Applications of advanced technologies and solutions applied to improve logistics security and efficiency in China ports
Contents

• Trade and transportation development in north east Asia

• Efforts on providing high quality logistics services to meet demand of increasing economic growth in north east Asia

• Advanced technologies applied in ports of China, Korea and Japan, and integrated solutions to improve logistics security and efficiency, enhancing regional competitiveness in the world
Trade development in north east Asia

GDP, all over the world in 2010

- China: 10%
- Japan: 9%
- Korea: 2%
- Others: 79%
The economic level in the world

- Total value of foreign trade 5.1 trillions of 3 countries in 2010 account for 18% of world total
- Korea as China's top 3 partner
  - Top 2 importer and top 3 exporter
- China as Korea's top partner
  - Top export and invest market
- Japan as China's top trade partner
  - China as Japan's top trade partner and top exporter and importer

Trade value of three countries amounted to $600 billions in 2010, bilateral trade volume between Japan and China is $303 billions, increased by 30.6%, China and Korea is $207 billions, increased by 32.6%.

As trade volume growing, more correlative dependent and more interactive among three countries in economic, require higher quality and safety of logistics and port services.
The marine transportation development of China, Korea and Japan

- International trade mostly depend on marine transportation
  - China, Korea and Japan play key important roles in world marine industry.

<table>
<thead>
<tr>
<th>Year</th>
<th>Share</th>
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<tbody>
<tr>
<td>1990</td>
<td>13.5%</td>
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<tr>
<td>2006</td>
<td>30.3%</td>
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<tr>
<td>2010</td>
<td>33.8%</td>
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Port container throughput share of world total of China, Korea and Japan
The importance of marine industry in world economic

• growing tendency of container throughputs of main ports in China, Korea and Japan
Port logistics development in China, Korea and Japan

- **Challenge and issues**
  - Lack of Regional logistics cooperation, low level of resources utilization
  - Barriers for information sharing among partners in region area
  - Inconsistent data standards
  - Integrated platform need for cooperation both in technical communication and data exchange
Efforts on improving capabilities of logistics services in Chinese ports and enhance safety and efficiency

- Most ports in China devoting much attention to logistics services, made lots of efforts on expanding business and providing more services to develop port logistics and improve logistics efficiency and security
  - Based on traditional terminal operation, providing agency for declaration and other applications, yards and warehouse services, trucks and fleet services
  - Using information technology tools to provide one-stop service for customers
  - Cooperative with authorities such as customs, Inspection and Quarantine and frontier inspection to facilitate clearance process
  - Allied with Inland logistics parks to build up inland ports, extended to the hinterland of the port services to implement remote territorial customs declaration
  - Developing port logistics to attract more manufacturing companies to expand service market
'All in one' services through Single window

container trucks

wharf

customs

bonded warehouse and logistics park

yard
Most ports in China have logistics information platforms and websites to provide comprehensive logistics information and services. For example, Qingdao Port logistics information network:

- All business partners can access the website, including Shippers, forwarders, shipping companies, shipping agents, wharfs, pilot stations, container yards and tally companies.
  - Information release: cargo, carrier, transport price, warehousing.
  - Centralized Procurement: bidding, relative price, tender.
  - Freight tracking and inquiring: location, status etc.
  - Line schedule inquiring and online shipment booking.
  - Hosted system or agency operation: apply to customs, Quarantine and inspection etc.

Other ports in China, such as Shanghai Port, Ningbo port and Tianjing Port, also provide these types of services.
Qingdao Port logistics information network
Advanced technologies applied in Ports to improve logistics security and efficiency

• Focus on logistics security and anti-terrorism requires high capabilities of ports operation
  – electronic seals will be very important to container transportation, RFID is one of most effective solutions, both for efficiency and for security

• Container RIFD system in Shanghai Port
  – Logistics information of container transfers in real time
    • container Information about identity and size etc.
    • cargo Information, such as name, weight and size etc.
    • Information about ships, ports and forwards ...
Advanced technologies applied in Ports to improve logistics security and efficiency

- Container RFID system in Shanghai Port
  - Security information about container
    - On-off time of container
    - Locations where container was opened and closed, through GPS.
    - Physical properties and environmental parameters such as temperature and humidity

- Trial lines cooperating with Yantai Port and Savannah Port and other ports
Trial line between two ports

- “两港一航”应用示范线5000TEU
  Application & demonstration line of "ports & 1 line" 5000TEU

- 集装箱电子标签
  Container RFID automatic identification system

- 标签tag
- 读写器reader
- 天线antenna

- 信息实时交换系统
  Information real-time exchange system

- 中间件
  Middleware

- 制定标准
  Make out standard
architecture of RFID automatic identification system
Advanced technologies applied in Ports to improve logistics security and efficiency

- RFID solution to improve container transportation on land outside Tianjing Port
Advanced technologies applied in Ports to improve logistics security and efficiency

