

Smart Gates in Smart Ports

Dr. Mohamed Mahmoud Ali

Director, Computer Networks & Data Center

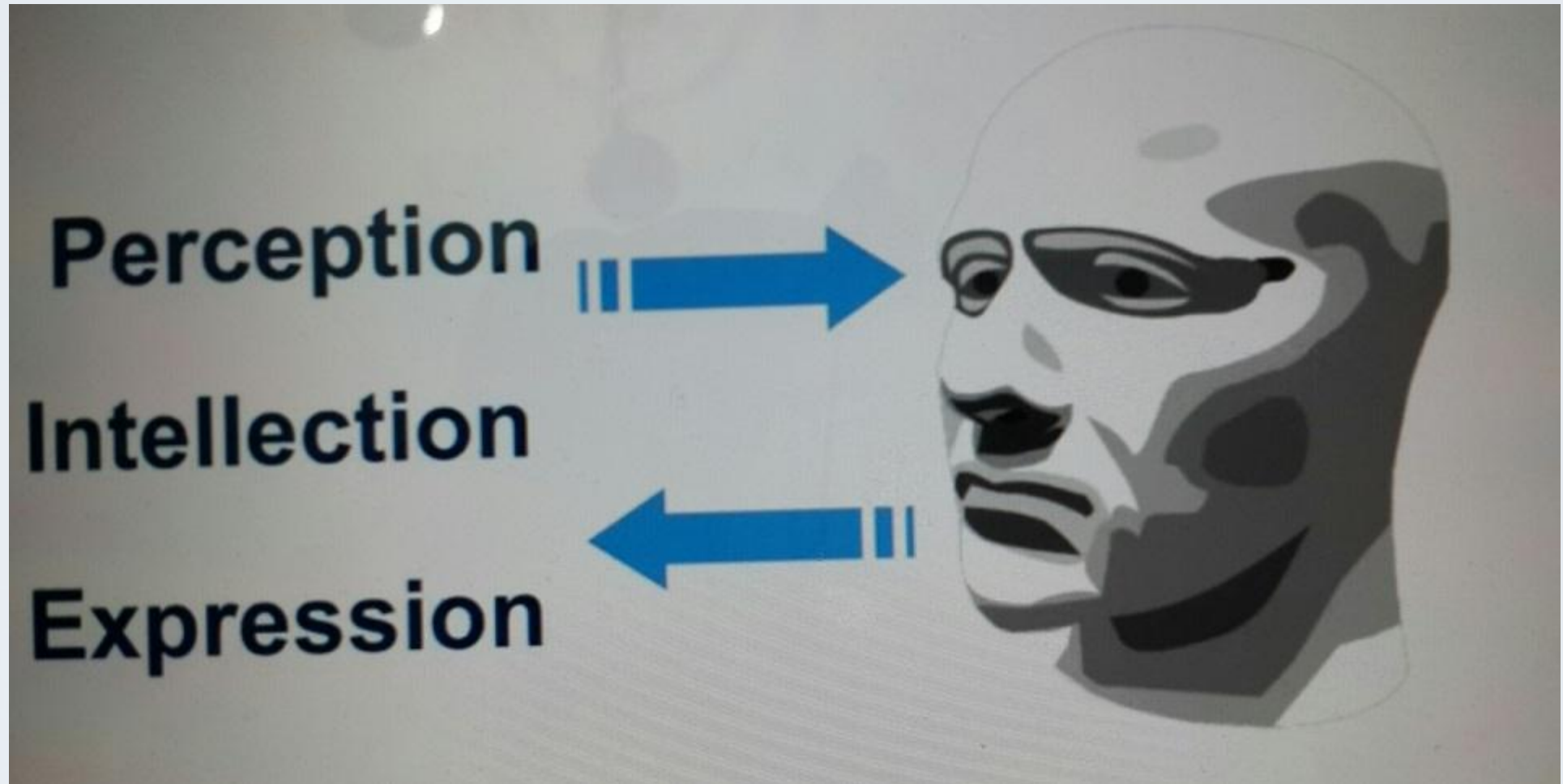
Arab Academy for Science, Technology and Maritime Transport



