Logistics Information System in Republic of Korea
- GCTS (Global cargo Tracking System) -
Contents

1. Review of GCTS
2. System Analysis
Review of GCTIS
(Global Cargo Tracking System)

1. Overview
2. Backgrounds
3. System Concept
4. Major Service
5. Expecting Effects
1. Overview

- RFID/USN Infrastructure for real-time cargo/truck tracking
- System tracks container and vehicles with RFID technology to provide movement status of container/vehicle in real time

1. RFID BASED GATE OPERATION SYSTEM (NATION WIDE)

2. LINK & SHARE Logistics Data

3. SUPPORTING TO DIFFUSE RFID TECHNIQUE TO DOMESTIC PORT & LOGISTICS Nodes
2. System Concept

GCTS

- Acquire Visibility on Container/Trailer Location
  - CNTR Info of In/Outbound
  - CNTR Stacking Info
  - CNTR Load & Unload
  - Build shipping plans and generate orders
  - Automatic RFID recognition of Principal node records
  - Automatic tracking of vehicles inside of a terminal

- Integrated Database
  - Advanced Information
  - Exception Reporting
  - Location Information
  - Confirmation

- Connected forwarder
  - Traceability (CTNR)
  - Traceability (Truck)
  - Traceability (DG)

- Shipping Company
  - Shipping schedule/Empty vehicle
  - Shipping Order
  - Results of Allocation of Vehicles

- Terminal Operator
  - Nonstop Gate pass Vehicle RFID

- Tollgate
- Gate
- Yard
- Berth

ICD
Railway CY

System manager
Tollgate
Gate
Yard
Berth

Manufacturer
Forwarder
Shipping company
Terminal Operator

II. Review of GCTS
3. System Architecture

II. Review of GCTS
4. SYSTEM H/W SCHEME

BARCORD → ELECTRONIC TAG (PORT GATE PASS)

CONTAINER STACKING GUIDING LED BOARD

CONTAINER STACKING INFORMATION

VEHICLE/CONTAINER TAG REGISTRATION INFO.

PORTABLE READER FOR ISSUING VEHICLE TAG

Access Point

RFID BASED GATE OPERATION SERVER

CONTAINER DELIVERY RECEIPT

BOOKING NO

P.O NO

CONTAINER NO

TIME

LOCATION

STATUS

비고

ACCESS POINT

RFID BASED GATE OPERATION SERVER

CONTAINER STACKING GUIDING LED BOARD

BOOKING NO

P.O NO

CONTAINER NO

TIME

LOCATION

STATUS

비고

BOOKING NO

P.O NO

CONTAINER NO

TIME

LOCATION

STATUS

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III. Review of GCTS
5. Gate Operation H/W

- **433Mhz ANTENNA FOR CONTAINER**
- **900Mhz ANTENNA FOR VEHICLE**
- **433Mhz READER**
- **900Mhz READER**
- **POWER SUPPLIER**
- **LED ELECTRIC SIGN FOR C/Y LOCATION**
- **ALARMING LIGHT FOR VEHICLE TAG RECOGNITION**
6. Pilot Project (1/3)

Real Time Container Tracking using GNSS Technology from Republic of Korea to CIS or Europe Passing TSR (Trans Siberian Railway)

- LGD LGE SAMSUNG Electronics
- Pusan Port (KR)
- Vladivostok
- Ulan-Ude Station
- Moskva Station
- Poland Brest Station
- Moskva (SAMSUNG)
- Wroclaw (LGD/LGE)

**TSR Route**

- GLONASS/GPS Support
- 433 Mhz RFID Built-in
- WCDMA, Automatic Roaming Support
- Remote Setting Support
- Battery lasts 20 days (Location Information 1time/1hr transmission)
- Temperature Range (-30 ~ 60)

**Telecommunications Co.**

**MOF GCTS**

( Global Cargo Tracking System )

**Shipper**

**Poland**

**Russia Federation**
## 6. Pilot Project (2/3)

### Features of TSR Container Tag (Type A and B)

#### How to install equipments

<table>
<thead>
<tr>
<th>Division</th>
<th>Type-A (Contracer)</th>
<th>Type-B (U4-1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside of Container</td>
<td><img src="image" alt="Type-A Body" /></td>
<td><img src="image" alt="Type-B Body" /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Type-A Antena" /></td>
<td><img src="image" alt="Type-B Antena" /></td>
</tr>
<tr>
<td>Outside of Container</td>
<td><img src="image" alt="Type-A Antena" /></td>
<td><img src="image" alt="Type-B Antena" /></td>
</tr>
</tbody>
</table>

