

04 chapter

Shipping Transformation and Digital Development

4.1 Cargo Shipping Safety Improvement

4.1.1 Freight Safety

On the premise of safe transportation, Yang Ming adheres to the international conventions, including SOLAS, MARPOL, CSC and IMDG CODE, abides by the restrictions on cargos and dangerous goods of ports, and complies with laws and regulations, to arrange its cargos for safe delivery worldwide. In addition to compliance with conventions, laws and regulations, to achieve the target of no container overboard, the Company introduced the professional weathering routing information system and certified stowage software. To strengthen the safety in container shipping, employees that conduct relevant business have been educated and trained, equipped with comprehensive knowledge and operational capacity regarding professional shipping safety system and software. With multiple checks in place, the Company practices well-rounded safety monitoring in order to reduce incidents of dangerous cargo for a safe shipment of freights trusted by customers.

After the review, there was no severely or abnormally dangerous cargo incident, nor service-related violation against the health or safety regulations in 2021. There was no cases were reported to the CINS (The Cargo Incident Notification System) as well.

■ The safe shipping management and stowage processes at Yang Ming

Education and Trainings

All stowage planners are required to receive sufficient trainings before taking on relevant missions.



Pre-trip Safety Checks

Cargo Safety:

Onshore/Offshore personnel use Class-certified stowage software and check software with features of “Apply specific route & short voyage” and “Lashing Force” to check various loading safety data and check for “Lashing force” and “Max. stack weight.”

Sailing Safety:

The weather routing service is employed. Together with safe routes recommended by professional institutions, it reduces concerns with the sailing safety of a vessel due to climate factors.

Review & Correction

In the event of any safety concern in voyage after port departure, voyage concern(s) are address through three approaches:

- Resolution by means of shifting of cargo in the next port of arrival.
- Return to the original port.
- Searching for the nearest port to address safety concern(s).

Sailing Safety Monitoring

Pre-trip checks and verification:

1. Upon receiving the stowage plan, the stowage planner will check the plan by the items of Pre-Plan Checking list(PPC) to verify the compliance for all safety items one by one.
2. Upon a plan of violation is detected, the port terminal is to revise the plan and send the revised plan to both the onboard/offshore personnel for verification of all safety data.
3. Only when the onboard seafarers verify that there is no safety concern can the loading process begin.
4. When any discrepancy between the actual cargo loaded and the plan that results in safety concern(s) detected in cargo loading, it is required to take corrective actions immediately.

In-trip:

1. The seafarers checks for the lashing security of all containers on deck as needed and make adjustment immediately as appropriate.
2. The Master keeps watch the weather forecast provided by the company of professional weather routing service to adjust routing plan or sailing speed to ensure sailing safety.

Post-trip:

1. Organize the seminar of stowage plan on a monthly basis to share stowage experience.
2. Participate in the discussions related to shipping safety issues organized by WSC Safety and Security Council.

4.1.2 Dangerous Goods Shipping

Yang Ming attaches importance to dangerous goods management, having a dedicated team for Dangerous Goods Management to enhance the safe and secure transport of dangerous goods. To ensure compliance with the relevant international conventions of dangerous goods transport and operation restrictions of port states, all dangerous cargos are subject to loading scrutiny and approval procedures before loaded on to the ships.

The “Dangerous Goods Policy” has been stipulated at the Company, centering around regulations of concerns as follows:

1. IMDG CODE prohibited or restricted cargos.
2. High-risk cargos.
3. Cargos with frequent anomalies during transportation and prohibited by most of carriers.

Aside from above three concerns, Yang Ming also refer to the professional knowledge and advice of CINS(Cargo Incident Notification System) to update the YM dangerous goods policy in time if it’s necessary.

The related documents of all dangerous containers shall be submitted to the Operations Department before loading to the ships. The applications are required to be in line with the IMDG CODE and the dangerous goods policy to be approved for loading. In addition, the dangerous goods from the carriers of joint service are also required to obtain approval through the same review procedure before arranging to load onto the vessels of Yang Ming.

Education and Trainings

The container shipping business is booming recently. The issues with vessel stowage planning and stowage safety are focuses of various parties. Also, maritime institutions and states around the globe rigorously demand container shipping companies to treat such as important shipping and safe operation items.

Yang Ming provides online dangerous goods training to fulfill the requirement of IMDG CODE in terms of the general awareness training course for relevant personnel in order to enhance the management of cargo safety.

To improve the professional knowledge of seafarers on the routine container shipping operation, The President of YANGMING (JAPAN) CO., LTD. conducted courses of “Introduction to Sea Transportation” and “Introduction to Stowage Operation” for the employees at the Tokyo Office and the Osaka office. Through the professional training on container shipping, while improving the core competences of employees, the course sought to advance the departments’ knowledge on relevant businesses and realize a full communication and exchange.