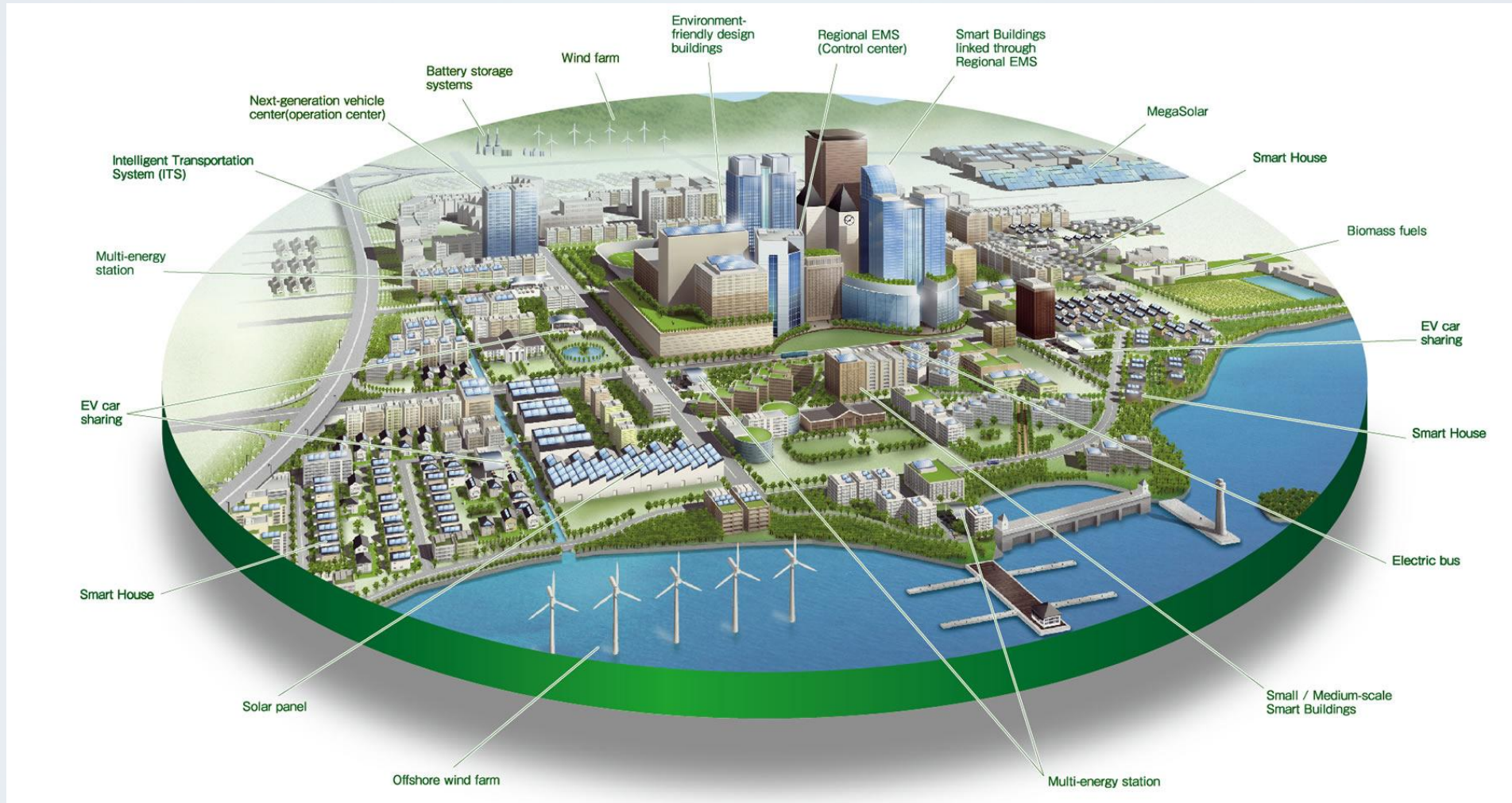


What is Smart ?





