THE CHANGING LANDSCAPE OF THE LOGISTICS MARKET

Making the logistics industry simpler, smarter and more sustainable

CEO Letter

Change is hard but essential for progress. This is why we're doing it.

ALP is the first logistics property developer in Taiwan, with a team of logistics, real estate and industry professionals. We position ourselves as innovators and disruptors, committed to changing a long-time neglected industry in Taiwan - Logistics. In the past eight years, we started from logistics real estate and developed into logistics solutions and logistics services. Now we have become Taiwan's most well-known logistics property developer, as well as SEA smart logistics solution experts.

As the logistics industry is facing labor shortages, increasing labor costs and fulfillment complexity, automation and technology solutions are considered to be the next viable step of development. Although the concept is simple, it is a big change to the old practices of the industry. We need to fundamentally change our processes and workflows. We need to incubate a group of logistics 4.0 engineers to plan out, design, procure and accomplish these tasks, along with the creation of an IT system as the brain of the logistics facility. The system not only can help coordinate between hardware and software but also provide better operational efficiency for industry clients, using selected data for analysis, optimization and discovering valuable insights to propel the industry forward.

In addition, the logistics industry is changing rapidly as retail industry transformation requires the support of next generation infrastructure. We are an innovative company that upgrades and scales up the industry in the age of technology and we are in the best position to assist retail industry transformation, as our agility is the core force supporting this change.

Making the logistics industry simpler, smarter and more sustainable is not an easy task, but we insist on doing the right thing. We are committed to changing the landscape of the logistics industry in Taiwan and abroad, providing a new generation of smart logistics solutions to upgrade the current industry and establish a sustainable business model.

The logistics market is undergoing a series of changes and challenges. Especially since the pandemic outbreak in 2020, brand owners and distributors have leaned toward more flexible and agile logistics systems to support their diverse needs. The increasing complexity of logistics operations, market uncertainty, and high reliance on human labor have led the logistics industry towards smart logistics solutions. As key elements of smart logistics become more mature, the future will be the era of integrated buildings, automation, IT, transportation and data analytics.

Smart Logistics Solutions is the core element to enhance brand owners and retailers' competitiveness. However, advanced technology and capital-intensive investment form barriers to upgrading. If there is an intermediate company offering a sharing service model to reduce companies' risks when facing transformation and seasonal fluctuations, while at the same time improving the efficiency of logistics operations and reducing required space from a long-term perspective to reduce resource waste, it will speed up the process for the industry to achieve these goals.

Countries in Southeast Asia are facing similar industrial development challenges. Supposing the experiences of Taiwan could be referred and replicated in Southeast Asia, and the smart logistics solution can be deployed ahead of time, the deployment would make it easier for the Southeast Asia logistics industry to respond to the fast-paced changing of retail and logistics demands.

Industry conditions

The logistics cost share of retail will increase from :
The retail market is developing toward omnichannel.
5% >>>> 10%

Idle resources during low seasons :
Companies have to pay an additional 5% cost in peak seasons
18%

Third-party logistics services provider (3PLs) contract mostly signed for
on average contract length, hard to invest in automation solutions for long-term use.
3 years

Reasons to upgrade

Among the total operating cost, order picking accounts for
Automation is estimated to save 20% operating expenses
63%

70% **of warehouses to use AI to lower operating cost and optimize efficiency and quality. (Estimated by 2026)**

Market drivers

50% of logistics revenue contributed by the retail market.

73% of consumers shop via multiple channels.

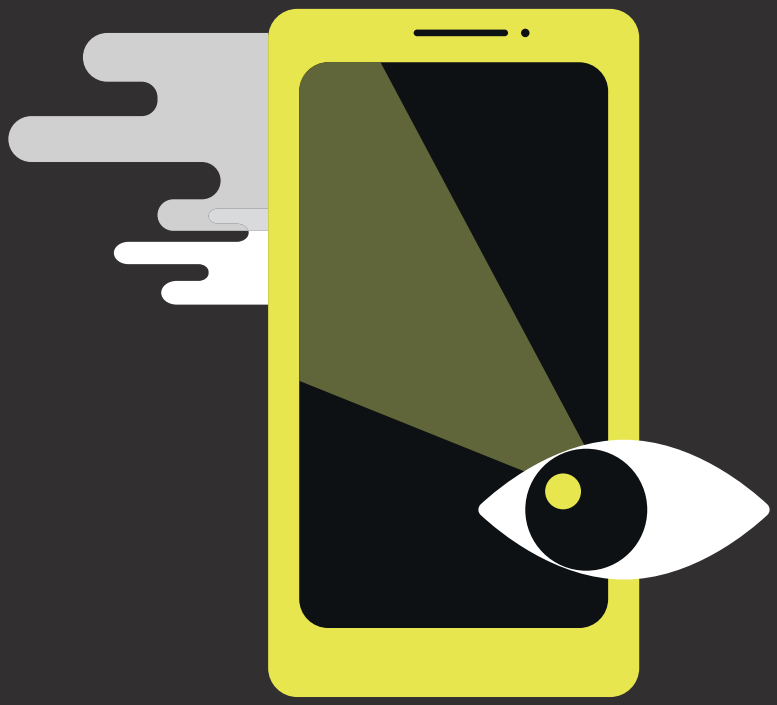
3 ultimiate goals in logistics

Changing

Smart logistics solutions require a centralized system to coordinate the software, hardware, and the entire warehouse facility, similar to an operating system in a smartphone that can integrate information flows

The co-sharing model of smart logistics solutions changes ownership to usership, allowing retailers to be free from additional expenses when facing seasonal operation changes or pre-build capacity for the next five years.

Major multi-national companies demand logistics services providers have sustainable development experience, serving as a qualification for selection in the tender process



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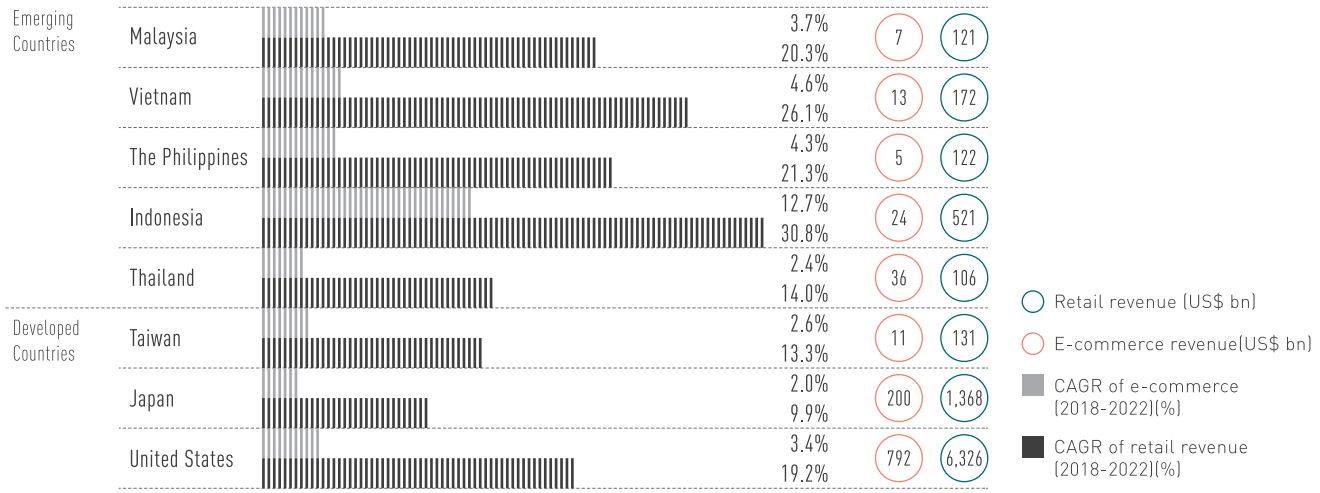
The Driving Force of the Logistics Market

Retail & E-commerce Revenue in 2020 & CAGR from 2018 to 2022 (US$ bn, %)



Source: ALP Research, 2021

1/ The growth of the logistics industry is driven by transformation in the retail space.

Logistics industry development goes hand in hand with retail industry demand. In recent years, the transformation of the retail industry has created a new impact on the logistics sector. A McKinsey report[1] pointed out 50% of logistics companies revenue is contributed by the retail market, and at this moment, the retail industry is undergoing a large-scale transformation, shifting the focus from physical retail stores to e-commerce, and heading toward omnichannel retail.

According to the same McKinsey report, between 2014 to 2019, global e-commerce revenue had increased 160%, which was six to eight times the growth rate of traditional retail. A Statista report[2] pointed out, e-commerce revenue accounted for 14% of total retail revenue in 2019. Due to the impact of the COVID-19 pandemic in 2020, the percentage grew from 14% to 17%. It is estimated that after the pandemic, consumers will continue their online-shopping habits.

