these factors,

the current logistics and supply chain industry focuses on automation.

Then the next question arises, what exactly automation is, and what makes it so attractive for businesses. For example let us look at our mind and body, just think about how your lungs absorb oxygen and how your stomach digests food you eat. Your mind does not have to command your body every single time you breathe or your food to digest. This is due to the fact that everything is happening unintentionally. The only reason behind this is that your body has already adopted automation to operate important tasks to give your mind enough room to operate other things much better. And the supply chain automation operates in the same manner. Automation automatically operates processes like picking, packing that take so much of employee time, leaving employees to work on a more important task that needs human contribution. Therefore in simple words, supply chain automation is systemizing part or the entire workflow using technology to manage and improve organizational processes.

Since supply chain automation is more accurate, efficient, and cost-effective than manual labor it can bring many potential benefits for an organization. Now let's look at what the benefits of supply chain automation provides for businesses are.

Improves customer service.

Reducing the time between ordering and fulfillment has a direct impact on customer satisfaction. With the help of automation, many long and time-consuming steps can be removed from many processes and those can be made much shorter and faster. Many automated warehouses have begun to implement small pick and pack robots that can quickly go through the warehouse and find the correct products by using SKU (Stock Keeping Unit), UPC (Universal Product Code), or RFID (Radio Frequency Identification). The benefit of these warehousing robots is, they are ready to move at any moment, very accurately and more importantly, they do not have to drop their tasks to grab the products they need to move. Other than these, robot automation serves customers in other ways too. Automation also helps to keep the customer updated on order status in real-time by providing the customers with real-time information on where their products are, when they will arrive, and by providing any other information the customer needs.

Protect organizations' supply chain.

Sudden adverse conditions such as a fire at a manufacturing plant, a power cut in an important area, or a situation that is worse than that can damage an entire supply chain. In a situation like that, supply chain automation can put systems back in place immediately without spending a huge amount of money. Automated systems can instantly place orders for integral equipment or parts from another plant without damaging the normal flow of the supply chain. This helps companies to eliminate the need for a team that monitors and reacts to situations like these and it makes companies stay ahead of the game at the same time.

Helps to keep up with the shipping demand.

As customers wish to receive their goods soon as possible and they require much information on their shipments, transportation of goods and data, this has become a vital part of a supply chain. Normally, employees spend so much valuable time figuring out the optimal way to pack a truck, plan the most efficient root, and connect the right truckers to the right shipment and to report transit status to clients. But supply chain automation can automatically operate and streamline all these transportation processes while cutting down on delivery costs. And also, automation eliminates the need

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Many automated warehouses have begun to implement small pick and pack robots that can quickly go through the warehouse and find the correct products by using SKU (Stock Keeping Unit), UPC (Universal Product Code), or RFID (Radio Frequency Identification).

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for a complex team to figure out all the trucking details and it enables employees to spend more time on other important issues.

Increase the transparency between the organization and the customer.

Since automated supply chains can provide updates to customers during the entire order management and fulfillment process, it increases the transparency between the organization and customer. And also it helps to build a strong relationship based on loyalty and trust within the customers. Although many benefits come from supply chain automation, still there are many challenges and drawbacks of automation to overcome. Supply chain automation set-ups are indeed very accurate and efficient but one of the major downfalls is that they lack the very human ability to cultivate relationships, plan correctly and make quick decisions by analyzing
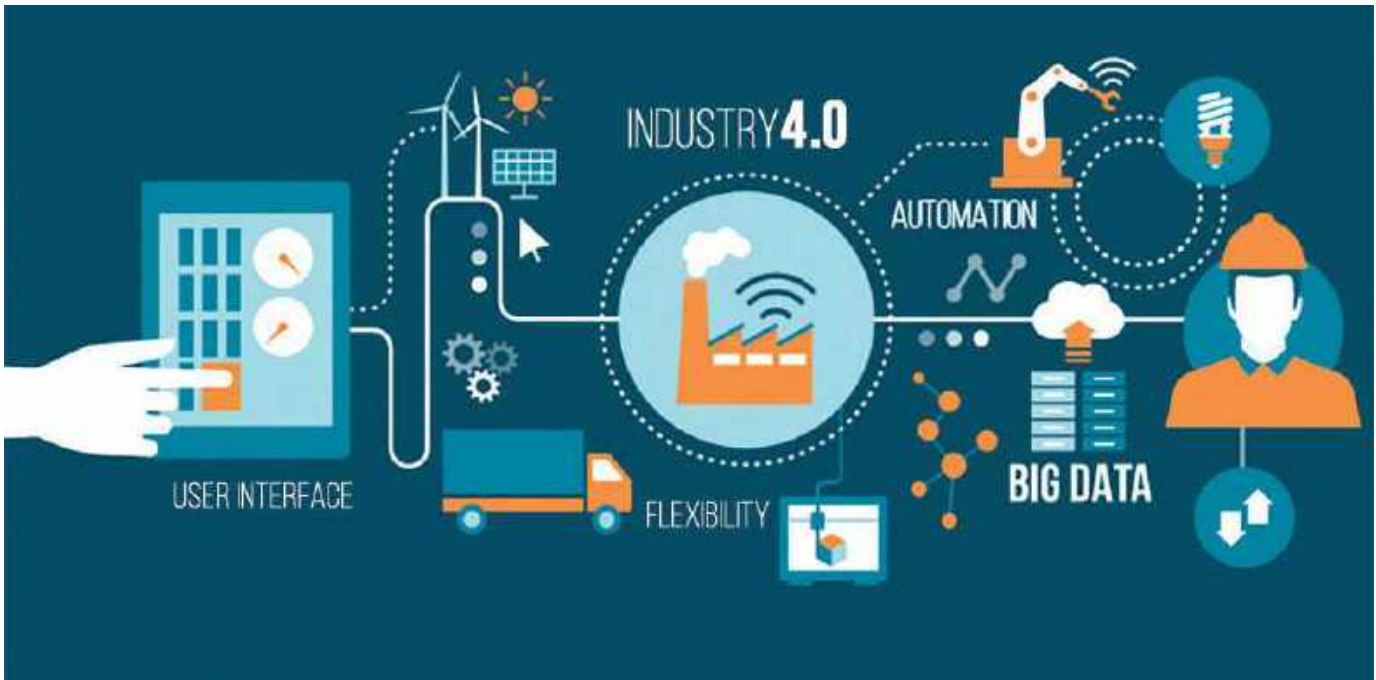
the environment. They even fail to deal with things that need empathy like dealing with problems regarding employees. Even though supply chain automation can do many things way more efficiently than human labor, organizations are still going to need a human touch to stay competitive.

Another challenge organizations face when implementing supply chain automation is the cost of entry. A recent report states that at a minimum, the average cost of a new industrial automation system could range from $50,000 to $80,000, and once the applications and specific peripherals are added it can cost anywhere from $100,000 to $150,000. Therefore these price tags cause some hesitance. Most companies do not want to be the guinea pig for new technology as they cannot afford disruption and risk. Thus, companies tend to hold back on implementing these new technologies such as robotics and Artificial Intelligence that come with supply chain automation.

Even though there are many challenges in automation, when looking at the emerging trends and patterns of the market it can be said that automation will become a major requirement in the future for many businesses. A recent report shows that labor shortages are continued to rise in the next few coming years. Thus as the world of e-commerce continues to grow rapidly, the trucking world and warehouses will struggle to find enough labor to keep up with the demand. Therefore organizations will feel the need for automated warehouses, automated trucking systems and driverless trucks and more in the coming future.

Most of the leading companies such as UPS, IKEA, Nike, FedEx, Amazon.com, and Coca-Cola are widely using automation in their supply chain operations. It is reported that automated services used at the world-

Nike's "Distribuzione" automated warehouse for the European region handles 43 million items annually and it can hold more than 25,000 SKUs.

port sorting hub help UPS to handle 84 packers per second and 416,000 packers per hour. And it is also reported that UPS annually invests around one million dollars for improvements in the said field. Nike's "Distribuzione" automated warehouse for the European region handles 43 million items annually and it can hold more than 25,000 SKUs. Other than that this automated warehouse handles both inbound and outbound orders automatically using a 280 meters long loop sorter. With the help of automation, these companies have been able to optimize their functions, reduce costs, and improve transparency and collaborations. But most importantly, they have been able to build a large, loyal customer base by achieving customer satisfaction.

In conclusion, it can be said that, as consumer bases are continuing to grow at a rapid speed, supply chains are moving towards modern technology to remain competitive. Therefore there will be no stopping in the adoption of automation in supply chains as time goes on. As the world learns to use technology more affordably, usage of automation in the supply chain will spread like a wildfire through the whole industry. Therefore, those who are not going to adapt themselves with this concept, are now going to be left behind in the future. ◗

DIGITALIZATION is a GREAT EQUALIZER

Ms. Gayani De Alwis

Global WiLAT Chairperson
Immediate Past President - CILT Sri Lanka
Founding Chairperson & Advisor - WiLAT Sri Lanka
Board Member - WCIC

Tell us who Ms. Gayani De Alwis is, and how your career journey has been so far.

I am a Food Process Engineer by qualification. I first joined Uswatte Confectionery Works as a Food Technologist. I worked there for 2 years and then joined Unilever as a Management Trainee. I did not straight away get into the field of supply chain at Unilever. I started my career in R&D and then in Quality Assurance, I reached the highest level in both R&D and Corporate Quality Assurance before I was sent on an expatriation posting

to Hindustan Unilever Research Centre in Bangalore. Upon returning to Sri Lanka after a two-year stint in Bangalore, I was offered an opportunity to move to the supply chain as the Raw Material Procurement Manager, which was not a familiar line of work for me at the time. My nature is such that I will not decline any opportunities that come my way. I love to take up challenges. Therefore, I worked really hard to understand the basics of the supply chain, with people at different levels in the department spending long

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hours. Year after year, I was given additional responsibilities and within 6 years I was promoted to the Board as the Director Customer Service, responsible for the supply chain.

After serving the company as a Board member for 5 years and after almost 20 years in the company in 2013, I took early retirement and left the company to start my own consulting and lecturing career. I enjoy teaching and knowledge sharing and with my passion for the supply chain. I got into consulting and lecturing in the supply chain.

When I look back, whatever I have achieved in my career due to sheer hard work, passion can-do attitude, and my ability to deal with people effectively at any level. I am friendly and patient with people. I always try to understand the challenges they face, by engaging with them closely. I was not afraid to dirty my hands by working at the ground level to understand the pulse of the people. Dealing with people is an art. You should know

Dealing with people is an art. You should know how to influence people from different backgrounds and cultures.

how to influence people from different backgrounds and cultures. As young children, our parents taught us to deal with people from all walks of life with respect, and this helped me to develop this ability to work with people without any power distance with empathy, which helped me immensely to reach where I am today.

What is WiLAT and what are the objectives of the organization?

Women in Logistics and Transport (WiLAT), is the women's forum of Chartered Institute of Logistics and Transport (CILT). WiLAT was set up in Sri Lanka with a mission to serve women to grow in this profession-. There were hardly any women in the supply chain and logistics industry a fact that we noted, which was only 3%. I sincerely believe that this should be and could be changed!