For Cities, Ports ...etc



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

Case Study

Smart Gates in Valencia Port



- 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



Background - Clearance procedure

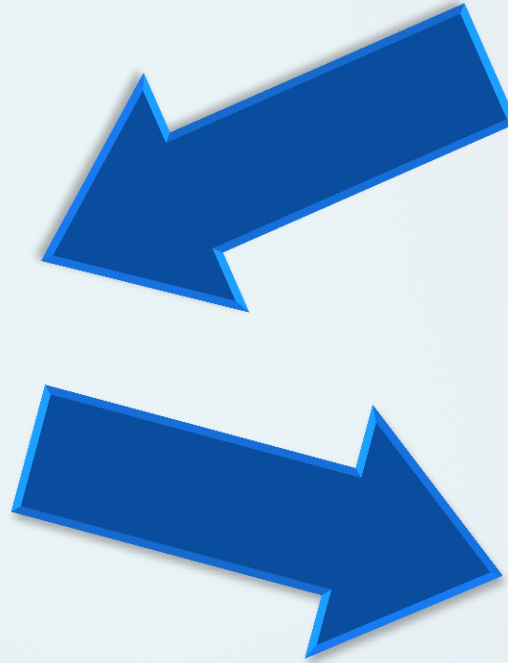
Some of the greatest problems were:

- Errors in the declared data because it was not cross- reference information from different sources
- the custom police to make the verification process manually



Background - Clearance procedure

First and foremost ... the problem with truck waiting line at the exit of the port



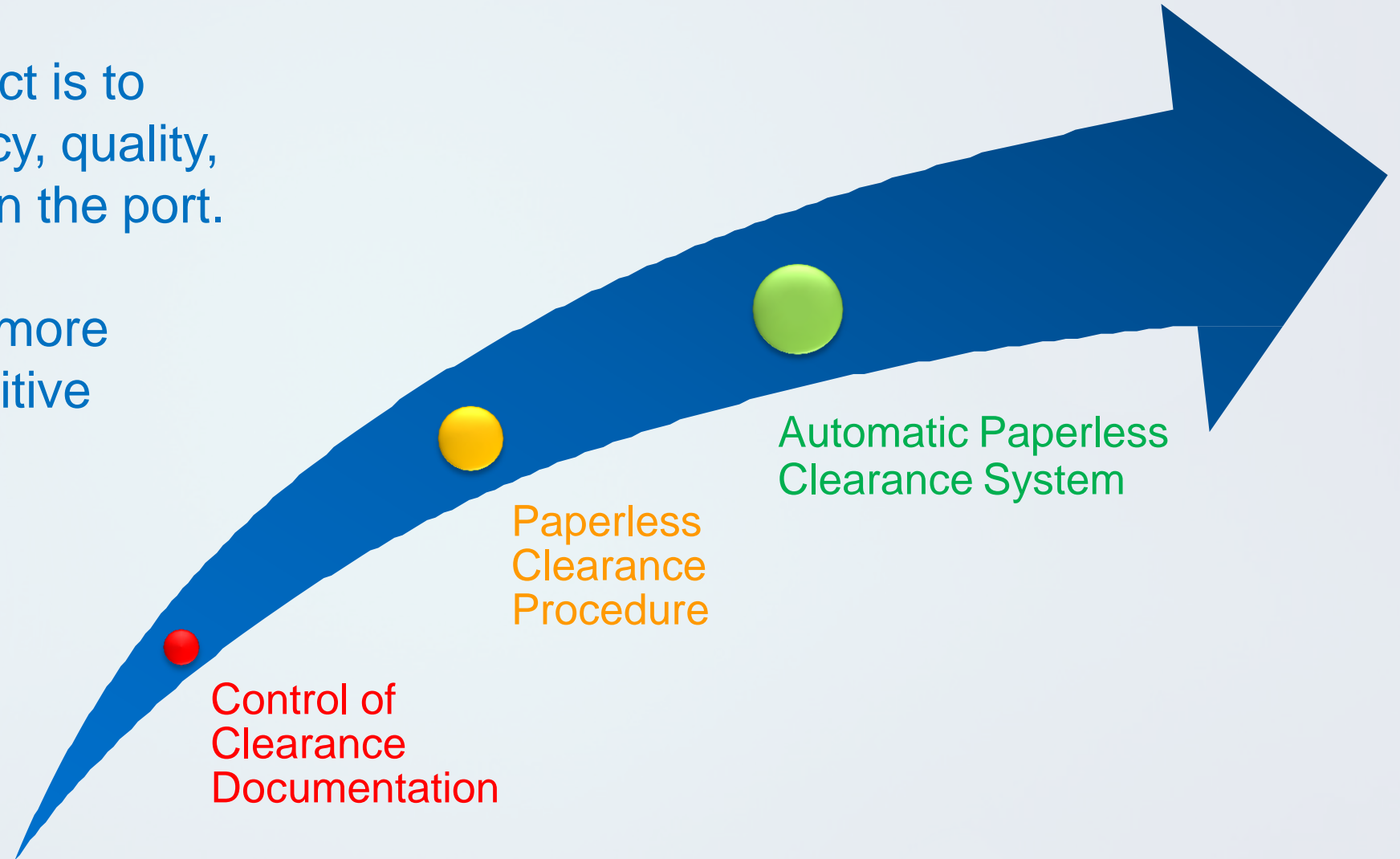
The more traffic port increases, the more truck waiting line grows