According to statistics from Taiwan's Ministry of Economic Affairs, Taiwan's e-commerce revenue has grown substantially, maintaining double-digit growth since 2018, and the proportion of e-commerce revenue over retail revenue has gradually increased. We expect that the compound annual growth rate of e-commerce from 2018 to 2022 will remain five times the retail revenue growth rate in Taiwan, Southeast Asia, and some developed countries.

50%

50% of logistics companies revenue is contributed by the retail market.

In addition to e-commerce thriving, retailers have also begun to adopt an omnichannel strategy to integrate with better logistics flow, so that they can allow consumers to shop in a variety of ways while enjoying their service whenever and wherever consumers are. According to Harvard Business Review (2017)[3], 73% of consumers are accustomed to shopping through multiple channels, only 20% retain physical channels as their sole option, and 7% choose only online shopping, displaying a progressively diverse consumption pattern.

2/ Business needs of the retail industry

Under this trend, based on the feedback we received from retailers, the following five most common and urgent logistics tasks and needs are summarized below. Among them, it can be concluded into: Flexibility, Accuracy, and Agility. These are three must-have abilities for retailers during transformation.

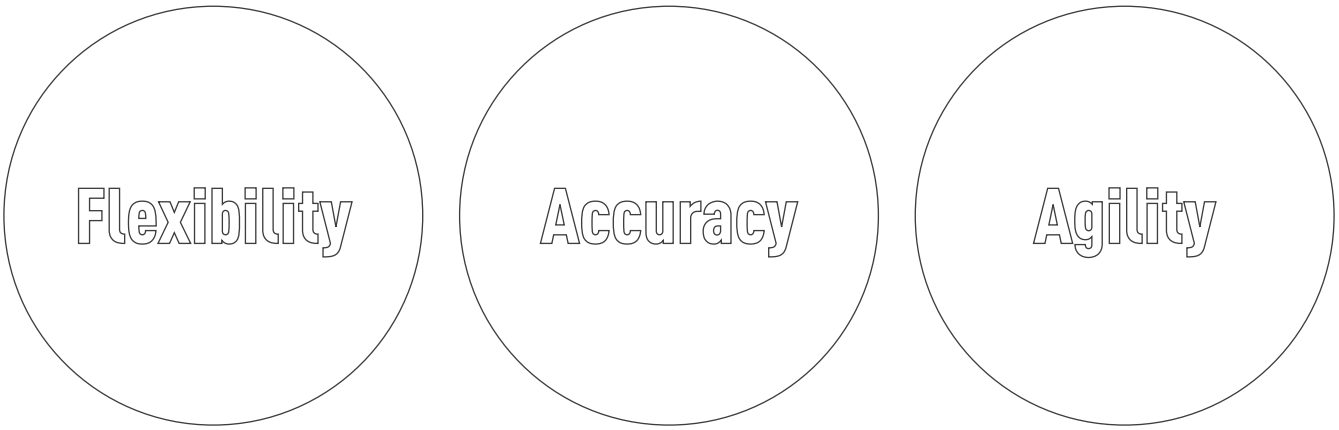
1/ Require a large-scale logistics facility to reduce the frequency for inventory transfer and solve the problem of managing multiple small warehouses

2/ Require a large-scale logistics facility to fulfill seasonal peaks capacity and meet the need for future expansion

3/ A B2B and B2C solution to fulfill orders from brick-and-mortar stores to online channels

4/ Improve operational efficiency and accuracy, while reducing reliance on human labor

5/ An improved and highly efficient operating model to elevate service level



Three must-have abilities for retailers during transformation

[1] McKinsey & Company. (2021, March 12). *Unlocking the omnichannel opportunity in contract logistics.* https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/unlocking-the-omnichannel-opportunity-in-contract-logistics#

[2] Statista. (2021, January). *E-commerce share of total global retail sales from 2015 to 2024.*

[3] Harvard Business Review. (2017, January 3). *A Study of 46,000 Shoppers Shows That Omnichannel Retailing Works.* https://hbr.org/2017/01/a-study-of-46000-shoppers-shows-that-omnichannel-retailing-works

02

Challenges in the Logistics Industry

The logistics industry is facing transformation in the retail sector. In addition to actively responding to new business demands, it also faces the problem of labor shortage and rising wages. These are constantly challenging the limits of the logistics industry and decreasing profitability. At the same time, we also see that third-party logistics companies, the core of the logistics industry, have pressures to transform from their core foundation of labor-intensive contract logistics.

In general, B2B logistics costs account for about 2-6% of sales, while B2C accounts for 8-20%.

1/ Challenges of retail transformation

When companies start to develop e-commerce and omnichannel strategies, logistics companies are facing unprecedented opportunities and challenges. The ability to operate smoothly and to fulfill complex orders in large quantities has become a key benchmark of logistics companies' response to industry transformation. These challenges include:

Swift order fulfillment

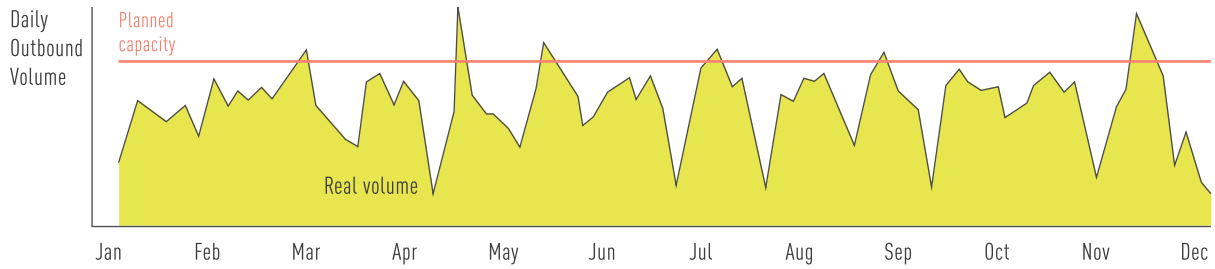
Consumers' requirements for timeliness have increased, from one week in the past, to same-day delivery, or even in just a few hours. Most e-commerce platforms are adopting fast delivery and free shipping strategies to attract more consumers.

Strict timeliness not only prompts different site selection criteria for e-commerce warehouses but also demands faster handling and shipping with higher efficiency; meanwhile, due to the nature of omnichannel, an order containing products from multiple warehouses needs extra consolidation and fulfillment time. In general, B2B logistics costs account for about 2-6% of sales, while B2C accounts for 8-20%.

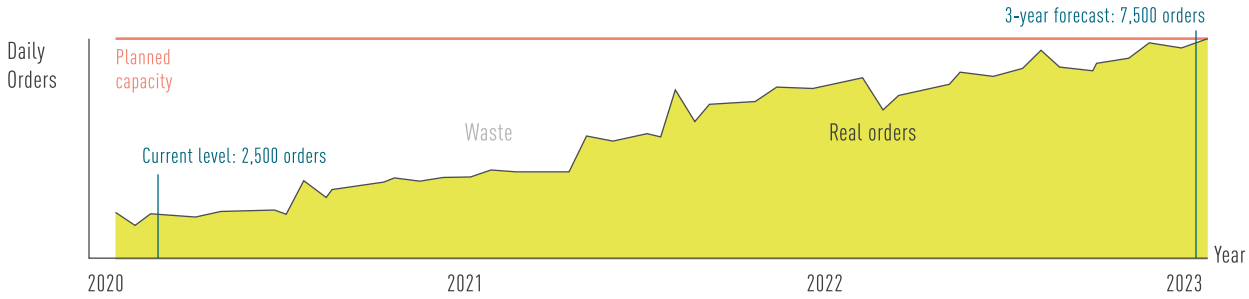
High volatility

As omnichannel retailing grows, the seasonal activities of e-commerce make the peaks and troughs of orders more obvious. According to observations, during the Christmas holidays or the Double 11 festival, the order volume can reach more than ten times the normal day. Moreover, consumers have more and more choices online, and gradually prefer unique and personalized products, which has greatly increased the number of SKUs provided by brands.

Order volume fluctuation and volatility have made sales projection more difficult. Warehouse automation also became harder to implement due to difficulties in determining investment size without clear visibility on future capacity. Furthermore, due to the increasing



* Real volume is based on real FMCG company's numbers



* Real order is based on real major retail channel's numbers

variety of products, there are too many products of different sizes and weights. According to our experience, there can be as many as 20 carton sizes in an e-commerce warehouse. If the cartons cannot be standardized, it will affect the processing efficiency of automated equipment.