Women generally are good at managing relationships, influencing, multi-tasking, and empathetic. Women, therefore, have the ca-

pability to contribute to this industry. When both genders are involved in the workplace both bring different skill sets to the table and those are complimentary. If talented women are left out merely due to the conscious and unconscious biases in the workplace and society, the industry would lose out a lot. The industry is considered rugged, male-dominated, and does not suit women. So, one of our objectives was to remove such myths and showcase the opportunities it offers. We first created awareness on the career opportunities available for women and then connected them with organizations on internship and job opportunities. Based on the industry job profiling carried out by WiLAT, it provided visibility on opportunities available in areas such as procurement, demand planning, business analytics, logistics optimization, etc. Your gender should not define what you want to do in life and should not limit your own aspirations.

Our role in WiLAT is to create momentum. Even though the industry has only 3% women, CILT now has 21% female members because we have created an impact for them to come to the forefront. No country can develop by leaving half of the population behind. As per the Global Gender Gap report of 2020, it will take 95 years to bridge the gender gap at this current pace. We cannot be disheartened about it, so through WiLAT we want to change the current situation and make an impact

How would you define Supply Chain Leadership and what do you think is the best model in the Volatile, Uncertain, Complex, and Ambiguous (VUCA) world we live in like this pandemic?

Supply chains are dynamic hence quick decisions are a must. In crises, it is not possible to obtain consensus-based decisions. We live in a highly volatile environment, and the COVID-19 pandemic is identified as a black swan event since it was an unforeseen risk and the impact was unprecedented. Delayed decisions will impact the sustenance of the business. Thus, it is important to be agile and adaptable to any situation. In a major crisis like this, you need to be ready even to collaborate with your competitors because in this situation everyone is affected. This is called co-petition. In a crisis, companies cannot wait for all the perfect scenarios with high accuracy levels, they should be able to work with 70-80% accuracy levels because the information is not available,

In a major crisis like this, you need to be ready even to collaborate with your competitors because in this situation everyone is affected. This is called co-petition.

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the change is so fast. The ability to quickly respond to situations with swift decision-making with available data, to grab whatever opportunities that come your way are the need of the hour. Speed is the currency in the VUCA world we live in. Therefore, supply chain leaders should practice situational leadership with a penchant for collaboration.

According to Deloitte, Global Supply Chain Strategies report; the Increased need for technology adoption is a long-term challenge while building a resilient supply chain is a short-term challenge. What do you think are the strategies that local companies can use to overcome these challenges?

Before the pandemic, most companies envisioned supply chains with a lean perspective, to operate with minimal inventory levels with single-sourcing locations. However, COVID-19 taught us how vulnerable our supply chains are. Supply chains must not only be lean but also be nimble and agile

at the same time. The common notion that "If an organization adopts an efficient supply chain strategy, they will not be able to provide responsiveness, is challenged in the new normal. On the contrary, you need to develop the supply chain capability to be agile by decoupling your supply chain. You cannot have an 'OR' behavior, but you need to have an 'AND' behavior; it is not "This" or "That" it has to be "Both".

Resilience is all about developing resistance and recovery capacity in the supply chains.,. Resistance capacity will enable you to proactively avoid and contain the risks, while recovery capacity will build capacity to determine how to get back on track or to get to a better position than before. If the time spent on recovery is fast and disruption is minimal. To be resilient, local companies must carry out a risk assessment of their supply chains, identify the vulnerable links and strengthen those weak links with migratory measures. A tried

and tested robust business continuity plan is a must to withstand these disruptions.

Appropriate technology adoption is the need of the hour. Companies must proactively assess the need and develop a technology road map, Digitalization was on the cards for a long time, but the Covid-19 pandemic expedited these plans. We saw a resurgence of new technological innovations during the first wave. Stationery manufacturing companies producing robots to deliver requirements for COVID-affected patients, 130-year-old, tea auction moving to e-auctions, shift to electronic documentation in the port, etc., are some of the examples we saw. Let us hope that these will not go back to old ways, once the pandemic is over. Also, it is important to have a global mindset with a good understanding of geopolitical issues, emerging trade wars, and trade shifts resulting in near-shoring and in-shoring of manufacturing, cybersecurity issues, etc., The companies must be ready to battle against all these emerging global challenges with better preparedness through business continuity plans.

You cannot have an 'OR' behavior, but you need to have an 'AND' behavior; it is not "This" or "That" it has to be "Both".

Recently FitsAir inducted into its fleet the 1st Airbus 320 as a freighter, to support the local exporters. Likewise, what are the strategies that different industries such as shipping, and domestic transportation can adopt to sustain import/ export trade in the country?

Sri Lanka is predominantly a service-oriented economy. Unfortunately, Sri Lanka does not have a good manufacturing industry base. Even though the government is taking steps to rectify the situation, it is an arduous task. During the pandemic, we experienced the negative impacts of the service economy without a proper manufacturing orientation. Our export basket is very limited mostly with commodity exports, without much value addition. During the pandemic both demand and

supply got impacted as most countries were in a lockdown state. Consumption dropped and supply market constraints disrupted raw material supplies.

According to 2018 census data, Sri Lanka spends about Rs. 400 billion just to import food items, and each household spends 52% of their income on food. At the same time, the irony is that 30% to 40% of fruits and vegetables produced in Sri Lanka are getting wasted due to post-harvest losses. An integrated yet visible supply chain should be implemented to reduce such malpractices with proper farmer education to arrest the situation in the agro-foods industry. It will also help us to locally produce some of the Agri-products using advanced agricultural technology to stop the foreign exchange drain out of the country. If we are to curtail imports to reduce the foreign exchange drain and be export competitive, we need to have proper infrastructure for storage, transportation with value additions, and technology adoption to make our products high quality, cost-efficient with attractive packaging.

Sri Lankan Airlines do not have any freighters in their fleet. During the pandemic, our national carrier was using the passenger to freighter (P2F) converted flights to carry the cargo. There is a plan to procure a freighter for Sri Lankan. FitsAir Airbus A320 is also a P2F aircraft and not a freighter but it will certainly help in supporting airfreight of export volumes.

Visibility and Transparency are extremely essential in the supply chain, to track each stage of the operations. During the pandemic period, many companies realized that they did not know much about their supply chains, in great depth. We must digitize the import-export process and implement the National Single Window (NSW) concept. Sri Lanka's geographical location advantage must be capitalized by developing the capability to tap into the global supply chain networks that are emerging. Sri Lanka's Ease of Doing Business Index (99/190 in 2019) and Logistics Performance Indicator (94/160 in 2018) rankings are not favorable to make Sri Lanka a preferred destination for foreign direct investments. Apart from improving the global ranking, policy consistency is another area that the government should focus on to improve the export competitiveness.

What do you think about the new digitized trends in the field of logistics and how does it impact the organizations and the wider society with the new normal condition?

In Sri Lanka, the supply chain industry has been slow to adopt the technology. Even though sophisticated technology adoption is not seen, companies should work on digitization to realize information visibility. Most organizations fail to realize the benefits of digitalization. However, some organizations have expedited the technology adaptation to a greater extent during COVID. It is expected that others will pick up this trend in the post COVID world too. During COVID due to lock down and social distancing many resorted to working from home adopting virtual communication platforms Since assuming my new role as the Global WiLAT Chairperson in July last year, WiLAT has connected more frequently than ever before and have added nine (09) new WiLAT chapters to the global family by working virtually.

During the pandemic period, China utilized autonomous vehicles for last-mile deliveries, In the UK reach trucks were operated virtually

It is important to understand the organizational readiness for technology adoption, conduct a pilot study engaging employees from the inception to obtain their buy-in. Like in any new initiative, change management is a must to make technology adoption a success.

from remote locations in warehouses, and in some of our local hospitals a remote sensor system was used to check the temperature of patients entering the hospital premises and doctors monitoring the temperature from a remote location to minimize the risk. Investing in technology requires careful study and planning to clearly understand the cost benefits that could be derived for the organization. Repetitive tasks could be automated eventually to improve the efficiency of the operation. It is important to understand the organizational readiness for technology adoption, conduct a pilot study engaging people from the inception to obtaining the

buy-in. Like in any new initiative, change management is a must to make technology adoption a success.

Do you think that the technology used in the Supply Chain can enhance sustainability? If so how?

In this day and age technology is sought after to reduce resource consumption – cleantech and green tech are all buzzwords in use. If organizations could reduce non-value-adding activities, it will directly improve the profits. The supply chain cost in an organization vary from 50 % to 80% based on the industry If the companies try to adopt lean management techniques to eliminate the seven wastes such as unnecessary transportation, excess inventory, unnecessary movement, waiting time, etc. as specified in Toyota production systems, the overall supply chain cost could be reduced. Efforts to reduce waste should start with a properly designed plan. Efficient resource consumption will make the supply chain sustainable.

As an example, Colombo Tea Auction adopted a virtual platform after many years to run the auction virtually during the pandemic. This virtual platform eliminated wastes such as unnecessary transportation, waiting for time and movement, etc. This is a simple clear example of how procurement function can be sustainably managed using technology

According to your opinion, do you think that the digitalization of the supply chain industry has influenced the career choice of women?

Digitalization is a great equalizer for women because a lot of tasks could be executed while working remotely and without muscle power. In the Middle East, gantry cranes are being operated remotely by women. Even though there is a perception that Middle Eastern countries are patriarchal societies and are oppressive towards women, they have more women employed in these lines of work. Even in Sri Lanka, there are 10 female rubber-tired gantry crane operators in the Port of Colombo working in a male dominant environment, which is a first for South Asia. I personally think that it is not women who do not want to pursue such jobs. Oftentimes, it is the choices that they themselves have to make because of external issues, peer, parental and societal

pressures. Hence, it is important for women to be strong, determined, and have a focus and passion by not getting carried away because of external pressures. It is also important to have mentors to develop self-confidence. You need to be surrounded by people who lift you, which will enable you to stand out from the rest.

Did you personally have to face any sticky floors or glass ceilings in your career and if so, how did you manage to overpower those?

The biggest challenge is getting into the industry. During my management trainee interview at Unilever, I was asked whether I am open to work in a factory environment where the majority are males and hardly any females. I was asked if I am ready to take up the challenge, for which my immediate response was in affirmative.,. Little did I realize at the time, that the question was posed to test my resilience. My confident answer got me the job! I never considered my gender as a limitation for my career progression. I faced some resistance when I newly joined the supply chain as a newcomer. I worked hard to learn the basics by reaching out to people, my ability to deal with people from different levels with ease without any power distance helped me to win people over The emotional connection that you build with people is very vital and it will take you a long way, Company recognized my capabilities and promoted me with higher responsibilities based on my consistent track record and not because of my gender. Unilever had an agenda to create a more diverse and inclusive organization as diversity was a great enabler for businesses. If you are capable and willing to accept challenges, then there are ample opportunities in the industry. Having strong male supporters and mentors also will help you to wade through these challenges and move forward.

To sum it up, I overcame many challenges through sheer hard work, the bias for action, and passion. Every time I was offered a new opportunity I embraced those without any hesitation and figured out how to do it later.

I was determined to achieve my goals and having a good understanding of people helped in achieving those. Women have good empathetic skills and you must make use of them.

Behind every product, service, or event there is a supply chain. If there is no supply chain, there is no life on this planet. Covid has made us rethink the way we manage the supply chains.

When women come forward in certain industries, religion becomes a barrier. What is your opinion on that?

