Puertos de Nueva Generación: Innovación Integral en la APBA

Enfoques Sistémicos para la Gestión del Cambio Ambiental

Francisco de los Santos *fsantos@apba.es*

1er ENCUENTRO INTERNACIONAL DE INVESTIGADORES. CAMPUS TECNOLÓGICO DE ALGECIRAS.

Enfoques sistémicos para la gestión del Cambio Ambiental: Taller de divulgación.

24 / 25 Noviembre 2016

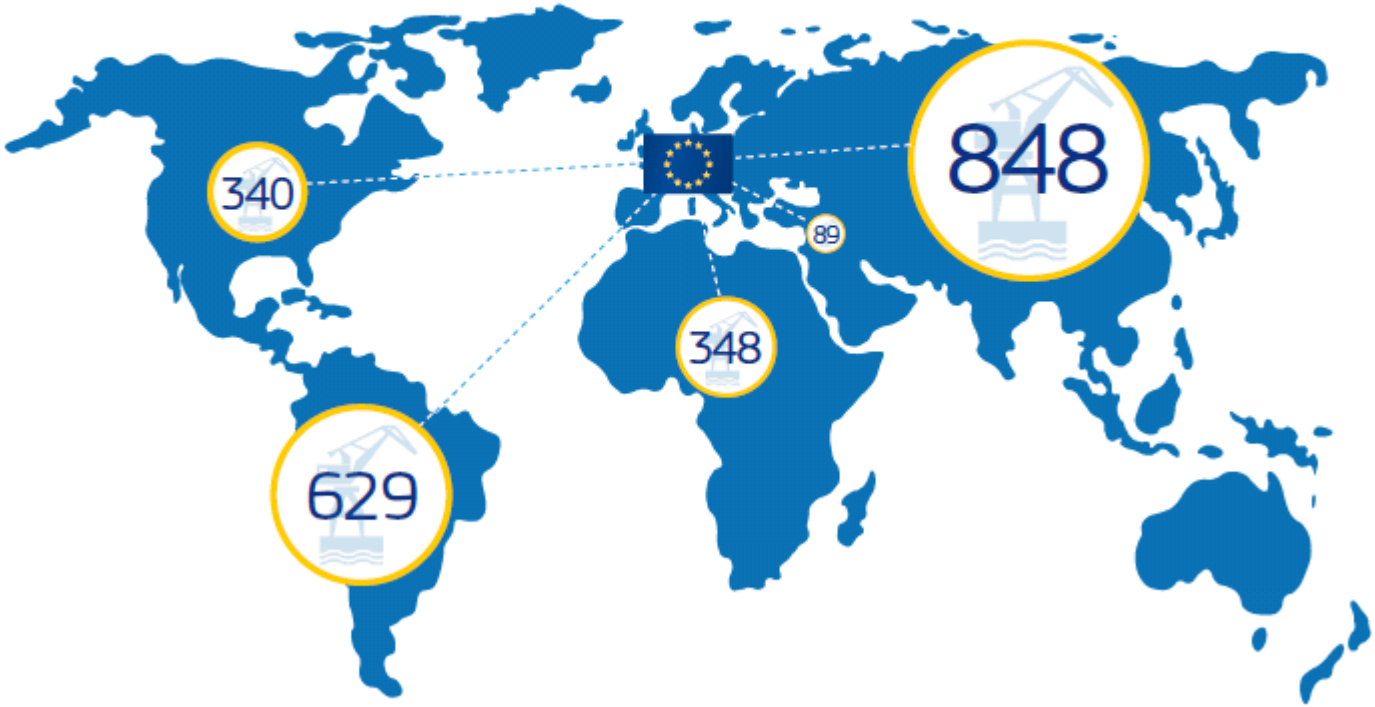
Puerto de Algeciras

Algeciras, 25 de Noviembre 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

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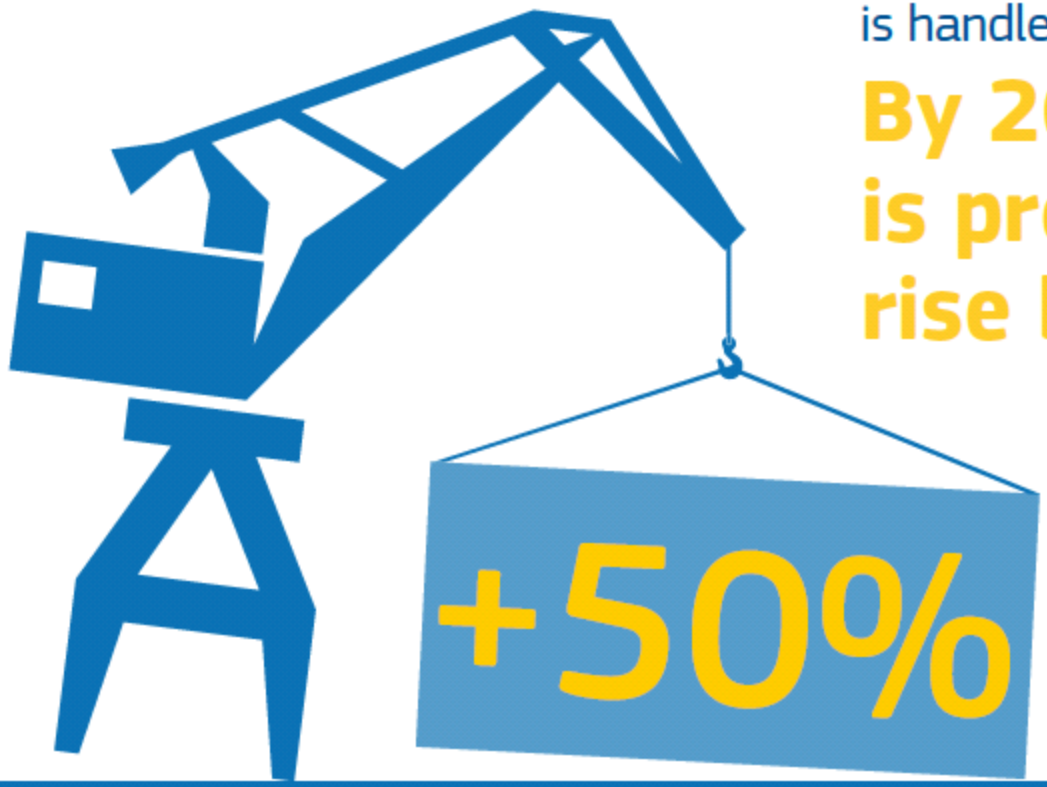
Algeciras Port Logistics Context