Background – Phases of clearance procedure

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



Paperless Clearance Procedure

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.

Marítima Valenciana FCSL
TERMINAL PÚBLICA DE CONTENEDORES
PUERTO DE VALENCIA
TAG: 0284
FECHA: 19/07/06
Nº BOLLETR: 69053009
HS: 07-44
SALIDA TERMINAL
Nº COMPETA: 503

| LINEA | SOBRE | CONTENEDOR | NUMERO | CLASE | SEÑAL | PAIS | HEMISFERIO | MATRICULA TRACTOR | TRAFICO |
|-------|-------|------------|--------|-------|-------|------|------------|-------------------|---------|
| MRL | PONU | 477333/9 | | 40 | L | | | 7328BBM | |

| ALUMNA | TIPO | TER. MAN. | VAL. BOT. | PRIORIDAD | CLASE | TIPO | PAIS | MT/UM | DESTINO |
|--------|------|-----------|-----------|-----------|-------|------|------|-------|---------|
| 96 | RD | -20C | | | | | | | HORIZON |

DAÑOS

30

EXTREMENAS RESOLUCION

PONU4773339/7328BBM

CUMPLA LAS NORMAS INDICADAS AL DORSO

EMPRESA CARGADORA:
TERMINALES MARÍTIMAS SERVICESA S.A.
NÚMERO XITA S/N - VALENCIA C.I.F.: A-96724125
ALBARAN CLIENTE: 149077
ALBARAN DESPACHO: 6000000
FECHA: 25/07/06

MATRICULA TRACTOR: 5786CJJ
MATRICULA REMOLQUE: V18026R
CLIENTE/RECEPTOR: CEMENTVAL, S.L.
POLÍGONO QUÍMICO
TRANSPORTISTA: TRANSEVISA, S.L.
MAESTRO GINER 50
PUERTO SAGUNTO
FAURA
CIF/NIF: B-96457510
CP: 46520
CIF/NIF: B-97280192
CP: 46512

BUQUE: 000007 COS ANGEL
PRODUCTO: 000003 CLINKER
DEST/PROCD: R
Observaciones: C. LA UNION - RIBARROJA DEL TU
BRUTO: 40.980
TARA: 13.660
NETO: 27.320

4611SP600000K027320DUA4611611111000015786CJJ

Paperless Clearance Procedure

- 1 The Terminal gives the document with the barcode to the truck driver.

