

# Tecnología e Innovación para el Negocio Portuario: Algeciras BrainPort 2020

## II Jornada de Innovación en Logística Portuaria

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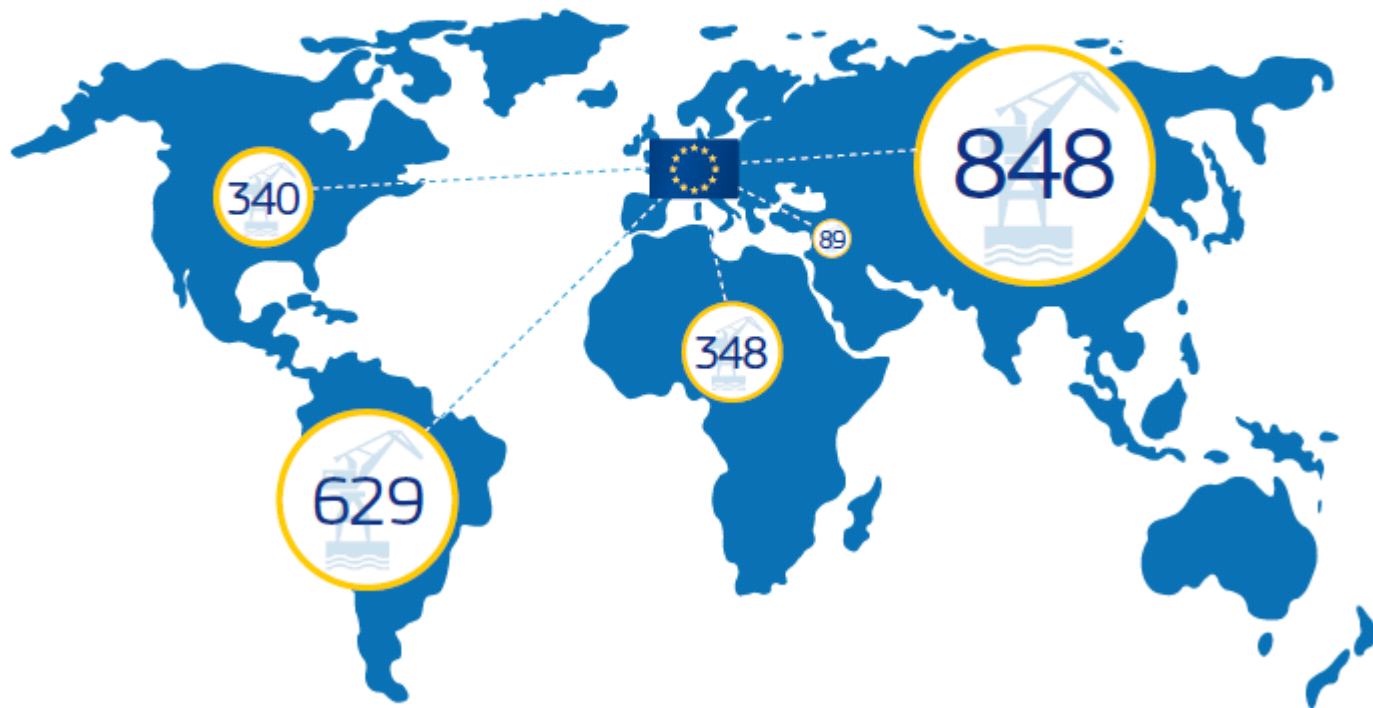


*Málaga, 29 de Septiembre de 2016*

# Algeciras Port Logistics Context

## 74% of EU trade goes by ship.

Ports in Europe are directly connected to **848** ports in the Far East and **629** in Central and South America.



Source: ESPO, European Port Performance Dashboard, 2012

# Algeciras Port Logistics Context

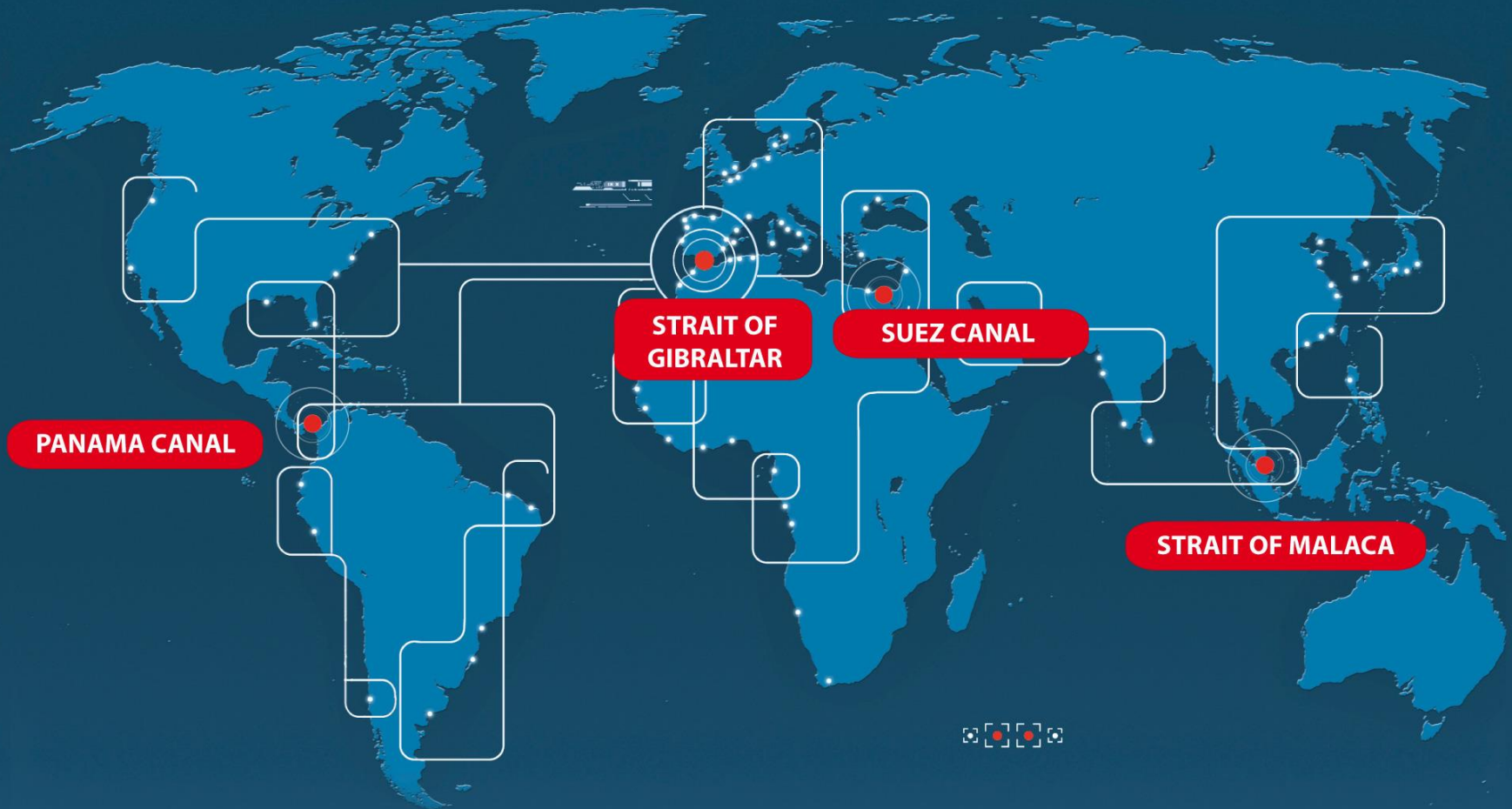
20% of traffic in the EU is handled by only 3 ports.