Trainings at YANGMING (JAPAN) CO., LTD.

Regulations Governing Loading and Shipping of Dangerous Goods

There was no violation against the IMDG CODE (International Maritime Dangerous Goods Code) or the operational restrictions on dangerous goods of port states by Yang Ming in 2021. To effectively maintain safe shipping operations, Yang Ming adheres to the four loading regulations for dangerous goods as follows:

■ Keys to the Dangerous Cargo Stuffing/Loading Management

1. Assurance of compliance with transport regulations:

All operations are in line with the International Maritime Dangerous Goods Code (IMDG Code).

2. Approval for loading:

The information of dangerous goods are required to be registered in the dangerous goods management system upon approval for loading onto the ship.

3. Dangerous Goods Declaration Form:

When receiving dangerous goods, a container yard is to check for the dangerous goods declaration, the placards of dangerous goods and the exterior of containers without leakage and damage and process the storage in line with the regulations pertaining to dangerous goods operations of respective container yard.

4. Regulations of Stowage:

Stowage is conducted in line with the regulations of certificates for vessels carrying dangerous goods and IMDG CODE.

■ Keys to the Dangerous Goods Loading Management

1. Loading/Stowage of Dangerous Goods Containers:

The personnel of Yang Ming conduct the loading/stowage of dangerous goods containers in compliance with the regulations of joint service contract and the YM DG policy for dangerous goods loading.

2. Implementation of Assessment of Dangerous Goods Containers Handling of Shipping Agency:

Delivery of documents of dangerous goods to vessels and transshipment ports is listed as one of the items of the shipping agency assessment.

3. Knowledge of Shipping Safety:

Participate in the shipowners' organizations like the World Shipping Council (WSC), Cargo Incident Notification System (CINS) and International Vessel Operators Dangerous Goods Association (IVODGA) to gain the first-hand knowledge of shipping safety information and have discussions related to shipping safety issues.

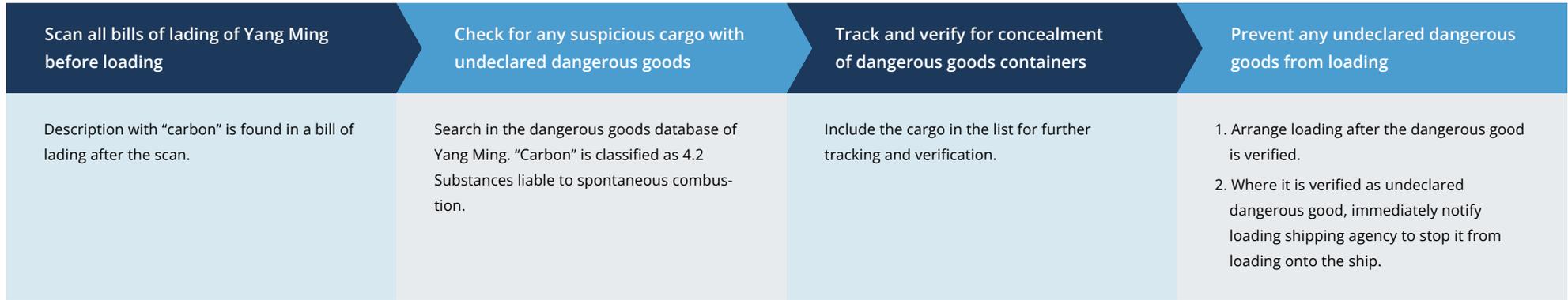
4. Risk Control and Management:

Promptly publicize & notify YM shipping agencies once receiving any incident notification from CINS, and ask shipping agencies to check if they have received the cargo same as incident case.

In addition, the Company demands shippers to present the container loading inspection report in random to verify that the declared information is in line with the contents in the container loading report. Yang Ming maintained the performance of no violation in this regard in 2021.

Either the general goods or dangerous goods, all shipments are through the dangerous goods keyword database and machine learning for daily scanning to further prevent mis-declared dangerous goods on board in order to secure the safety of cargo transportation.