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

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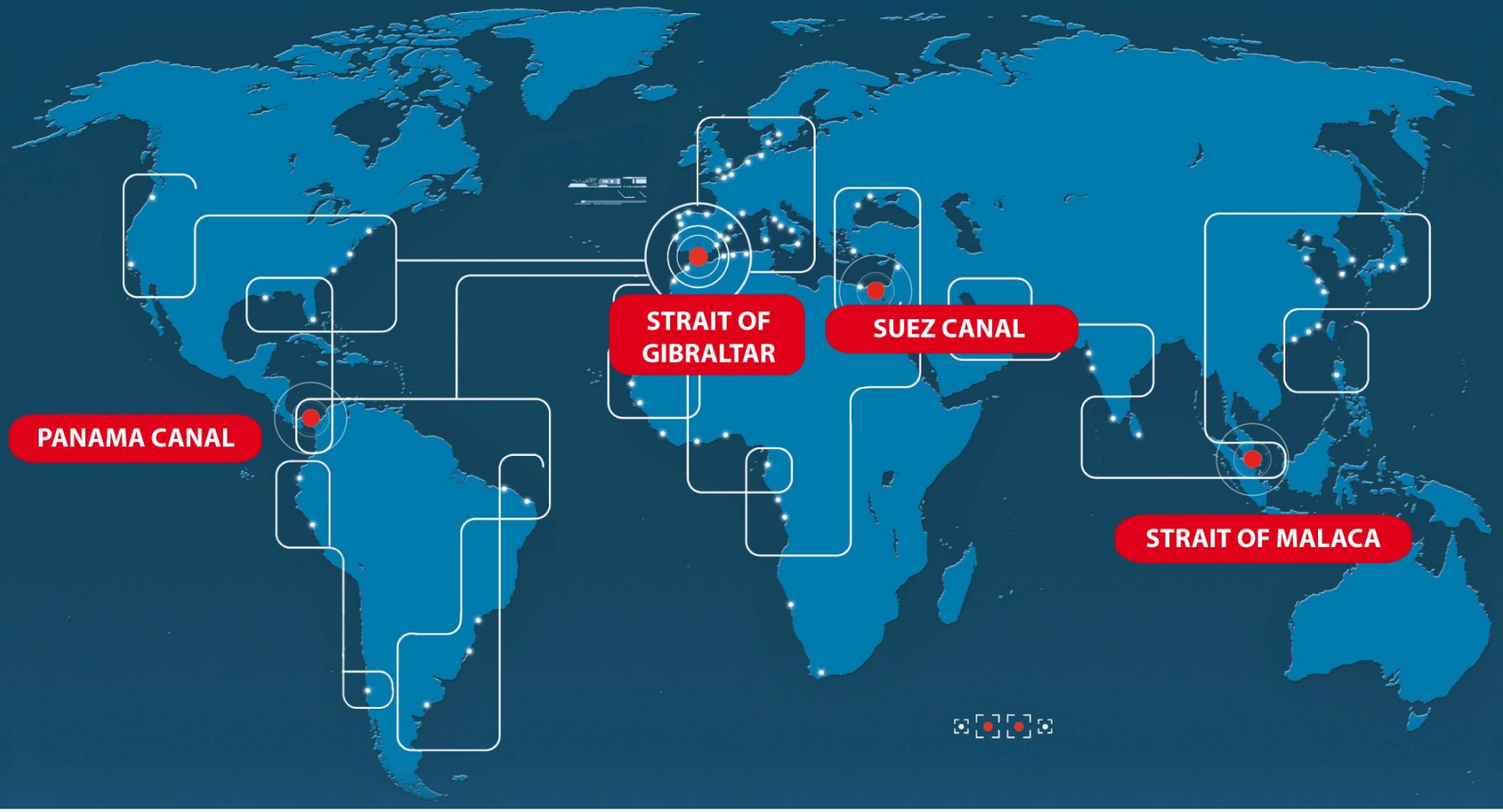
Algeciras Port Logistic Context



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

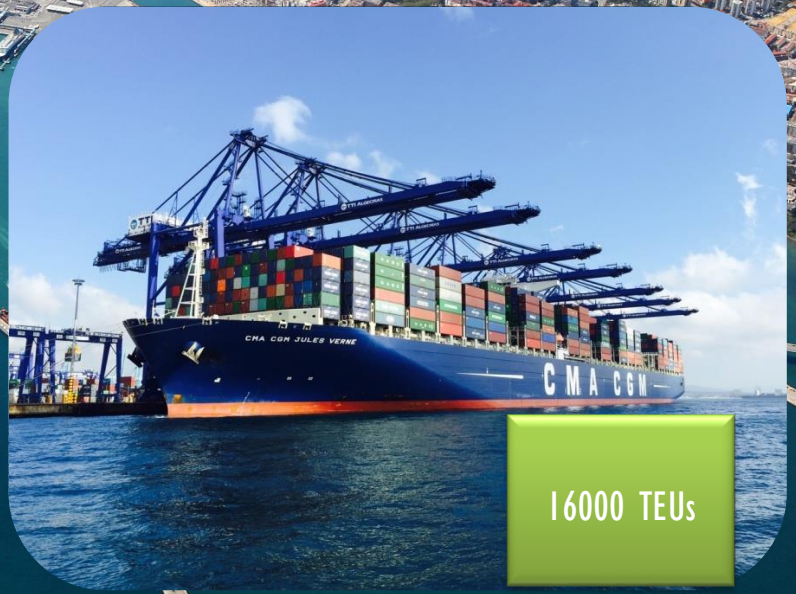
Algeciras Port Infrastructures: Impact of Megaships

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 THROUGPUT
98,2 MILL TON

CONTAINERS
4,5 MILL TEUs

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

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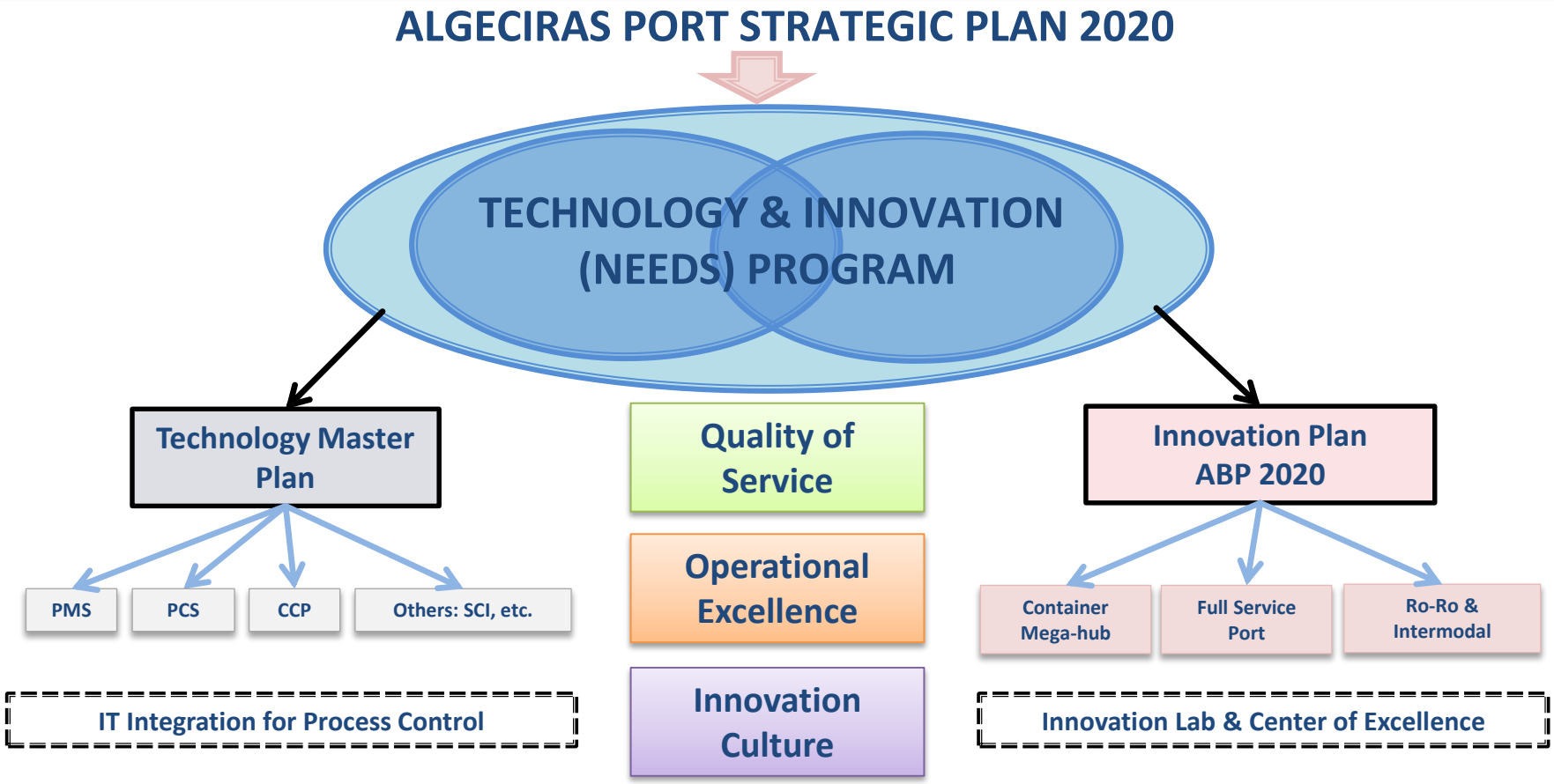
Port Technology & Innovation Program 2014-2020



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.