**By 2030 traffic is predicted to rise by 50%.**



**Source:** Impact Assessment accompanying the proposal for a Regulation establishing a framework on market access to port services and financial transparency of ports, 2013

# Algeciras Port Logistic Context



**Key Global Maritime Node Linking Europe with Africa and the Mediterranean with the Atlantic**

# Algeciras Port Infrastructures: Impact of Megaships

Port of Algeciras:  
Ready to Attend New  
**+20,000 TEUs** Megaships



# Algeciras Port Infrastructures: Impact of Megaships



18000 TEUs

Port of Algeciras:  
Ready to Attend New  
**+20,000 TEUs** Megaships



19000 TEUs



16000 TEUs

# Algeciras Port Logistics Context

**2015**



**TOTAL THROUGHPUT**  
**98,2 MILL TON**



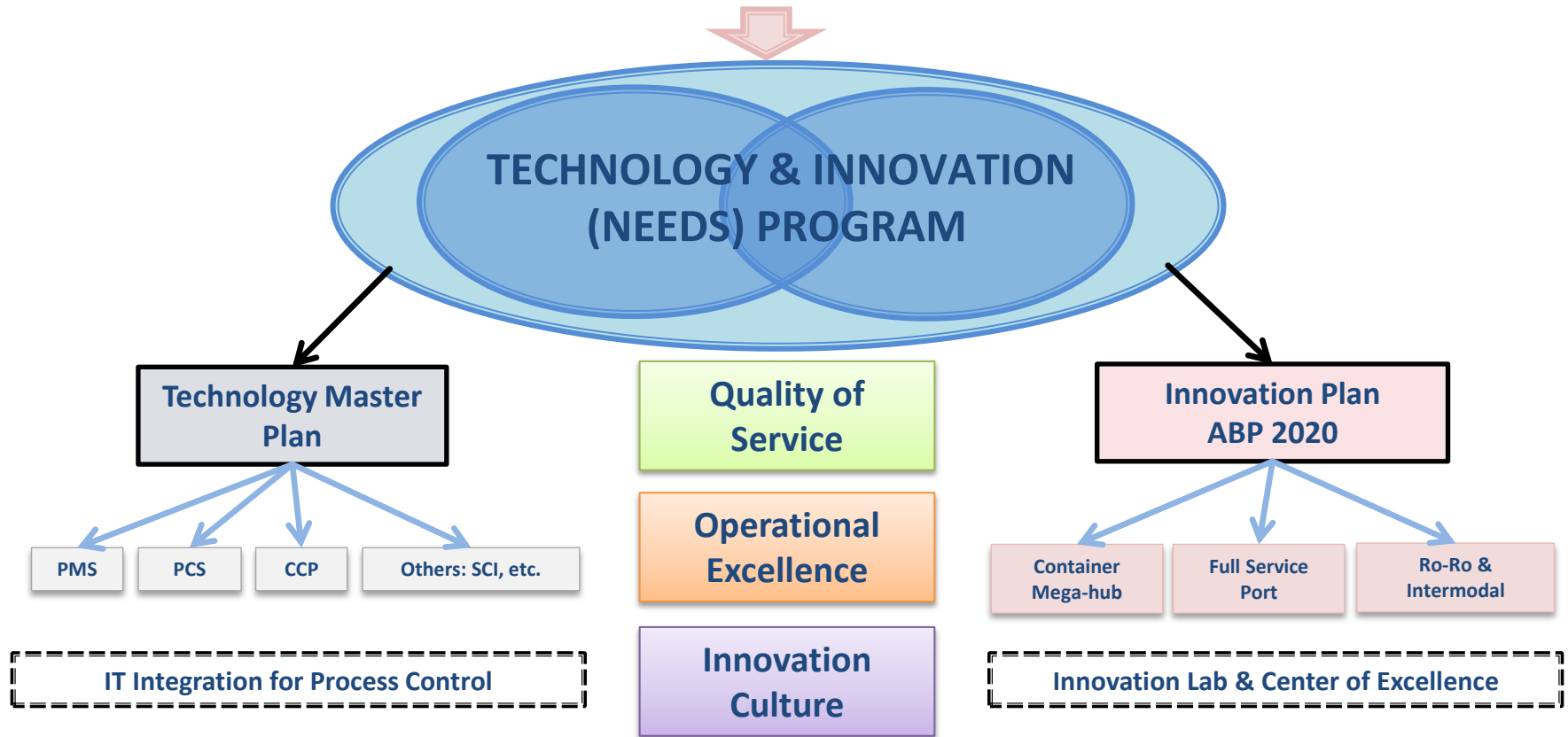
**CONTAINERS**  
**4,5 MILL TEUs**



**RO-PAX**  
**Trucks : 290.142**  
**Passengers : 5,2 MILL**

# Port Technology & Innovation Program 2014-2020

## ALGECIRAS PORT STRATEGIC PLAN 2020



**Technology & Innovation to the Core for Operational Excellence & Continuous Improvement Mindset With and For Algeciras Port/Logistics/Trade Community. Collaboration across the Port Community & Integration along the Logistic Chain.**



# Port Technology & Innovation Program 2014-2020

**Algeciras Port Value Proposition:** 1st Spanish and 4th European port in total cargo. Superior quality of service at geostrategic location. *“The Just-In-Time Full Service Port”*



**Quality of Service at Competitive Price:** Completeness + Efficiency + Reliability + Flexibility

Operational Excellence & Port Authority As Efficiency Partner

Port Collaborative Decision Making & Port Logistics Integration

Better Coordination, Port Logistics Integration and Systematic Innovation Culture

# Technology & Innovation Master Plan Principles

## Technology & Innovation to the Core



## Visibility & Transparency



## Port Collaborative Decision Making



# Technology & Innovation Master Plan Principles

## To Be Ready for the Future



## Next Generation Port Concept – “Smart/Brain Port”



Rafael Yuste, científico español que ha inspirado el Brain Activity Map Project (BAM) y firmante sénior del artículo de *'Neuron'*