■ Cargo detection and defence system flow and example:

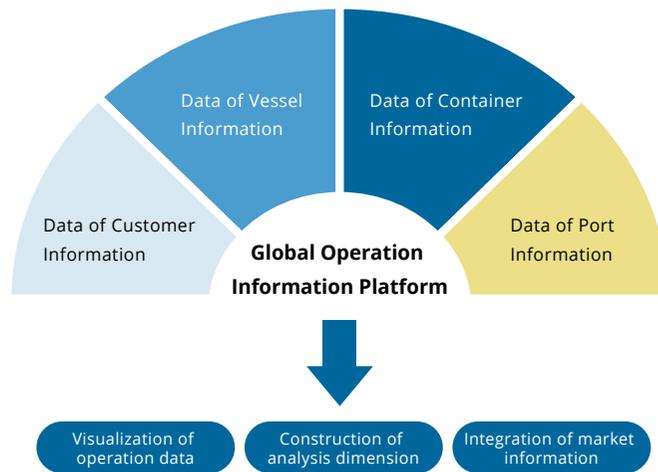


Looking forward in 2022, Yang Ming aims for digital transformation, actively developing dangerous goods management system to elevate the transmission quality and safety of dangerous goods information and boost the efficiency of dangerous goods management.

Topic	Goals in 2021	Execution Results in 2021	Goals in 2022	Mid-/Long-term Goals
Shipping safety – dangerous goods management	Strengthen the safety of vessels in operation and ensure the safety of individuals and cargos.	<ul style="list-style-type: none"> • There were no failure found in the dangerous goods audit in 2021. • 4 items in bill of lading were found to be cargos of mis-declared dangerous goods. 	<ul style="list-style-type: none"> • Continue to check for cargos of dangerous goods through the dangerous goods management system. • Continue to enhance the education and trainings of sales staff and boost the professional ability for the business of dangerous goods. 	Improve the information transmission speed and management efficiency for dangerous goods through integration of the data output system for cargos of dangerous goods and accelerate the provision of relevant documents of complete loading information of dangerous goods to ports and partner carriers to reduce the overall shipping risks.

4.2 Digital Transformation for the E-Generation of Shipping

Upholding the philosophy of convenience, diversity, timely and accuracy, Yang Ming effectively supports other businesses via digital transformation and offers services of better quality. As such, the Company launched the global operation information platform covering information of various aspects, including customers, vessels, containers and ports. The massive operational data is presented via visualization, so that employees can all be accustomed to the digital spreadsheet tools fast, conducting relevant business analysis with a digital thinking. Meanwhile, through various dimensions of analysis, it boosts the speed for the decision makers of departments in gaining knowledge of market context, elevating their efficiency and quality in decision-making.



In response to the ever-changing market and ever-rising customer needs in the future, the Company launched its digital transformation project for an effective promotion of data management. Also, through encouragement from the management and the organization of Power BI contest, the digital competence of its personnel and their capacity for digital tools are cultivated. As a result, the employees are able to familiarize themselves with the operation of the global operation information platform, increase the efficiency of routine operations and foster a long-term competitive advantage.

Power BI Contest at Yang Ming

Microsoft Power BI has been introduced in the Company. After training, personnel of various departments can brainstorm from the perspectives of their routine businesses and produce spreadsheets necessary for decision making and management.

To speed up employees' familiarity with the tool and solicit innovative ideas, the Company organized Power BI Contest. The works were evaluated with criteria like whether they were forward-looking, aligned with market needs, rationality of the data analysis and smoothness of their layout design. Through the contest, it inspired

ideas from the employees and facilitated practices, effectively improving the data management competence of the employees as a whole.