Terminal



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

Customs Police



- 4 Exit of goods is introduced in Central Customs System

Central Customs System



- 3



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



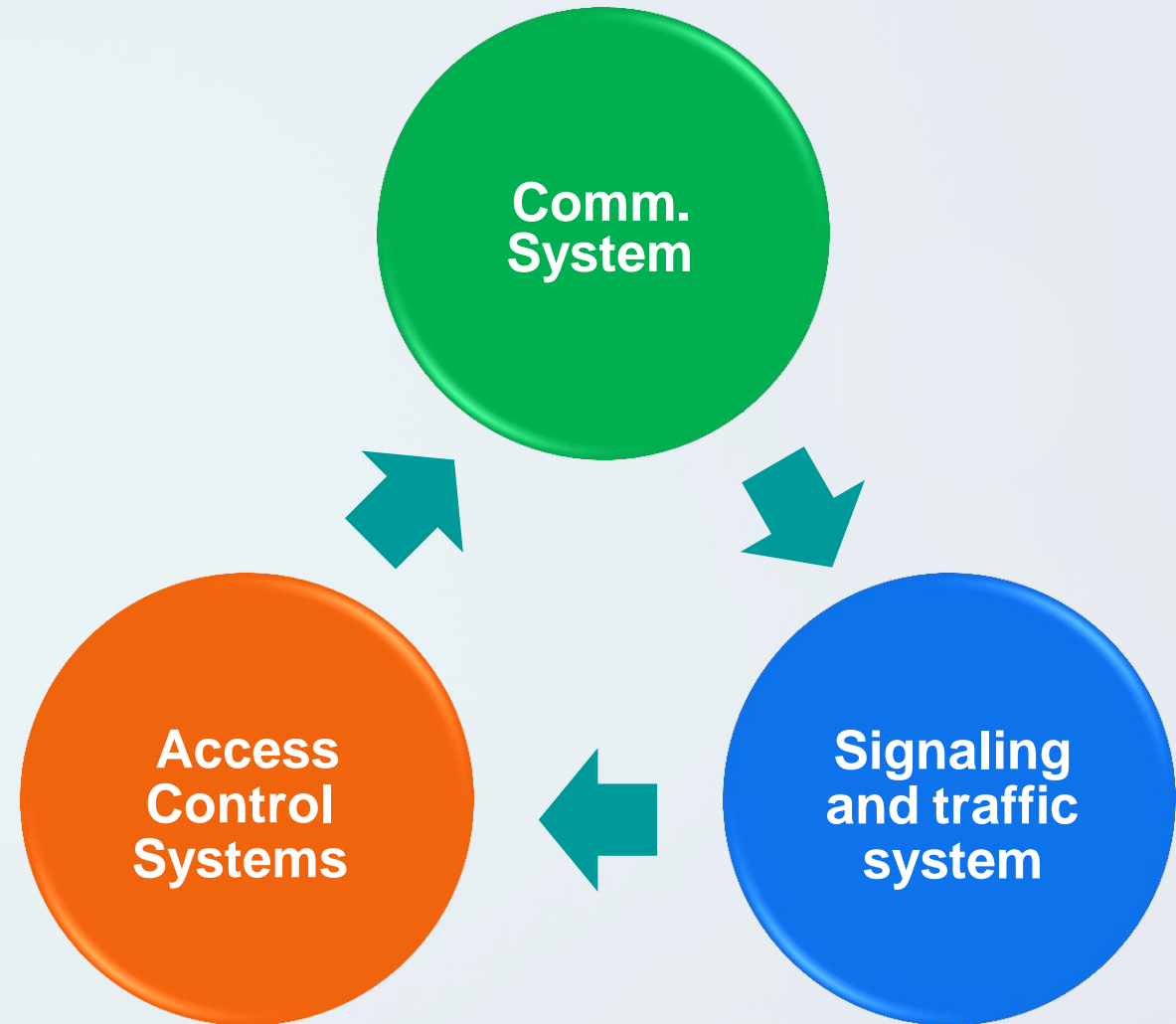
Automatic Paperless Clearance

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.