# Algeciras Last Generation Port Concept

## NGP Next Generation Port Concept: BrainPort Vision



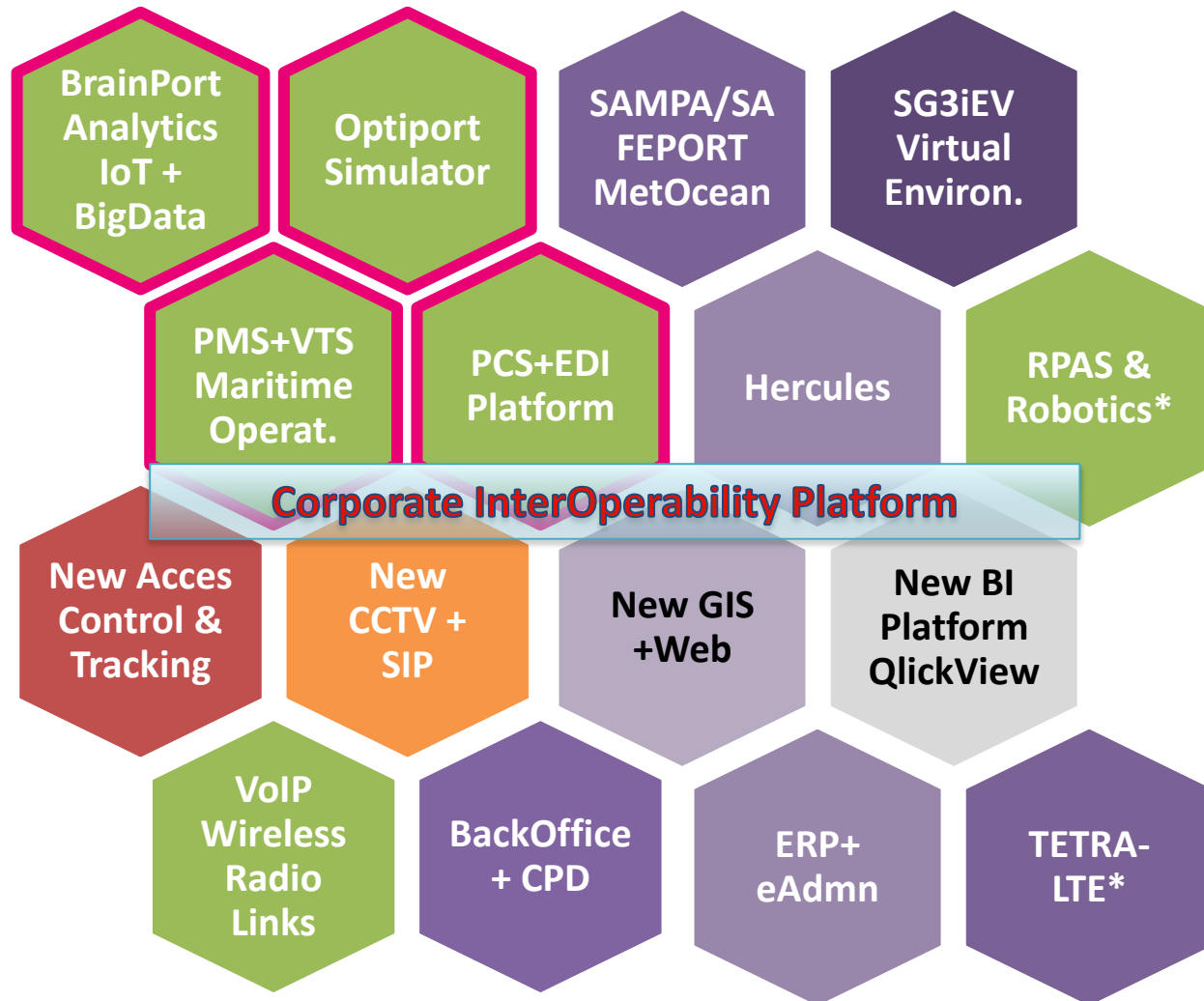
- **Port Digital Layer: Real Time Info & Efficiency of Every Business Process**
- **Business Analytics Platform: Learn & Take Better Decisions**
- **Port Collaborative Platform: Smart Integration of Systems and Agents to Share Information => Towards a High Quality Seamless Logistic Chain**
- **Holistic Port Processes Simulator for Planning (years) and Management (hours) => What if scenarios?**
- **Systematic Innovation Culture at Port Community Challenges the Status-Quo => Continuous Improvements Mindset & Ready to Adopt New Business Models**

# Technology & Innovation Master Plan 2014-2015/6

## What's going on in practice?

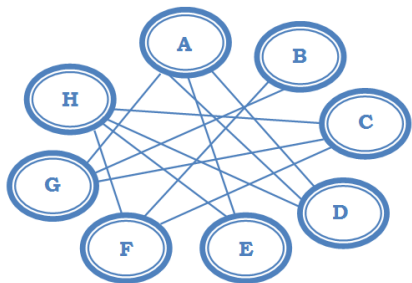
**2014 – 2015/6**

20% PCS & PMS  
25% TELCO Inf.  
25% Security & Tracking  
30% Innovation



# Port Community System TELEPORT -> TELEPORT 2.0

## Information and Documentation Exchange Platform



*From **Port** Community System To **Logistic** Community System To **Trade** Community System  
**Integration Along the Logistic Chain***