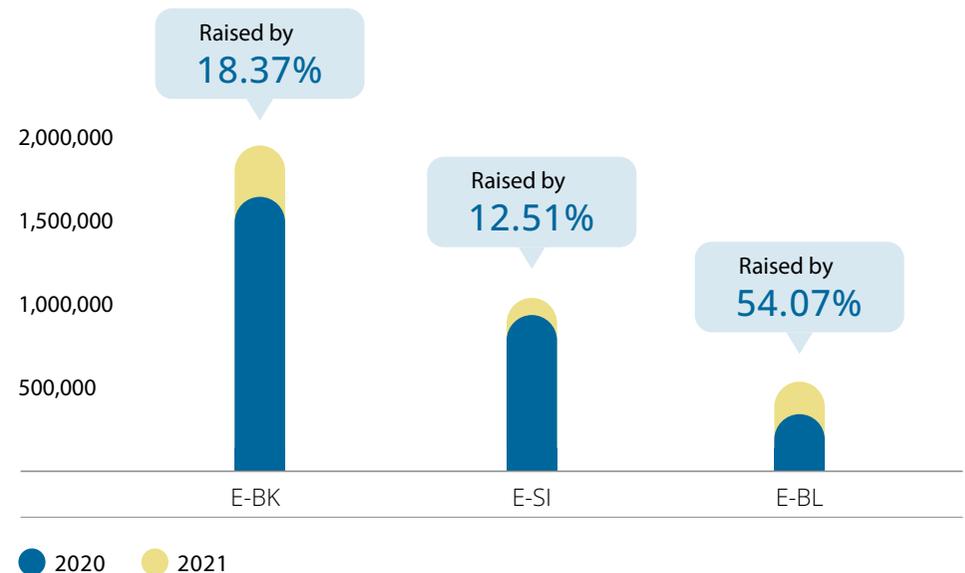
E-Systems of Yang Ming

Yang Ming cares for customer needs. Offering service experience of better convenience has always been the long-term goal the Company pursues. In recent years, new digital services have been constantly launched. As of this year, there were services launched in succession, including LINE Chatbot, intelligent documentation system, and e-D/O (electronic delivery order service) and e-Counter, as well as the online request for quotation and RFQ status query platform for customers to be launched in 2022. Through innovative digital services, the Company creates better added values for its customers.

The integration of all the digitalized systems at the Company was the first instance that verified the blockchain concept applied to the international trade domestically. Through the blockchain technology, it successfully accelerated the financing processes of maritime transport and trade. In addition, through the digitalization of delivery order, it enabled customers of WFH or Staggered Shifts to handle import/export businesses remotely, saving the costs in the printing and circulation of paperwork.

The digitalization timetable and result of the Company is as follows:

Use of e-Service at Yang Ming



<p>LINE Chatbot Container Yard Chatbot</p>	<ul style="list-style-type: none"> Improved from the conventional inquiry via phone in the past, the instant messaging inquiry service allows customer to check the latest vessel and container movement information via LINE Chatbot on the phone. 		<ul style="list-style-type: none"> Instant tracking of vessel movement Improved cargo check efficiency for customers Instant information sharing 	<p>2017</p>
<p>e-D/O Service</p>	<ul style="list-style-type: none"> The Delivery order (i.e. D/O) is stored in the cloud for import customers to download, streamlining the complicated import D/O exchange process. 	<ul style="list-style-type: none"> Usage of 35% in 2021 Usage raised to 50% in 2022 through promotion planned 	<p>2019</p>	
<p>e-Voucher</p>	<ul style="list-style-type: none"> For the need of travel due to difference between D/O and pick-up site, the e-Voucher service of Yang Ming enables customers to speed up and simplify the transmission of e-D/O through cellphone authentication, effectively improving the speed and timeliness of import process for customers. 	<ul style="list-style-type: none"> Usage of 35% in 2021 Usage raised to 50% in 2022 through promotion planned 	<p>2020</p>	
<p>e-Counter</p>	<ul style="list-style-type: none"> Due to the limits of communication from the epidemic, we further cooperated with the banks, launching the “e-Counter” service of Yang Ming for the digital transformation of the traditional import/export processes. 	<ul style="list-style-type: none"> Approx. 85% or more using online reservation services in 2021 	<p>2021</p>	
<p>Digitalized Telex Release</p>	<ul style="list-style-type: none"> Digitalized Telex Release saves nearly 67% of costs in paper and toner from export bills of lading for the Taiwanese enterprises, allowing customers to speed up the process without works over the counter. 	<ul style="list-style-type: none"> Up to 81% of export bills of lading digitalized overall in 2021 	<p>2021</p>	
<p>Intelligent Document System</p>	<ul style="list-style-type: none"> In line with the digitalization strategy of Yang Ming, the Robotic Process Automation (RPA) introduced benefits to the general affairs like bill import process that was highly repetitive. With the Optical Character Recognition (OCR) technology and RPA combined, the manual reading and import process can be replaced, significantly raising the efficiency and accuracy of document preparation. 	<ul style="list-style-type: none"> Result: three vendor invoice recognition and verification introduced in 2021 with a minimum recognition rate of 98%, and the acceptance meeting of which to be called in March 2022 	<p>2021</p>	
<p>Online Inquiry and Quotation</p>	<ul style="list-style-type: none"> The online inquiry and quotation platform for customers is scheduled to be launched in Q2 2022. The online inquiry feature breaks free from the traditional shipping operation model, allowing customers to directly submit price inquiries online 24/7, free from the limit of regular work hours. The manual processes are reduced and streamlined by creating digital spreadsheets. 		<p>2022</p>	

