Smart Gates in Smart Ports

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What is Smart?
For Human

Perception

Intellection

Expression
For Cities, Ports ...etc

Perception (sensors & Networks), Intellection (Programming Logic) and Expression (Actions)
Case Study

Smart Gates in Valencia Port
Port of Valencia

- Largest port in Spain
- Largest port in Mediterranean Sea
- Fifth busiest seaport in Europe
- Container traffic capacity of 4.6 Million TEU (2015)
- Annual traffic capacity of around 70 Million tones of cargo (2015)
- 7,728 ships in 2015.
• Valencia Port Authority
• Valencia Port Foundation
Automatic Paperless
Import Clearance
Background - Spain situation

- Spanish Ports are considered Customs Areas ➔ Customs Security Protection

- Customs control over all goods that leave the port by land. Customs Police do not allow the exit of goods without a proper customs authorization
Background – Valencia port situation

- Many different terminals
- Different types of cargo

A SINGLE ROAD ACCESS in the port of Valencia
Some of the greatest problems were:

- Errors in the declared data because it was not cross-reference information from different sources

- The custom police to make the verification process manually
First and foremost … the problem with truck waiting line at the exit of the port

The more traffic port increases, the more truck waiting line grows
The aim of the project is to improve the efficiency, quality, security and safety in the port. Making it more and more efficient and competitive.
In a first step, The docks’ receipt note includes one or several barcodes with enough information in order to be able to perform a computer assisted control of the departure of goods.

With the information provided by the barcodes, customs police checks at the national customs system whether the goods have proper customs authorizations for leaving the port.
The Terminal gives the document with the barcode to the truck driver.

The truck driver presents the exit document with the barcode. Customs police reads the barcode.

If “OK”, the truck driver can exit the Port with the goods without having in hand the official customs clearance paper.

Exit of goods is introduced in Central Customs System.
Go one step further, the project of Automatic Paperless Clearance introduces automated systems into the current operative (access control systems, truck’s license plate recognition, container number recognition, electronic panel information signs, etc.) without requiring a continuous intervention of the customs police.
The Automatic Paperless Clearance System is composed by three systems:
Automatic Gate for Containers

1. The Gate system reads the truck plate and container(s) number(s) and validates the information.

2. If “OK”, the barrier will open and the goods departure is registered in the Central Customs System.
Automatic Gate for general cargo: platforms, new cars, bulk cargo...

1. The gate system reads the truck plate and opens first barrier
2. It also detects radiation (MEGAPORTS) and reads the container(s) number(s)

3. It sends the truck plate

4. Real time query on authorization to Customs

5. If OK, it opens 2nd barrier

Information about the truck, goods and Customs clearance
Signaling and traffic System

5 exit lanes
Automatic gate (max. 4)
Manual gate (min. 1)
Traffic signal, traffic lights, variable message panels, traffic regulators…
License plate recognition system (LPR)
Signaling and traffic System

Automatically identify ISO Containers (OCR)
Signaling and traffic System

- Lane traffic automation system
- Entry and exit barriers
- Information system of boards and sensors
• Radiation detection System (MEGAPORTS)

MEGAPORTS is the result of an international security program designed by the US Department of Energy to prevent illicit trafficking of nuclear and radioactive materials.

The installation of radiation detection equipment enables both imports and exports handled in the port facilities to be examined.

The implementation of this system reduces the probabilities of smuggled nuclear or radioactive goods being brought onto the port premises and will increase security at the Port of Valencia.
Access Control Systems

Cargo information → License plate → ISO Containers

Container? →
- Consult Customs clearance of container
- Consult Customs clearance of general cargo

→
- Notification of departure container
- Notification of departure of general cargo
Automatic Paperless Clearance

- It is easier the access information
- It is more efficient and effective the process control
- It is faster the exit and reduced congestion at ports

Source: the Valencia Customs Department
Automatic Paperless Clearance
Automation of 8-lane container terminal entry and exit gate
Port smart gates facilitate the movement of trucks
Control containers import and export
Full reporting Automated system
New features can be added
Eliminate human errors (on purpose or mistakes)
Thank You