I do not think that it is a major concern. There are societal norms and beliefs that prevent women from joining industries that are unconventional and not conducive for women due to the nature of the job. Such perceptions that are prevalent in society and deeply rooted in the minds, cannot be changed overnight. Society needs to be sensitized. Anyone should be given the freedom to do what they want regardless of their religion or gender. All you need to have is your strength and conviction to conquer your mind. This change of attitudes and mindset should start from your childhood i.e., from your homes and schools. Even the school textbooks need to be relooked at to prevent gender stereotyping in certain roles. But with the new generation, these things are slowly changing.

As a Supply Chain Transformation Catalyst, what are your concluding notes or recommendations to the companies which plan to transform their supply chains, post COVID-19?

Behind every product, service, or event there is a supply chain. If there is no supply chain, there is no life on this planet. Covid has made us rethink the way we manage the supply chains. You need to develop a good understanding of your supply chains to identify the weak links, build strategic relationships upstream and downstream supply chains to have a smooth flow. You not only have to be lean, but also agile. A resilient supply chain is a great enabler and a value creator for businesses. Organizations must employ the right supply chain talent to drive the organizations in this VUCA environment to achieve the competitive advantage. 🔳
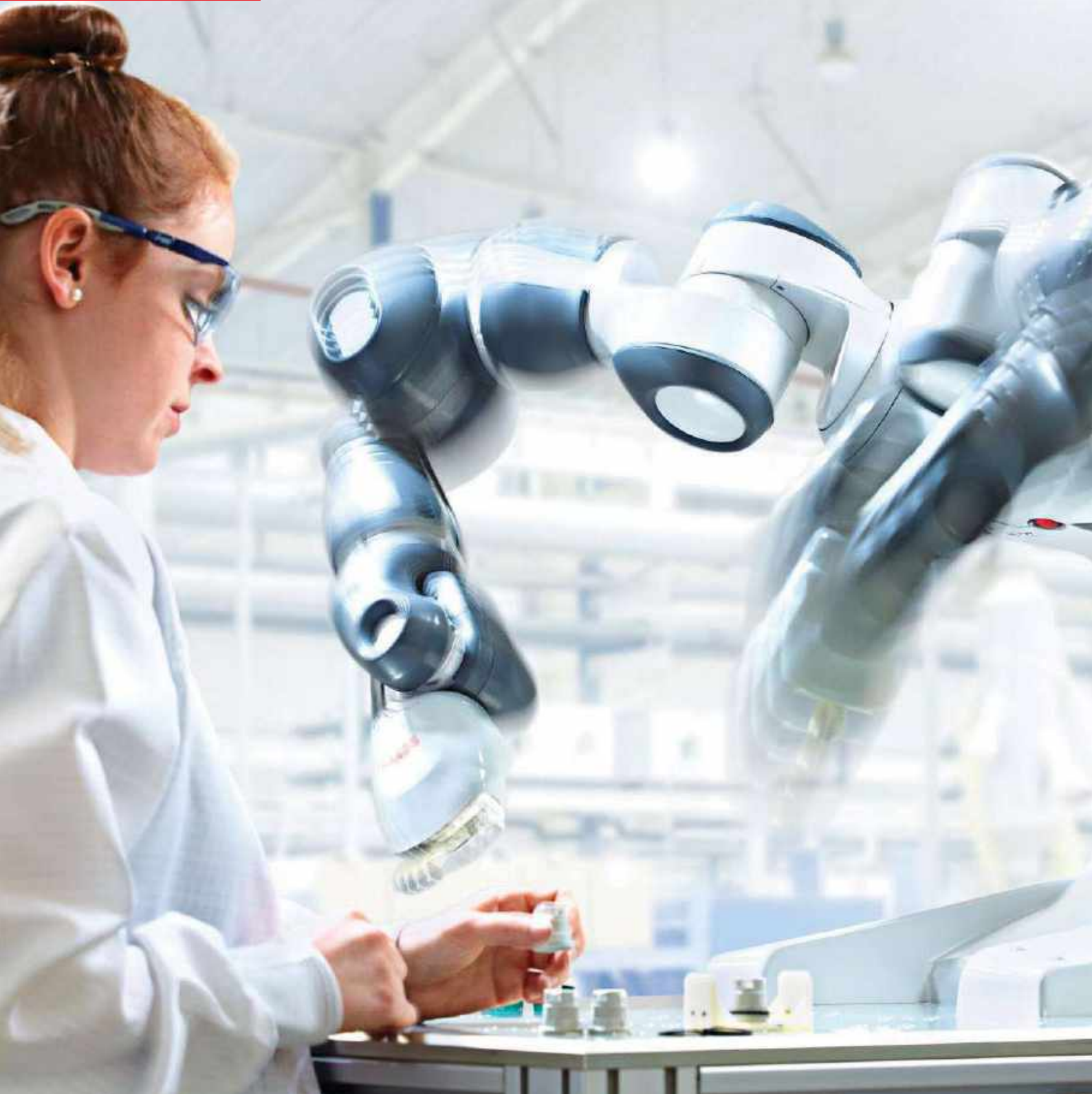
COBOTS

Cobots or "collaborative robots", are robots designed to work side-by-side with humans — but without protective guarding. In other words, they're "human-friendly" automated machines.

FUN FACT

Did you know that Cobots will be a game-changer in the manufacturing industry in the future?

By working side by side with humans, Cobots can take on the more strenuous, mundane, and repetitive processes, freeing the human operator to do other value-adding tasks. Hence, in the near future, Cobots will be assigned to repetitive, boring, and dangerous jobs in the industry without replacing humans which can be cost-effective and safe.

"The
real competition is
between
Supply Chains,
not companies."

-Martin Christopher-

DIGITALIZATION IN SMART SUPPLY CHAIN MANAGEMENT ACHIEVES GREEN SUPPLY CHAIN AND SUSTAINABILITY

Aravindhi Fernando
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Every organization wishes to gain the loyalty of a customer by delivering a splendid service which could make them overwhelmed. Over the past years, supply chain management has been a crucial factor for the success of a business that had long-term goals. It is the main factor that facilitates attaining customer loyalty. Effective supply chain management is a vital attribute shared by organizations that have vigorous growth and success. Simply, supply chain management is the management of how goods and services are enlarged into products that could be in a state to be sold to consumers. It comprises the procedures of moving and storing the materials used to produce goods. Further, storing the completed products up until they are taken to be sold. Moreover, to track where the sold products will be delivered to so that it could be useful in the subsequent sales procedures. The supply chain includes each and every minor process, from the procurement of the raw materials to produce the goods to the delivery of the final product to the end-user. The whole process of supply chain management entails each and every facet of a business's functions. Such as logistics, purchases, and information technology. It merges several factors. It combines the materials, suppliers, ventures, manufacturing facilities, merchandisers, distributors, and customers into an evolved, integrated system that could enhance productivity. This process can be identified as one of the most important processes among the whole business industry which deals with information, cash, and human assets. Nonetheless, due to the reasons related to the field of management, such as convolutions and the lack of certainties, a vast number of supply chain processes are facing many complexities and problems in functioning effectively. There are distribution hold-ups, stock-outs, costing problems, and a lack of inventories. Within the growing interdependence of the world economies and globalization, the number of obstacles faced by the experts in the supply chain industry is high. Therefore, they have recognized that the supply chain management should be smarter and sustainable.

Within the developing era, it is essential to apply the innovations of information and communication technology to make the supply chain management procedures smarter and more sustainable. Smart supply chain management can be expounded as the management of interlinked, tiered, functionalized, and whip-smart supply chains with more affiliated work process which could connect more diversified multiple supply chain partners around the world to bring on and manage an adequate flawless flow of information and distribution of products. Mainly smart supply chain consists of the technologies such as IoT (Internet of Things), smart machines, and intelligent infrastructure, and capabilities such as interconnectivity, fully enabling data collection and real-time communication across all supply chain stages, intelligent decision-making, and efficient and responsive processes to better serve customers. Irrespective of the problems

and complexities, smart supply chain management possess it offers numerous advantages while performing beyond the traditional methods in the supply chain. Enterprises can function in a seamless way where the procedures are smoother and quicker.

Coupled with the concept of having a smart supply chain the concept of the sustainable supply chain can be spawned. There are conflicts among organizations with regard to environmental, risk, and waste costs of an organization's supply chain and logistics processes. Therefore, there is a need for a sustainable supply chain that could create value and enhance competitive advantages for the business. Mainly supply chain sustainability comprises of three responsibilities and they are social, environmental, and financial. When the environmental aspect is considered, green supply chain management could contribute more to it. The green

extremely changing market. Having said that currently, industry experts are looking forward to focusing on Industry 4.0 to implement tech solutions so that the business and development processes run equal with each other to make manufacturing and logistics resilient, cost-effective, green, and high quality. It could help in minimizing the remaining shortcomings in traditional supply chain methods while subsidizing environmental responsibility. Along with the innovations in information technology, it impacts the green supply chains as it could serve to build a reliable and green transportation system and supply of goods. To that end, enterprises should initiate programs to encourage employees to embrace smart and connected tools and software applications such as cloud, sensors, blockchain, big data analytics, machine learning, and the IoT. It could create an interconnected, smart, extremely productive, and sustainable digital logistics

The expanding digitalization in supply chain management requires innovative concepts which could assist the green supply chain management to reduce the adverse outcomes of traditional supply chain methods.

supply chain management makes certain that there is an equivalent responsibility in the supply chain in every stage and procedure to certify that harmful impact on the environment is lessened. The expanding digitalization in supply chain management requires innovative concepts which could assist the green supply chain management to reduce the adverse outcomes of traditional supply chain methods. Furthermore, it is crucial to bring out ways to use smart supply chain management to downgrade the CO_2 emissions and enlarge more resource-efficient enterprises and waste management models which could intensely affect the operations in the supply chain both in local and global networks. The combination of information technology and the physical system is more required to attain more environment-friendly, effective, and safe logistics, supply chain, inventory, and production operations. It could pave the way to sustain within the current business world consisting of emerging dominant trends adhering with green supply chain management.

The expedited digitalization elicited by Industry 4.0 has modernized the business processes, creating an

ecosystem that could enhance the modern supply chain trends. The system would be apparent to all the key players in the supply chain starting from the suppliers of raw materials to the consumers in the end. It is proposed to decrease the logistics-related emissions in the environment which makes harmful impacts using smart supply chain management. The transformation in information technology and innovation could drive the growth in green supply chain management. The green digital logistics aims to reform digital business models and business processes within the supply chain for sustainable engineering and balance sustainability considering economic, social, and environmental aspects with tight connections between them.

The logistics operations including cargo and shipping are revolutionizing in a pioneering way with the developing technologies and applications while delivering enormous advantages in supply chain management. It enables to foresee risks and track the real-time visibility of shipping. Furthermore, it assists in implementing smart procurement and optimized warehousing. When Artificial Intelligence and Big Data are considered, they are

ing various ways to share their shipping details among fellow shipping companies which provide an integrated network of road, rail, and sea transport resources. This is called "sharing shipping". This algorithm could track and record the delivery details of shipping firms using GPS data. Consequently, the system is acquainted with the information. Such as the conditions of shipping, inventory details, vehicle type, costing, and the return systems. Accordingly, when this system is used it increases the collaboration with other firms, helps to expand the network, saves money. Furthermore, most importantly it aids in reducing pollution while making the supply chain more eco-friendly and greener. There is another concept in AI as autonomous transport which also could enhance towards greener supply chain.