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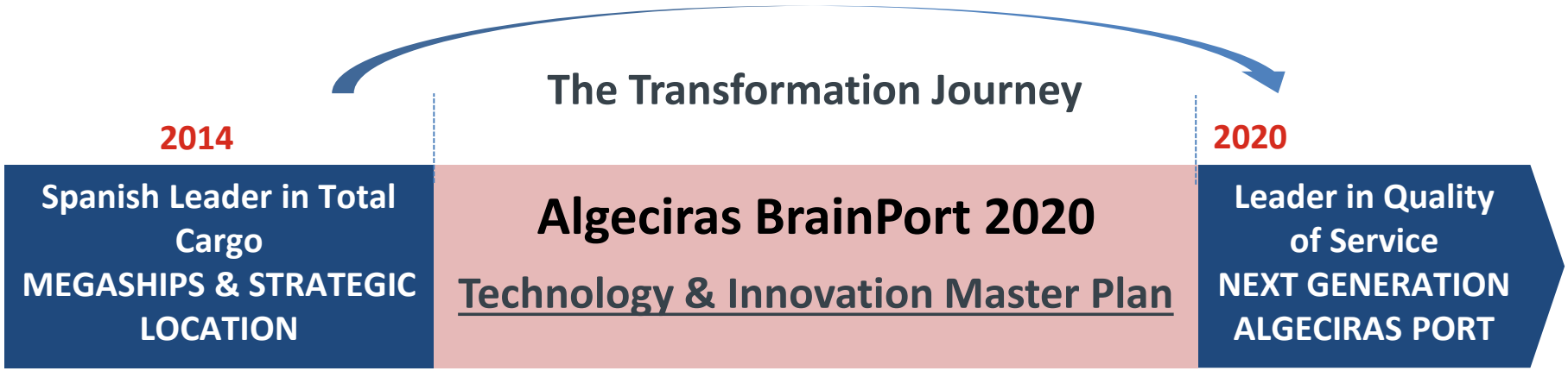
Port Technology & Innovation Program 2014-2020

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 Logistic Platform***"



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

Operational Excellence & Port Authority As Efficiency Partner

PORT COLLABORATIVE DECISION MAKING

PORT LOGISTICS INTEGRATION

SYSTEMATIC INNOVATION CULTURE

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Technology & Innovation Master Plan Principles

Technology & Innovation to the Core

Visibility & Transparency

Port Collaborative Decision Making

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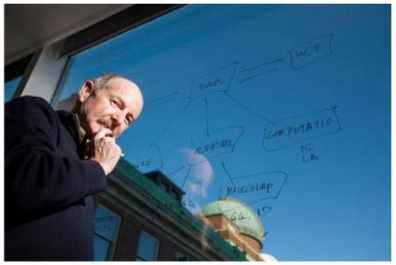
Technology & Innovation Master Plan Principles

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***’

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Algeciras Last Generation Port Concept

NGP Next Generation Port Concept: BrainPort Vision

Puerto de Algeciras

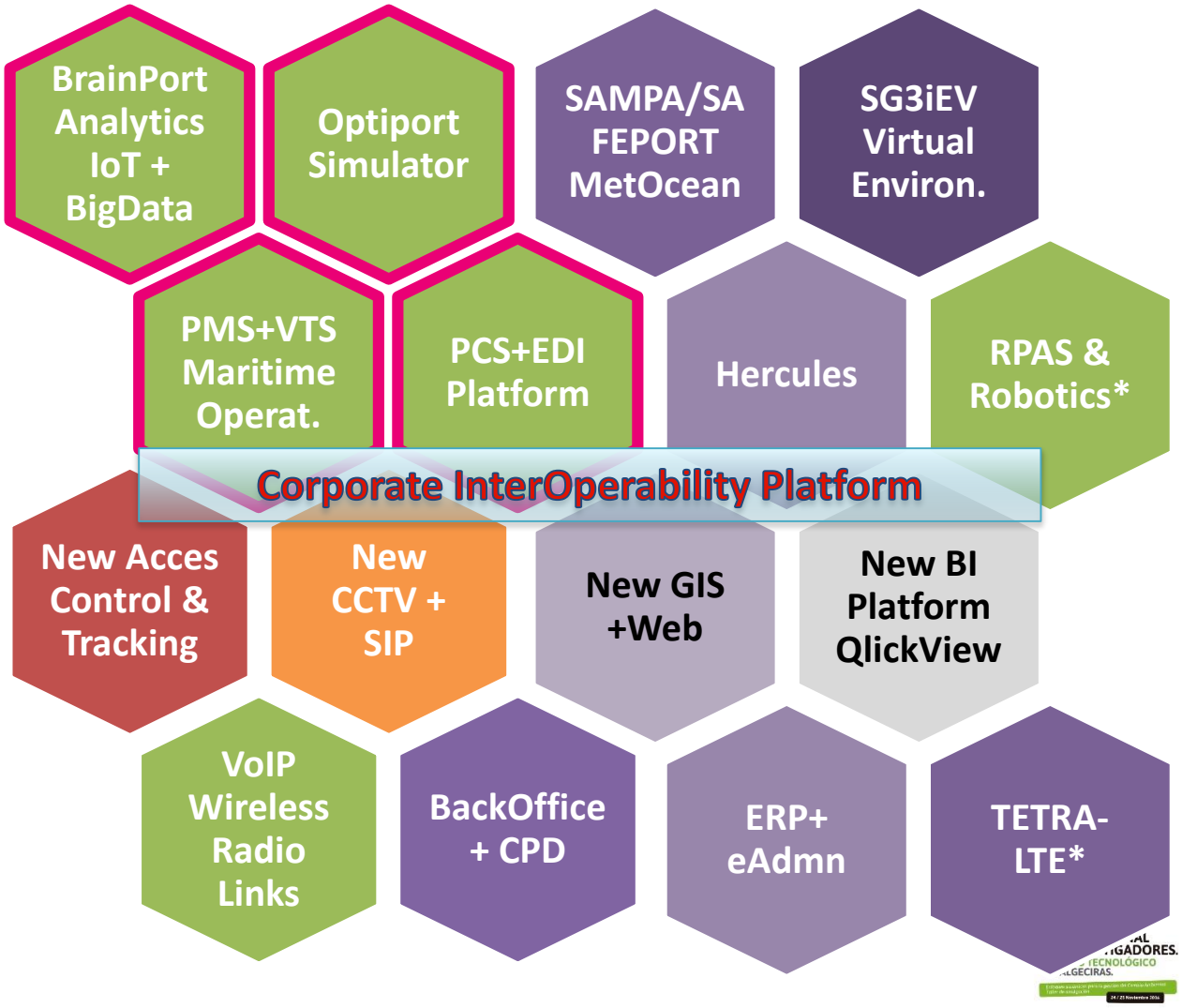
- **Port Digital Layer**: Real Time Info & Efficiency of Every Business Process
- **Business Analytics Platform:** Learn & Take Better Business Decisions
- **Port Collaborative Platform:** Smart Integration of Systems and Agents to Share Information => Towards a High Quality Seamless Logistic Chain
- **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 2014-2016

What´s going on in practice?