### TELEPORT 2.0

*Downstream:  
Inland*

*Upstream:  
Port-to-Port*



# Port Operations Management System: Phase I

Data Acquisition &  
Standardization

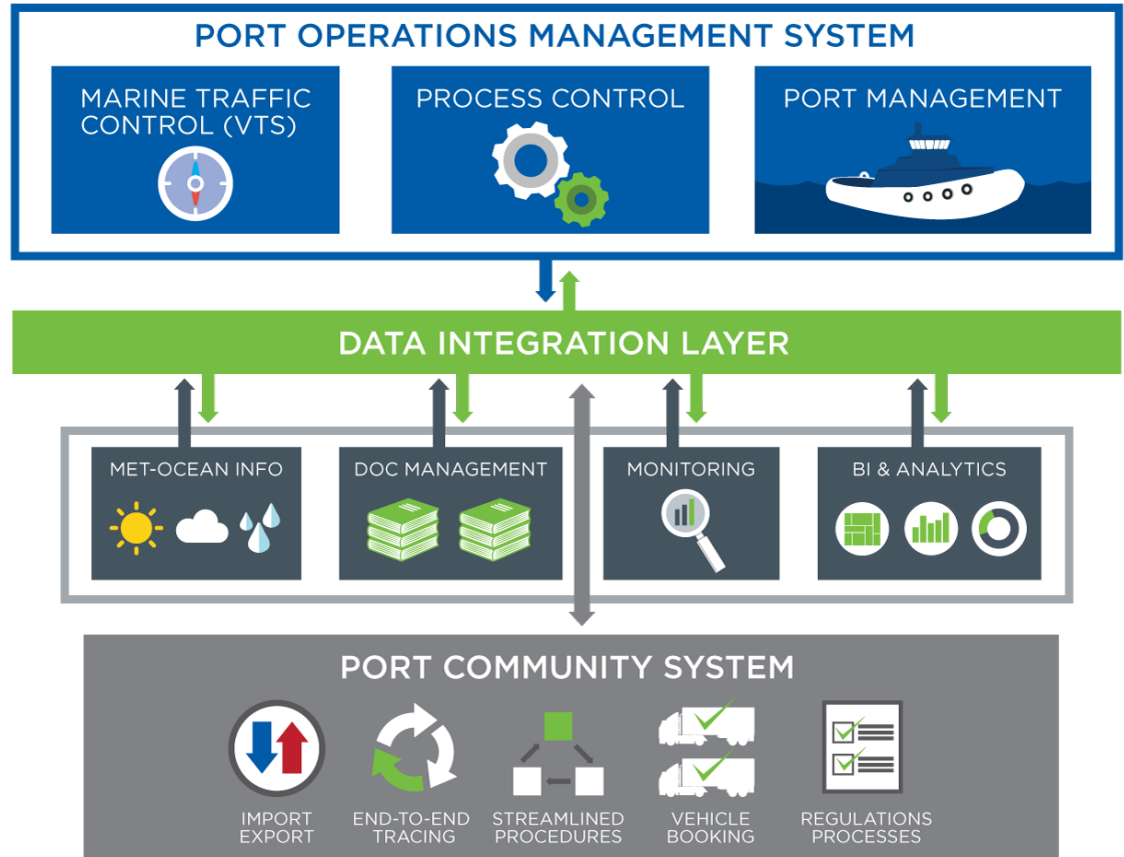
Dynamic Data Exchange

Visibility Among  
Stakeholders

Support Executives to  
Optimize OPS



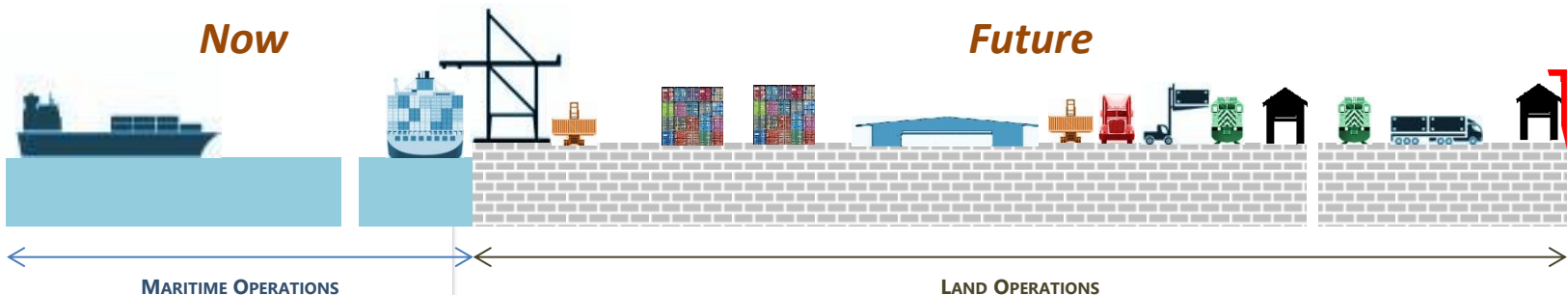
Integrated OPS Excellence



*Now*

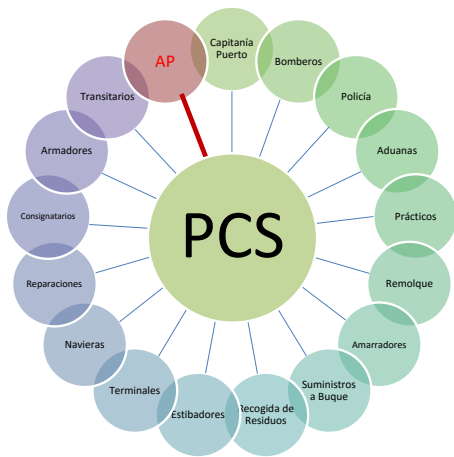
*Future*

15



# PMS-PCS Integration

## Interface With Port/Logistics Community



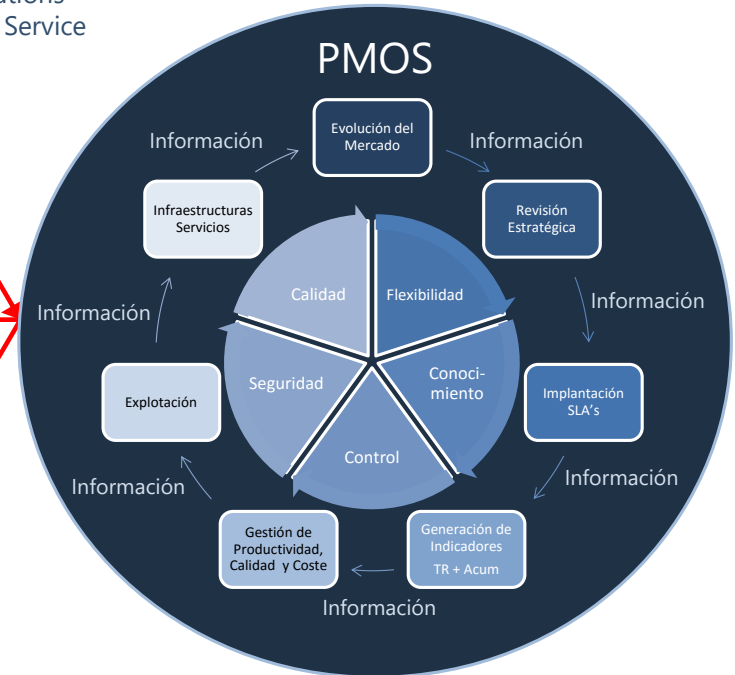
Applications

Authorizations

Info about Operations

- ✓ Vessel Calls
- ✓ Bunkering
- ✓ MARPOL
- ✓ Reparations
- ✓ Water Service
- ✓ ...

## Monitoring, Control & Management Port Operations



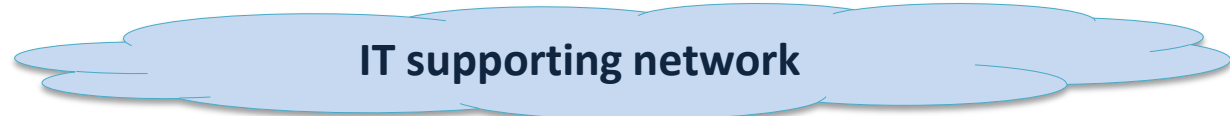
**Better Information – Better Coordination – Better Operations  
More Shared Value!**



# BrainPort Analytics: Processes, IoT, Big Data & BI

Operations + Meaningful Information = "Process Intelligence"

Advanced Sensorization



## BrainPort Analytics

Sensor Data

Processed Data

Real Time communication – Sensor Network management

Real Time

BigData

Analytics

Data Processing

BI

Real-time Data

Historical Data

Processed Data

Balanced Scorecard

INTEGRATION PLATFORM – BUS EAI

PCS

PMS

GIO

SIP

x

x

x

...

Big Data

# BrainPort Analytics: Processes, IoT, Big Data & BI

**SIGCA Cámara CAMS\_PIF-OUT**  
 Unnamed Road, 11201 Algeciras, Cádiz, Spain

**LOCALIZACIÓN**

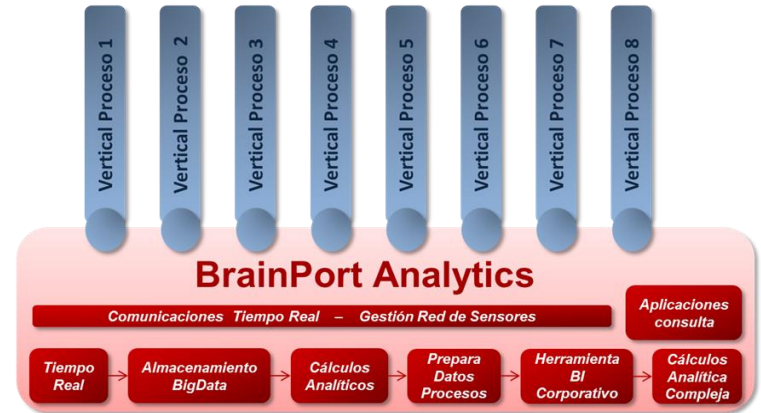
**IMÁGENES**

**MÁS RECIENTE**

**ACTIVITY**

Fecha	Hora	Identificador
11/11/2015	14:28:00	5678-CFN
11/11/2015	14:33:40	3958-CMC
11/11/2015	14:39:00	9024-AOG
11/11/2015	14:39:30	3839-ADM
11/11/2015	14:41:10	2034-AGG
11/11/2015	14:43:10	0122-DPS
11/11/2015	14:44:50	1320-ACV

Descripción: Fecha de creación: 09/10/2015 Ubicación: Estático



## Access to BPA



**Cuadro de Mando** | Análisis | Informes | Configuración | Ayuda

Fecha Actual = 11/11/2015 10:45  
 Última Recarga = 10/11/2015 15:05

2013 | 2014 | 2015 | ene | feb | mar | abr | may | jun | jul | ago | sep | oct | nov | dic | Día

Naviera	Nº Equipamientos	Var Nº Equip: 12,9%	Nº Escalas	Var Nº Escala: 15,5%	Tiemp Med Levante-Import
Acciona	18.267		1.142		2d 14h 41m
Balearia					
Benzú					
Frs	20.976		1.352		0d 11h 44m