• RFID solution to improve container transportation on land outside Tianjing Port zone
  – Using RFID and EDI to facilitate data exchange between different business systems, manage port infrastructures and track container trucks, enhance the efficiency and security of port logistics and have a good impact on port operation
Advanced technologies applied in Ports to improve logistics security and efficiency

- Other projects in Tianjing Port
  - Intelligent system of Yard Gate Inspection and passing management
  - Visualized system of container terminal operation and management
  - Innovative automatic weighing and identification system of truck loaded with two containers
Other roles involved in logistics security and efficiency

- license management
  - Maritime Safety Administration using IC card for ships and crew management, for identity recognition of sailors.
Other roles involved in logistics security and efficiency

- Electronic documents declaration
- bill of lading will be required to summit to customs in advance before cargo arrival
Collaborations in North East Asia

- North east Asia logistics network (NEAL-NET)
  - Its goals
    - establish non-profit international logistics information platform for data exchange between partners in China, Korea and Japan
Collaborations in North East Asia

• North east Asia logistics network (NEAL-NET)
  • Its goals
    – Reduce logistics costs, and CO2 emission, enhance logistics security and efficiency in north east Asia
    – Build up collaboration mechanism among countries in north east Asia
    – Project proponents, LOGINK of China, Colines of Japan, SP-IDC of Korea
  • Updating works
    – First technical meeting in Busan Korea, April 25th, 2011
    – Second technical meeting in Ningbo, China, June 19th, 2011
    – Experience sharing and exchange session in Japan, hosted by AOTS
Collaborations in North East Asia

- Emphasis in the first stage
- Information services of international container transportation
Collaborations in North East Asia

• **Emphasis in the first stage**
  - Data standards assure seamless exchange of information, increasing interoperability of modes at data level
    - data elements for Marine and road transportation
    - Unified Code standards
    - Standard system interfaces

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<th>#</th>
<th>Data elements</th>
<th>Format</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>Vessel Name</td>
<td>Within 35 Bytes</td>
<td></td>
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<tr>
<td>2</td>
<td>Call sign</td>
<td>Within 9 one-byte characters (Big letter)</td>
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<tr>
<td>3</td>
<td>IMO Ship Identification number</td>
<td>3 one-byte characters (Big letter) + 7 digits</td>
<td>IMO+00000007(digits)</td>
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<tr>
<td>4</td>
<td>Import Voyage No.</td>
<td>Within 12 digits</td>
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<tr>
<td>5</td>
<td>Export Voyage No.</td>
<td>Within 12 digits</td>
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<tr>
<td>6</td>
<td>SCAC Code</td>
<td>Within 4 one-byte characters (Big letter)</td>
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<tr>
<td>7</td>
<td>Port, Terminal code</td>
<td>Within 10 one-byte characters (Big letter)</td>
<td>UN/LOCODE Country Code 2 digits + Port (Region) - regional Code 6 digits</td>
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<tr>
<td>8</td>
<td>Estimated Time of Arrival (ETA)</td>
<td>17 digits</td>
<td>YYMMDDHHMMSSZ2Z + Time zone. See ISO</td>
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<td>YYMMDD00</td>
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<tr>
<td>18</td>
<td>CY Cut</td>
<td>8 digits</td>
<td>YYMMDD00</td>
</tr>
</tbody>
</table>

• Electronic transport documents to facilitate business processing
Collaborations in East Asia

- Intermodal transportation between China ports and Korea ports (Weihai port, China, and Busan port and Incheon port, Korea)
  - Joint marine and road transportation
  - Roll-on-roll-off Shipping
  - Drop and pull transport
Collaborations in East Asia

- **Qinhuangdao port (China-Korea project)**
  - RFID System deployment and trial tests
  - Container tracking and tracing information platform
Future works – Integrated solutions
cargo and container tracking and visualized logistics management

- **Cargo, transport units, containers and vehicles**
  - Automatically identify transport units and collect data from RFID tags attached to cargo, cases, pallets, containers and vehicles.
  - Navigate, track, monitor vehicles using onboard devices installed in vehicles with Integration of GPS, GIS, GPRS etc.

- **Port terminals, container yards and land transportation terminals**
  - Use management information systems, monitoring systems, RFID automatic identification system to improve efficiency of operation.
Future work – Integrated solutions
cargo and container tracking and visualized logistics management

• Ports are very important to build up seamless end-to-end supply chain, exploiting integrate technologies and practices to integrate multiple systems
  – Advanced technologies and related standards R&D for tracking and tracing of cargo to enhance logistics visibility and efficiency;
  – Advanced technologies and related standards R&D for Navigating, tracking and monitoring freight vehicles to ensure logistics;
  – Pilot field test to assure operability for implementation
Future works

• Identify promising technologies and solutions to improve Port logistics
• Identify operational and administrative bottlenecks to launch R&D of policies and strategies.
谢谢观看

thanks to watch