2014 – 2016

New Digital Ecosystem
New Innovat. Framework



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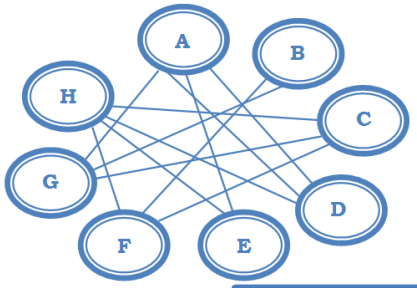
Port Community System TELEPORT -> TELEPORT 2.0

Information and Documentation Exchange Platform



TELEPORT

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

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Port Operations Management System: Phase I

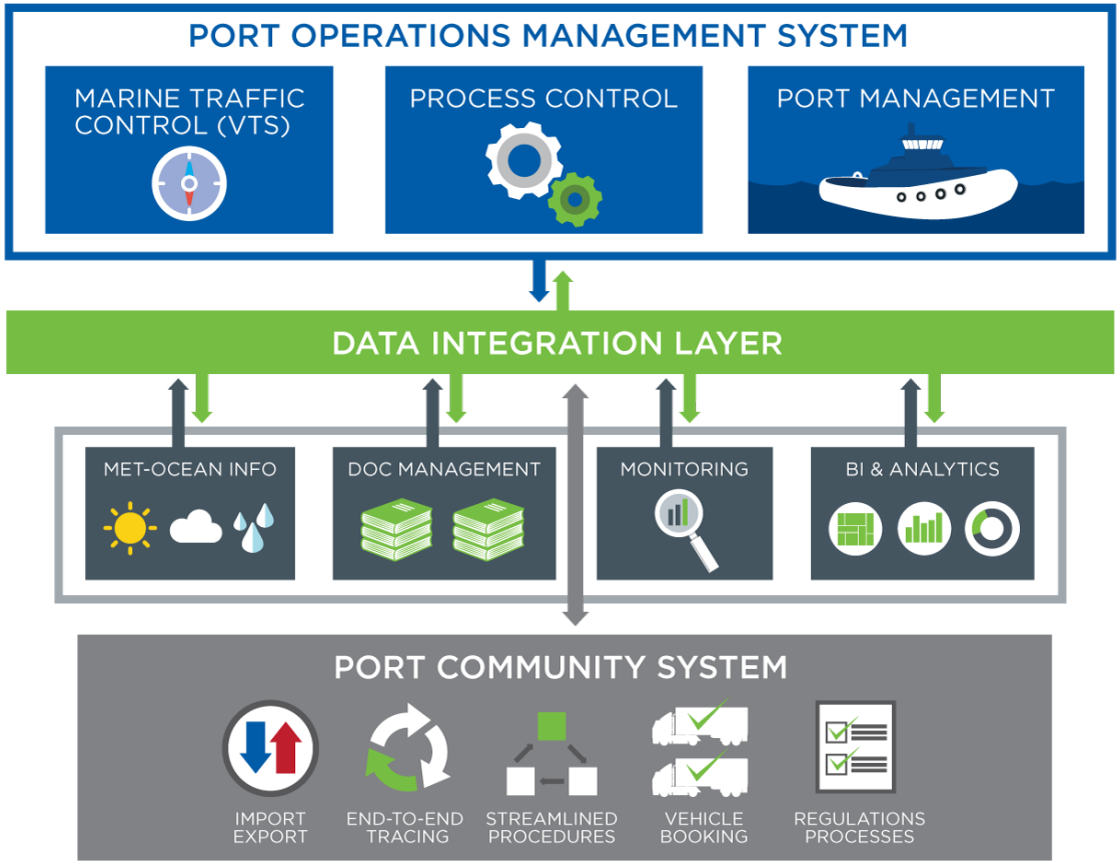
Data Acquisition & Standarization

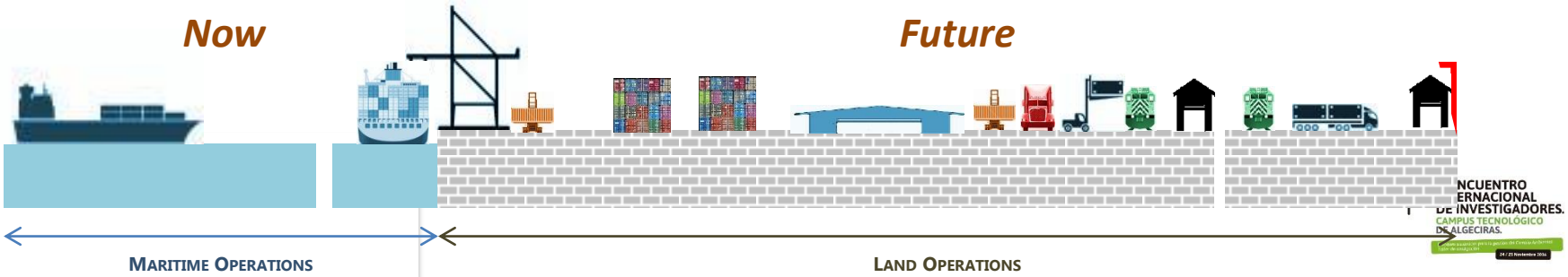
Dynamic Data Exchange

Visibility Among Stakeholders

Support Executives to Optimize OPS

Integrated OPS Excellence



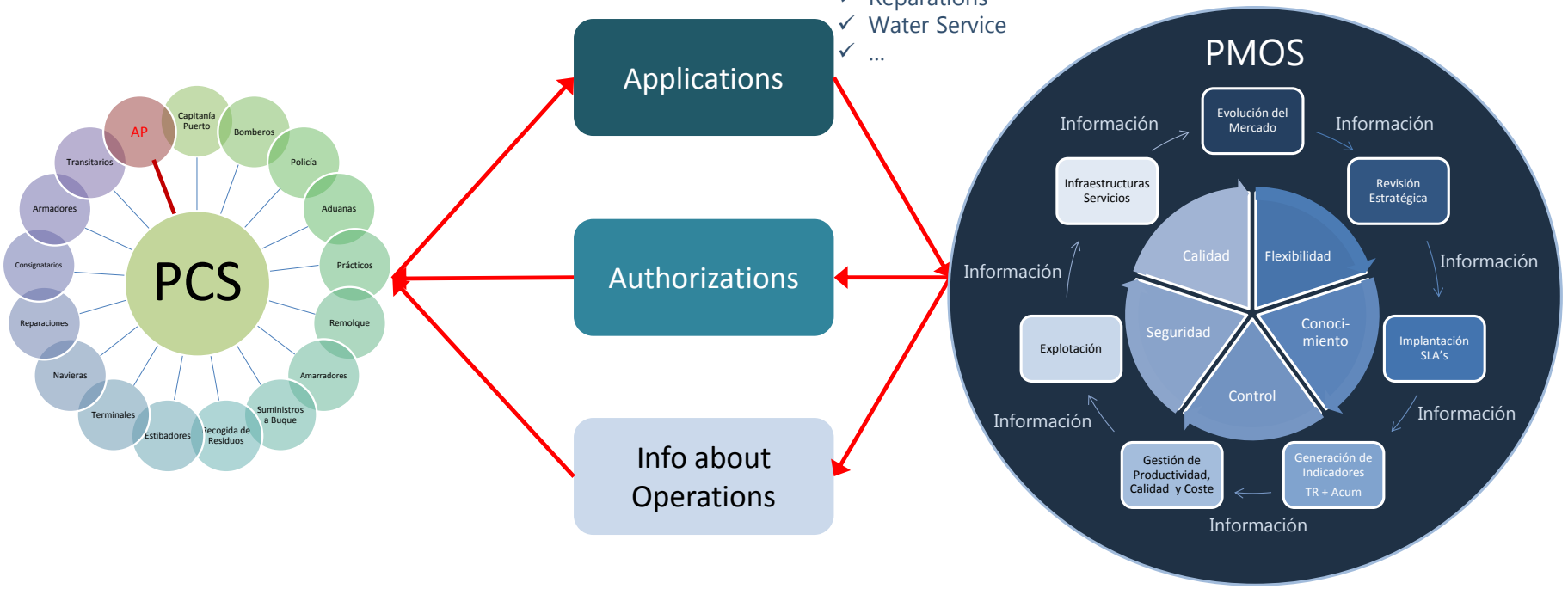


PMS-PCS Integration

Interface With Port/Logistics Community

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

Monitoring, Control & Management Port Operations



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

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BrainPort Analytics: Processes, IoT, Big Data & BI