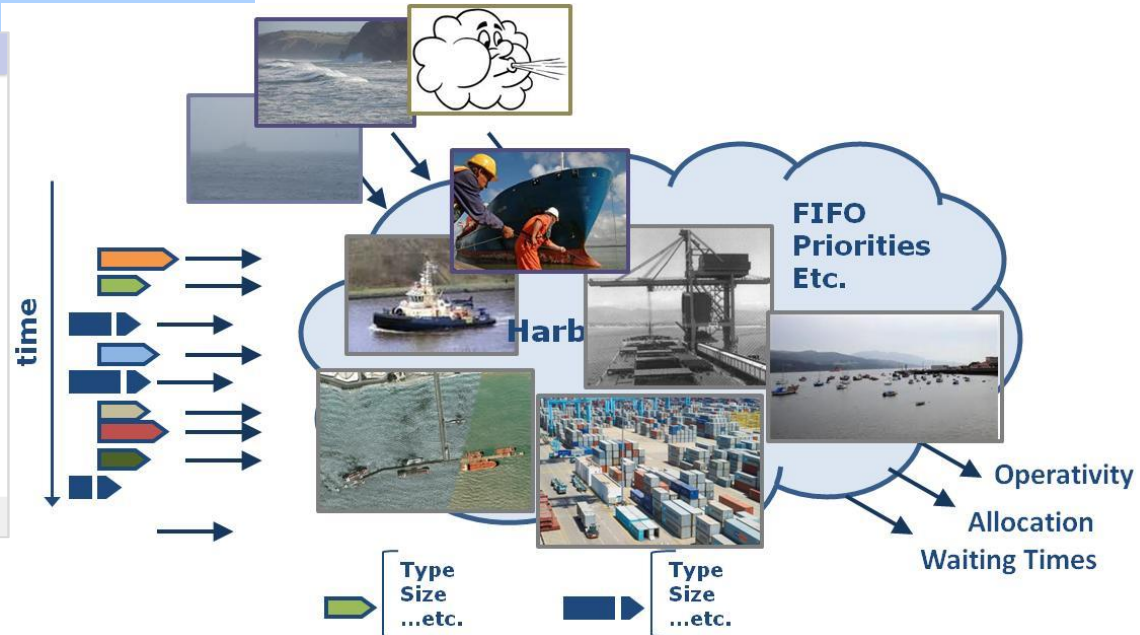
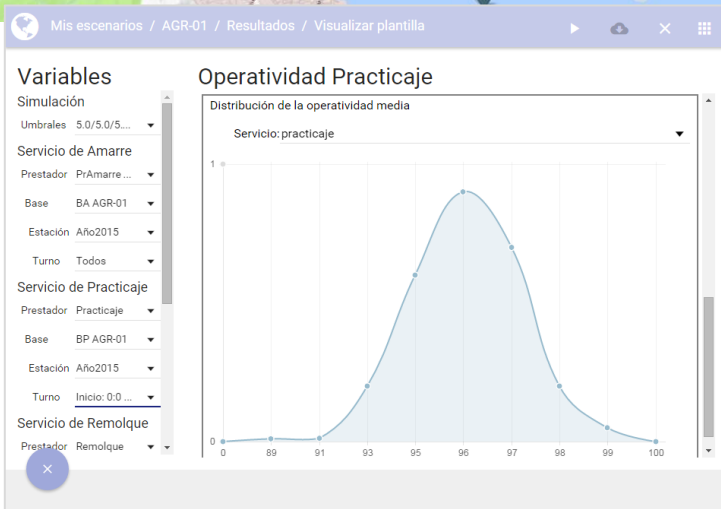
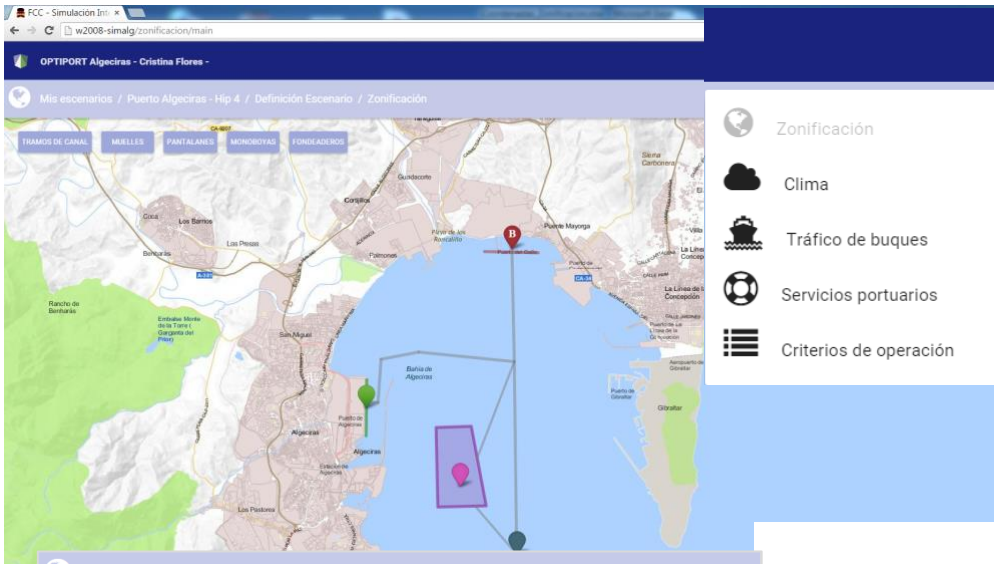
Nombre Buque	Retraso medio Llegada Buques (hh:mm)	Retraso medio Salida Buques (hh:mm)	Tiempo medio Atraque Buques (hh:mm)
Alboran	ago 2014: 01:22	ago 2014: 01:13	ago 2014: 02:25
Alcantara Dos	ago 2015: 01:04	ago 2015: 00:52	ago 2015: 02:34
Algeciras Jet			
Amman			

Muelle Atraque	% Medio Ratio Ocupación PIF	Var % Ocupac PIF: -9,6%	Tiempo Medio PIF (hh:mm)	Var Tiempo Med PIF: 18:15	% Med Ausencia Cita Escáner
Dique Norte	21,1%		15:14		3,6%
Galera Atraque 1					
Galera Atraque 2					
Galera Atraque 3					
Galera Atraque 4	11,6%		09:29		1,8%
Galera Atraque 5					