#### Equipment Detail Spec.

<table>
<thead>
<tr>
<th>Division</th>
<th>Type-A (Contracer)</th>
<th>Type-B (U4-1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture</td>
<td>ICC(Korea)</td>
<td>KIC Systems(Korea)</td>
</tr>
<tr>
<td>Communication Module</td>
<td>GSM quad-band</td>
<td>GSM quad-band</td>
</tr>
<tr>
<td></td>
<td>WCDMA/GSM</td>
<td>WCDMA/GSM</td>
</tr>
<tr>
<td>Reception of position information</td>
<td>GLNASS/GPS/GALILEO</td>
<td>GLNASS/GPS/GALILEO</td>
</tr>
<tr>
<td>weight</td>
<td>850g</td>
<td>780g</td>
</tr>
<tr>
<td>Operation Temp</td>
<td>-30°C to 70°C</td>
<td>-30°C to 80°C</td>
</tr>
<tr>
<td>I/O Port</td>
<td>USB</td>
<td>USB</td>
</tr>
<tr>
<td>Battery</td>
<td>Lithium-ion 13,000mA</td>
<td>Lithium-ion 14,000mA</td>
</tr>
<tr>
<td>Size</td>
<td>244.2x116.6x106.7mm</td>
<td>232x77x108mm</td>
</tr>
<tr>
<td>Image</td>
<td><img src="image" alt="Type-A Image" /></td>
<td><img src="image" alt="Type-B Image" /></td>
</tr>
<tr>
<td>Quantity</td>
<td>220EA</td>
<td>80EA</td>
</tr>
</tbody>
</table>
6. Pilot Project (3/3)

Real time Maritime container tracking using RFID and GNSS technology from shipper factory to destination

Stuffing Container and Arming container Tag
- Put a container Tag in Container (Shipper’s Factory)

Inland Transportation
- Vehicle Passing check by RFID in main Tollgates

IGATE and Loading in CNTR TML
- Vehicle and Container Passing check by RFID in Gate (Container Terminal)

Marine Transport
- Vessel Tracking in Ocean (General Information Center on Maritime Safety and Security)

Unloading and Out Gate in Foreign (ex; Russian Federation)
- Real Time Tracking using GNSS Tech.

Inland Transportation (Ex; TSR)
- Container Arrival Checking by RFID
- Container Tag Collection

Arrival at Dest.
7. Major Benefits

Expecting Benefit (Maritime Container Visibility)
(Case : Pilot project for TSR Container)

**Reduce unnecessary expenses**
- Transportation Cost Saving by reducing of Time and Distance Between Asia and Europe
  - Ex) Republic of Korea- Finland : Ocean 35 days, TSR 25 days, Japan-Europe : Ocean 20,800Km, TSR 13,000Km
- Deliver product on time To Russian Federation and CIS by Reducing transportation time

**Real time CNTR Track**
- Provide exact container location in real time
- Prevent Cargo Losing

**Increase The Business Efficiency**
- Estimate exact time of arrival at the final destination
- Shipper can manage related transportation schedule by real-time cargo positioning
  ⇒ Get the Reliability and Accuracy
System Analysis

1. Users/roles/key function
2. Data standards/type used
3. Institutional Arrangement
4. Cooperation mechanism
5. Connectivity
6. Financing
7. Other Issues
## 1) Users/roles/key function

<table>
<thead>
<tr>
<th>Division</th>
<th>Contents</th>
</tr>
</thead>
</table>
| System provider & operator      | - Provider: MOF (Ministry of Oceans and Fisheries)  
- Operator: KL-Net (as SM contractor)                                                                                                                                                                       |
| System user                     | - Private sector: Logistics companies including shipping line, terminal, shipper, trucking Co. and etc. (Shipping Line, Terminal operator, Trucking Co. University, Institute, Consulting Company, etc.)  
- Public sector: MOF and MOLIT                                                                                                                |
| Roles                           | - System provider - system development, system connection, budget  
- System operator: Non-stop service (24h*7), M&R, Quality Assurance  
- System user: use for container tracking  
- Public user (administrator): service control                                                                                                         |
| Key function                    | - Collect separated logistics information to one spot. Participant access the information and process civil appeal related to harbor on internet. It cut off the price for logistics fee.  
- It can be access from anywhere by internet. Also, it support collaboration process by sharing information  
- Provide PNT (Positioning, Navigation, Timing) on container                                                                                        |
## 2) Data standards/type used(1)