There are companies that use deep reinforcement learning. For those, AI would be a better alternative to make more complicated decisions easier in line with the notion of a green supply chain. As an example, it could assist in deciding the number of goods to ship, the time to pack and to decide the transportation method. This could impact on reducing waste. Every act that aids in lessening the amount of waste increases quality and improves sustainability. As per the reports, more than 67% of enterprises functionalizing with industrial IoT solutions have practically experienced upgrading in environmental sustainability by 2018. When there are enough resources, the organization can make efforts to make the supply chain greener through smart supply chains. Using the Internet of Things, a transportation provider can find better planning routes and ship stocks directly which consists of a better market than others. It could reduce fuel consumption and gas emission. Whereas it shrinks the impact on nature. Moreover, the Internet of Things gives the ability to the companies to check, observe and record the conditions of the goods even when they are inside the containers. If they are recognized as damaged or to be expired products, they can be reshipped for a replacement straight away. This can decrease the demand for reverse logistics practices as consumers will rarely find the reason to return products. While tracking the location also aids in decision making in production and delivery which as a result reduces the waste of goods. As a result, utilizing these technologies will be more beneficial in present and also in the future.

Within the next decade, sustainability will be a primary concern in organizations. Therefore, it is essential to adopt novel smart technology trends aligned with the green supply chain management to be consistent in the logistics industry. All things considered; it is pivotal to drive a change in the organization allied with inventive models that are eco-friendly. Profoundly, it is our duty to ensure sustainability for our future generation. Therefore, it is crucial to espouse smart supply chain management in order to obtain a green supply chain and environmental sustainability.

> Industry experts are looking forward to focus on Industry 4.0 to implement tech solutions so that the business and development processes run equal with each other to make manufacturing and logistics resilient, cost-effective, green, and high quality.

two of the main technologies which could magnify sustainable supply chains while sticking to the green supply chains concept. These tech solutions can increase the competitive advantage by establishing novel methods of shipping and transporting. These technologies can help the companies which are emerging in the market to grow and for the remaining companies to gain efficiency. By pertaining to artificial intelligence and innovative algorithms in computer science, enterprises could significantly amplify the sustainability and efficacy of supply chains by making them more constructive. These technologies could support strengthening the bonds between vital parties in supply chains. There are significant algorithms that could assist an organization in find-

CONTRIBUTION OF THE PERKS OF SMART SUPPLY CHAIN MANAGEMENT FOR A BETTER TOMORROW

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The World is developing day by day and man has stepped from the airplane era to the era of the flying car. With this rapid development process, the need for smart technologies is highly emphasized. Following smart strategies in order to maximize productivity as well as efficiency has been the recent trend of the world and this trend is observed in the Supply Chain Management (SCM) process as well. The term Supply Chain Management stands for the proper handling of the entire production flow of a good or service. That means almost all the activities that involve once the production process is started by manipulating raw materials and finally ending up with the desired outcome. Most precisely, SCM is the management of processes that are involved in the journey of a product or a service from its crib to coffin. When attention is paid to the current global supply chains, it is observed that they are highly complex which elucidates the need for a data-driven approach to the supply chains. As per the findings of in a data-driven supply chain process, the processed data (information) is shared along the entire supply chain having the ultimate intention of connecting supply chain partners and providing end-to-end access to data related to supply chains. However, this visibility of the process could be achieved easily by adopting smart strategies and implementing them in the supply chains which will end up having the outcomes such as good vendor and supplier relationships, effective cost control, securing the right logistics partners and adopting innovative supply chain technologies. The joint contribution of these activities intends to achieve the supply chain optimization at the end by making the best use of resources such as the Internet of things (IoT), Artificial Intelligence (AI), etc. The yield of Smart Supply Chain Management is honestly amazing and it is worth having a look at the benefits which are gained by making this process a "smart" process.

Many companies complain that managing the flow of information has become a crucial problem for them which will also contribute to the malfunctioning of several important processes in the company. As per the data of the database Oracle, more than 70% of the global companies don't have an automated flow of information across the supply chain and half of the companies state that this fragmented nature of the flow of information has given them terrible results by making them lose some valuable sales opportunities. Maintaining an integrated software system is a smart strategy that could be provided to avoid conflicts of this nature. This kind of an automated system can avoid all types of bottlenecks available in the existing system by providing a consistent flow of all the related information. Further, it can paint a clear-cut picture of the processes related to Supply Chain Management from the beginning to the end. An Automated integrated software systems can provide all the details which are essential for Supply Chain leaders to make more practical decisions by utilizing that provided information

in an effective manner. Moreover, better collaboration is ensured among all the parties who are involved in the Supply Chain and it clinches the better performance of all Supply Chain related processes.

In the manufacturing process, quality control plays a pivotal role. Quality controlling is the process of reviewing the quality of almost all the factors which are contribute to developing and designing the desired product or service respectively. When the ideas of reputed scholars and other resource personalities are reviewed, they have suggested that the quality control issues follow the rule of 10. This rule suggests that at each step in the value chain process, fixing the problems that arose in a particular phase is approximately ten times fast-paced and cost-effective than trying to fix that problem in the next phase. It is clear that following the rule of 10 aids companies to save money and avoiding unnecessary costs. When companies have higher control over their direct suppliers and the suppliers of suppliers', suppliers have the capability of achieving boons and they are also rewarded with perks. When standard minimum quality criteria are introduced, direct suppliers can identify and make partnerships with secondary partners who suit their requirements. Some companies periodically conduct audits or they request documents that explain policies, specifications instead of simply providing quality criteria. Besides all these strategies, the key performances of a system could be evaluated by implementing a Management Information System with criteria such as product delivery systems, final product quality reviews, findings from assessments done on quality suppliers, and time for complaint resolution. This smart strategy could be used by companies to analyze performance data and to make partnerships with vendors having the best performance and quality suppliers to end up with high-quality products or services which will also contribute to the prolonged reputation of the company.

Occurrences of delays in the manufacturing process make companies initiate backup plans such as requesting raw materials from a backup supplier which will avoid delays. Lack of real-time data causes companies to end up with out-of-stock or late in a shipment of commodities to end customers and create so many other conflicts. Automation solutions could be introduced to avoid these aggressive situations. The Company "Healing Hands Scrubs" has introduced a mobile robot named 6 River Systems who can double the productivity and it also has reduced the unnecessary walking of employees by 75%. Following smart, automated strategies to maximize the productivity and the efficiency of the process by reducing conflict situations will aid in painting a positive image

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The Company "Healing Hands Scrubs" has introduced a mobile robot named 6 River Systems who can double the productivity and it also has reduced the unnecessary walking of employees by 75%. Following smart, automated strategies to maximize the productivity and the efficiency of the process by reducing conflict situations will aid in painting a positive image about the company and its supply chain-related activities in customers' minds which will ultimately end up boosting the company's reputation.

Pre-identification of risks in the Supply Chain aid companies to be leaner on operations and automated smart strategies would contribute in a higher per-centage for the improved risk mitigation tactics.

about the company and its supply chain-related activities in customers' minds which will ultimately end up boosting the company's reputation. When it comes to inventories, we can identify several types of inventories available in companies. Slow-moving inventories, low-velocity inventories, higher-velocity revenue-producing inventories are some of those types. When companies are capable of making accurate predictions of their available demand, they can decrease their overhead costs by replacing slow-motion, less-velocity inventories with higher-velocity, revenue-generating inventories. The costs related to the fulfillment of warehouses have a higher contribution towards increasing the overhead costs. These costs could be reduced by optimizing the layout of the currently available warehouse, implementing suitable and smart automated solutions which will nourish productivity, and finally by adopting a proper inventory management system. Reduction of overhead costs could also be done by identifying the unnecessary expenses. For example, a company could change their supplier to somebody else who is offering the same set of operations, if the current personnel are incurring a higher cost. This is considered an effective way of achieving leaner operations. When it comes to the term "Risk" it could be defined as a certain or an uncertain situation that couldn't be eliminated. Risks are observed in the operations related to the Supply Chain Management process as well. Doing a proper analysis of the big-picture and the granular supply chain data can postulate the potential risks, and allow companies to be ready with back-up plans and mitigation strategies to respond to those unexpected situations. Negative impacts such as turmoil of the supply chain, issues arise in the quality controlling phase and so many other types of conflicts may arise due to different types of risks. Companies can avoid these negative impacts from risks by taking

necessary mitigation actions. Pre-identification of risks in the Supply Chain aid companies to be leaner on operations and automated smart strategies would contribute in a higher percentage for the improved risk mitigation tactics. So, the aforementioned perks arise by automating and introducing smart strategies for the Supply Chain will let companies make genius and realistic decisions, pick up the most suitable partner for future operations, and accurately estimate and respond to market and demand changes while dropping supply chain disruptions. Moreover, it will also improve and nourish the bottom line of the company. For example, if a particular company collaboratively work with a supplier who is reliable and trustworthy, they would not only be rewarded with less turmoil to their supply chains and satisfied customers but will also gain the ability to improve the cash flow and get paid for the commodities and services very sooner. This positive cash flow could be achieved by initiating more cost-effective solutions to avoid unnecessary costs and to deduct excessive overhead costs.

Discussed above are the perks which are obtained by implementing smart Supply Chain Management strategies and these perks are capable of transforming Supply chains into a better performing, highly efficient, and more productive version. With the rapid Globalization process, new technological trends and smart solutions are introduced to the World at a supersonic speed and if companies can grab these technological tactics to make their Supply chains more efficient, they will be blessed with the ability to achieve the competitive advantage in the industry over their competitors by eliminating all the conflict situations. It's worth enough to look forward to such a smart era to be dawned in the near future!

INNOVATION
is the Name of the Game Today

Mr. I.G. Perera

President - ISMM

Management Consultant & Trainer

You commenced your career as an inventory controller and moved onto different fields of logistics, gaining a heap of experience and exposure in the field. As the President of ISMM, how do you describe your journey so far?

To begin with, I started my career as an inventory controller, and thereafter I took some overseas assignments and served in many multinational organizations. In Sri Lanka, I have worked in the capacity of a Project manager, Warehouse Manager, Logistics Manager, Human Resource and Administration Manager, Plant Manager, Lean and Six-Sigma Implementation Manager, and Head of Corporate Quality. If you just look into my career path it has covered many disciplines. Hence, I believe that this is the secret behind me to be an effective lecturer as I impart much practical insight in the teaching and learning experience. Nevertheless, my life itself is a case study, facing a lot of challenges and issues encompassing different periods.

Interviewed by:
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You have worked for several reputed multinational companies and have led many executive roles, but currently, you have set priorities for lecturing in your carrier life. What motivated you to become who you are today?

Well, I got into lecturing upon the completion of my MBA, and was exhausting myself with all the course work and had enough time and space for myself to engage in lecturing thereafter. One of my colleagues suggested me to start lecturing, saying that I was a born lecturer. When I started lecturing some of the MBA students at Colombo University ranked me as the best lecturer and I realized my passion was in lecturing. Not only it allows me to be updated with knowledge but

Public health organizations like WHO should come forward specially to help poor governments who might not have adequate facilities for cold storage and effective distribution of these drugs."

also gave me an opportunity to meet with knowledgeable professionals and further expand my horizons. I'm proud to say, today I am a lecturer, a consultant, and a trainer.

What is the role of ISMM?