Taking the FMCG sector as an example, in order to ensure the logistics services can meet most requirements, companies usually build their capacity based on peak-season data. However, during this time, logistics service providers still need to spend an additional 5% expense to rent temporary warehouse space, adding more workers and equipment. However, during weekdays and off-season, they could suffer up to 18% of idle resources, space, and equipment. In addition, taking a large retailer starting to build up their online retail channel, although it can be expected that it will grow more than three times in the next three years, it still has to bear the cost of a large amount of empty space in the short term.

Labor intensive

Based on our internal research, a labor intensive e-commerce warehouse has nearly 1,000 full-time employees. This number matches the McKinsey report (2019)[4]. The report indicates in some large e-commerce warehouses, there can be as many as 2,000 - 3,000 full-time employees in one warehouse, triple the number in a traditional B2B logistics facility. Operations in e-commerce warehouses are more complex, where workers have to pick piece by piece, then pack and label manually, unlike its B2B peers where orders are processed in bulk or by pallet. Furthermore, in peak season, operators need to deploy extra labor forces in advance, bringing great operational obstacles in regions with limited labor supplies.

2/ Challenges of manpower

Labor shortage

According to the Ministry of Interior of Taiwan, the country has stepped into negative population growth in 2020, and the number of newborns in the past five years has dropped from 210,000 (2015) to 160,000 (2020), showing Taiwan will face severe labor shortage in the future. In addition, given the labor intensity of the logistics industry, the working environment is physically demanding with higher occupational injury risk, making recruitment more difficult. Therefore, the logistics industry needs to upgrade, to improve working environments through implementing automation equipment, systematic workflows, and to reduce dependency on human labor.

Southeast Asian countries haven't faced a serious labor shortage. But in some countries, like Thailand and Malaysia, workers from various neighboring countries, with different languages and beliefs working in the same warehouse, language barriers and miscommunication may cause inefficiency and management difficulties.

Rising labor cost

Countries with higher labor wages such as Taiwan, Thailand, and Malaysia have reached the cost-effective threshold for automation investment. Implementation of automated equipment and IT systems can help slashing labor costs.

For example, an order picker with AGV (Automated Guided Vehicle) in a picking station can operate at an efficiency triple that of traditional manual handling. As real wages continue to grow substantially, we estimate that, within six years, Indonesia, Philippines, and Vietnam will also reach the cost-effective threshold for automation investment. However, when planning a smart warehouse, it is necessary to consider future development trends for the next one or even two decades, building a solid foundation for future operational demand. Nevertheless, as some Southeast Asian countries have large and low-cost labor forces, it is crucial to start planning for future automation and considering asset heavy strategies, to tackle future operation and management issues.

Shortage of employees in the transportation and warehousing industry in Taiwan (Total)

Month Year	Number of Shortage (Person)	Month Year	Number of Shortage (Person)
Aug. 2015	6,843	Aug. 2018	7,398
Aug. 2016	6,709	Aug. 2019	7,677
Aug. 2017	6,881	Aug. 2020	6,616

Country	Salary/ warehouse worker/ month(USD)	2020 forecast real salary increase
Thailand	1,250	4.1%
Malaysia	747	4.7%
Indonesia	434	4.6%
Philippines	373	3.7%
Vietnam	354	5 1%

Source: ECA Salary Trends Survey (2020), Human resources online.net

3/ Challenges for third party logistics service providers

Even though logistics companies want to solve the aforementioned issues through the implementation of technology and automation, they still face many risks and dilemmas. According to a study by McKinsey (2019)[5], the percentage of logistics companies with automation implementations is lower than that of its clients, such as pharmaceutical companies or car manufacturers. And the implementation growth is forecast only at 3% to 5% annually by 2025. These dilemmas include:

Short-term logistics service contracts

The term of most logistics contracts is three years. Third-party logistics companies usually need to conduct preliminary investment evaluations based on the needs of individual customers, including investment in site, manpower, shelves, automation equipment, etc. Capital intensive automation will make it difficult for third-party logistics companies to reach the break-even point during the contract term. Therefore, according to our internal research, it is difficult for third-party logistics to make long-term investments in automated warehousing solutions based on short-term contracts. At the same time, the McKinsey (2021)[6] report also confirms this view, pointing out that only 20% of global third-party logistics companies service Omnichannel clients. Generally speaking, unless third-party logistics companies haves external investment support or the development of new business models, it is difficult to change the norm.

Competition with large retail platforms

Large retailers and e-commerce platforms usually have stronger bargaining power and they can easily switch 3PL if not satisfied. This resulted in a very thin margin for 3PLs, impacting the return on automation asset investment.

Another pressure comes from the large e-commerce platforms which usually build their own logistics services, such as Amazon in the US, JD.com in China, and Momo in Taiwan, investing in proprietary facilities, operational teams, transportation fleets, and other infrastructures. If the logistics department of Amazon were an independent company, it would become the fifth-largest logistics company in the world. As Amazon owns a huge amount of data, it is able to analyze, forecast, and adjust, allowing them to maintain service level of same-day or next-day delivery even during peak seasons.

[4] McKinsey & Company. (2021, April 24). *Automation in logistics: Big opportunity, bigger uncertainty.* https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/automation-in-logistics-big-opportunity-bigger-uncertainty

[5] McKinsey & Company. (2021, April 24). *Automation in logistics: Big opportunity, bigger uncertainty.* https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/automation-in-logistics-big-opportunity-bigger-uncertainty

[6] McKinsey & Company. (2021, March 12). *Unlocking the omnichannel opportunity in contract logistics.* https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/unlocking-the-omnichannel-opportunity-in-contract-logistics#

03

Key Capabilities and Thoughts for Industry Upgrading

Facing the new challenges from new business models, the logistics industry has to confront the necessity and urgency to upgrade. We have seen that industry upgrading should incorporate Logistics 4.0 techniques, IT data analytics breakthroughs, and innovation in logistics facility design to tackle the new challenges. The new type of automated facilities with Logistics 4.0 solution should be the cornerstone for the industry's future development, plus the integration of management systems, software, and hardware, can help create a complete, flexible and sustainable solution for the logistics industry.

1/ Application of Logistics 4.0

Different from traditional automation, in the Logistics 4.0 era, technological development will be towards intelligent development, which means that the equipment modules themselves have partial autonomous decision-making capabilities and can independently complete the tasks delivered by the commanding system without human intervention. Each module is commanded by a central system capable of autonomous decision-making, and can make optimal resource allocation and scheduling based on the information feedback from each module and the order requirements. With the reduction of system costs, the logistics industry is developing rapidly towards the 4.0 generation.

In order fulfillment centers serving omnichannel or e-commerce clients, order picking accounts for up to 63% of the total operating cost[7]. Therefore, most automation solutions are order picking related. For example, Amazon warehouses in the US applied AGV (Automated Guided Vehicle) robots to save 20% on operating expenses, and Alibaba in China also replaced 70% of the labor force by picking robots. With the development and maturity of robotics, AI, AR, and computer chip technology, the application of intelligent technology in warehousing operations will spread throughout the field, but the realization of this technology depends on the following two key points:

In response to the development of omnichannel, the application of Logistics 4.0 needs to consider the pain points of multiple retail channels, commodities characteristics, and automated equipment features.

Retailer's logistics centers have begun to adopt new systematic processes to replace paperwork and to solve the disarray from the differences between B2B & B2C operations. On the other hand, in the warehouse of a large retailer in Taiwan, workers have to walk 11 kilometers per day and for safety reasons, they work in teams of 3 people to ensure safety and the aisles' are clear of forklifts or automated equipment. Therefore, their warehouse requires intensive human labor. But after implementing the AGV system with the good-to-man picking, workers stay at the picking stations, avoiding overlaps from humans and machines, improving operational efficiency and safety.

Each industry / product / channel may require different types of automated solutions for their own needs. These requirements lead to various distinct details on planning. Take AGV as an example, it's picking capacity could be 500 pieces per hour for cosmetics, but only 100 pieces for groceries. Huge variety of SKU specifications like size and weight makes handling complicated, and affects the number of robots and picking stations.

Brands and retailers have different needs for logistics centers. Logistics centers for retail channels pick in bulk and deliver to stores. For example, to fulfill orders for a cosmetic retail chain, the logistics center has to process and pick over 2 million items each day for hundreds of stores. Under an 8-hour shift, it requires at least 200 to 300 workers to finish picking and distribution. For some retail chain stores developing online retail platforms, they are also facing a large number of articles in different sizes, with each order on average taking up more than 2 types of carton. The design and planning of AGV picking stations are also different from the operation of other e-commerce platforms, requiring many stations and picking shelves capable of handling products in multiple sizes, and satisfying the demand from various order types.

Traditional automation technology relies heavily on fixed mechanical equipment, such as box conveyors. The advantage is that it is conducive to continuously move products with similar specifications. However, this rigidity also makes it unsuitable when product specifications differ dramatically along with different picking methods etc. For example, in the logistics center, products being sent directly to the customer may require a different process and cannot use the automation resulting in a loss of operating flexibility and loss of equipment efficiency.

