EFFICIENT PORT GATE AUTOMATION

A VALUE-ADDED PERSPECTIVE FOR TERMINAL OPERATORS

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A port terminal is a restricted area due to regulated public sector operations in ports such as customs, immigration, quarantine and national security. Therefore, a port terminal gate serves as a key check point to identify and record each entity entering or leaving the restricted area. As the size of modern container ships has increased, the volume of container traffic passing through gates has also risen dramatically. As a result, employing technologies to improve the efficiency and security of gate operation has become the predominant strategy for terminal operators dealing with heavy traffic passing through their gates.

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The typical entity that commonly passing through port gates comprises three critical components: a driver, a truck, and a container. A basic Gate Automation System (GAS) must be capable of identifying and recording these three components accurately and promptly. Accordingly, three subsystems are necessary to establish the foundation of a GAS. The ideas of implementing these subsystems are introduced as follows:

1. Driver identification system (DIS): To ensure security and facilitate checking drivers' identities at gates, drivers are required to register in the GAS and obtain ID cards after registration. After that, when a truck arrives at the gate, the driver must tap his ID card and key-in his personal identification number (PIN). Some modern terminals (e.g. PSA Singapore) allow drivers to scan their fingerprints instead of keying in PIN numbers to enhance the level of security.

2. License plate identification system (LPIS): Since each truck must install license plates, which have to be displayed properly both on the front and rear according to traffic regulations, the easiest and most efficient way to establish an LPIS is through optical character recognition (OCR) technology. That is, when a truck arrives at a gate, the preset closed circuit television (CCTV) cameras capture several images of the truck from different angles. The license plate is then identified and recorded promptly to the GAS. Currently, OCR is a common LPIS solution used in many terminals due to its competitive cost and the ease of its installation. Identification using this method is also accurate, although the performance might be influenced occasionally by bad weather such as thick fog or heavy rain.

3. Container number recognition system (CNRS): Just like the LPIS, the easiest way to identify a container is still using OCR technology; however, the difficulty
At the gate for each container truck by
This operation model cuts check-in time
in a timely way. The real-time locating
system (RTLS) implemented at the gate of
the mobile phones can be tracked on a timely
basis, and drivers’ feedback to the TOS can
be easily obtained.
Second, identifying the seals is still an
obstruction for developing a GAS. The
closest solution to tracking its location is an
approaches the designated location in
yard, which saves waiting time for both
RMGCs and trucks.

REFERENCE
Cheaper by the Yard”, RFID Journal, 2003

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National Taiwan Ocean University, which
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