Currently, I am the president of ISMM. Our vision is to be the most sought-after professional institution in the field of procurement and supply chain management. This institution started way back in 1972, by a group of professionals at that time, to cater to the deficit of supply chain management professionals. Even now this deficit prevails, which we intend to cater to by providing well-trained supply chain professionals to the country. To convince people concern that there is a deficit, we are now conducting training programs, consultations, and CPD programs. To develop procurement and supply chain professionals through executive education, training, and consultancy, innovative and continuous professional development are, what we aim to achieve through ISMM.

When Covid-19 became a global pandemic in early 2020, the life science and healthcare supply chain faced unprecedented

challenges. What are the strategies that were developed by the government to mitigate those challenges?

When the WHO recognized and declared this as a pandemic, some governments like Italy, UK, and the USA did not take it seriously, and as a result, they faced severe repercussions. Their strategy at the beginning was to let people face it and be immunized, but many people died. Fortunately, Sri Lankan Government took this seriously and implemented few initiatives such as imposing lockdowns, restricting air travel, and closing airports, which allowed the government to control COVID-19 to a greater extent. However, these government restrictions reflected negatively on the supply chains as they restricted production, labor mobility, and the flow of materials. This was the case globally as well. Although the demand for FMCGs, medicines, and other goods increased, supply was inadequate due to the supply chain being disrupted by these initiatives. Similarly, the medicine production giants could not operate as scheduled, so the production of drugs and medicine was restricted and limited. Airfreight capabilities were also constrained. Drugs were mainly transported by air freight still many airports were closed, fewer flights were operating. Even port operations were restricted. Ships were not calling. Even today there are so many containers in different ports outside Colombo waiting to come to Sri Lanka, but they can't find the required number of vessels. At present, due to this high demand and limited supply, prices per container has risen which resulted in high prices in local markets. There was a shortage of drugs and people could not buy timely prescriptions and had to wait in long queues. As the OPA (Organization of Professional Association), we presented a concept paper with high contribution from ISMM, to the President in which we included what measures the government could take; permission to use the license provided by the National Medicines Regulatory Authority (NMRA) to distribute drugs, giving concessions for essential drugs even though the license was expired, pharmacies adapting to online systems, appointing central areas like churches, Grama Seva Niladhari offices as temporary medical centres where doctors could go to patients and facilitate the adequate amount of specialized doctors as a long term strategy. Also, we have to ensure as a country that we have an adequate

number of cold storage and freezer vehicles as well. And it is important to maintain proper cold supply chains in which we have to maintain the appropriate temperature (0-5 Celsius or even below 0).

As "Vaccine Logistics" takes the center stage, how can we streamline and adapt to the continually updated demands and risks in vaccine distribution and transportation? How far is technology important in this process?

At the moment there are 3 vaccines approved by many governments. The Oxford AstraZeneca, the Russian Sputnik, and the Chinese Sinovac. Simultaneously, about another 200 vaccines are being tested now. As the world population is reaching 10 billion, the demand for vaccines will also reach about 10 billion within 3-4 years. While it might take about 2-3 years to completely vaccinate the global population. Unlike the time when vaccines were first developed by Edward Jenner, now the general public is well aware of how these vaccines are produced, who develops these, under

which conditions these are transported, up to the point they get vaccinated. This is the power of social media. However negative myths are spreading via social media such as fertility will be adversely affected. To debunk these myths government should have a proper plan and also proper communication should be there between the government and the general public because getting as many people vaccinated is the best way to control the pandemic. Public health organizations like WHO should come forward specially to help poor governments who might not have adequate facilities for cold storage and effective distribution of these drugs. And also, the vaccine production itself has many concerns such as how to assemble, produce, control temperature, vaccinate, and after all, how to dispose in an eco-friendly manner and with the technology evolving, how physical networks should integrate with online platforms. As we are talking about smart supply chains, we should have smart facilities, equipment, and most importantly smart people.

How can we leverage and integrate existing technology and infrastructure to accelerate the levels of collaboration, communication, and digitization across supply chains?

Supply chain management is continuously evolving especially with IT. Traditional supply chains are moving towards a connected, smart, and highly efficient supply chain ecosystem. At the same time, supply chain 4.0 is becoming increasingly lean, interconnected, and digitally-enabled. There was a time where we talked about supply chain management, warehousing, sourcing, and inventory management separately in silos. But with the development of cloud technologies and the internet, these aspects cannot be treated separately anymore and should be considered as integrated aspects. Smart Supply Chain Networks depend on a number of key technologies: integrated planning and execution systems, logistics visibility, autonomous logistics, smart procurement and warehousing, spare parts management, and advanced analytics. The result will enable companies to react to disruptions in the supply chain, and even anticipate them, by fully modelling the network, creating "what-if" scenarios, and adjusting the supply chain in real-time as conditions change. Once built — and the components are starting to be developed today — the digital supply "network" will offer a new degree of resiliency and responsiveness enabling companies that get there first to beat the competition in the effort to provide customers with the most efficient and transparent service delivery.

If you are a supply chain professional, you should have IT knowledge and if you are an IT professional you should be knowledgeable in your area of specification, because now everything is 100% integrated. The key thing today in any discipline is IT and that is why there is a huge demand for IT professionals. First and foremost, the supply chain should be integrated. I also firmly believe in leadership and management. Leaders will give the direction to set goals and objectives, but to achieve them, management principles (planning, organizing, leading, and controlling) should be incorporated. Nowadays organizations have to make decisions using well-analysed data, but not based on intuition.

On the other hand, the supply chain consists of several industries. The primary industry is in which the resources from nature are extracted such as paddy and cotton. The secondary industry is when these natural resources are converted into the product demanded by consumers, such as converting cotton into yarn and then fabric. The tertiary/service industry is when that final product (garment) is taken to the consumers by a set of people including wholesalers, retailers, and distributors. The fourth industry which encompasses all these industries is the IT industry. This is where big data analytics come into play especially to analyse data and avoid piling up excess inventories. The fifth level of industry is the government which is facilitating and regulating all the other industries. This is why knowledgeable and ethical people should represent the government. They have a greater responsibility formulating applicable laws, if required amending the laws, to match the requirements, and reformulating and continuously engaging in facilitating whatever the industries operated within the country.

Adding on to that, what do you think is the role of the government in enforcing all these mandates and regulatory requirements and all that with the increasing technological intervention in the supply chain field?

A government in any country plays a significant role. In our country adapting to technologies is quite slow. For example, some government institutions will take up to 2-3 years to completely automate their processes. But by that time the world will move towards much better technology, where we will still be lagging. Getting medical equipment like MRIs will take months and months, but we cannot afford to wait for that much. In countries like the USA, tenders are finalized within a day while in our country it takes months. By now at least we should step into e-tendering processes while reducing malpractices. The government can bring technology and good governance to these practices. Because in supply chain management, if you are a manufacturing organization more than 60% of your total revenue is back again spent on materials and supply chains. Therefore, the most powerful person in terms of spending money will be the purchasing manager or the purchasing director in the organization. If we can save 1%, we can increase the profit of the organization by the same percentage. No other manager in the organization has got this facility. So that is the most important area in terms of money and spending on the organization. If you can bring digitization to this, that itself will be facilitating good

"We should get the tested technologies; just because the technology is introduced, we should not spend money. Thus, such projects should be evaluated to get the tested technologies into organizations and only then we will be able to get the benefits of the investment."
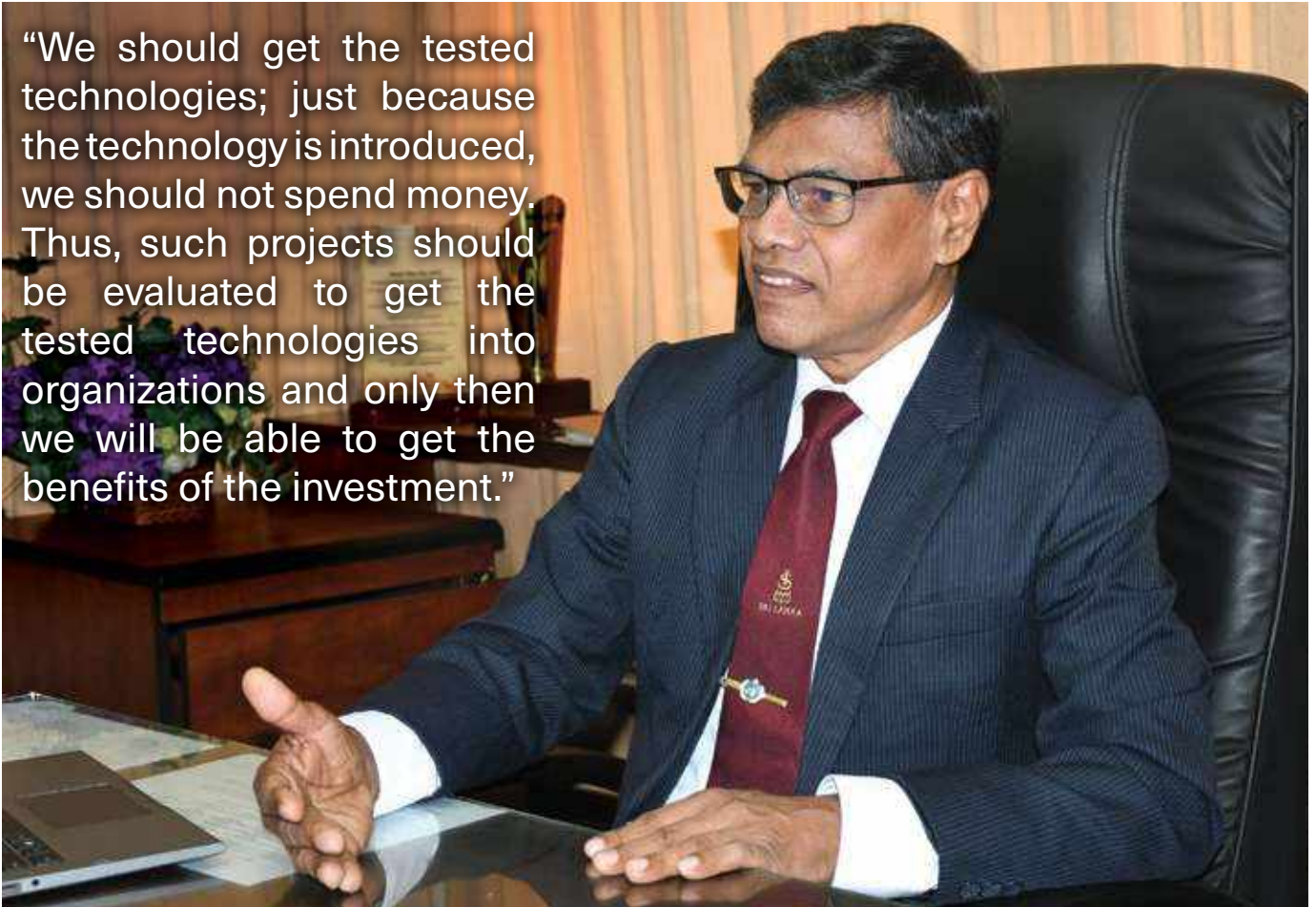
governance and do a lot of cost savings to run these supply chain management concepts very effectively to bring benefits to the governments and the organizations.

With the emergence of smart supply chain management, what are the best technological solutions available to embed product integrity and security (food and medical supplies) across the logistics and supply chain networks?