Operations + Meaningful Information = "Process Intelligence"

Advanced Sensorization

IT supporting network

BrainPort Analytics

Sensor Data

ssed 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

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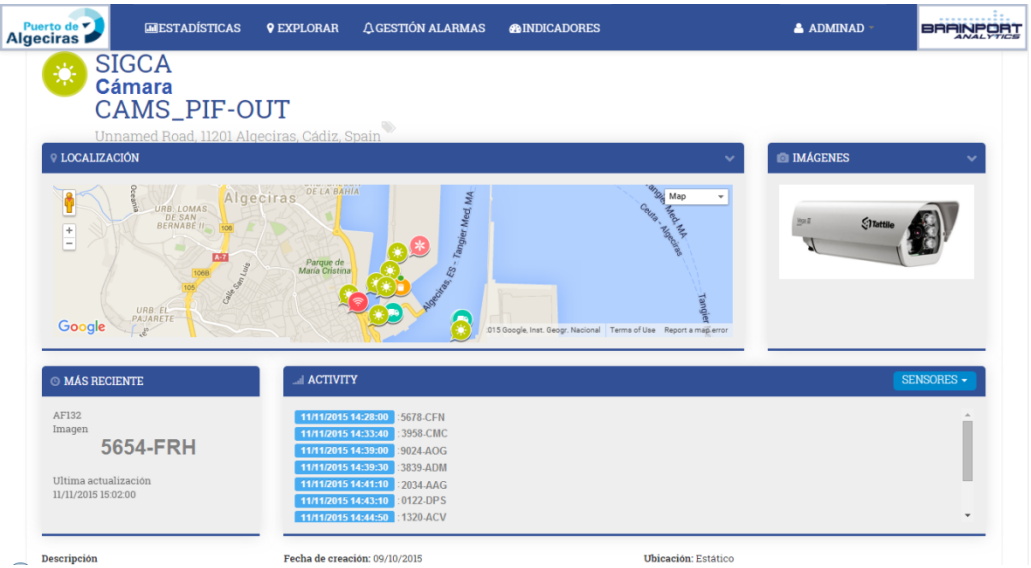
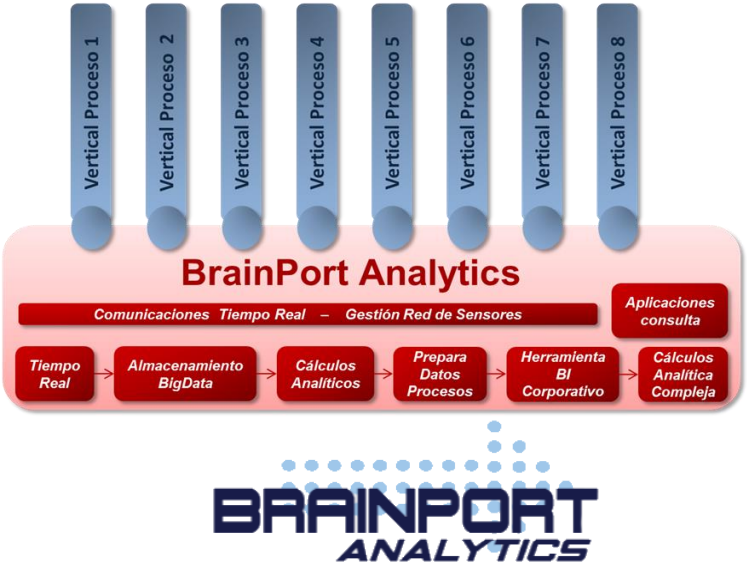
BrainPort Analytics: Processes, IoT, Big Data & BI





[Access to BPA]

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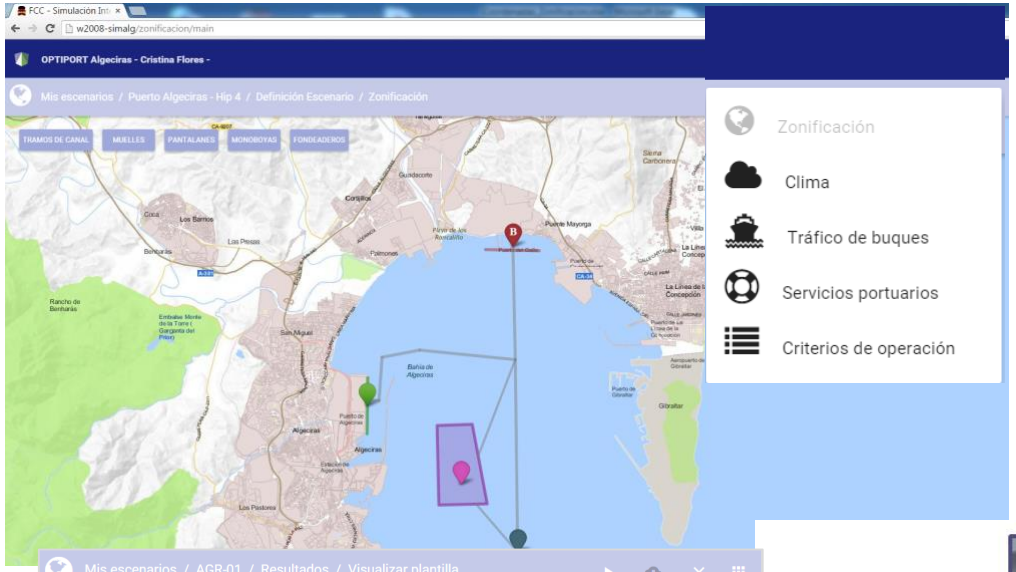
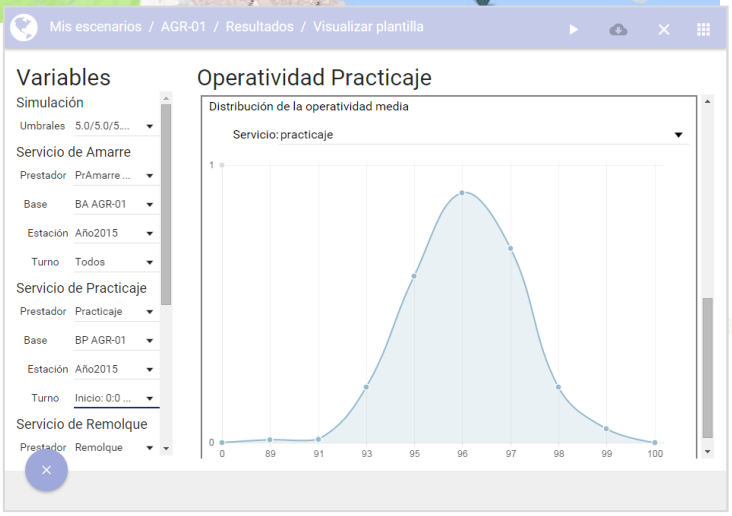
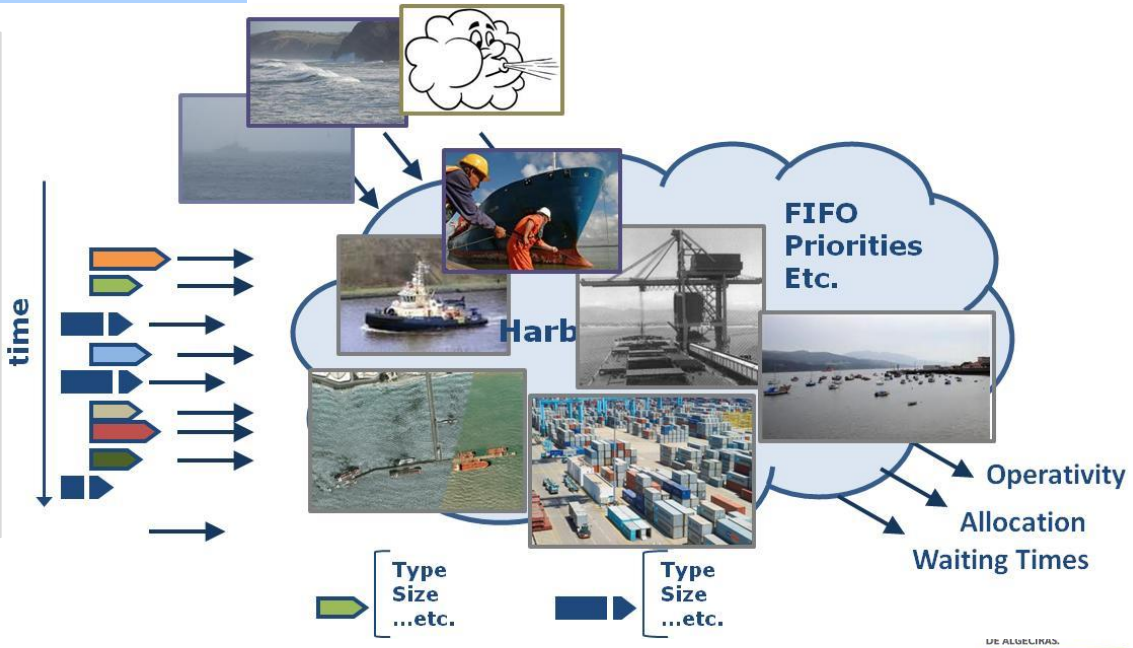
OPTIPORT: Integral Simulations of Port Operations