<table>
<thead>
<tr>
<th>Division</th>
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</tr>
</thead>
</table>
| National data standard        | - Follow national standard (ex: KS)  
- Adopt and consider to apply international standard  
- (ex: Code set, EDI message and technical standard) |
| Interoperability              | - Cost  
- Exiting system  
- Public and private  
- VAN service  
- Recommend to follow national and international standard |
| International data standard   | - Refer NEAL-Net standard  
- ✓ International – EPCIS – NEAL-Net standard |
| International standard        | - Agreement : understand & communication  
- Patience (take long time)  
- Step by step approach  
- Involve and support from government  
- Expansion to other economy  
- Simplicity (follow int'l’ standard)  
- Cooperate int'l’ organization |
## 2) Data standards/type used(2)

<table>
<thead>
<tr>
<th>Data type</th>
<th>Public and private</th>
<th>Standard vs non standard</th>
<th>Negotiable vs non negotiable</th>
<th>Open data vs personal data (privacy)</th>
<th>B2B vs G2B/B2G</th>
</tr>
</thead>
<tbody>
<tr>
<td>cargo/tracking information</td>
<td>Private data</td>
<td>Standard</td>
<td>Non negotiable</td>
<td>Personal data</td>
<td>B2B</td>
</tr>
<tr>
<td>EDI transmission Message</td>
<td>Private data</td>
<td>Standard</td>
<td>Non negotiable</td>
<td>Personal data</td>
<td>B2B</td>
</tr>
<tr>
<td>Code set</td>
<td>Public data</td>
<td>Standard</td>
<td>Negotiable</td>
<td>Open data</td>
<td>G2B</td>
</tr>
</tbody>
</table>
## 3) Institutional Arrangement

<table>
<thead>
<tr>
<th>Division</th>
<th>Contents</th>
</tr>
</thead>
</table>
| **Lead Agency (Gov’t support)** | - Financial support (Allocate budget)  
                            - MOF & MOLIT                                                              |
| **Legal aspect**          | - Data protection: Need strong  
                            - Still negotiation as CSD (Container Security Device)                  |
| **Issues**                | - Pilot stage: Not yet commercial base operation  
                            - Need negotiation between trading partner country (Customs)  
                            - Cost: Global data communication cost                                    |
4) Cooperation mechanism

<table>
<thead>
<tr>
<th>Division</th>
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</thead>
</table>
| Domestics     | ◦ Share logistics information among logistics node(shipper, terminal, ICD)  
                - Inland : Warehouse, Rail  
                - Ocean : GICOMS(Provide Vessel Monitoring System) |
| International | ◦ Service coverage : Global  
                - Pilot project : Russian Federation & CIS, USA, China, Italy, Japan and so on |

5) Connectivity

<table>
<thead>
<tr>
<th>Division</th>
<th>Contents</th>
</tr>
</thead>
</table>
| Domestic   | ◦ Connected with major regional container terminals  
            ✓ Incheon(3), Pyongtaek(1) Kunsan(1), Kwangyang(5), Busan(12) |
| International | ◦ Ref : Service coverage |
## 6) Financing

<table>
<thead>
<tr>
<th>Division</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>- Financing by government: GCTS (annual operation cost)</td>
</tr>
<tr>
<td></td>
<td>- Included maintenance and repair budget for PORT-MIS’s system</td>
</tr>
<tr>
<td>International</td>
<td>- Project based</td>
</tr>
</tbody>
</table>

## 7) Other issues

<table>
<thead>
<tr>
<th>Division</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>- Protect cargo information and personal data</td>
</tr>
<tr>
<td></td>
<td>“Information Protection Act and Privacy Act”</td>
</tr>
<tr>
<td>Update</td>
<td>- MOF will update and renewal GCTS</td>
</tr>
</tbody>
</table>
ขอบคุณมาก
Thank you for your attention
谢谢
ありがとうございます
阿里嘎とうございます
감사합니다