

Novel technologies to boost the shipyard industry

# DIGITAL TRANSFORMATION PLAN IN NAVANTIA

Elena Carrasco - NAVANTIA

ORGANIZED BY THE EU HORIZON 2020 PROJECTS:

**FIBRE4YARDS**  
SHIPYARD FOR  
THE FUTURE



**MARI4YARD**  
MARI4ALLIANCE

30<sup>th</sup> and 31<sup>st</sup> May 2023, RTD Innovation Dock, Rotterdam

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements n° 101006860 (FIBRE4YARDS), n° 101007005 (RESURGAM), and n° 101006798 (Mari4\_YARD).



# NAVANTIA at a glance



➤ Spanish company with more than 300 years of experience dedicated to civil and military shipbuilding.

➤ Our products and services:



Military ships



Systems



Propulsion



Repairs



Life Cycle Support



Offshore wind

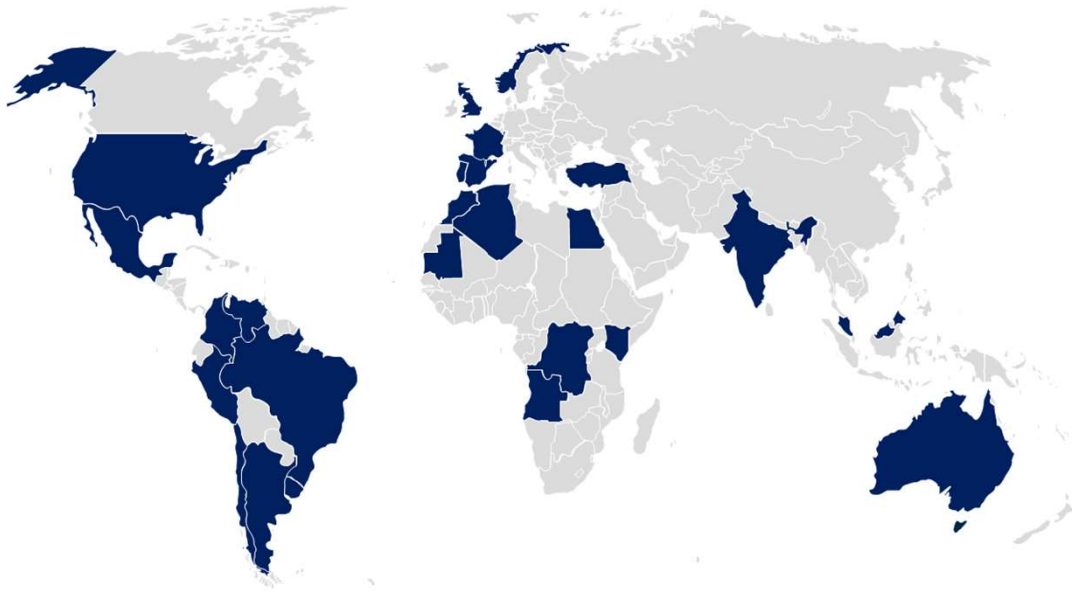
➤ Strategic for the Spanish Defense and for the National Industry