The new generation of intelligent solutions will massively apply AMR (Autonomous Mobile Robot) and Robotic Arm technologies to meet a small number of diverse and highly flexible operation requirements. To meet these diverse and highly effective operational requirements such as providing highly-dense space utilization and complex picking, packing and staging solutions.

Finally, as Logistics 4.0 develops, there are many mature automation solutions for picking operations, which accounted for the largest proportion of expense. Global large e-commerce platforms and equipment suppliers are actively focusing on automated solutions for the packaging process. We are expecting the development focus of the next stage of Logistics 4.0 will be smart operations that further integrate smart equipment modules, through the introduction of 5G, AI, IOT, big data and other technologies, it connects the upstream and

downstream information of the supply chain, dynamically responding to sales strategies in real time, carrying out the optimal scheduling of logistics operation resources and advanced operation functions such as decision-making support, process analysis and optimization, preventive equipment maintenance, and equipment benefit analysis.

Creating a co-sharing model with Logistics 4.0 brings economies of scale to clients

The business model of Logistics 4.0 is capital and technology intensive. The traditional logistics industry intends to upgrade from 2.0 and 3.0 generations to 4.0, and will face the dilemma of insufficient economies of scale. To break through this bottleneck, it is estimated that the path to success can be divided into the following two categories:

1/ Large-scale retail channels and e-commerce platforms self-developed automated logistics centers, tailor-made to their demand and operation, which can be only used by themself or their suppliers. Amazon is one of the classic cases. However, as the degree of development toward 4.0 becomes higher, the need to invest its own capital and the demand for high-tech talents also increases, which invisibly increases the risk of operation and diversifies the efficiency of resource use.

2/ Automated warehouses invested and developed by resource-integrated companies, providing service to small and medium retailers, leveraging economies of scale to offer a competitive fee.

A co-sharing model enables clients with limited resources to afford a customized solution, reduce reliance on human labor, improve operational efficiency, shorten lead time and eliminate human-related errors. In addition, a co-sharing model can bring various clients together. In terms of operation, it can regulate and reduce the capacity differences between off-season and peak-season of multiple industries, fully utilize equipment usage and labor force planning to reach maximum economic efficiency.

2/ IT and data analytics breakthrough

A stable and flexible IT system has proven indispensable when dealing with complex operating procedures. In the past, warehouse operations relied on people to manage each process. But in the era of Logistics 4.0, the IT system should guide each operation, developed on the foundation of information flow integration, using a user-friendly interface to guide human workers during the operation. In traditional warehouses, workers have to carry stacks of papers or a laptop around the warehouse, take pictures and communicate with clients when tackling product or inventory issues. These incoherent actions lacking an intuitive interface leads to bottlenecks during operation.

What is the key system to upgrade the logistics industry?

In response to the omnichannel trend, a new generation of technology and architecture needs to be actively implemented to the core system.

In the era of Logistics 4.0, a large number of intelligent systems will be added to the logistics operation, requiring process redesign and a new operational framework. The new operating system also needs to introduce a new generation of technical thinking and architecture,

and maintain a certain degree of system flexibility to respond to changes and adjustments in front-end sales strategies.

Nowadays, retailers are selling goods on multiple online and offline channels simultaneously. On the system side, it is necessary to integrate the information flow of every channel for each retailer. For example, as consumers purchase a wide variety of SKUs and increase in quantity, how to effectively distribute and package products using system calculations, algorithms and AI has become very important. If an order with several items is divided into different packages, additional delivery and packaging expenses will be incurred. Unnecessary packaging material will also increase the burden on the environment. Consumers will also be troubled by receiving multiple packages, which could affect the brand's reputation as a result.

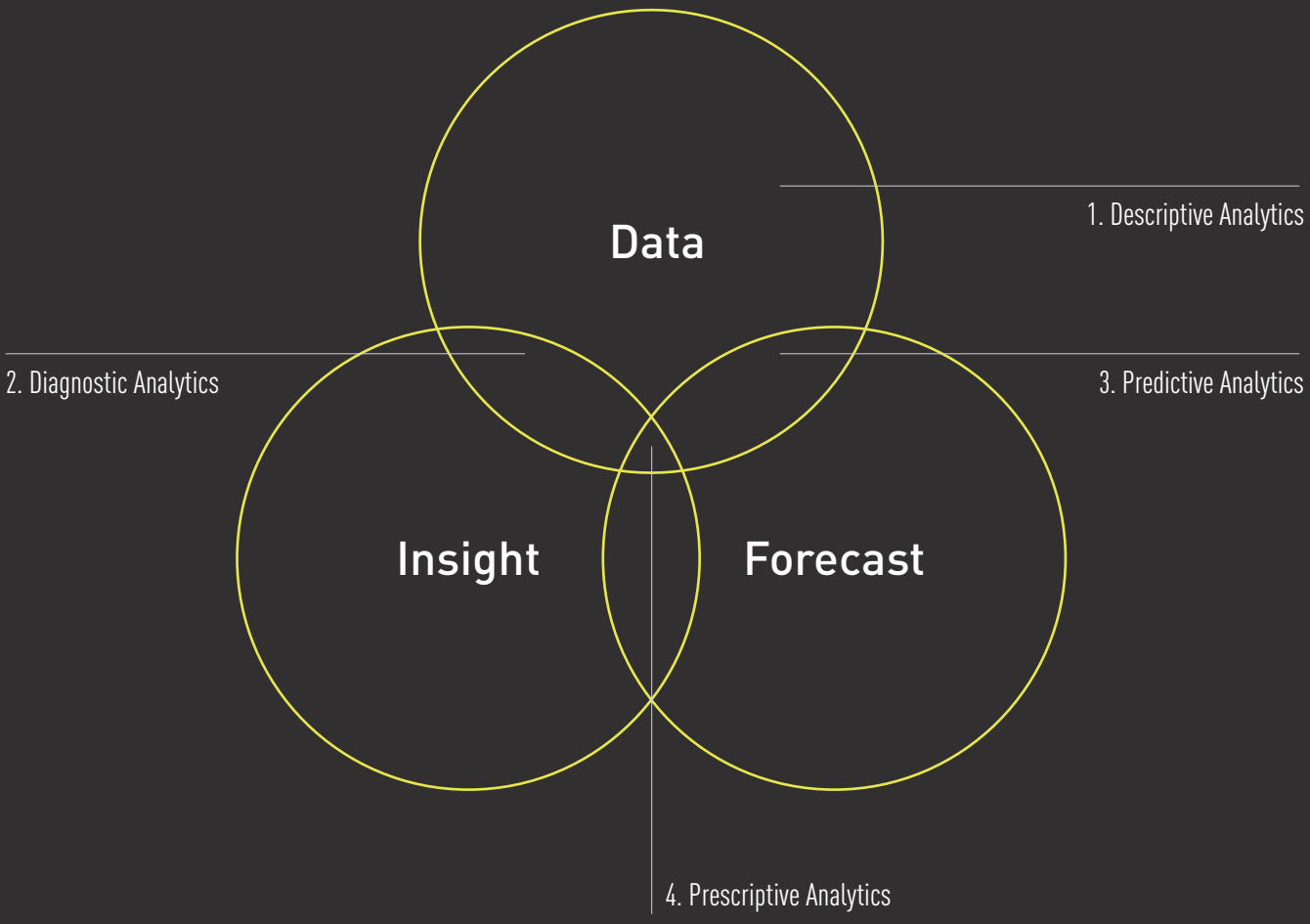
In addition, retailers often face seasonal fluctuation, where multiple marketing activities are held to attract more consumers. These activities require a solid and flexible back-end system to support. The IT system needs to be flexible enough to take into account fluctuations in volume, identify problems and support operations management to ensure a smooth flow during sales peaks.

IT system as the brain of the logistics operation

As operation complexity increases, the warehouse operating system becomes the brain to power daily operation, especially in large-scale logistics facilities. With multiple clients sharing the same hardware and equipment, it is necessary to have a software system that can intelligently manage shared resources. This system can not only optimize overall resources in the operation but also help evaluate and allocate idle ones, helping save business operating costs.

In addition, real-time information transparency and visualization allows all warehouse clients to keep track of daily operations, such as inbound, outbound, transhipment, delivery receipt, and many other statuses of the logistics operation. It also provides clients with detailed sales reports and identifies unsalable SKUs, assisting clients in making strategic business decisions. The real-time information can be leveraged into a dashboard on site or an app to keep warehouse managers and staff up to date with the latest operational progress.

A flexible and agile IT system is also an important foundation for a new business model. Taking the billing management system as an example, it can have a flexible pricing model for pallets, storage shelves, or space leasing. Clients only have to pay for their actual usage so that they can reduce their daily operating expenses. The system can also be designed to digitally switch product ownership, making the goods transfer process between upstream and downstream simpler.



