Realizing the Vision of e-Port: Automatic Gates and Its Related Subsystems at the Bangkok Port

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Objectives of the presentation

- To explain the overall **e-Port** system for **Cargo and Container Handlings**, and their **documentary procedures** at the Bangkok Port.

- To describe **business processes and related technology** including e-Documents, RFID, Automatic Container ID Recognition and Camera Systems for automatic gates, port safety, cargo and container management and operations.
Subsystems of e-Port (for Bangkok Port)

- **e-Gate**
  - Automatic Gate Systems

- **CTMS**
  - Container Terminal Management System

- **ERP**
  - Enterprise Resource Planning

- **VCMS**
  - Vessel Cargo Management System

- **AIS**
  - Automatic ship Identification System
Layout of the Bangkok Port (Klongtoey)
Equipments at the Gate

- Light Signal
- Alarm & Siren
- RFID Reader
- Message Board
- Barrier
- Traffic Light
- OCR Camera
- Barcode Reader & Microphone/Speaker

OCR = Optical Character Recognition
RFID = Radio Frequency Identification
Every time, any persons and vehicles enter in or leave out of the Gate

- E-Gate System will automatically read the information about those persons and vehicles from the Radio Frequency ID cards (RFID) and the database.
- Time stamps would be recorded, along with data cross checking with CTMS, VCMS and e-Customs systems for the permission to get in & out.
Entering through the Main Gate

Business Operation

- Capture images of Containers and Automatically recognize the container ID number (CCTV & OCR)
- Identify the persons and vehicles entering into the port (security measure according to ISPS code)
- Automatically cross check for the permission of Export Containers with CTMS system and Paperless Customs System
- Information about entering time is recorded, with the Destination/Location Information displaying on the message board, and the gate barrier is open.
Entering through the Sub Gate
(into the Container Terminal)

- Read Container Number
  - RFID READER

- Equipment Interchange Receipt

- Semi-Automatic Damage Inspection

- Inform yard location

- CTMS

- e-gate Database
Equipments at the automatic gate

**Status Light showing readiness for service**

Entering traffic light for each lane
Camera Systems & OCR

Closed Circuit TV Cameras

For capturing images of containers, analyze and recognize the Container ID number automatically, and also for capturing images of drivers, vehicle plate numbers for security.
RFID Reader (Antenna)

RFID Antenna communicates with Person ID card and Vehicle ID Card
Message Board

Display information to communicate with Drivers, e.g. Destination location, Amount of money left on the debit card, etc.
Traffic Light

Showing the status of this lane
Communication Channel

Speaker and Microphone

The e-Gate operator in the control room could communicate verbally with the driver in the vehicle.
Bar Code Reader

In some cases, the driver needs to bring a pre-advice paper document with barcode to be read by the barcode reader at the e-Gate’s lane for data-cross checking.
Light for exceptional handling cases

Light for Alarm Alert

Alarming with Light for alerting e-gate operators and drivers for exceptional cases
Sound Alarm Signal

Sound Alarm

Alarming with Sound for alerting e-gate operators and drivers for exceptional cases
Gate Barrier

Physical barrier to open or remain close automatically or manually
Business Process Example concerning e-Gate and its related e-Port Sub-Systems

FCL Container Movement for Export

FCL = Full Container Loading
A Trailer with FCL Container(s) from outside, then moving into the Bangkok Port for Export

1. The Trailer with FCL Container(s)

2. Bring the Container to Terminal 1 or 2 for Export

3. Trailer with no Container leaves the Port

East Main Gate

Container Terminal 1

Container Terminal 2
As-Is Process – Export FCL Container moving from outside, entering through a Main Gate, then to a Container Terminal in Bangkok Port

1. Pre-Advice Paper submission (bkp 308.2)

2. Using Information in Invoice & Packing List to electronically submit Customs Declaration

3. Issuing Customs Declaration ID

4. Submission for Container Movement (นวณ.49)

5. Issuing Customs Movement ID

6. Contact a driver (for a trailer truck with FCL container) with BKP 308.2, Container Movement 49, Customs Declaration

7. Driver
   - Drive the trailer with FCL Container through the Main Gate
   - Stop and pay for entering fee with a port staff
   - Get the payment receipt