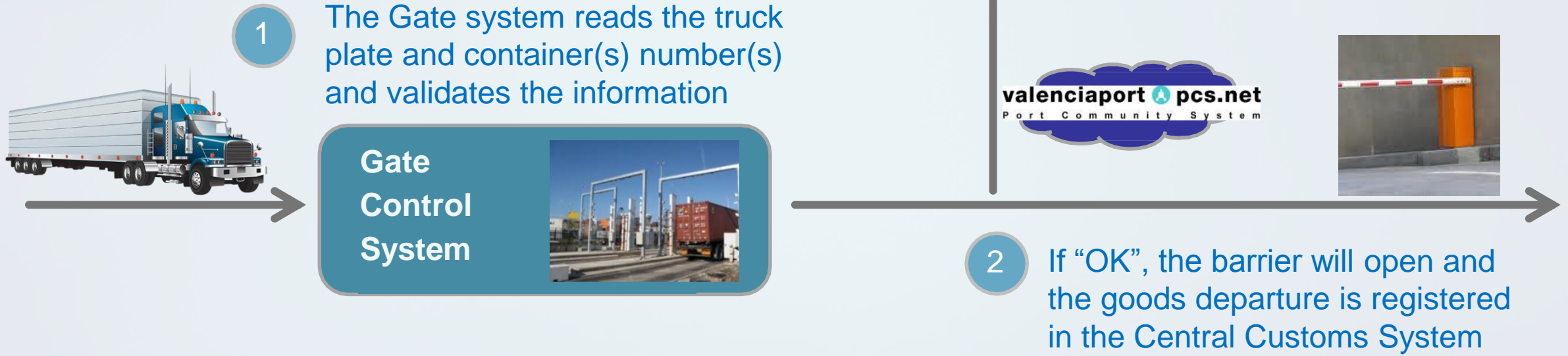


Automatic Paperless Clearance

The Automatic Paperless Clearance System is composed by three systems:

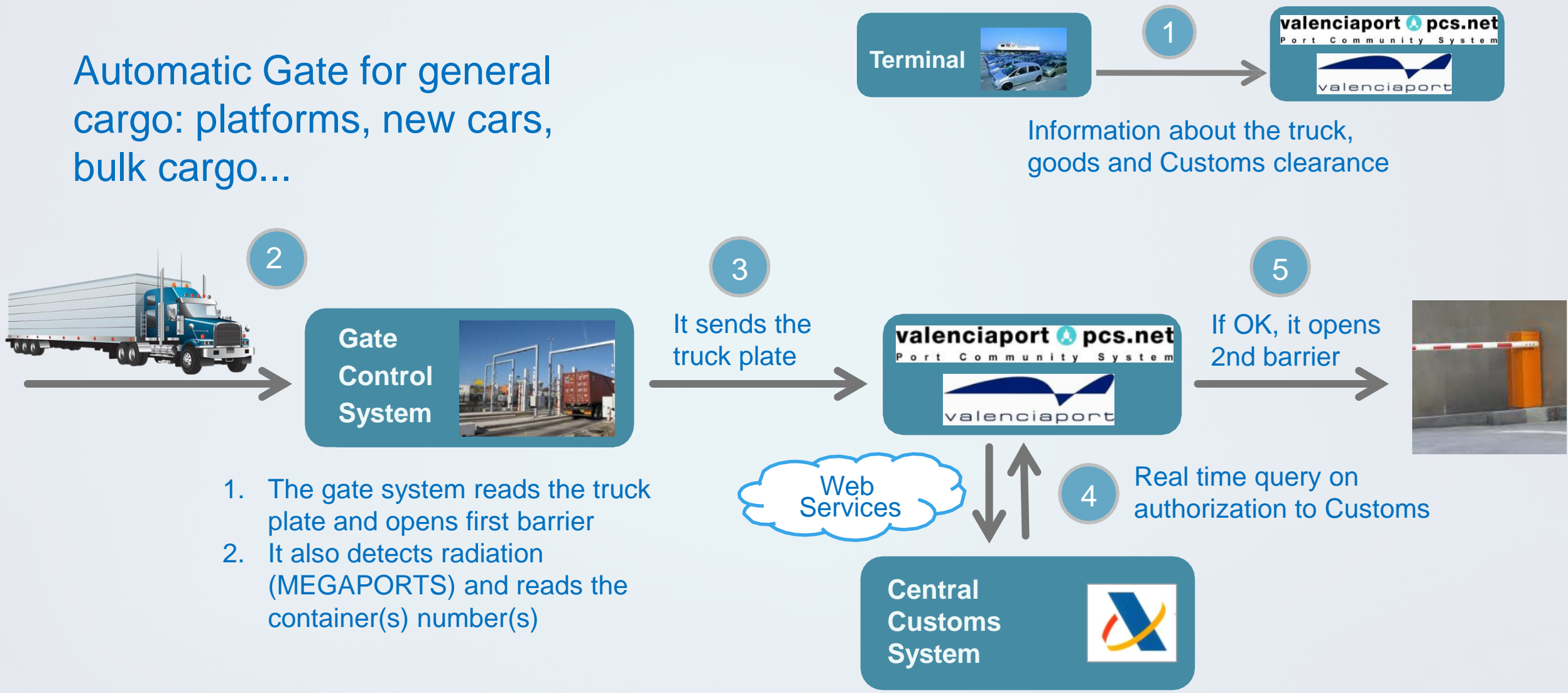


Automatic Gate for Containers



Communication 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)

Signaling and traffic System

5 exit lanes

Automatic gate (max. 4)

Manual gate (min. 1)



Signaling and traffic System

Traffic signal, traffic lights, variable message panels, traffic regulators...



Signaling and traffic System

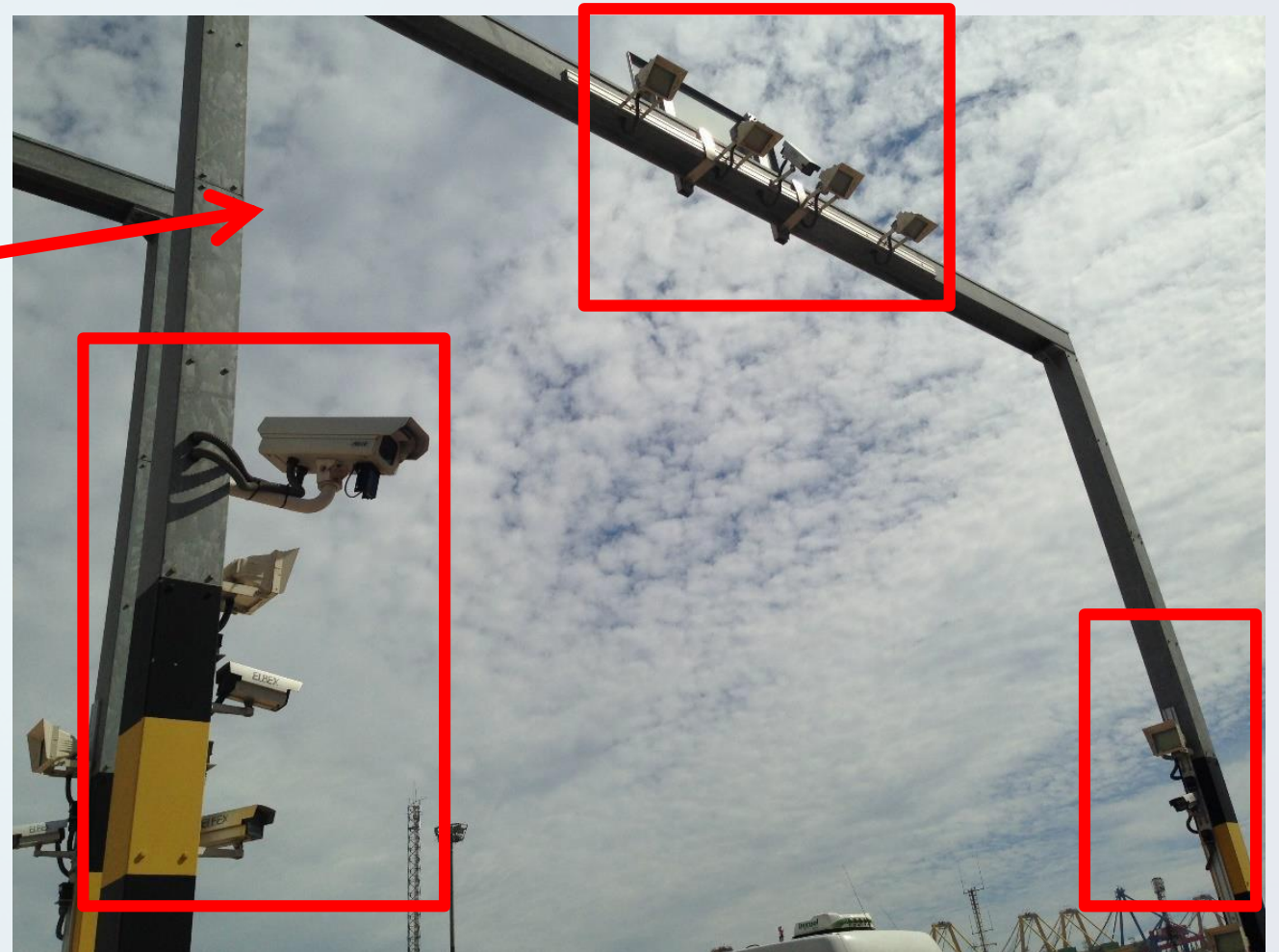
License plate recognition system (LPR)