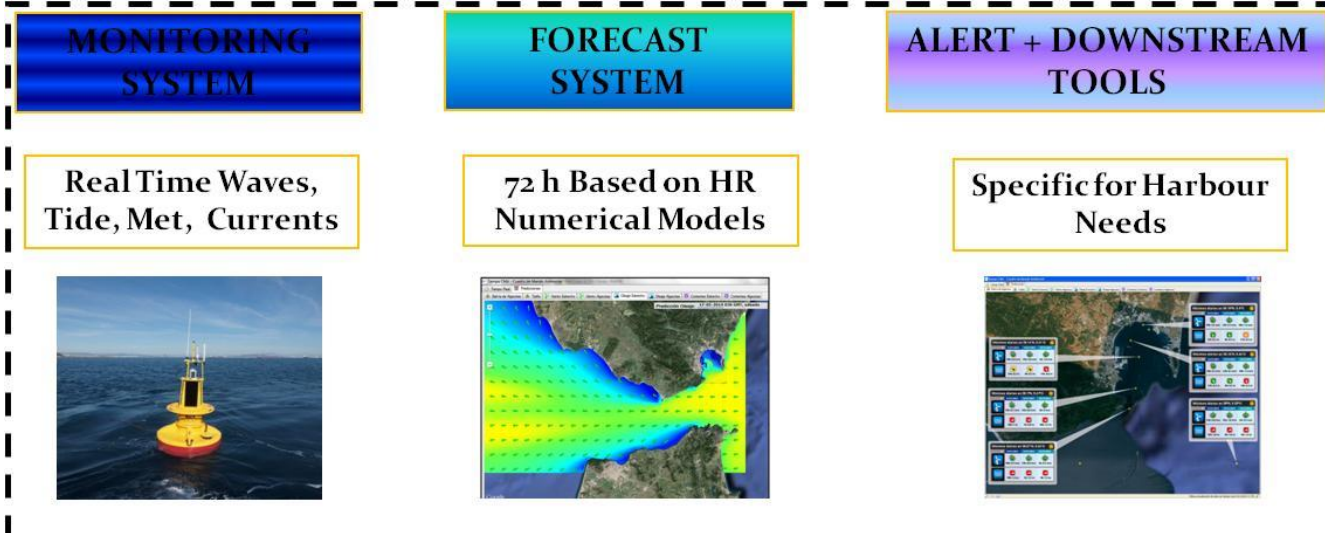
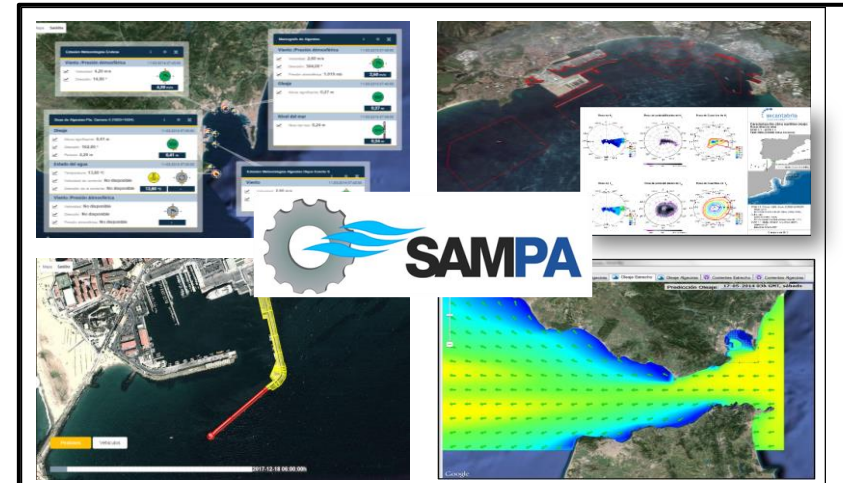
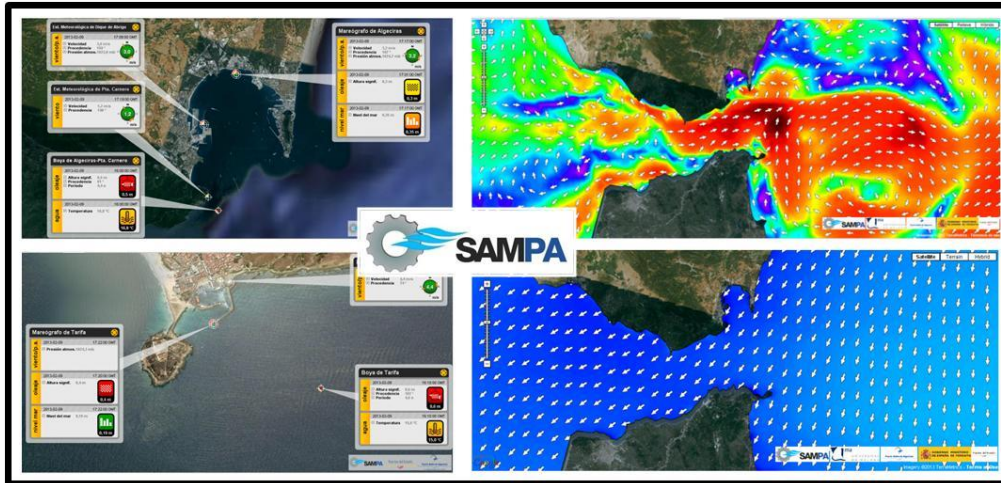
# OPTIPOINT: Integral Simulations of Port Operations

## What If Scenarios for Planning!

[Access to Optiport](#)

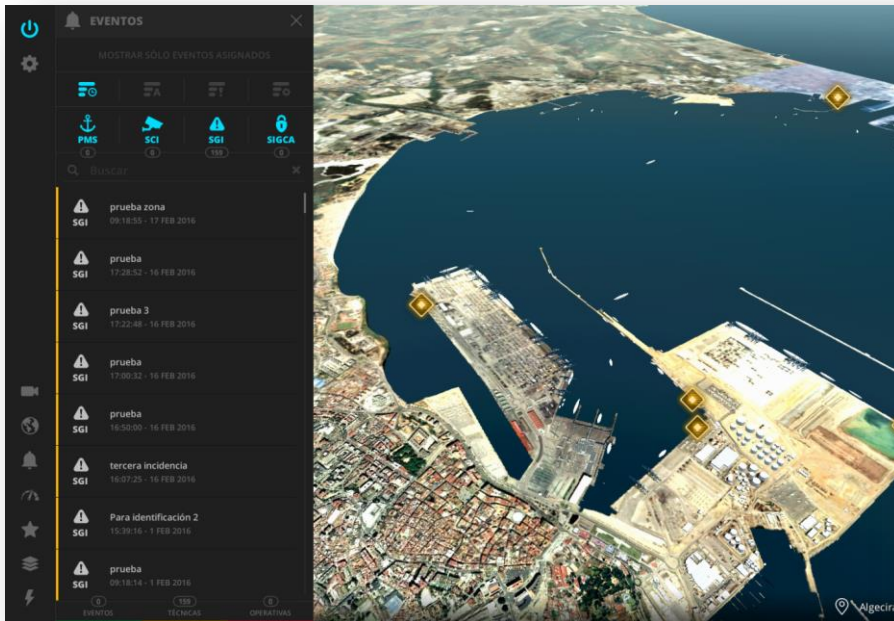


# SAMPA: Advanced Met-Ocean Monitoring and Forecasting



# SG3iEV: Virtual 3D Infrastructure Management Platform

GIS – 3D – Real Time Integration – Complex Event Processing  
TOWARDS UNIQUE INTUITIVE 3D PORT INTERFACE  
From System Operators To Business Operators



[Video SG3iEV](#)