What If Scenarios for Planning!

[Access to Optiport]



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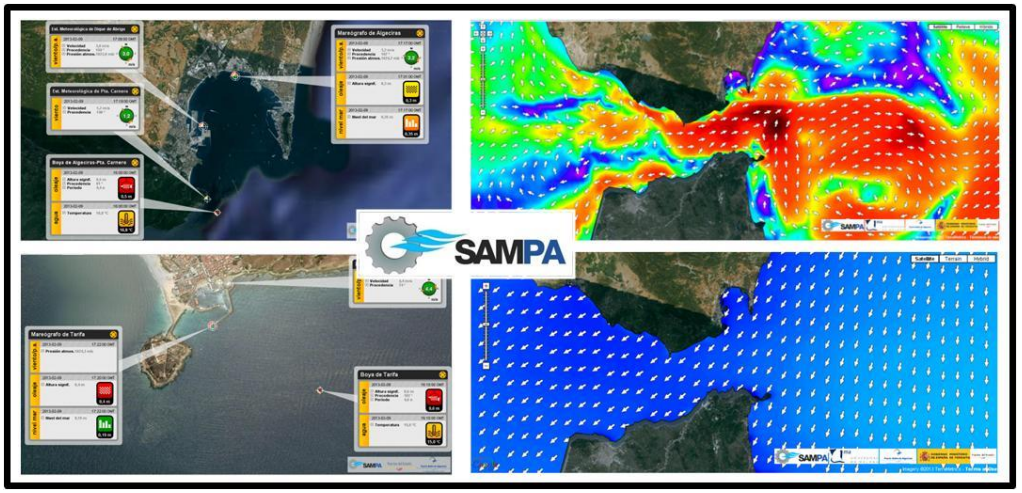
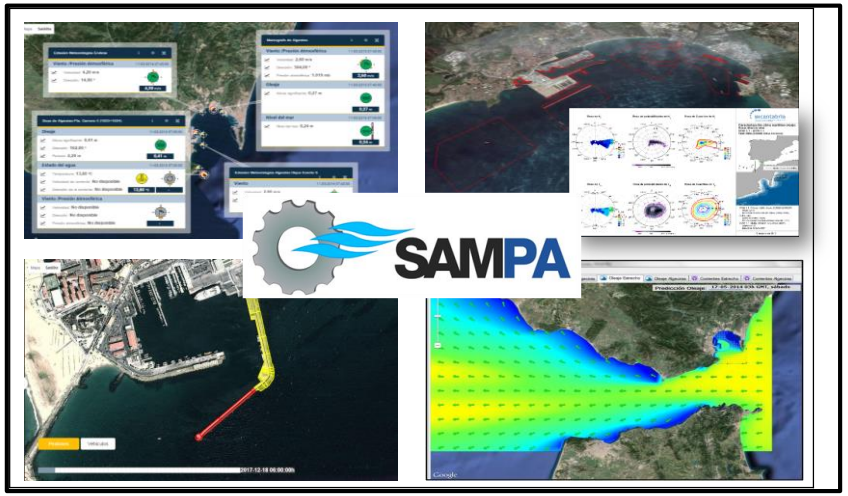
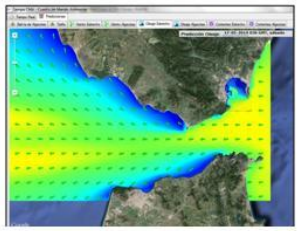
SAMPA: Advanced Met-Ocean Monitoring and Forecasting





MONITORING SYSTEM	FORECAST SYSTEM	ALERT + DOWNSTREAM TOOLS
Real Time Waves, Tide, Met, Currents	72 h Based on HR Numerical Models	Specific for Harbour Needs



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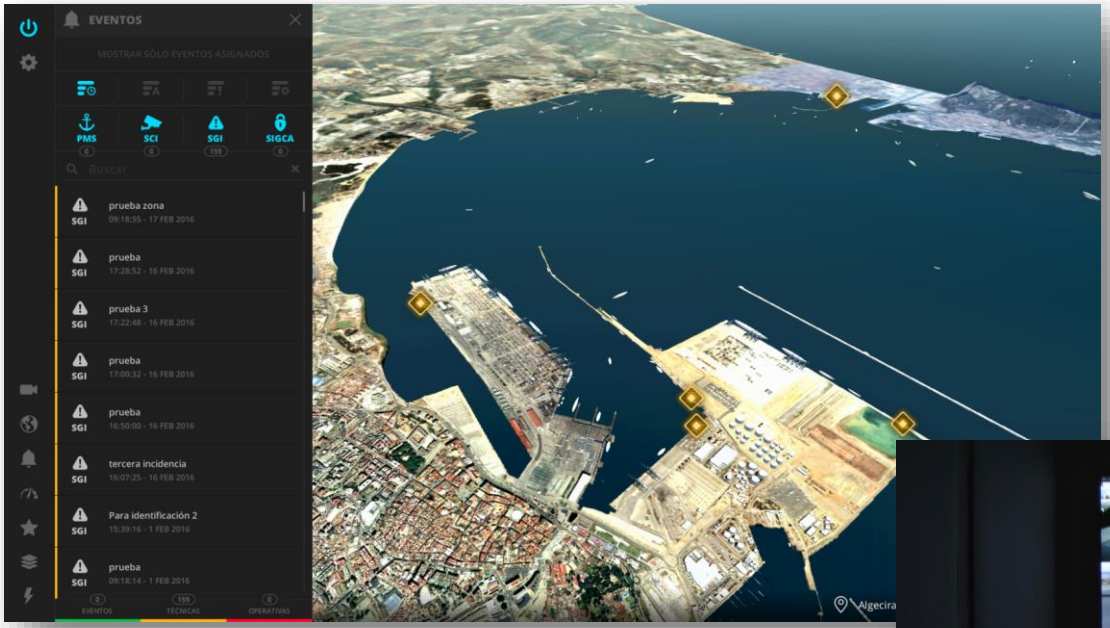
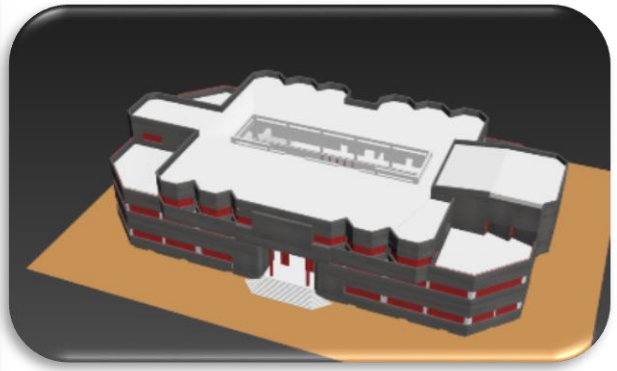
SG3iEV: Virtual 3D Infrastructure Management Platform