Today one of the main concerns about the supply chains is security. Cybercrimes are happening at a huge level. Unethically infiltrating the businesses is seen along with massive technological developments. Unethical people will develop higher level of technologies to attack networks and do cybercrimes. Therefore, irrespective of the areas in the supply chain, we are affected by risk factors. When the risk factors are unknown, it is hard to be controlled, which is what happened at the beginning of the pandemic. But as people did research and projects, the unknown factors became known so it came to a controllable level. As an example, in one apparel giant in Sri Lanka,

there was a superb level of connectivity. If one operator was infected, they could track the entire chain of contacts and send them to quarantine. If it becomes a known factor from unknown to known, level of control will be increased. We can develop control mechanisms, and have a plan for vaccinating people. So we can implement whatever the health guidelines. Controllability will be increased and finally, the total negative impact will be very less. Many organizations today are implementing these and controlling the disease with minimum disruptions to organizations. There are so many technologies introduced by many suppliers today to control network security. We should get the tested technologies; just because the technology is introduced, we should not spend money. Thus, such projects should be evaluated to get the tested technologies into organizations and only then we will be able to get the benefits of the investment. We believe in 3Ps: people, profit, and planet when it comes to sustainability. Whatever the solution we implement, it should protect the people associated with the organization, generate profits (high return on investment),

and protect the environment. You should have network security systems, you should protect your people, and protect your systems in terms of networks. You should apply the correct technologies there. You should have a proper method of disposing of your waste and also getting supplies in an environmentally friendly manner. Look after the environment and look after the people as well. Then only you will be able to sustain your business.

On a concluding note, what kind of smart supply chain network would you suggest for our country to establish a stable and safe supply chain?

In terms of a smart supply chain, the supply chain cannot be smarter, if you don't have smart people. Any organization bears a greater responsibility today to develop smart people. Earlier it was training and development. Anybody can give you training and it is up to you to take it or leave it. But we have a broader concept today; learning and development. We should develop smart people to carry out smart supply chains, but not machines. Then smart people cannot continue with old systems. They should be having smart systems. Unfortunately, organizations still are implementing SAP kind of systems after investing $5-6 million but we are still working with excel and uploading them to maintain the installed system. That should not be the way. If we have implemented the systems, the system should be your life. The organization should be run by the system. That applies to a country as well. We should have systems running the country. That is what our president is emphasizing always. To correct the system, you have to correct the people as well. But rather than correcting the people correct the system. Hence, when you correct the system, there are fewer and fewer chances for you to make mistakes. As a result, number one is the smart systems. For you to implement smarter systems with smart people you must have facilities and the technologies. For you to do all these things you have to have a smart government, which should be updated first in this area. We have learned from Toyota-Japan and the University of Kentucky in the USA, about how they have implemented lean systems, etc. But on top of that what I have seen from those institutions is that they have got very smart people, very smart systems, and always there is a board member responsible for innovations and technologies. Innovation is the Name of the Game Today. You should have smart people who are innovative.

On the other hand, still, as I am a strong believer in management principles (planning, organizing, controlling, and leading and coordination) the controlling mechanism should be there. Despite the level of people, everybody needs control. Otherwise, you will not be able to achieve the given targets at the given timelines. The answer is, of course, you must have new technologies, smart supply chains, smart people, smart facilities and you should have good governance and smart governance as well. This is the fifth level industry I was relating to. This can be achieved by allowing smart people to work with smart systems and creating the environments and the legal environments. On a final note, without these, you would not be able to develop smart supply chains.

"Innovation
is saying no to a
Thousand Things"

- Steve Jobs-

DE-RISKING THE SERVICE SECTOR SUPPLY CHAIN

Dineth Perera
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Standard Chartered Bank

The disruptive power of digitalization has left its indelible mark on the concept of the supply chain. Through version 4.0, supply chain as a concept relies on the power of analytics through associations with big data, the internet of things, and purpose-built artificial intelligence to deliver superior performance in meeting the objectives – principle amongst which is optimizing commercial value.The senior management will always likely view the supply chain as a function responsible for commitment to the bottom line. Therefore, armed with the digital capability supply chain now more than ever needs to be smart about how to achieve targets. It is important to engage with the most rewarding and stable third parties. Ensuring the financial benefits from such relationships are as budgeted and smooth functioning of the arrangement and meeting the set turn-around times, conformance to various parameters of quality including to that of the consumer public and regulators alike are key amongst other considerations. Therefore, the management will need to decide the limit of engagements with third parties which can be identified as the total level of acceptable risk or as the risk appetite of the organization. The set of tools that are available for an organization to ensure that the supply chain process operates within the risk appetite is broadly referred to as risk management.

Few approaches can be identified in terms of a smart supply chain, that organizations can associate with basic risk management. As a start, the organization should answer "what are we going to do" with regards to supply chain management. This can be concerning the overall strategy of the organization and the demands of the macro factors in the environment. In other words, the organization should have a policy on supply chain management. A policy statement should capture the direction and the alignment of supply chain management to the overall strategy of the organization as alluded to by the management team.

Secondly, the organization should identify a standard or a procedure, thus understanding – "how we are going to carry out the function within the organization". Here it is required this standard should concur post relevant addendums are set up to cover parties who are connected to the organizations, key here are the regulators. The standard will identify the process steps, refer to systems where relevant, and guide stakeholders of the organization to complete the duties. This document together with the policy can be digitally published, maintained, and reviewed with pre-assigned periodicity - after all, they must be kept relevant.

The developed standard will be the primary point of reference to the process of the supply chain. It will advise the reader as to the expectation of carrying out activities related to the supply chain. However modern supply chains are complex, drawing from different jurisdictions, different regulators, and is a mix of cultures, time zones,

and operating conditions. Hence a single standard alone cannot adequately cover the full process. Therefore the concept of interrelated processes is identified which are governed by their policies and procedures to supplement the supply chain management standards. With the level of digitization offered through supply chain management 4.0, there are digital checklists, combining the requirements to one composite document – to ensure upfront risk management is performed on the third parties on-boarded by the organization. Some organizations have successfully used artificial intelligence to capture the completion of these digital checklists through chat-bots.

The main purpose of executing these digitized risk-based checklists before, during, and after setting up a third-party arrangement is that, as an example, Equifax, where approximately 148 million records of customer financial data were compromised back in 2017 if the right kind of information security tests were conducted on Equifax the supplier, the financial institutions who depended on Equifax may not face this situation – the fallout, costs of remediation, the building of the brand value that was lost, suffering of the reputation to name a few of the problems. There are other examples including

are managed under compliance assessments within the digitized checklist. The regulators might be keen on operating conditions of other countries on which the organization is dependent for raw materials which can be due to geopolitical reasons or economic reasons such as forex risk. Hence compliance is necessary under all regulators both home and at the host country if multinational procurement is at stake.

Some organizations execute controls on the level of spending. However some will want it on the level of risk. Taking the latter as an example, the concept of continuous compliance is arrived at. These cover the frequencies of such checks which crystalize on the arrangement depending on the overall level of risk. The process of supplier engagement meetings which are required to discuss the ongoing performance will increase in frequency if the risk is high and vice versa.

In any risk mitigation exercise, the concept of information and correct classification of it is important. If the classification of such information involves items that can be identified with relation to an individual i.e. the customer or a client, necessary safeguards in terms of privacy needs to be in place. Further, if information moves

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Modern supply chains are complex, drawing from different jurisdictions, different regulators, and is a mix of cultures, time zones, and operating conditions. Hence a single standard alone cannot adequately cover the full process.

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the near mind-numbing fines that are imposed on financial institutions by various stakeholders on non-conformance to regulation, in dealing with third parties. Hence at every stage of the supply chain, these risk-based assessments are the first line of defense for the organizations to ensure the process is hygienic and quality is not compromised.

This risk-based appraisal happens in parallel to commercial undertakings. Once the third party is permitted to engage through the assessment of risk, it is up to the supply chain management personnel to attract the best possible deal for the benefit of the organization. Risk assessment of the third party is a continuous exercise that needs to be undertaken if the supply chain needs to operate efficiently. Hence the organization will need to employ different kinds of assessments to identify, mitigate and manage the residue of risk.

Any organization will need to identify if the third party-related process is governed under a Regulatory Direction such as those issued by the Central Bank or Customs and Aviation authority for example. Such expectations

outside of the organization's custody, then information and cybersecurity requirements need to be assessed by competent authority either in-house or third party organization. The risk of external failure such as breach of such controls is plain to see in the world and the repercussions of it, severe.

Covid has relentlessly explored the flaws in organizational design in terms of resilience. Is the third party having a routinely tested backup arrangement to operate?, what is the continuity plan in case Covid lockdown, and what is the contingency of the organization if the third party suppliers fail to deliver? – these safeguards are required to make the supply chain resilient to external issues like pandemics and other such events having the ability to break the supply chain. The business resilience management should work in tandem with Chief Supply Chain Officer and team to identify and put in a plan to action such issues.

The supplier or the third party should have the necessary financial strength to operate independently and is assessed through the financial due diligence of the third-party assessment process. The supplier will be graded

Another important milestone in third-party risk management is the technology sector. There are different considerations within technology – including but not limited to cloud computing, technology standards, hardware accreditation services, and software management.

as high or low financial risk resulting from the assess-ments of the published financial performance which is similar to a credit assessment of the supplier. Further, taxation will come into the picture in terms of the third-party arrangement and would also pause a regulatory risk. The organization should be clear that necessary obligations around tax are fulfilled by the third party. Similarly, the contractual relationship between the organization and the third party should hold the adequate cover in terms of necessary clauses for the operation. Through outsourcing or the in-house legal department should be called upon to vet the contracts as required.

Anti- Bribery, corruption, and the concept of modern slavery are essential in terms of supply chain risk mitigation. The use of intermediaries too in the process has to be regulated. There can be unnecessary political favors that are expected by intermediaries in turn and may lead to different outflows from the organizations simply as felicitation payments – a trend that needs to be arrested promptly.

Another important milestone in third-party risk management is the technology sector. There are different considerations within technology – including but not limited to cloud computing, technology standards,

hardware accreditation services, and software management. The main disruptions around supply chain 4.0 stems from the aforementioned areas. Some of the more novel concepts such as cloud for example are not yet fully covered under regulations depending on the country. Hence the pace of disruption is even challen-ging the regulators and organizations alike.

The continuous oversight in terms of risk management will lead to third parties who are either lacking or simply not owning up to the risk assessments they are subjected to. This requires careful management of exits of such parties from the supply chain of the organization. Exits should be undertaken with pre-completed checklists and with a view to minimum disruptions in terms of the process and reputation of the organization.