e-Services Available to Customers of Import/Export Business Respectively

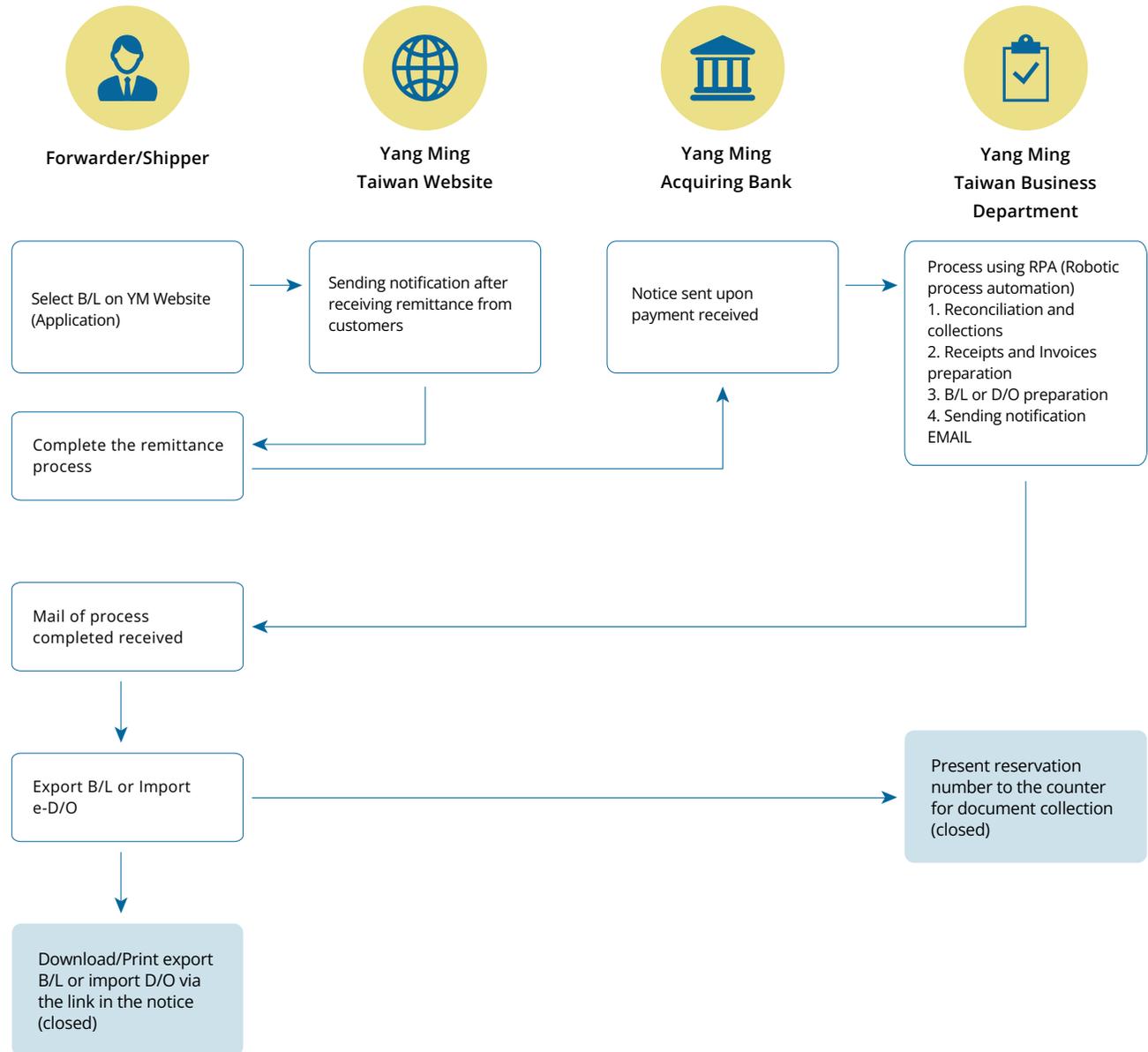
Import Customers

- Register and activate e-D/O services.
- Proceed with “Imported Online Application Service” platform and make a payment with remittance.
- Receive B/L and e-Voucher.

Export Customers

- Proceed with “Exported Online Application Service” platform and make a payment with remittance.
- Attach B/L link on replying and notifying emails for Sea Waybill.
- Download or print for reference deemed necessary, along with e-invoice attached