8. Port Staff
   - Main Gate In (East)
   - Port Staff in each lane

9. Port Staff
   - Drive the trailer with FCL container through the Terminal Sub-Gate
   - Weigh the trailer and FCL container
   - Submit bkp 308.2, Container Movement 49 to the Port Staff
   - Port Staff do the damage inspection
   - Port Staff reports any damage, documents and issues EIR form to the driver (Equipment Interchange Receipt)

10. Port Staff
    - Yard Equipment list off the container to the designated yard location (ready for moving into the vessel)

11. Port Staff
    - Drive out from Terminal Sub Gate Out
    - Show EIR to the Port Staff at the Main Gate

12. Driver
    - Drive the trailer with no Container out through the Main Gate Out

IT section of Bangkok Port (Terminal1/Terminal2)

Exporter/Shipping

Customs Department

Sub Gate In (Terminal 1 or 2)

Port Staff

Yard Location

Container Yard

Main Gate Out (East or West)

Sub Gate Out (Terminal1 or 2)

Driver

Electronic documents exchange or electronic submission

Paper documents and/or physical movement

Customs Official Terminal1/Terminal2
To-be Process – Export FCL Container moving from outside, entering through a Main Gate, then to a Container Terminal in Bangkok Port

e-Port System (CTMS) electronically cross-checks Customs Declaration ID & Container Movement ID with e-Customs System

Export/Shipping

1. Submit 308.2-Pre-Advice through CTMS-Web, data cross checking with Customs Declaration ID & Container Movement ID. User submits ID of Debit Card ready for Entering Fee Payment.

2. Using Information in Invoice & Packing List to electronically submit Customs Declaration

3. Issuing Customs Declaration ID

4. Submission for Container Movement (กศก.49)

5. Issuing Container Movement ID

6. Contact a driver (a trailer & FCL container) (no paper needed)

7. • Drive the trailer with the FCL Container through the Main Gate
• e-Gate automatically reads Driver ID & Trailer ID
• e-Gate recognizes the Container ID Number with OCR Image Processing Technique
• Data cross checking with 308.2 Pre-Advice e-Document within the CTMS system
• e-Gate calculates the Entering Fee and cashes it through the earlier informed ID of the Debit Card
• Message Board displays the Container’s Destination Location, with the amount of entering fee charge
• The gate barrier is open.

8. • Drive the trailer with FCL Container through the Sub Gate in
• Weigh the trailer and FCL container
• e-Gate calculates the weight of Goods in the Container, send the weight to e-Customs System for risk management and Customs Clearance Decision (Green, Red, X-Ray, Block)
• e-Gate analyzes the possible Container Damage
• e-Gate checks for the permit from CTMS and with EIR Inspection.
• e-Gate prints out the EIR receipt at the gate.
• Message board displays the yard location for the driver.
• The barrier is open.

9. • Drive to the informed yard location.
• Yard Equipment lifts off the container.

10. • Trailer with no container leaves the Terminal Sub Gate Out.
• e-Gate electronically checks Driver ID and Trailer ID
• e-Gate automatically checks the permission from CTMS.
• The barrier is open.

11. • Drive the trailer out through the Main Gate Out
• e-Gate electronically checks Driver ID and Trailer ID
• e-Gate automatically checks the permission from CTMS.
• The barrier is open.

Electronic documents exchange or electronic submission
Paper documents and/or physical movement
Conclusion
Critical Success Factors for Realizing the Vision of e-Port

People
Stakeholders, Users, Operators and Staffs
(Exporters, Importers, Customs Brokers, Freight Forwarders, Ship Agents, etc.)

Technology
Hardware, Software, Network, Equipments, Construction, etc.

Business Process
New Operations, New Regulations, etc.
Some Suggestions for UNESCAP

- Stocking taking and promotion of best practices (case examples) of Business Processes in various scenarios,
  - e.g. cargo stuffing for export, importing process at the sea port and air port, and free-zone operations
- Develop Guidelines for Change Management (including Stakeholder Management) (people issues in trade and transport facilitation improvement)
Thank You