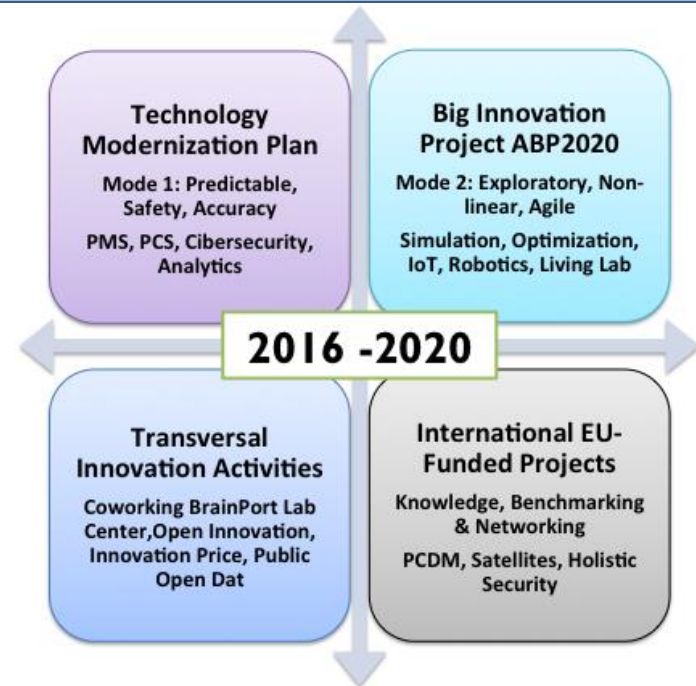
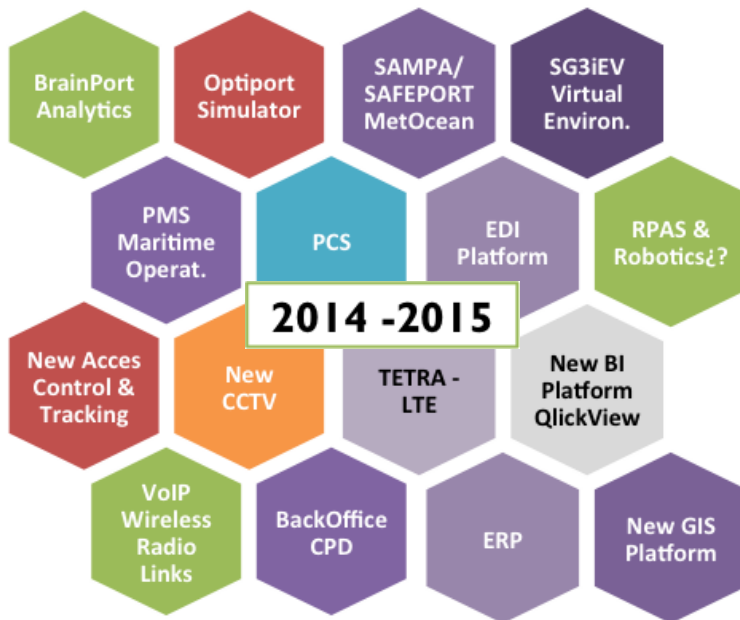
# Technology & Innovation Master Plan Next Steps

## Phase I (2014-2015/6)

- **IT Infrastructure & Corporate Platforms**
- **Innovation Framework**
- Digital APBA Eco-system
- Core Foundation + Quick Wins

## Phase II (2016-2020)

- **Integrated Operational Excellence (QS)**
- **Port Collaborative Decision Making**
- **Maximize Impact on Port Community**
- **Systematic Innovation Culture**



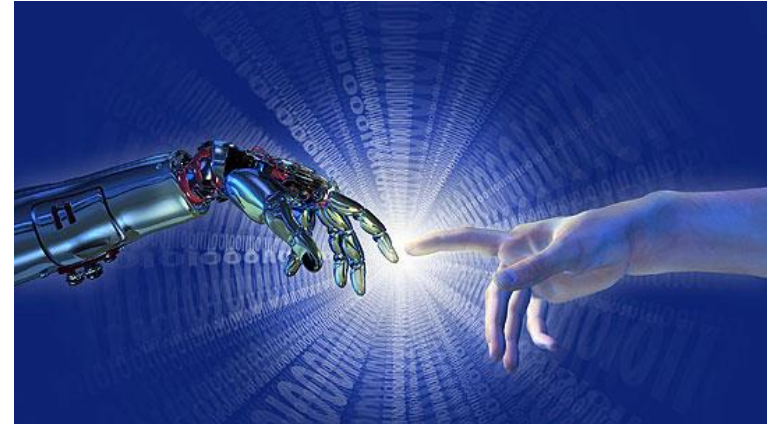
# Technology & Innovation Master Plan Next Steps



*i-momentum*



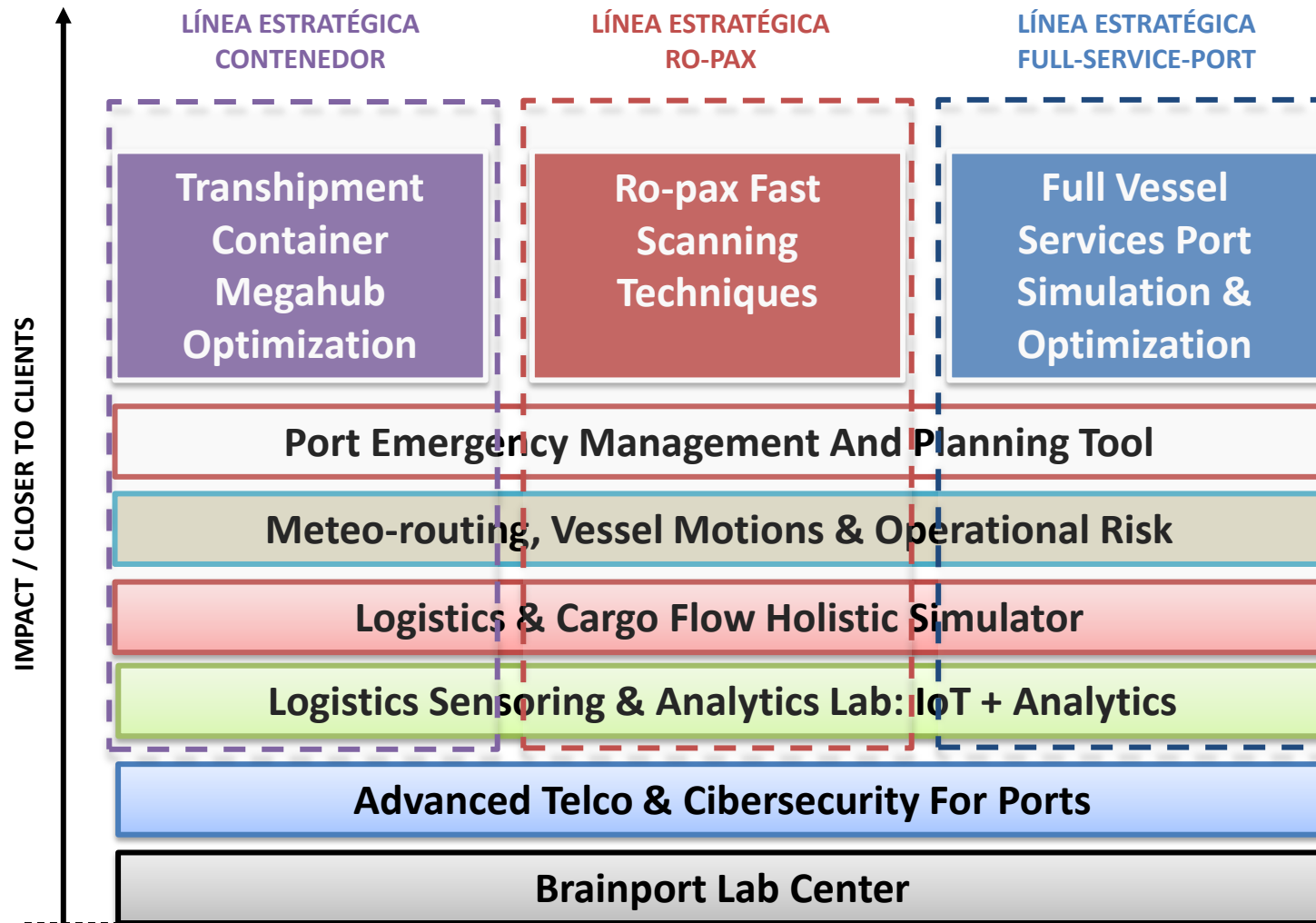
# Big Innovation Program ABP2020 II with 11 Initiatives