Flow of e-Service



■ Execution Results and Future Goals of Digitalization at the Company

Topic	Goals in 2021	Execution Results in 2021	Goals in 2022	Mid-/Long-term Goals
Operation improvement via digital management	<ul style="list-style-type: none"> Use data analytics and introduce system application to achieve optimal operational performance in vessel utilization, container flow balance, cost control and cargo value contribution. 	<ul style="list-style-type: none"> “Global Operation Information Platform” was promoted as a digital spreadsheet tool that is easy to adopt for personnel to obtain various analytic data on the unified platform, elevating the efficiency and quality of decision making via digital thinking. With the Agency KPI/All Service Route Analysis PBI modules, the operational efficiency optimization was achieved via data analysis. Incorporating and uploading information such as BSA/BWA in the uniform format of Excel file was formulated for the shipping agencies worldwide. 	<ul style="list-style-type: none"> Implement “Digital Transformation Project” with the aim to improve the competence of employees for digital technology and their capacity for relevant tools. Analysis of all routes and BSA/BWA data. 	Ensure steady profitability.
Digitalization of customer services	<ul style="list-style-type: none"> Offer online request for quotation feature. Whole new version for the app. Expect more banks to join the information sharing platform. 	<ul style="list-style-type: none"> After the testing phase, it is expected to come online by 2022. 	<ul style="list-style-type: none"> Launch “My Ocean Freight” function by 2022 Q3 for online customer rate inquiry and negotiation for shipping agencies worldwide replying the quotation as well as introducing quotation into the freight report system (FRT) for the pricing team’s approval. Launch the updated e-Service app by 2022 Q2 with the booking feature added for the mobile app, so that customers can handle booking business anytime anywhere. Improve the new app features and introduce AI (share tracking, voice assistant, Apple Watch, etc.) 	Creates better added values for customers via innovative digital services.
Improve on information technology – involved in the industrial standard projects	<ul style="list-style-type: none"> Create the API for DCSA Trace ver. 2.0. Create the API for DCSA Operational Vessel Schedule ver. 1.0. Engage in the creation of IoT Container. 	<ul style="list-style-type: none"> Participated in meetings of DCSA and completed the publishing of TNT/OVS/ e-BL/ JIT and API development. Conducted discussions in collaboration with DCSA, including discussions for Booking Process, Arrival Notice and Shipment Release Process, Standard BL Form, Digital Address, Digital Identity, Cross Platform Titleholder Verification, Standardization of Bylaws and Clauses (on BL form). 	<ul style="list-style-type: none"> In line with the overall planning by DCSA, the following operations shall begin with relevant standards stipulated: <ol style="list-style-type: none"> TnT / OVS API version update; API creation and improvement JIT API standard; API creation Platform establishment for DCSA Partners and customer subscription – subscription inquiry / announcement subscription inquiry e-B/L / e-BK API standards; API creation Stick to the progress of DCSA e-Documentation project. 	Continue to promote digital services for the industry, stipulate the standardized operating procedures for the industry, and elevate the performance and efficiency of the global supply chains together with container shipping carriers internationally.