Descriptive Analytics (What happened)	Diagnostic Analytics (Why it happened)	Predictive Analytics (What is likely to happen)	Prescriptive Analytics (What should be done)
Automated Warehouse Planning - Bottle neck analysis - Stress testing	**Automated Warehouse Planning** - Client demand analysis - Scenario testing	**Automated Warehouse Planning** - Predictive maintainance	**Automated Warehouse Planning** - Picking efficiency optimization
Optimization in Operation - Cost analysis - Productivity analysis - Worker performance analysis	**Optimization in Operation** - Replenishment analysis - Supplier ranking and management	**Optimization in Operation** - Peak time demand forecast - Human resources forecast - Inbound/outbound forecast - Cross-warehouse stock forecast	**Optimization in Operation** - Flexible and dynamic pricing model optimization
Transportation Management - Driver performance analysis - Worker experience analysis	**Transportation Management** - Real time traffic prediction - Delivered time prediction - Deliver volume prediction - Loading time analysis	**Transportation Management** - Real time traffic prediction - Delivered time prediction - Deliver volume prediction - Cost and revenue prediction	**Transportation Management** - Truck loading recommendation - Dispatching and routing recommendation - Expansion of delivery capacity recommendation - Best hour for better delivery service

Optimize operation process through data analytics

According to a study by MHI and Deloitte (2021)[8], only 12% of companies apply AI technology in their warehouses in 2020. But it is estimated that by 2026, more than 70% of warehouses on the market will use AI to lower operating cost and optimize their efficiency and quality. Based on our experience and Gartner's analysis, data analytics in the logistics industry can be divided into four stages, from Descriptive Analytics, Diagnostic Analytics, Predictive Analytics to Prescriptive Analytics.

In addition, when implementing automation, data can be collected through every operational procedure, from inbound, volume measurement, putaway, order generating, order issuing, picking, packing, sorting, and finally to shipping. The processing time and various product-related information will be collected and recorded by the system. Through data analysis and algorithms, companies can make strategic decisions in advance, plan ahead for new business models, and be well-prepared for human labor needs in their operations.

3/ The innovation in logistics facility design

In recent years, the logistics warehousing industry has become familiar with the concept and specifications of modern logistics infrastructure, such as steel and reinforced concrete structure, dock space for 40-foot container trucks to maneuver, ceiling height from 9m to 13m, standard industrial floor loading, a fire-safety system in compliance with international and local regulations, etc.

However, as land price and construction cost rise, as well as storage demand of clients increases, single-story or double-story warehouses are becoming multi-storey constructions. The new warehouse type is beginning to incorporate high-density storage and automated systems to maximize land development efficiency. The common specifications of the original modern logistics facilities may be changed due to the consideration of automation equipment and new operating modes. The need for human-machine collaboration also raises the question of workplace safety, adaptability, and sustainability. It is foreseen that the future development of logistics facilities will be toward mass storage volume and multi-functional.

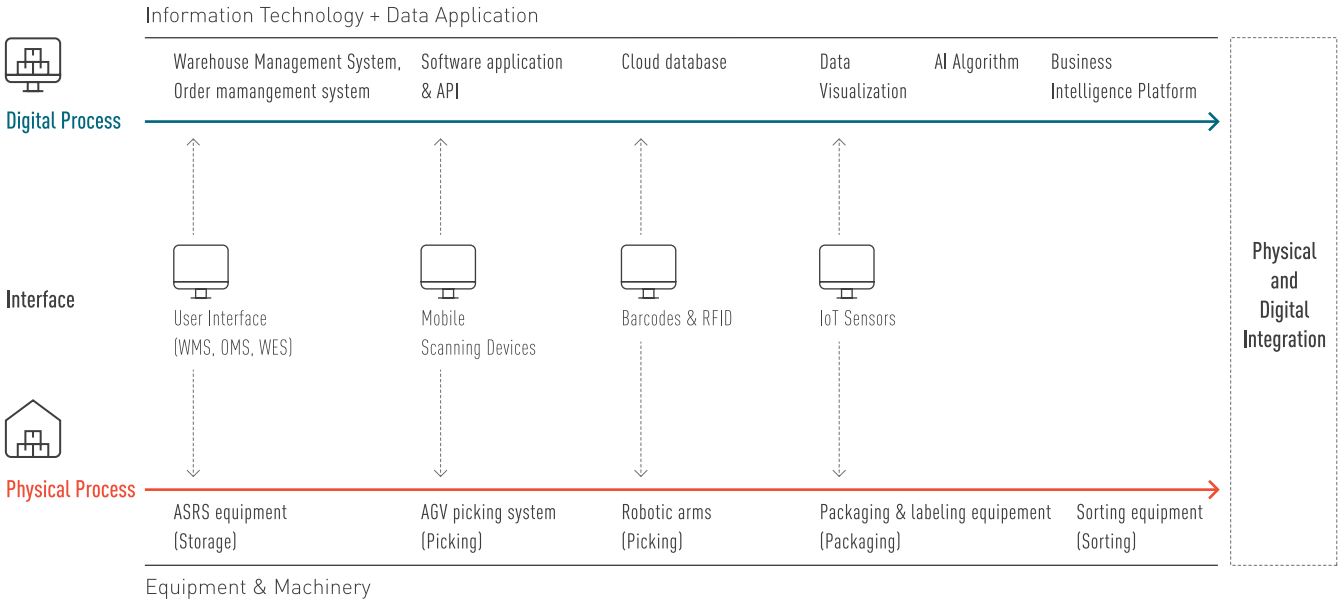
Changes and considerations during construction of a smart logistics facility

In the past, the existing logistics facilities would have to be reconstructed or remodified when automated equipment needed to be installed and implemented. The equipment would not only be limited by the current building specifications, such as floor loading and ceiling height, it also caused waste of space and resources. Take the AGV system as an example, with a 2-meter AGV shelf, the building does not need a 9-meter ceiling height, but requires a great level of floor flatness in order for AGVs to

navigate smoothly. Therefore, on the trend of developing mass storage and multifunctional logistics facilities, it is necessary to consider the effect of building design and plan for future installation of automated systems for a smart logistics facility.

There are various benefits of combining automation planning with construction design. In addition to the more efficient use of space, building design can also be adjusted according to the characteristics of automated equipment to reduce material expense and construction time. For example, the racking of an AS/RS system (Automated Storage and Retrieval System) can be used to support warehouse roof and exterior structure. In this case, the ceiling height would change from 13-meter to 40-meter. Furthermore, to plan ahead for future installment of automated systems, it is necessary to simulate and test various types of fire-safety systems, mechanical and electrical equipment.

Most traditional warehouse operations rely more on chargeable equipment like forklifts. But in automated warehouses, power supply plays a crucial part, where equipment depends on constant electricity supply to operate. Therefore, in smart warehouses, backup generators' capacity also needs to be designed and carefully considered for future use, to guarantee normal operation in case of a power outage. In addition, under the Logistics 4.0 co-sharing model with multiple clients using the same facility, it is fundamental to review fire-safety standard in different countries, including fire protection zones, locations of sprinklers, fire-proof



Source: ALP

wall or automatic rolling shutters, etc., to ensure the warehouse mechanism can quickly and resiliently respond in case of emergency.

Finally, smart warehouses heavily rely on network systems and device-to-device communication, with a higher requirement for network infrastructure. It has even become one of the major considerations for site selection. In the past, it was common to use copper wires, but now the optical fiber network is the new standard. In the future, when more devices and equipment are added or applied, using 5G networks can upgrade the stability to a new level.

Innovation and sustainability of a smart warehouse

In addition to the integration of automation equipment with warehouse construction, we expect that the deployment of park monitoring and management systems will become mainstream, including environmental sensors, hazardous area control, remote equipment control, dock area management, access control, and traffic guidance. These sensor systems will help smart logistics parks integrate physical and virtual information, maintaining facility operational safety and emergency response capability.

In response to sustainable operations, more and more logistics property developers are willing to apply for green building certificates, helping reduce waste and carbon emission during the construction process, using more eco-friendly materials to conserve water and energy resources. Furthermore, it is necessary to consider client demands, maintain facility safety, provide a comfortable and healthy workplace, such as people-oriented traffic flow design instead of just truck-oriented, and air circulation for easier temperature adjustment in warehouses.