1. **Transshipment Container Mega-Hub Optimization (PDCM in Container Flow)**
2. **Full Service Port Simulation and Optimization (Slot & Dynamic Pricing Mgment)**
3. **Ro-Pax Fast Scanning Techniques**
4. **Port Emergency Management and Planning Tool**
5. **Land Operations & Cargo Flow Holistic Simulator**
6. **Meteo-Routing, Vessel Motions & Operational Risk Forecast System**
7. **Logistics Sensoring Lab & Advanced Data Analytics (IoT & Predictive Analytics)**
8. **Advanced TELCO for Port Environments (3 Projects)**
9. **BrainPort Lab Center: Innovation + Coworking + StartUp Accelerator**



# Big Innovation Program ABP2020 II with 11 Initiatives



# Big Innovation Program ABP2020 II with 11 Initiatives

## Business Goals – Scope - Innovation

Datos de Partida  
(Agentes del Medio Físico)



Monitorización Infraestructuras  
y Buques Atracados



Simulación de la Respuesta  
del Buque Atracado

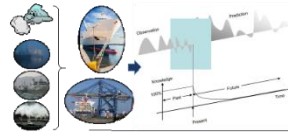


Fiabilidad y Operatividad  
de las Infraestructuras  
Existentes



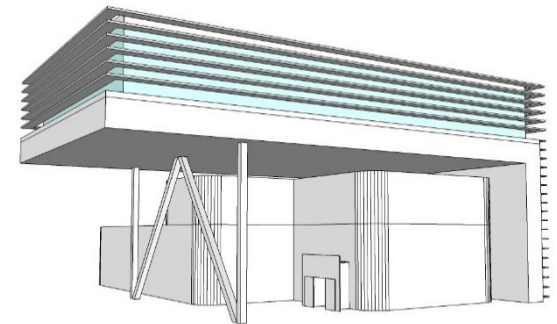
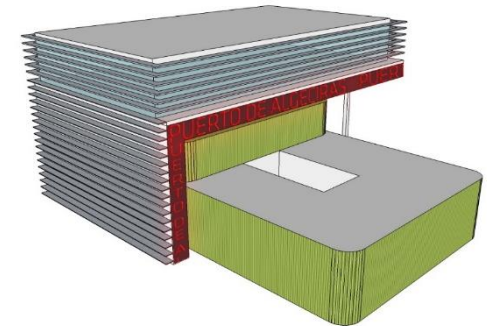
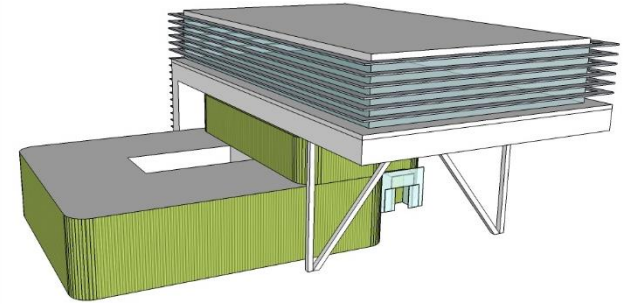
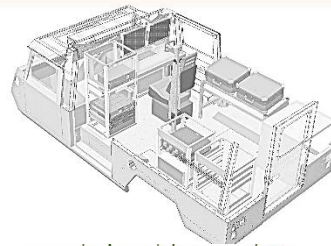
Herramientas SW para la  
planificación y gestión portuaria

- Riesgo Infraestructural
- Ventanas Operativas (Rendimientos)



Optimización de Rutas Marítimas

- Estrecho
- Canal Suez-Algeciras Rotterdam



# Big Innovation Program ABP2020 II with 11 Initiatives

PROYECTO	PRESUPUESTO	INICIO DIALOGO COMPETITIVO*
Simulación y Optimización en un Hub de Contenedores	2,5 M€	Jun 2018
Simulación y Optimización de Servicios Marítimos	3 M€	Jun 2017
Scanner de Vehículos de Turismo en Puertos de Gran Afluencia	5 M€	Jun 2017
Herramienta de Planificación y Gestión de Emergencias Portuarias	3 M€	Jun 2017
Riesgo de Infraestructuras Portuarias y Buques Atracados	2,5 M€	Ene 2017
Simulador Holístico de Procesos Portuarios Logísticos	2,5 M€	Ene 2017
Sensorización y Técnicas Avanzadas de Data Analytics	2 M€	Jun 2017
TELCO I: Puesto de Mando Avanzado Desplegable	0,6 M€	Jun 2018
TELCO II: Infraestructura de Red Avanzada Portuaria	2,5 M€	Jun 2017
TELCO III: Ecosistema Virtualizado y Unificado de Ciberseguridad	0,5 M€	Jun 2018
BrainPort Lab Center	3 M€	Jun 2017
<b>TOTAL</b>	<b>27,1 M€</b>	

\* Plazos y Presupuestos Estimados Pendientes de Revisión Final

# Technology & Innovation Master Plan Next Steps

ALGECIRAS PORT



BRAINPORT LAB  
CENTER



MARITIME  
TECHNOLOGY &  
INNOVATION CLUSTER

## Phase I (2014-2016): New IT & Innovation Framework

New Corporate IT Platform & Digital APBA  
Ecosystem

New PBA Innovation Framework & Quick  
Wins



## Phase II (2016-2020): IT Structure & Innovation Culture

Maximize Impact on Port Community &  
Integrated Operational Excellence

Sustainable IT Resourcing Plan, Systematic  
Innovation Culture & StartUps



## Phase III (2018-2025): Marit. Tech. & Innovation Cluster

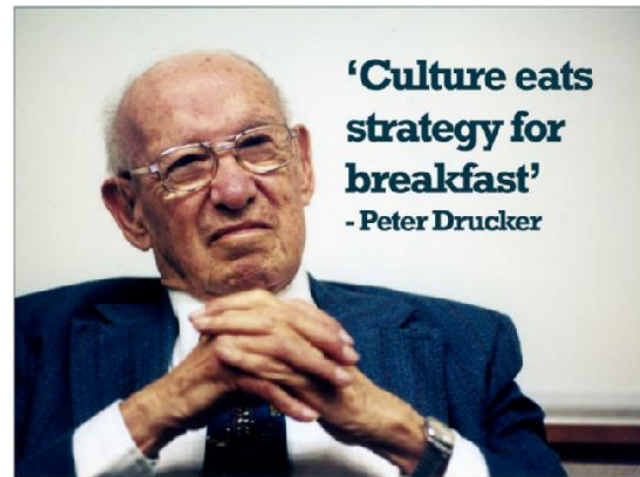
StarUp Accelerator & Strategic Excellence  
Centers Consolidation

Cluster Consolidation & International  
Partnership & Executive Education

# Conclusions

- Long Term Program 2015-2020 and beyond!
- Towards the Next Generation Port Concept
- Team Work across all Port Community & Integration along Logistic Chain
- New Products & Services + Innovation Culture Improvement

**Technology & Innovation to the Core for Operational Excellence & Continuous Improvement Mindset With and For Algeciras Port Community  
Collaboration across PortCom & Integration along LogChain**



A satellite view of the Earth showing the Strait of Gibraltar, the narrow waterway connecting the Atlantic Ocean to the Mediterranean Sea. The land is shown in shades of green and brown, and the water is a deep blue. The curvature of the Earth is visible on the right side.

**Puerto de  
Algeciras**



**Gracias!**