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





[*Video SG3iEV*]

Puerto de Algeciras

Technology & Innovation Master Plan Next Steps

2014 — 2017 — 2020 — 2025

PHASE I: 2014-2016

- BI — Qlikview. New Platform
- EDI — Vessel Calls
- PCS — Teleport 1.0
- SIP — Passeng. Inform System
- VTS — Nepshys
- PMS I — Maritime OPS
- SCI — New Video System
- SIGCA — Control Access & Tracking
- VoIP WiFi Rad-Links
- New GIS & WEB

Corporate InterOperability Platform

- BPA — Analytics-IoT-BigData
- OPTIPORT — Simulator
- HERCULES — New OPE App
- SAMPA — MetOcean
- SG3 — Virtual Environ.

PHASE II: 2017-2020

- Port/Logistics/Trade Commnunity System
- Port Operations Management System
- Harbour Analytics
- Cybersecurity
- Port Location Strategy
- eAdmon, TELCO Optiz, TETRA/LTE, Office 2.0, SGSTI, DevOps, SIGCA2, CeCon, PRINCE2-ITIL-AGILE

Big Innovation Project ABP2020 II

Simulation, Optimization, IoT, Robotics, Living Lab
Container, Ro-Pax, Full Service Port

Horizontal Innovation Activities

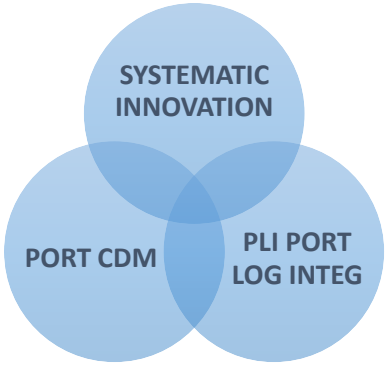
BrainPort Lab Center, Open Innovation, Public Open Data, Innovation Price, BrainPortHack, StartUp Accelerator

International EU-Funded Projects

PCDM, Satellites Applications, Holistic Security

PHASE III: 2020-2025

NEXT GENERATION ALGECIRAS PORT



ALGECIRAS TECHNOLOGY & INNOVATION CLUSTER

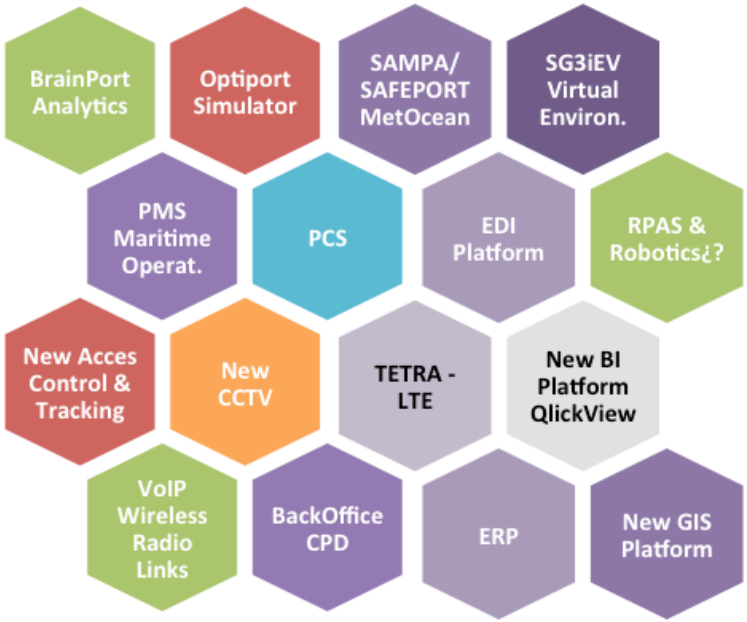
Puerto de Algeciras

1er ENCUENTRO INTERNACIONAL DE INVESTIGADORES. CAMPUS TECNOLÓGICO DE ALGECIRAS.

Technology & Innovation Master Plan Next Steps

Phase I (2014-2016)

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



Phase II (2017-2020)

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

Puerto de Algeciras

I ENCUENTRO INTERNACIONAL DE INVESTIGADORES. CAMPUS TECNOLÓGICO DE ALGECIRAS.

Technology & Innovation Master Plan Next Steps

Technology Master Plan

PMS (OPS Optimization), PCS (Port->Log->Trade), Cybersecurity, Analytics Platform

Big Innovation Program ABP2020 II

Simulation, Optimization, IoT, Robotics, Living Lab

Container, Ro-Pax, Full Service Port (Maritime Full Service Center)

2017 - 2020

Horizontal Innovation Activities

BrainPort Lab Center, Open Innovation, Public Open Data, Innovation Price, BrainPortHack, StartUp Accelerator

International EU-Funded Projects

Knowledge, Benchmarking & Networking

PCDM, Satellites Applications, Holistic Security

i-momentum

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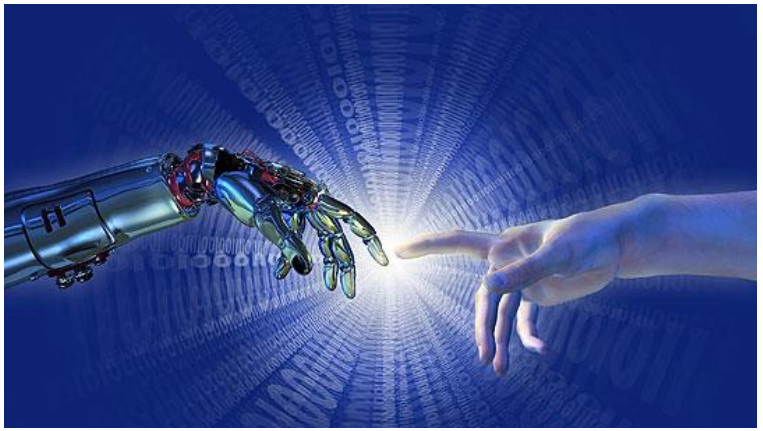
Big Innovation Program ABP2020 II with 11 Initiatives