[7] Approved Freight. (n.d.). Industry Update: *How Companies Are Using Automation & AI in Supply Chain.* https://www.approvedforwarders.com/how-companies-are-using-automation-ai-in-supply-chain/

[8] MHI & Deloitte. (2021, April). *The 2021 MHI Annual Industry Report – Innovation Driven Resilience.*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04

Smart Logistics Solutions

We continue to conduct experiments and research on three key capabilities on our way to promote industry upgrading, to observe and broaden our views on how the logistics industry will undergo more significant changes. The existing value chain of the logistics industry and its business model have the opportunity to be reorganized to provide more sustainable, flexible, resilient, and smart logistics solutions. These solutions will have more opportunities to grow rapidly, where similar development trajectories can be seen in other industries. Under a highly competitive market, industries and clients need whole new solutions that are different from the past.

1/ The paradigm shift of the industry: from the industrial revolution to AI

	Industrial Revolution	Factory Workflow	Computerization and Automation	AI
Characteristics	Mechanical machine evolution	Scaling up repetitive works and reducing error rates	Using machines to process mass data and reducing labor burden	Using world wide web, algorithm with AI to potentially change the society
Supply Chain & Logistics Operation	Used within small areas; only a few operate through government or military	Global trade became popular; growing number of multinational companies using various types of tools for management and distributions	Global trade became prosperous, growing transactions; computers and the internet being used for commerce	Business models changed; decentralization appeared; super computers and AI start-ups becoming key targets of large investment funds
Workforce Demand & Changes	Labor intensive, limited output	Machines installation and manual work simplification allowing mass production	Through different supporting systems, future workforce will gradually shift to creative roles, or working with a large number of assisting machines.	Through different supporting systems, future workforce will gradually shift to creative roles, or working with a large number of assisting machines.

Source: ALP

So far, in the era of AI, business models have been changing non-stop due to greatly improved network infrastructure and cloud computing capabilities. We have observed that under the current development of AI and big data, from the one-time purchasing model of software of the traditional internet era, many companies' business models have changed to the sharing economy to create a diversified value. For that reason, products have transformed to services; ownership has changed to using rights; clients only need to pay for services on-demand, using user-friendly interfaces to simplify and improve the inefficient user experience in the past.

The application of the sharing economy in various industries, like Uber and Wework, has become very mature. People are gradually getting familiar with it and adopting such on-demand services. But in the logistics industry, space, equipment, and resources are unused and idle during off-seasons. Clients are requiring more flexible logistics solutions to cope with their rapidly changing business model. In addition, we have also seen the benefits of network effects and economies of scale in the aforementioned companies. We believe that the next generation of smart logistics solutions should include breakthroughs in software and hardware, and also needs to leverage new business models to create greater room for market growth.

2/ The development of logistics facilities

Before 2010, Taiwan was at the cross-road between traditional and modern logistics facilities. Nowadays, modern logistics facilities have become a mainstream and basic requirement of multinational clients. From 2014 to 2020, Taiwan has released a total of 700,000 sqm of modern logistics space (self-built factories not included). Based on the current statistics, between 2021 to 2025, there will be at least an additional 1.4 million sqm to be developed in Taiwan. It is obvious that modern logistics facilities have crossed the chasm of the development cycle, growing into the essential need of clients and facing more pressure and challenges of the competitive market nowadays. Therefore, we believe right now is a precious opportunity to develop and redefine the next generation modern logistics facility in response to the ever-changing industry landscape.

According to internal research, compared with Taiwan, Southeast Asian countries have a much lower warehousing space per capita, showing a lot of potential for growth. In addition to the expected growth in the total area of logistics facilities, we also believe that as multinational customers increase their warehousing standards and the growing amount of foreign investment in Southeast Asia, these countries will soon face an industrial development trajectory similar to Taiwan's. These fast-growing markets are also facing the same issues of product positioning and execution plans on how to help brands and distributors move forward with the retail transformation.

The change in warehouse stock in Taiwan (2014 to 2025)

	2014	2025
Warehouse stock (sqm)	40.28 million	42.40 million
Modern warehouse stock (sqm)	12.08 million	14.21 million
Ratio of modern warehouse stock over total	30.0%	33.5%
Avg. warehouse area per capita	1.72	1.80

Source: ALP Research, 2021

Current warehouse space of Taiwan and Southeast Asian countries

	Taiwan (including 2025 pipeline)	Malaysia (2019, Klang Valley only)	Vietnam (2020)	Philippines (2020)	Indonesia (2020)	Thailand (2020)
2020 GDP per capita (constant on 2016)	US$28,330	US$9,900	US$3,145	US$3,059	US$3,581	US$6,965
Population (2020)	23,617,000	32,939,000	97,406,000	108,770,000	270,204,000	69,800,000
Warehouse space (sqm)	40,997,666	4,208,473	3,700,000	1,700,000	7,924,860	5,400,000
Modern warehouse space (sqm)	12,799,653	510,962	733,498	1,105,000	773,460	4,400,000
Share of modern warehouse space (sqm)	31.2%	12.1%	19.8%	65.0%	9.76%	81.5%
Warehouse space per capita (sqm)	1.74	0.13	0.04	0.02	0.03	0.08

Source: 2020 GDP per capita - IMF (2021), Population - IMF (2021), Warehouse space - ALP research (Taiwan), Mapletree Annual Report2019/2020 (Malaysia), Cushman & Wakefield (Vietnam), JLL 2020 (the Philippines), Jefferies Hong Kong Limited (Indonesia), Krungsri 2021 (Thailand)

People are gradually getting familiar with it and adopting such services. But in the logistics industry, space, equipment, and resources are unused and idle during off-seasons. Clients are requiring more flexible logistics solutions to cope with the rapidly changing business model. In addition, we have also seen the benefits of network effects and economies of scale in the aforementioned companies. We believe that **the next generation of smart logistics solutions should include breakthroughs in software and hardware, and also needs to leverage new business models to create greater room for market growth.**

3/ Smart logistics solutions

From mobile phone to smartphone, from modern logistics facilities to smart logistics facilities

In 2007, the first smartphone was launched. At that time, not everyone understood its gravity. Nowadays, we all know how smartphones completely changed the way we interact with phones and how smartphones created a huge ecosystem for countless apps and services to be created based on its infrastructure. With a smartphone on hand, people won't need a map, music player, camera, compasses, or game consoles because it has incorporated all these functions, with even more apps and services available for download.

This makes us wonder, what if a logistics facility, as a link in the logistics industry, can incorporate more functions physically and connect more information virtually besides just providing storage and handling space. We believe that the core of smart logistics facilities is a centralized system that can coordinate between the software and hardware of a logistics facility, just like an operating system of a smartphone. The building also needs a brain to integrate work processes, automated equipment, building management systems, and warehouse management related information. In the past, warehouse managers usually managed and dispatched based on experiences. Now with the assistance of a centralized system in decision making, the warehouse staff will change from doing repetitive and simple tasks into handling abnormal and urgent ones.

In addition, smart logistics facilities that integrate information flow will have the opportunity to apply AI and big data to achieve the following three advantages. The first is to improve on-site warehouse managers and clients' user experience, such as providing them with real-time operational information. The second is to enhance the capabilities of logistics operators, eliminate time-consuming processes, use algorithms for decision making and shorten the operation time. The complicated workflow can be simplified and guided through the system interface, making it easier to master. Finally, using data to replace materials. After implementing automation, collecting data from every operational procedure becomes more feasible. Collected data can also be analyzed and for subsequent planning and maintenance, such as using an algorithm for choosing the most suitable packaging to reduce unnecessary waste.

Smartphone

Advanced applications of the sharing economy

Logistics has a large gap between peak and off-seasons, so traditionally, the owner will rent space to store 120% of their normal inventory to fully meet demand. However, through the use of a co-sharing model, clients can share the same mass-storage facility. Clients only have to pay for what they use, without their own heavy capital investment into automated equipment; therefore, from clients' perspective, the co-sharing model will transform Logistics 4.0 technology and IT system ownership into the right of use. Brands and distributors with rapid growth needs can be fulfilled with more flexible support. They no longer need to bear the additional cost of seasonal change or development demand for the future.

However, designing a co-sharing model for the logistics industry requires a deep understanding of individual industries to find the common ground and solution among them. At the same time, such model should be built and implemented upon the foundation of a smart logistics facility, while having full control over information flow, integrating the facility with automation systems, establishing a flexible pricing model, and creating a user-friendly and maintaining data security for individual clients.