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)

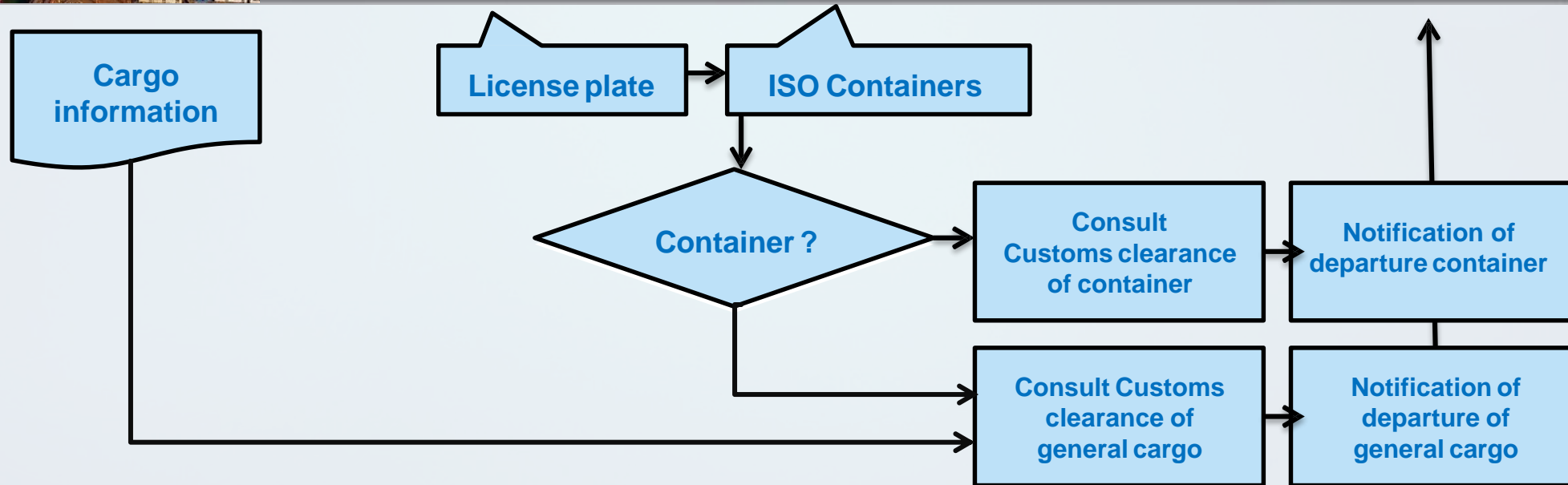
MEGAPORTS is the result of an international security program designed by the US Department of Energy to prevent illicit trafficking of nuclear and radioactive materials.

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



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

PAST



SUBMIT



CHECK



EXIT

PRESENT



Source: the Valencia Customs Department

Automatic Paperless Clearance

MOS4MOS



Co-financed by the European Union

Trans-European Transport Network (TEN-T)



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