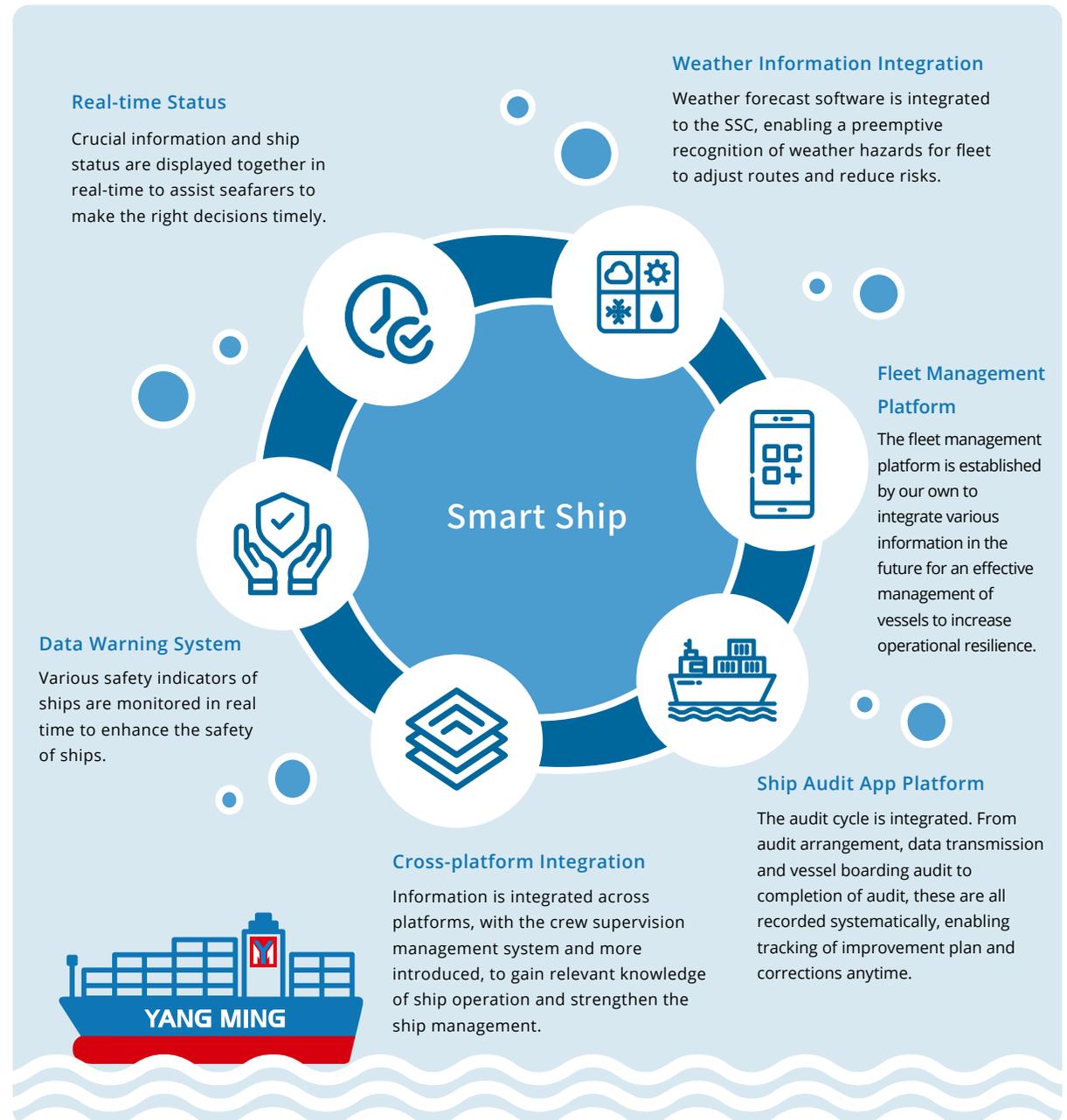
4.3 Digitalization and Smart Ships

The smart ships of the Company are combined with new ship building designs, with big data servers collecting voyage data and engine room operating data. Management is conducted onshore via satellite networks to analyze data, capture the work status onboard, and assess the equipment health and potential risks. As result, we achieve the purposes of fuel consumption reduction, energy efficiency and emissions reduction.

The smart ship information security management at Yang Ming encompasses focuses as follows:

1. ISM management incorporated; shipboard cybersecurity officer appointed.
2. Cybersecurity certificates obtained for the engineer room monitoring system from the equipment supplier of smart ship.
3. Close collaboration with communication suppliers regarding cybersecurity monitoring.

The 2,800 TEU class vessels introduced at the Company saves about 30% of fuel consumption compared with the chartered vessels of the same size. Compliance with the environmental regulations and low emissions is taken into consideration for the new vessels to be built in the future. Hence, a significant drop in the carbon emissions compared to the existing vessels in operation is expected.



Execution Results and Future Goals of Fleet Cybersecurity at the Company

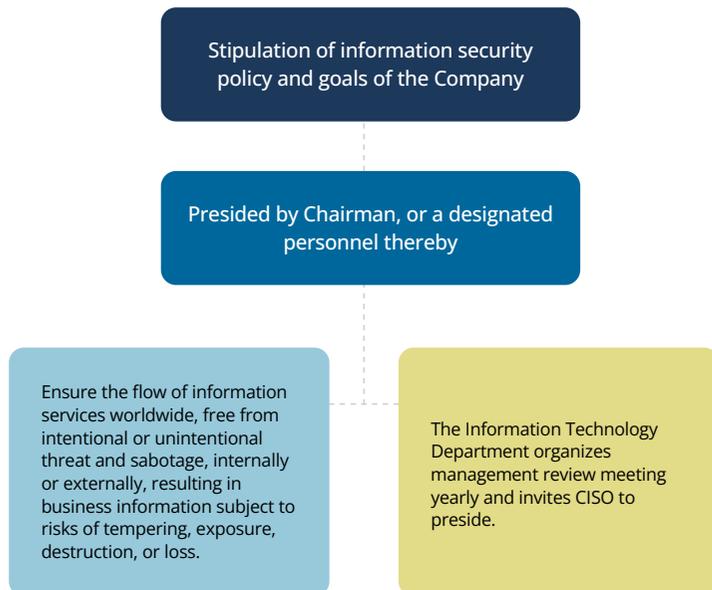
Topic	Goals in 2021	Execution Results in 2021	Goals in 2022	Mid-/Long-term Goals
Shipping safety – Fleet Cybersecurity	Improve the information security defense competence of fleet (Integrated Safety Management)	<ul style="list-style-type: none"> • According to the report of CHT Security Co., Ltd. and the responses of vessel information management, no property loss incurred from information security for the fleets in 2021. • All infection incidents scanned and detected preemptively. • Information Assets Security Guidelines officially online on January 1, 2021. • CHT SOC services introduced to 40 vessels. <p>Email social engineering drill conducted for fleet in June, with vessels that failed the test disclosed and the Cyber security risk education and trainings arranged for relevant crew.</p> <ul style="list-style-type: none"> • The cybersecurity security systems of ships passed the external audit by DNV (with zero nonconformance and no recommendations). • The fleet cybersecurity security assessment was conducted. (Medium risk: port agency engaged USB data exchange/ external units boarding for equipment maintenance) • The fleet cybersecurity security exercise was conducted. (Handing of IT equipment infection and restoration procedures) 	<ul style="list-style-type: none"> • Continue to better the information security protection competence of fleet. • The API shall be integrated with the CHT Security monitoring system in the SSC Phase II to check the information security performance of fleet via a unified interface. 	<ul style="list-style-type: none"> • Vessel safety • Personnel safety • Cargo safety