We believe that a smart logistics facility must have the following characteristics:

1/ Sharing a mass storage space to meet peak and off-season demand

2/ Efficient inbound-outbound equipment to offer various and flexible options to multiple users

3/ Product owners can confirm inventory status anywhere, anytime through a well-designed interface

4/ A core system for software and hardware management

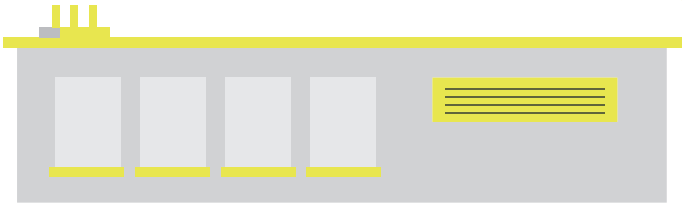
5/ Integration of warehouse management and delivery schedule to improve delivery and dispatching efficiency

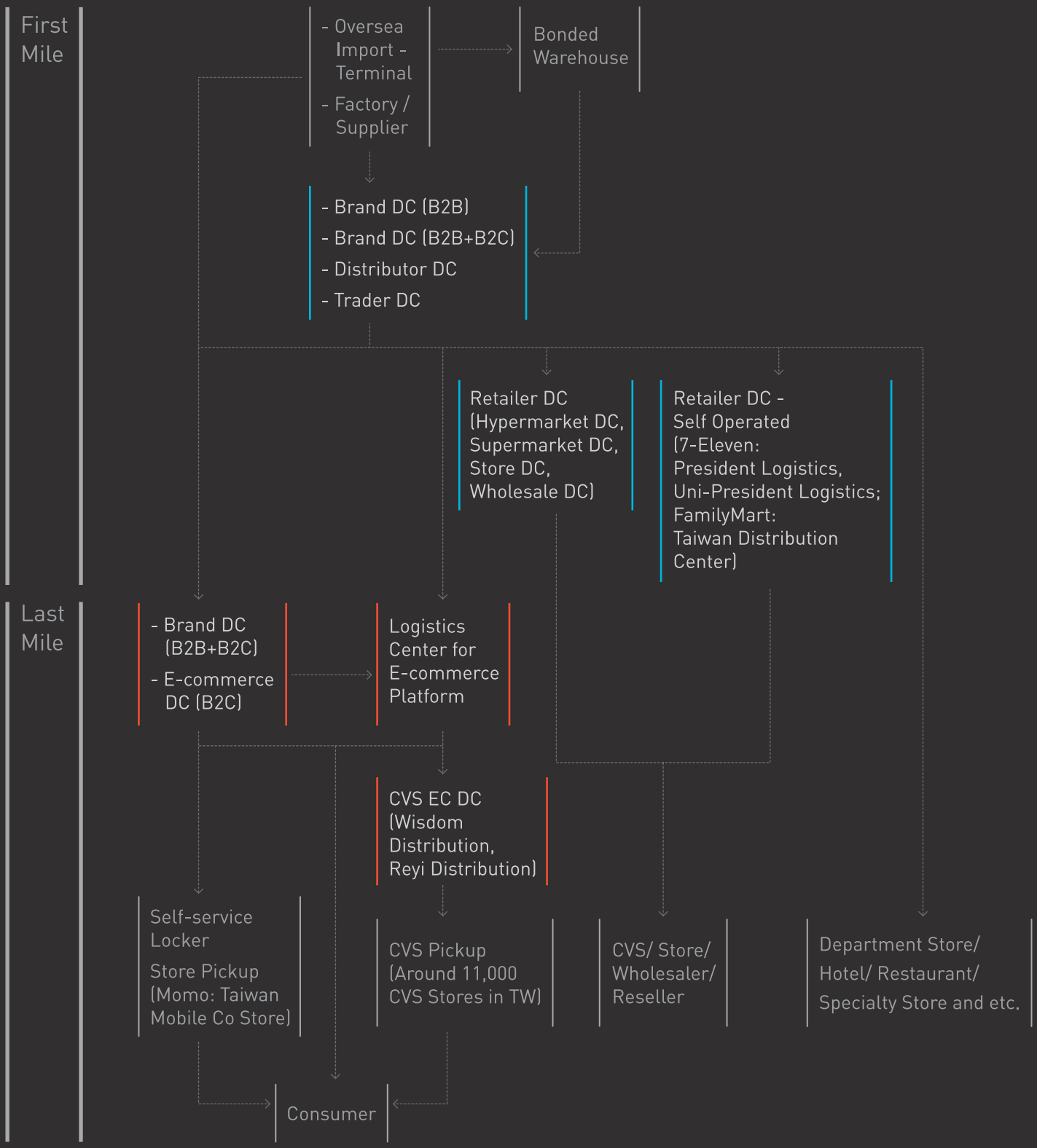
4/ Ways to shorten the supply chain

The rapid growth of e-commerce has put tremendous pressure on last-mile delivery. According to our observation and Capgemini's (2019)[9] research, warehouse operation can apply advanced automation and systematic operation to greatly reduce outbound time. But under a surge in the number of orders, limited delivery time to multiple points, last-mile delivery expense still takes up 41% to 56% of total e-commerce logistics cost.

In the past, B2B shipping was only in bulk and delivered to fewer locations. After being picked and packed in the logistics center, the cargo is delivered to the physical store in full boxes or in pallets. While B2C shipping is just the opposite. After the goods leave the merchant's warehouse, it has to be shipped to e-commerce platforms' warehouses or convenience store distribution centers and then shipped to consumers or designated convenience stores for pick-up. Whether it is B2B or B2C shipping, due to lack of supply chain integration, additional resource waste or environmental pollution may occur in the process.

What are the advantages that the co-sharing model can bring to the logistics industry?





*DC: Distribution Center
EC: E-commerce
Momo: Momo.com Ltd

*President Logistics, Uni-President Logistics, Wisdom Distribution are subsidiary companies of 7-Eleven.

*Taiwan Distribution Center and Reyi Distribution are subsidiary companies of FamilyMart.

*Momo.com Ltd is Taiwan Mobile Co's e-commerce subsidiary.

Source: ALP

Integration of first-mile and last-mile

Traditionally, before consumers get their products, the supply chain is divided into different nodes and each node corresponds to different types of operations. From the first to the last mile, the redundant transfers between each node will cause additional resource waste.

However, according to our experience, the easiest and most viable option is to integrate brands and distributors in the same large-scale logistics facility to reduce the transfers and shorten the supply chain. For example, after receiving shipments at the logistics center, brand owners can put the product away into the large co-sharing storage area. When the distributor orders the product from the brand owner the automated forklift in the co-sharing storage area can move the pallets to a new storage location without leaving the warehouse, and ownership of the product can be updated in the various systems.

Warehouse and delivery integration

Effective collaboration between logistics operation and transportation is one of the most important ways to shorten the supply chain. The transportation smoothness and inbound/outbound effectiveness is a key among that collaboration. In order to reflect the maximum value of warehouse and delivery integration in the smart logistics center, we believe that the following two important management systems platform must be established:

I. Park access control and dock management system

Smart logistics park connects and integrates first-mile and last-mile delivery. It is necessary to be able to manage a large amount of traffic and use smart transportation technology to monitor the vehicle at the same time to ensure the logistics park's safety. An IT system is required to control and block non-related vehicles entering the park, monitor dispatched vehicles entering and exiting the park, make appointments for sharing loading docks, control vehicle flow and routing to speed up the unloading and shipping process, and avoid unnecessary shipping delay from temporary stops, jammings or even accidents. The most important benefit of the IT system is to help guarantee worker and traffic safety inside the park. The following is a description of specific system scenarios:

1/ The park smart security system can deny access to non personnel and vehicles. At the same time, it can pre-arrange guiding instruction, reduce parking and waiting time.

2/ Combining warehouse internal information with outbound operation, preparing scheduling guidelines in advance, and notifying incoming drivers of the location of loading docks at the park entrance to improve dock efficiency and turnover.

3/ In addition, with the construction and architecture plan of the park, establish a truck waiting area, and incorporate with the internal system of the park to ease waiting time and avoid waiting lines.

II. Transportation platform and management system

In Taiwan, small and medium freight companies are the majority. If there is a transportation integration platform which can integrate the transportation capacity of small and medium-sized freight companies to meet the needs of shippers such as brands and retailers, as well as help cargo owners take risks and establish an operational standard, there is an opportunity to create a more complete supply and demand mechanism to meet new demands and challenges. In addition, in order to be able to handle peak shipments or eliminate shipping issues caused by a large number of urgent orders, apart from relying on the experience and judgements of warehouse managers, it is important to have a data-driven process to forecast demand, dispatch planning, route optimization, and eventually fulfill inbound and outbound needs of a highly-efficient warehouse. For this transportation integration platform to be successfully market-oriented, it must reflect the following four characteristics:

1/ Establishing a trustworthy relationship with small and medium shipping companies, to improve delivery efficiency and shipping experience through user-friendly interface.

2/ Using technology to reduce drivers' burden and make working hours more transparent, to change the social stereotype of the industry and improve labor shortage.

3/ Applying historical data and real-time information to predict traffic situations, delivery time forecasts, and delivery volume, help carriers control cost-benefit and improve service quality.

4/ Based on data analysis and algorithms, pre-planning transportation routes can be generated according to consignment's demand and road condition, and receiving stores and consignees can be notified in advance.