Furthermore, checking the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence over the Internet ("the cloud") to offer faster innovation, flexible resources. Economies of scale is another approach that is fundamental to the way supply chains around service sector should operate. Incorporating risk management principles is one key consideration of creating a smart supply chain.
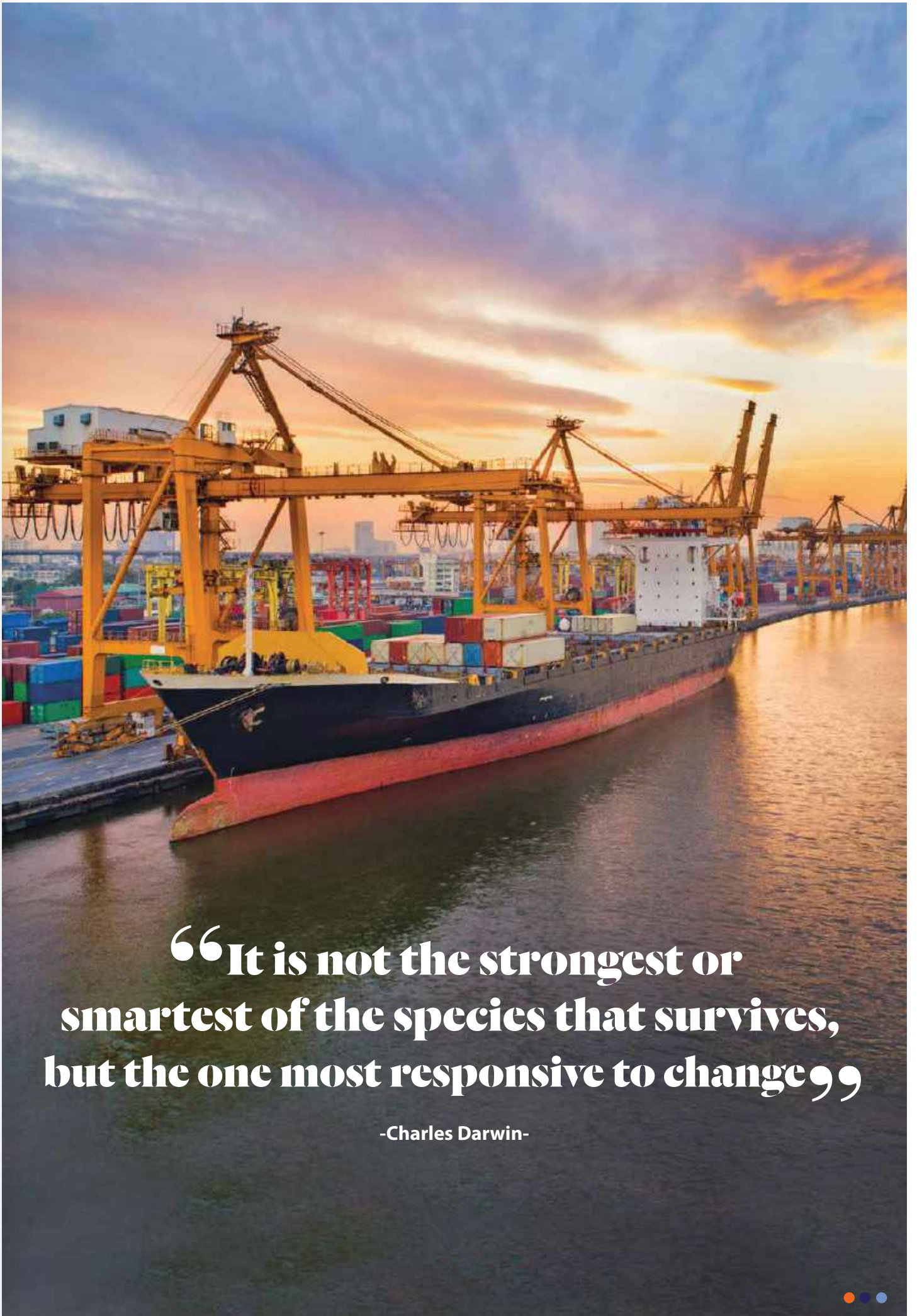
"It is not the strongest or smartest of the species that survives, but the one most responsive to change"

-Charles Darwin-

LEGAL STATUS OF SMART CONTRACTS IN SMART SUPPLY CHAIN MANAGEMENT

The management of the flow of products and services is referred to as supply chain management, and it covers all processes that turn raw materials into finished goods. Ever since traditional supply chains have become increasingly intelligent with more devices equipped with sensors, improved communication, automation capabilities and intelligent decision making, the modern smart supply chain offers incredible opportunities for cost savings and quality enhancement. Due to the massive increase in industrial activities in modern society, there are numerous challenges associated with supply chain management, especially at the coordination level. The use of blockchain technology may be one way to solve these coordination problems. Blockchain technology is a distributed ledger technology that can be used in a wide range of industries and smart supply chain activities. This technology incorporates a useful concept known as "smart contracts," which can support smart supply chain management by offering many benefits and advantages. However, there is growing controversy about whether smart contracts are equivalent to legally enforceable contracts. This article aims to determine the role of smart contracts and their legal status in smart supply chain management.

Smart Contracts for Smart Supply Chain Management

The supply chain as a whole is heading towards smart manufacturing, with applications embedded in the internet of things (IoT) in controlling the majority of the supply chain process. Especially, as a result of Industry 4.0, a range of innovations have increased that are changing traditional working practices. Many of these megatrends and consumer demands are changing the supply chain system, and supply chains now have the potential to achieve the next stage of operational effectiveness. They will take advantage of new supply chain business models to turn their organization into a digital supply chain, which is referred to as smart supply chain management.

At this point, Blockchain technology takes a step forward in making smart supply chain management even smarter. Blockchain is a distributed ledger technology that safely, permanently, and verifiably records value transactions between parties. Though it was first used for financial transactions, Blockchain applications are far-reaching and they have the potential to affect a wide range of industries. Supply chain management is one such application. Supply chains are highly complicated due to various stakeholders and business transactions. There are numerous barriers, such as a lack of accountability and traceability, disturbances and difficulty managing risks, and the need to develop trust and credibility. Smart contracts, which are facilitated by Blockchain technology, have the potential to solve these problems.

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Smart contracts are digital agreements between parties involved, written in computer code and uploaded to the Blockchain, where they will enforce themselves when predetermined requirements are met. They minimize supply chain uncertainty by automating the verification and execution of the various business transactions involved. A decentralized, permanent record also helps to build trust by ensuring that all stakeholders have equitable access to information. Smart contracts boost the supply chain's accountability, traceability, and performance, enabling it to be more flexible while also improving stakeholder relationships.

The legal status of smart contracts

Smart contracts, despite their many possible applications, also have their own disadvantages. The regulatory framework and how smart contracts can impact existing legal practices are the key challenges. Since smart contracts are such a new technology, there are very few rules regulating their use. To resolve concerns about privacy, security, consumer protection, and crime prevention, regulations will need to be created. Security is important when using an open Blockchain that is highly visible and usable while still storing confidential data.

• Timeframes for the manufacture of goods between receiving an order and shipping.

• Provisions for rewards and fines.

• Payment terms for clearing invoices.

One would argue that this is simply a contract between two parties where the basic elements of a contract, i.e. offer, acceptance, and consideration are fulfilled but without legal enforceability. And there is some information that can be written into a traditional operating contract and can also be written into a smart contract, making smart contracts ideal for virtual agreements to manage complicated supply chain relationships operationally.

Leaving aside any issues regarding the qualification of 'contracts' for specific contractual relationships indicating unacceptable, fraudulent, or illegal contracts, the very first question regarding the legal enforceability of smart contracts is whether smart contracts create 'promises or agreements' intended to be legally enforceable. However, a valid definition for smart contracts as (legal) contracts should consider whether they constitute an exchange of concrete obligations, in the "normative relation

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Professor Green, an Associate Professor of Law at the University of Oxford, once mentioned that "Currently, when the meaning of a contract is disputed by the parties to it, a court will consider what that agreement would mean to a reasonable human observer. Where that agreement is written in computer code, however, and intended for communication to artificial intelligence, the significance of a reasonable human observer's interpretation is a matter of contention".

It is also uncertain how existing contract law will come into play in resolving smart contract disputes. Professor Green, an Associate Professor of Law at the University of Oxford, once mentioned that "Currently, when the meaning of a contract is disputed by the parties to it, a court will consider what that agreement would mean to a reasonable human observer. Where that agreement is written in computer code, however, and intended for communication to artificial intelligence, the significance of a reasonable human observer's interpretation is a matter of contention".

The smart contract is used to define the relationship that exists between a manufacturer and a distributor for supply chain purposes can state:

• The cost of the goods incurred as part of a specific order.

between the parties." Another question arises whether smart contracts constitute 'promises or obligations'. Although it might seem at first sight that they do not, the view that smart contracts are agreements that must be agreed upon. Smart contracts are the implementation of an automated framework that can't be avoided later. Smart contracts, on the other hand, clearly "identify the rights and obligations of the parties" and almost always result in the conclusion of "existing agreements without further commitments to fulfill." They explicitly enforce mutual assent, regardless of the type of this mutual agreement, i.e. a code executed through a Blockchain platform.

However, a closer analysis shows that smart contracts are not, and should not be, neglected by law. Where the following smart contracts are considered examples: Company **A** rents a warehouse from Company **B.**

TRADITIONAL CONTRACT	SMART CONTRACT
PARTIES CONTRACT 3ʳᴰ PARTY EXECUTION	PARTIES SMART CONTRACT EXECUTION

They agree that if company **A** fails to pay the rent, company **B** will have the right to lock the warehouse door. They also agree to use a smart contract to enforce their deal, which would automatically lock the door if company **A** fails to pay. Many people would argue that the smart contract, in this case, would ensure that company **A** pays the rent on time. And this is likely right. The problem is that, under certain rules, the use of a smart contract in this example is unconstitutional because a landlord cannot evict a tenant solely for failing to pay the rent. He must first cancel the contract, which he can do only if the tenant has not paid rent for at least 2-3 months. Even then, he'll have to go to court to have the tenant evicted, with the tenant's rights as a weaker party obviously in hand. As a consequence, the example highlights the need for a legal framework to decide if smart contracts are true or invalid, legal or illegal. They need a legal framework to act as a normative reference point.

However, with all the growing controversies, **Belarus** became the first country to legalize smart contracts in 2017 after enacting the *Decree on the Growth of the Digital Economy*. **Denis Aleinikov**, a Belarusian lawyer, is widely credited as the developer of the *smart contract legal concept* adopted by the decree.

A US senate report of the year 2018 stated; "while smart contracts might sound new, the concept is rooted in basic contract law. Usually, the judicial system adjudicates contractual disputes and enforces terms, but it is also common to have another arbitration method, especially for international transactions. With smart contracts, a program enforces the contract built into the code. " Many US states have passed legislation on the use of smart contracts, such as Arizona, Nevada, Tennessee, and Wyoming.

However, this concept is still in the developing stage in many legal systems. Especially, developing countries like Sri Lanka lack the knowledge of these concepts. Implementation of smart contracts at international level is what seems to be beneficial and important to every country so that they will try to enforce smart contracts at the national level.

Conclusion

Smart supply chain management is defined by the application of various and advanced information and communication technology, as well as manufacturing technologies, to all activities and processes involving the planning, coordination, monitoring, operation, and optimization of the total supply chain system. The existing supply chain processes have become longer and more complicated as market practices have increased. Smart contracts can help with this process by simplifying the process and increasing transparency in the supply chain. Smart contracts can track inventory and the chain of custody in a supply chain by integrating them with IoT devices that can track the location of products. So that, Companies would be better prepared to cope with disruptions or accidents such as recalling with this knowledge. This also reduces the risk of supply chain theft or fraud. Smart contracts enable businesses and customers to assess the provenance of products in addition to tracking their journey. This is particularly important in the food industry for health reasons, but it is also becoming increasingly important as environmental protection becomes more of a concern. Businesses like Walmart, Ever ledger, and Maersk have all begun to explore the use of smart contracts to track a variety of products, including meat, shipping containers, and mining samples.