4.4 Information Security

The Company has been certified to ISO 27001 Information Security Management System. Each year, through the management review meetings regularly, it promotes various information security activities and reviews goals of the year and risk improvement progresses to ensure the information security at the Company. The management review meeting is chaired by the Chairman, or the individual designated thereby and attended by relevant departmental supervisors. An ISO 27001 external audit is conducted yearly as well to verify the compliance of its management system and performance with the ISO requirements.

In addition, pursuant to Paragraph 1 in Article 9 of “Regulations Governing Establishment of Internal Control Systems by Public Companies,” the Chief Information Security Officer(CISO) is appointed, along with several information security supervisors and personnel instituted. The employees received education and trainings and have obtained information security related certificates. Looking forward, it shall recruit information security professionals and establish dedicated units through job division.

Maintenance and Management of Information Security at Yang Ming



Information Security Management Review Meeting

1

The management review meeting is presided by the Chairman, or the personnel designated thereby, and attended by relevant departmental supervisors. Based on various information or result reports, the appropriateness, adequacy and effectiveness in the implementation of information security management system are reviewed on the meeting.

2

The agenda of the management review meeting includes tracking and managing:

- Progresses of motions previously reviewed.
- Changes in the internal and external issues pertaining to the information security management system.
- Feedbacks on the information security performance.
- Feedbacks from the concerned parties.
- Risk assessment results and risk management plan status.
- Opportunities for ongoing improvement.

3

The output of the management review shall include decisions related to opportunities for ongoing improvement and any need for change(s) to the information security management system.

4

The management review results shall be documented and kept in line with relevant regulations.



Information Security Management

Through the management review meeting, it promotes various information security activities and reviews goals of the year and risk improvement progresses to ensure the information security at the Company. The management review meeting is chaired by the Chairman, or the individual designated thereby and attended by relevant departmental supervisors. An ISO 27001 review is conducted yearly as well to verify the compliance of its management system and performance with the ISO requirements.

Information Security Risk Assessment

In line with the requirements of the Information Security Policy, the information security risk assessment is carried out yearly, assessing items like system structure, system alternation management, project and resources management, asset and physical environment management, software/hardware authorization and compliance, etc. At the same time, to consider internal and external cyber security issues, occurrence probability, impact degree, impact degree scale, etc., to evaluate the risk degree score. The assessment result is then reported to the management review meeting, with descriptions of the handling, mitigation and response measures for items of higher risk.

Information Security Notification and Handling

To respond and address information security incidents timely, employees may notify incidents encountered. Upon notification received, the dedicated information security units shall handle incidents based on the incident category.

Information Security Response Exercise Plan

Receiving from the Security Operation Center (SOC) notification, system detection or user notification of computer and network abnormalities, to each unit counting the number of infected machines, communicating and coordinating each unit, and immediately taking contingency plans, in order to strengthen the enterprise's ability to withstand information security attacks Check the process through drills, familiarize yourself with the operation of each stage, and revise the contingency and recovery plan.

Small scale	Large scale
Infected computers or local networks taken offline	Backup system, following recovery and so on to be initiated

Information Security Improvement Plan

To mitigate the threat of ransomware, three measures were taken to reduce risks:

1. USB disc banned
2. Enhanced protection: to ensure antivirus software update and hotfix update in place
3. Regular vulnerability scan: to ensure host vulnerabilities patched

Information Security Education

To improve employees' information security awareness, information security education and trainings and promotion activities are organized regularly to improve their information security awareness and protect information assets from interference, sabotage, invasion or any other malicious act. "Social engineering" is conducted for all subsidiaries and fleet to popularize the information security education.

After the review, there was no substantiated complaint involving violation of customer privacy or customer data loss in 2021.