1. Transhipment 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

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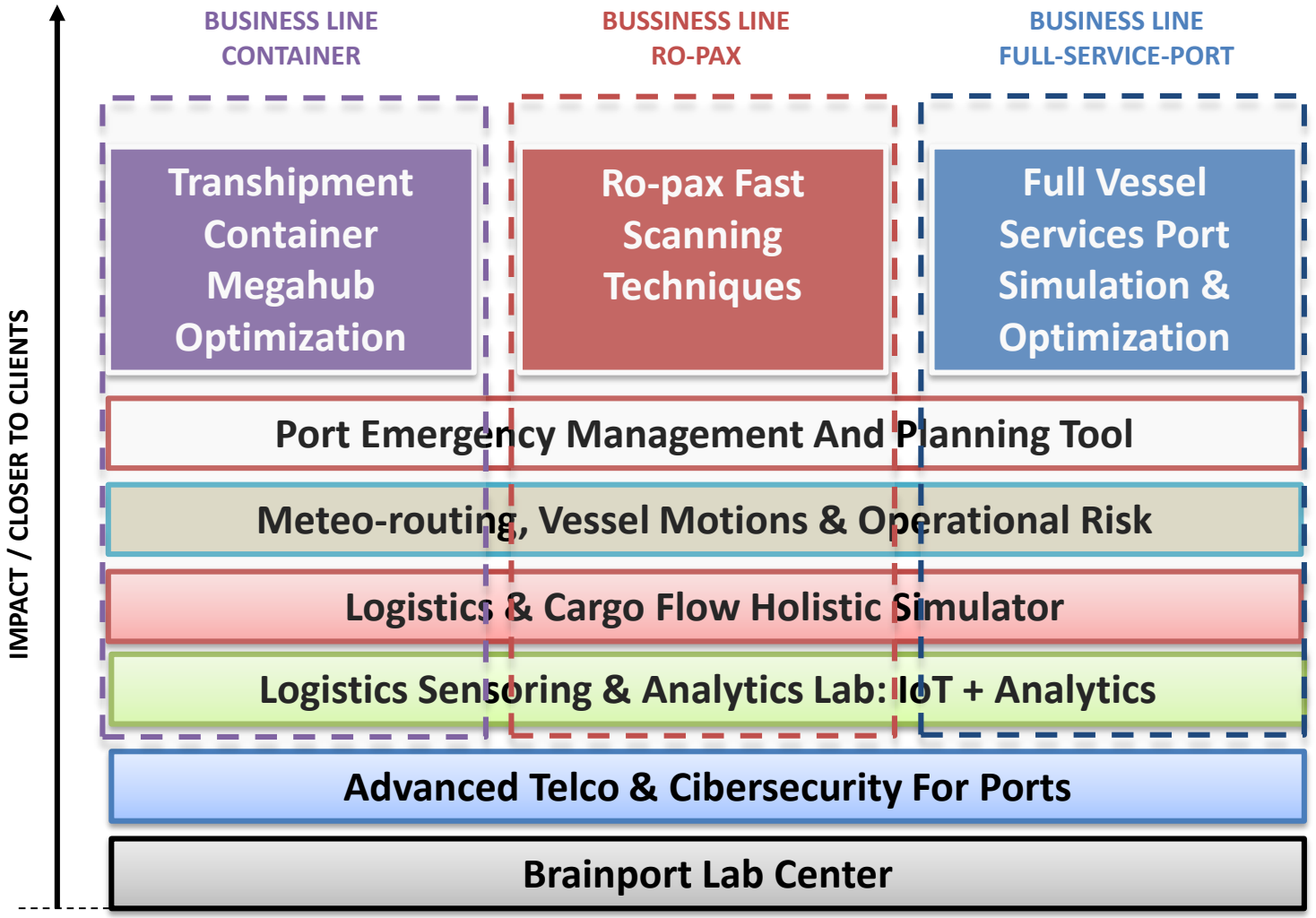
Big Innovation Program ABP2020 II with 11 Initiatives



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Big Innovation Program ABP2020 II with 11 Initiatives

Business Goals – Scope - Innovation

Datos de Partida
(Agentes del Medio Físico)

SAMPA

SAFEPORT

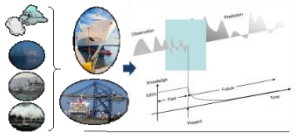
Monitorización Infraestructuras y Buques Atracados

Simulación de la **Respuesta del Buque Atracado**

Fiabilidad y **Operatividad** de las **Infraestructuras** Existentes

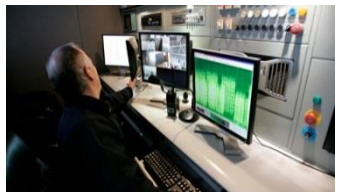
Herramientas SW para la **planificación y gestión portuaria**

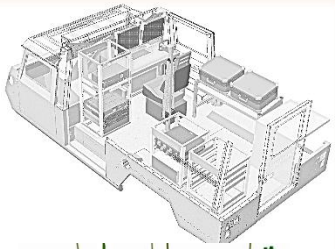
- Riesgo Infraestructural
- Ventanas Operativas (Rendimientos)

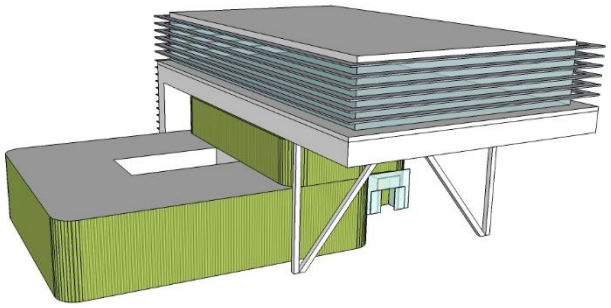


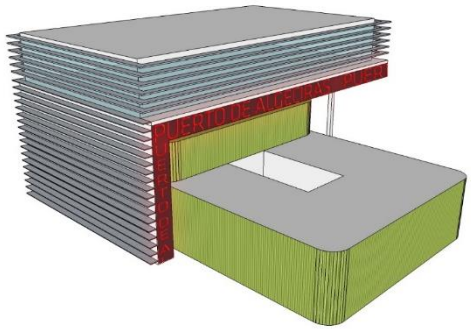
Optimización de Rutas Marítimas

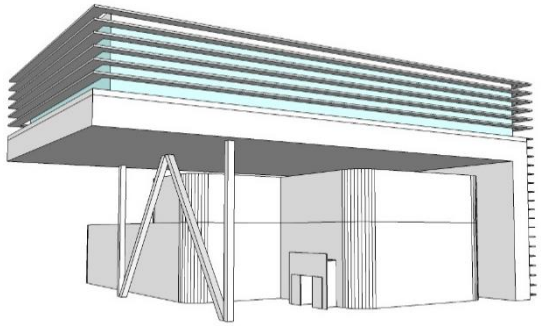
- Estrecho
- Canal Suez-Algeciras Rotterdam











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Big Innovation Program ABP2020 II with 11 Initiatives

PROYECTO	PRESUPTO	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
TOTAL	**27,1 M€**	

** Plazos y Presupuestos Estimados Pendientes de Revisión Final*

Puerto de Algeciras

1st ENCUENTRO INTERNACIONAL DE INVESTIGADORES. CAMPUS TECNOLÓGICO DE ALGECIRAS.

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 (2017-2020): IT Structure & Innovation Culture

Maximize Impact on Port Community & Integrated Operational Excellence	Sustainable IT Resourcing Plan, Systematic Innovation Culture & StartUps

Phase III (2020-2025): Marit. Tech. & Innovation Cluster

StarUp Accelerator & Strategic Excellence Centers Consolidation	Cluster Consolidation & International Partnership & Executive Education

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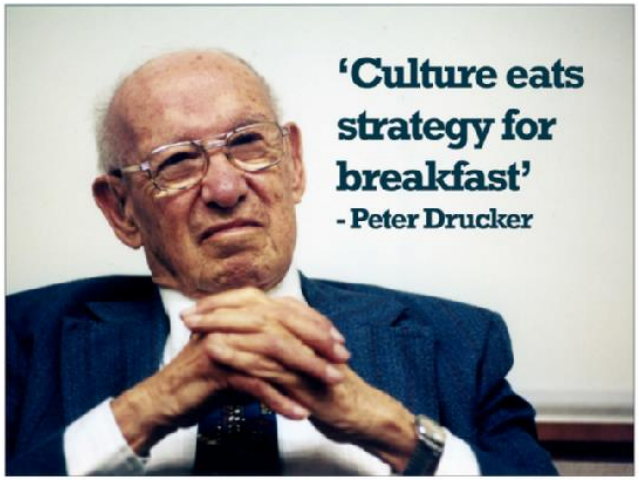
Conclusions

- 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



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Gracias!