[9] Capgemini. (2019, January). *The last-mile delivery challenge.*

05

Sustainable Development and Corporate Responsibility

1/ What is sustainable development?

Sustainable Development refers to the pursuit of present needs without compromising the economical or environmental potentiality for future generations. As the world emphasizes more and more on environmental conservation and social issues, many corporations adopted the concept of "Sustainable Development" into their business strategies when pursuing growth. While committing to social corporate responsibility and environmental sustainability, many companies refer to the United Nations' Sustainable Development Goals to formulate their corporate development strategies.

2/ Why does the logistics industry need sustainable development?

The linear economy business model of the traditional logistics industry is in shortage of long-term and sustainable solutions. Lacking integrated plans for logistics space and land resources will lengthen transportation route, time, labor cost, and greenhouse gas emissions. The poor working environment and labor issues of the logistics industry have attracted social attention in recent years. The US's Amazon as an example has accumulated several controversies due to labor issues.

Therefore, it is very important to consider the sustainability of logistics facilities. In addition to obtaining green building certificates such as LEED, BREEAM, there are also investor-driven organizations such as GRESB, where real estate developers can adhere to their sustainability development standards, providing investors with the corporation's sustainable management priority ranking (including environmental, social, and corporate governance). It is undeniable that sustainable development is a crucial element that logistics real estate developers can't overlook. According to our observation, there are five important sustainable development goals that the logistics industry can implement.

3/ 5 important sustainable development goals to implement

Effective use of resources and improve logistics operational efficiency

At the moment, there are already logistics real estate developers establishing logistics parks and warehouse networks for long-term operation, with improved efficiency, cutback waste of space and land resources. By assisting clients to invest in automated equipment and warehouse management software, they can help increase operational performance and reduce the cost of unattended errors. In addition, the implementation of automated equipment can also reduce the physical and psychological hazards of high-intensity labor, and also reduce the frequency of direct product contact with workers to ensure that the entire logistics operation process meets the highest safety standards.

Abandon traditional linear economy of thinking

Circular Economy is in the process of being incorporated into logistics development and operation. Unlike the traditional Linear Economy, where raw materials are used to make products, and discarded immediately after use. Sustainable development and operation for the logistics industry means reducing material waste, scrab, and old equipment discarded after the departure of a client. The business strategy should be oriented towards maintaining a sustainable relationship with clients, assisting their long-term use of space, or specializing in servicing group clients of a specific industry.

Reduce energy and resources wastes

This includes the consumption of energy and water resources, as well as garbage and greenhouse gas emissions. Under a large-scale and well-rounded logistics network, it is easier to help clients reduce unnecessary waste or pollution during operation by combining the resources and integrating multiple clients together. For example, by clustering companies in the same supply chain together, it is possible to shorten or simplify transportation routes, thereby reducing carbon emissions.

Capabilities to invest in clean energies

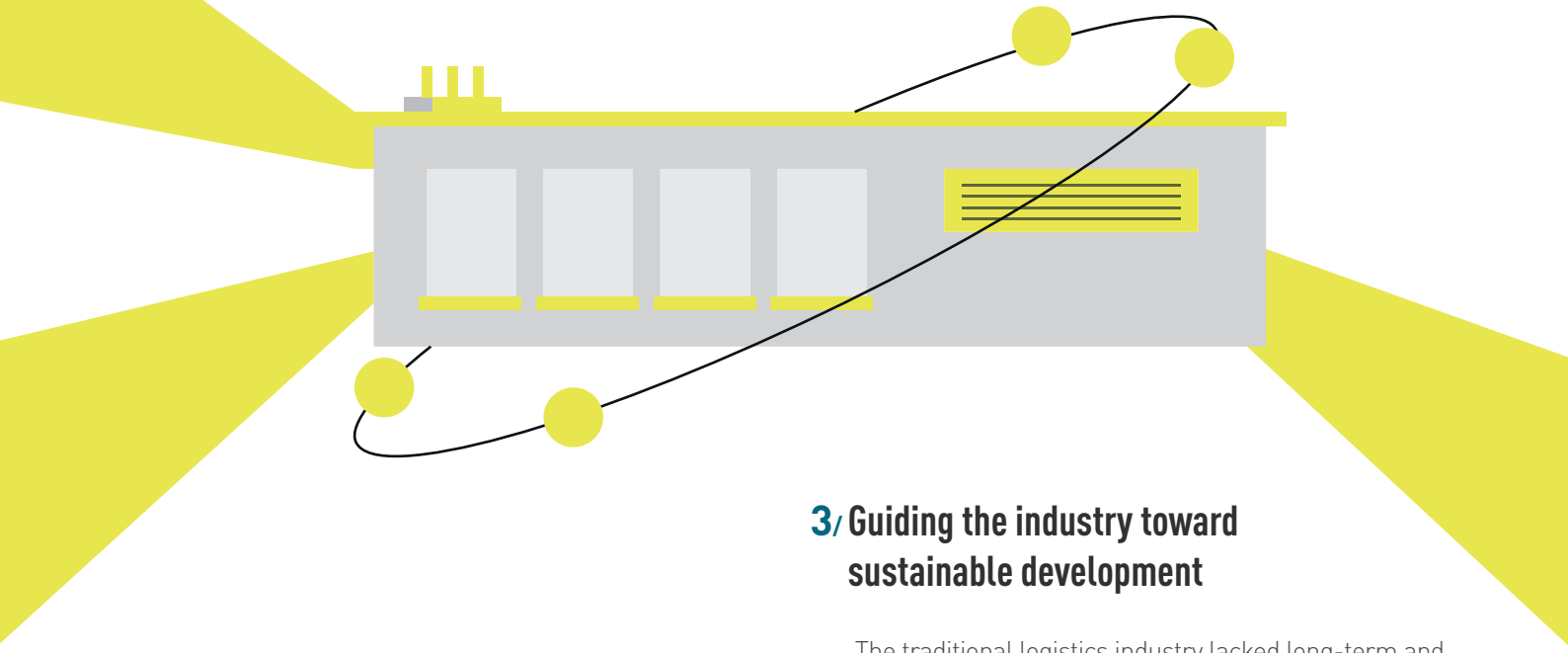
Many major logistics real estate corporations have installed solar panels atop their warehouses. The self-generated energy can be used to directly power their own facility, or sell to electricity companies. By utilizing self-built solar panels, these corporations can provide clients with new power solutions from renewable energy.

Value the harmony with the environment

When it comes to operational strategy, various multinational brands and distributors are paying more attention to human rights and environmental conservation issues. For example, logistics real estate developers can help clients improve the sustainability level of the warehouse, which is not only a place for storage, but also a place where warehouse staff work every day; therefore, when planning internal design, the "human-friendly" factor should be taken into consideration to improve the working environment of the logistics industry workers.

06

The Future Prospects of the Logistics Industry



1/ Corporations want more flexible and agile logistics resources to support transformation

Whether corporations have an internal logistics department or outsource their logistics, it is evident that they are focusing more on flexibility, accuracy, and agility of the logistics operation. We expect corporations will need larger logistics facilities with dense storage to integrate B2B, B2C, and multiple retail channels operational demand, taking advantage of automated equipment and systems to reduce reliance on manpower, improving resilience when facing emergency situations, and providing a better service level to the end consumers.

2/ Smart logistics solutions need to integrate construction, Logistics 4.0, IT and data analytics

Smart logistics solutions require a core system hub to connect related software and hardware. Based on the needs of different industries, we need to carefully consider from architecture design, automation planning, implementation, IT system integration, to data analytics in actual operations, as well as communicate with various industry professionals to provide clients a flexible, well-rounded service that can quickly respond to their business demands while being cost-effective and practical.

3/ Guiding the industry toward sustainable development

The traditional logistics industry lacked long-term and complete solutions resulting in unnecessary waste in the supply chain process. Nowadays, the industry is going to invest more resources in creating efficient business models, sustainable energy use, and creating harmony between nature and humanity. At the same time, large multinational clients also require supply chain operations to meet their internal standards, which are also qualifications for the logistics service providers' tendering process. Therefore, any logistics companies that want to interact with large clients must actively respond to these topics.

4/ Development and trends of Southeast Asian countries

Based on Taiwan's development experiences, the logistics market of Southeast Asia will soon face labor shortage, and it is inevitable that land and construction costs will drastically rise. We also see that the Southeast Asian market is more curiosity-driven and willing to adopt new technologies. Therefore, we can expect that the rapid growth of Southeast Asian economies will be followed by a thriving retail industry. The demand for smart logistics facilities will continue to rise after the local infrastructure becomes more mature. However, Smart logistics solutions need to be planned ahead for the development needs of the next one to two decades before integration and incorporation of building design, automated equipment, and IT systems. Therefore, smart logistics solutions implementation is essential and imperative.

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