Smart contracts, on the other hand, are still in their infancy, but the technology is rapidly improving. Smart contracts are also being used by large businesses across their supply chains. However, existing legal standards would need to be revised to better handle smart contracts. Since many companies are gradually using smart contracts, this will ultimately boost the reliability and productivity of smart supply chain management. Smart contracts are more effective in supply chain management than traditional contracts because they require less paperwork, do not cause delays due to lengthy transfers, and are transparent. Nonetheless, at a time when the entire world must respond quickly to the disruption caused by COVID-19, implementing smart contracts in every country and encouraging people to use them is a smarter idea for overcoming the challenges they face, especially in supply chain management and other related areas. ⌊

Memories

LOGISTICS DAY 2020

The 6th Logistics Day of the university history planned to be held in the year 2020 under the theme of "Challenges in Integrated Logistics Optimization", had to undergo the unexpected situation of the COVID-19 pandemic outbreak and this resulted in the inability of holding the event in an extravagant scale as usual. Yet, it is a remarkable effort that reached success, taken by the organizing committee of the year to hold the first ever online launching ceremony of the fifth edition of the Logistics Times Magazine where the first issue was presented to the Vice Chancellor of the university, Major General MP Peiris.

KDU LOGISTICS CHALLENGE 2021

KDU Logistics Challenge is a case study competition organized for Logistics graduates and undergraduates with the hope of enhancing their critical thinking and team-building skills and groom them for the industry. HIPG being the case study providers the 45 teams registered were given two case studies to choose from and provide a competent solution. The competition was of two main phases where in the first phase the teams were asked to submit a report which showcased their solution and according to the standards of the reports, 5 teams were selected to pitch their ideas to a panel of judges to obtain the grand title which also includes job security for the winning team members.

INSTALLATION OF THE EXCO 2020/2021

Technical Sciences and Management Society (TSMS) is an eminent club of General Sir John Kotelawala Defence University which nurtures undergraduates to embrace themselves as balanced personalities, rich in academic accomplishments, soft skills and extracurricular activities. The 3rd annual general meeting held on the 28th September 2020 demarcated a major milestone of the Department of Management and Finance, with the installation of the Executive Committee of TSMS, for the years 2020/2021.

This event was graced by the distinguished presence of the Dean of Faculty of Management, Social Sciences and Humanities, Dr. Kithsiri Amarathunga, the Head of Department of Management, senior lecturers and lecturers of the department.
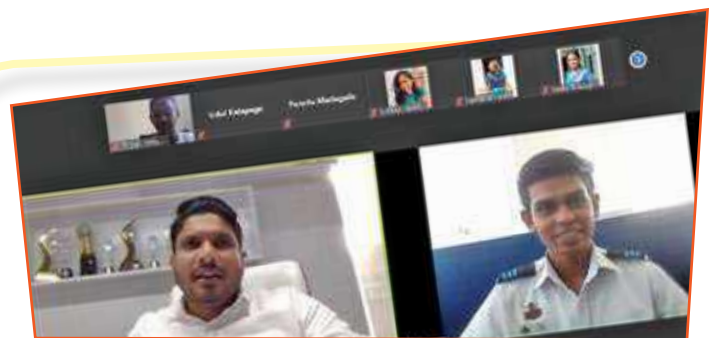
MONTHLY EDUCATIONAL WEBINARS

The Technical Sciences and Management Society of General Sir John Kotelawala Defense University organized a series of educational webinars which were held monthly to create a platform to facilitate the undergraduates to enhance their industry-related knowledge before stepping into the corporate sector, focusing on field related topics and especially the current situation.

The first session of the series was on Bulk material storage in Silos with Mr. Yasantha Roshan, Senior Manager - Logistics, Ceylon Grain Elevators PLC, Prima Group which ended up in a high note where the undergraduates were also given an invitation for a field visit in the future.

The second session of the series was on Entrepreneurial initiatives in the IT Industry with Mr.Dhanika Perera, CEO of Bhasha Lanka(Pvt) Ltd, Founder of Helakuru, PayHere & ShopHere.

The educational webinar series was indeed a great success and will be continued in the years to come.

TOP 10 TRENDS IN SMART SUPPLY CHAIN AND LOGISTICS

01 SUPPLY CHAIN DIGITIZATION

Digitization improves the speed, dynamics, and resiliency of the supply chain operations, leading to greater customer responsiveness and ultimately higher revenue. By embracing digitalization, companies can experience real value, increased revenue, and market valuation. In the field of digitization, the Internet of Things (IoT) holds a prominent place as a highly transformative technological solution in the logistics sphere. IoT refers to a system of interrelated computing devices allowing the transfer of data over networks without human input. It helps companies monitor inventory, manage warehouse stock, optimize fleet routes, and reduce dead mileage.

02 SUSTAINABILITY POWERED BY TECHNOLOGY

Sustainability can be seen as an exceptional trend that has been cutting across industries and logistics. Last-mile delivery, in particular, is traditionally very time- and energy-consuming, which is also why it presents many opportunities for fresh and smart approaches. To reduce the negative environmental impact, companies support a massive amount of technologies from actual electric vehicles to AI-based software that calculates the route with the lowest generated emissions. Moreover, similar logistics technological trends can be even seen in the shipping sector recently, which uses ships and different types of marine fuel with zero carbon emissions on the high seas by 2030. With all efforts, it tends to inspire the whole industry to adopt a more sustainable mindset.

03 MORE FOCUS ON RISK MANAGEMENT AND SUPPLY CHAIN RESILIENCY

Supply chain risk management is a way to prepare for undesirable events. The increasing outsourcing practices, off-shoring, product versatility, supply chain security, and substantial interdependence throughout the supply chain further accentuate the importance of dealing with risks in the supply chain. Still, it can't prevent things from happening. This is where supply chain resiliency comes into the picture. It's a real measure of the ability of a company to withstand disruptive events.

Steps to make the supply chain more flexible and resilient include visibility throughout the supply chain so disruptions can be detected on time, close cooperation with suppliers and distributors so alternative supply routes can be found, and a good incident response plan to provide a course of action when disruption occurs.

04 WAREHOUSE ROBOTICS

Without a doubt, it can be seen that warehouse operations have undergone a significant shift in recent years – and with technology being progressively integrated, this is one of the logistics technologies trends that is likely to continue. One of the obvious innovations in warehouse robotics, a fast-growing field. According to the Global Customer Report 2019, there has been an 18% year-over-year increase in the testing of warehouse robotics. It may not only be within the scope of wearable technology, driverless vehicles, or multifunctional robots, robotization can significantly improve the efficiency and speed of warehouse processes.

05 CIRCULAR SUPPLY CHAIN

The term "linear supply chain" refers to the conventional concept where goods flow linearly from raw material to finished products. Modern logistics practices focus on the circular supply chain concept, involving the use of previously used products as raw materials. The reuse of products and materials is known as reverse logistics, and it is a novel, innovative approach. It helps companies reduce administrative and transportation costs, achieve higher sustainability, better customer service, and loyalty, create value and conserve resources. Used products can be kept in circulation through good cooperation between companies and their suppliers and customers.

06 ARTIFICIAL AND AUGMENTED INTELLIGENCE

Over the past several years, the logistics industry has started to integrate Artificial Intelligence solutions including intelligent transportation, route planning, and demand planning in their operations. From last-mile delivery robots and sustainability solutions, to warehouse automated picking systems and predictive optimization software, AI is already making a huge difference in logistics. Along with AI, the use of Augmented Intelligence has gradually increased. Augmented intelligence combines human intelligence with AI automated processes. E.g., in logistics planning, using Augmented Intelligence can even be superior to using AI alone, since it can combine inputs from human planners (experience, responsibility, customer service, flexibility, common sense, etc.) together with AI technology which is left doing the repetitive and boring work. With the implementation of more Augmented Intelligence solutions, it can be expected that it may promote logistics professionals to do their jobs more quickly while reducing lags and creating cost-savings.

07 ENHANCED SUPPLY CHAIN VISIBILITY

Supply chain visibility gives insight into what's happening in the supply chain of each node. Proper analysis of the trends and the alterations of the supply chain can improve forecasting and decision making which can be improved through supply chain visibility and transparency. It is a crucial factor for the efficiency of the entire supply chain including manufacturing, transportation, procurement, etc. One of the benefits of improved chain visibility is real-time inventory management. It involves the use of mobile point-of-sale systems and sensors and takes inventory management to a whole new level.

08 DIGITAL TWINS

Digital twins are possibly one of the most exciting logistics technology trends to keep an eye on in 2021. As many logistics professionals know, products are never the same as their computer models. Modeling in its current state doesn't take into account how parts wear out and are replaced, how fatigue accumulates in structures, or how owners make modifications to suit their changing needs. With the help of digital twins, physical and digital worlds can be melded into one, thus allowing us for the first time to engage with the digital model of a physical object or part just like we would with their physical counterparts. The application of digital twins tends to be vast. In the shipment sector, digital twins can be used to collect product and packaging data and use that information to identify potential weaknesses and recurring trends to improve future operations. Warehouses and facilities can also use the technology to create accurate 3D models of their centers and experiment with layout changes or the introduction of new equipment to see their impact, risk-free

USE OF SAAS IN THE SUPPLY CHAIN 09

The use of the software-as-a-service model in supply chain technologies and logistics management is gaining popularity, hand in hand with the rise of cloud computing. This is mostly due to the safety and security of SaaS and the convenience of being able to use only the services you need on a pay-per-use basis. SaaS allows companies to avoid high fixed costs of continuous system maintenance, upgrades, and infrastructure-related costs.

BLOCKCHAIN 10

Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system. A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain. Each block in the chain contains many transactions, and every time a new transaction occurs on the blockchain, a record of that transaction is added to every participant's ledger. The decentralized database managed by multiple participants is known as Distributed Ledger Technology (DLT). Blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash.

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Blockchain	Rotable	Drones
Hyper automation	Transparency	Hitchment
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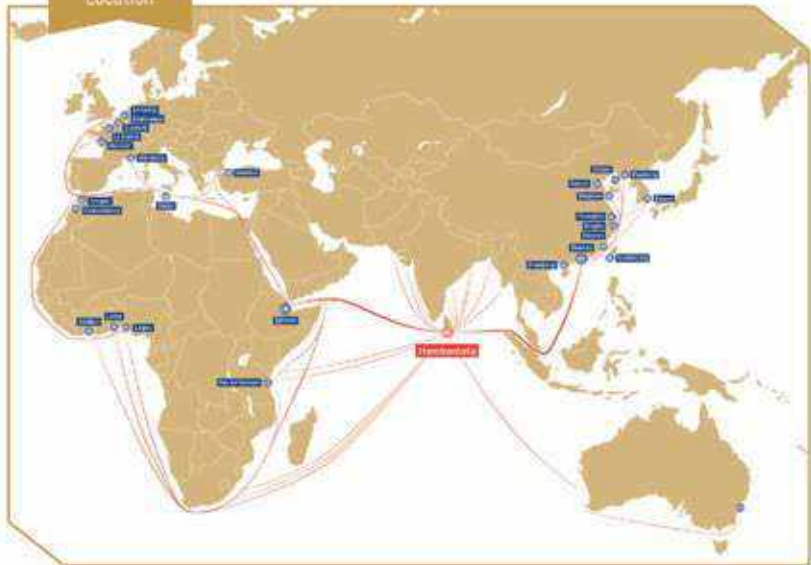created in partnership with South Pole.

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