# Navantia at a glance - facilities



**~ 4.000 internal employees +  
~ 8.000 external**

# Navantia at a glance - Customers



+

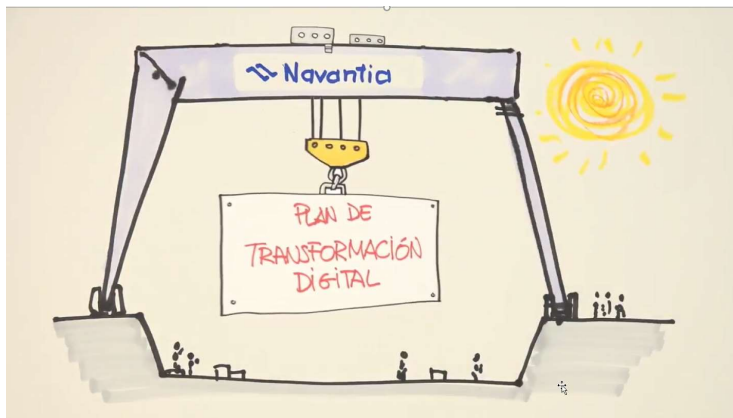
Countries

Navantia has developed  
naval programs in more  
**20** than 20 countries

# Digital Transformation Plan in Navantia

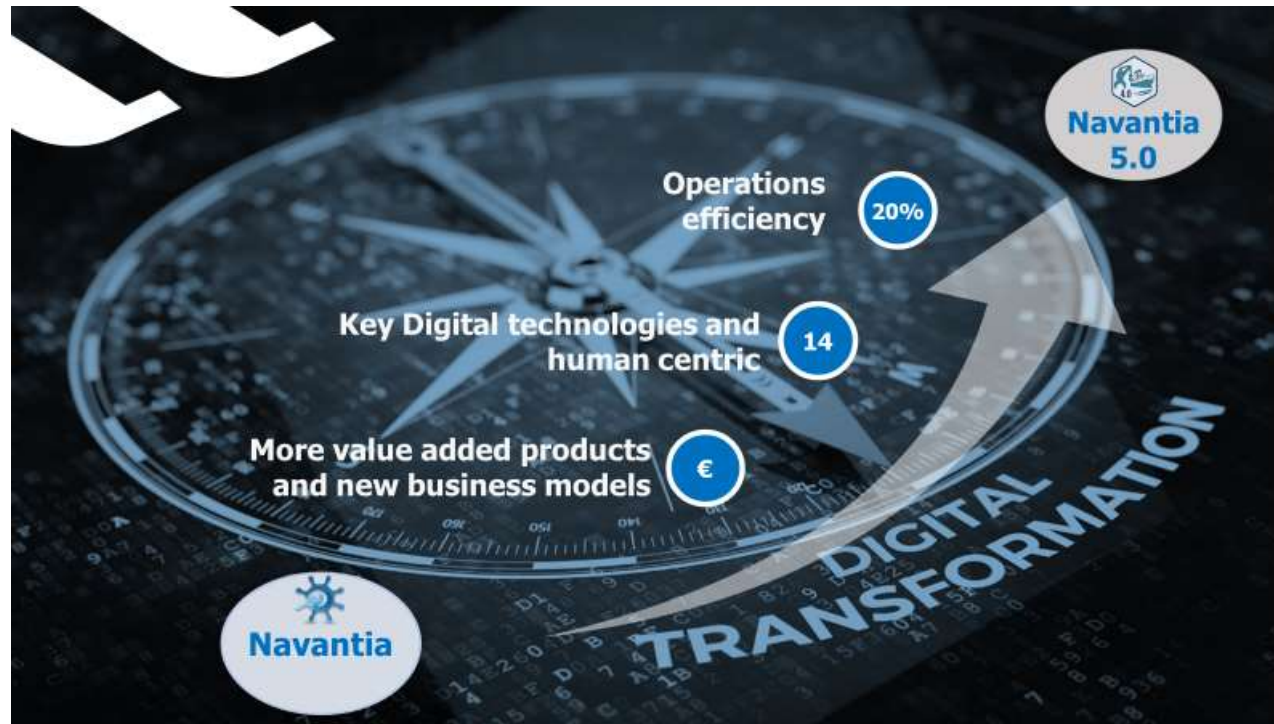
It is one of the pillars of the Navantia Strategic Plan approved at the end of 2018.

It is bringing the modernization, sustainability and competitiveness of the company and our ecosystem.



- All business areas
- The entire life cycle of our products
- All processes of the company
- Supply chain integration

# Digital Transformation Plan - Objectives



# Digital Transformation Plan - Roadmap

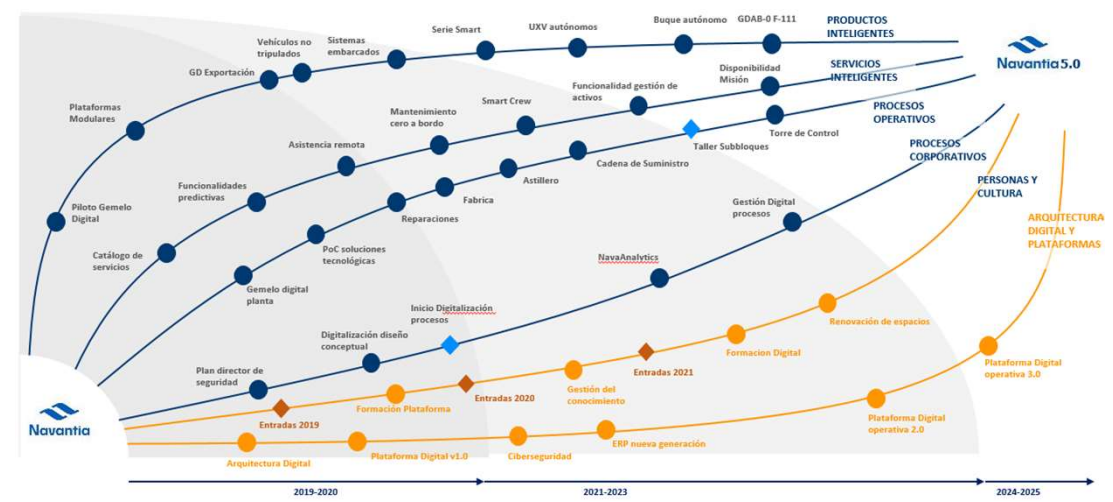
**3** Axes

**6** Action lines








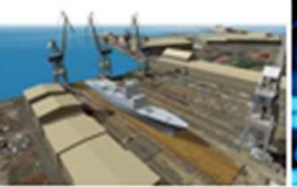
**+50** Initiatives

- MARKET DISRUPTION**
  - OPERATIONAL EFFICIENCY**
  - ENABLERS**
- Smart Products
  - Smart Services
  - Business processes
  - Corporate processes
  - Digital platform and architecture
  - People and culture

- Digital tween
- Smart ships
- Fleet availability
- Shipyard 4.0
- Supply Chain Integration
- Logistic 4.0
- Processes transformation
- Digital architecture
- Digital Platform
- Cibersecurity
- Culture, Capabilities

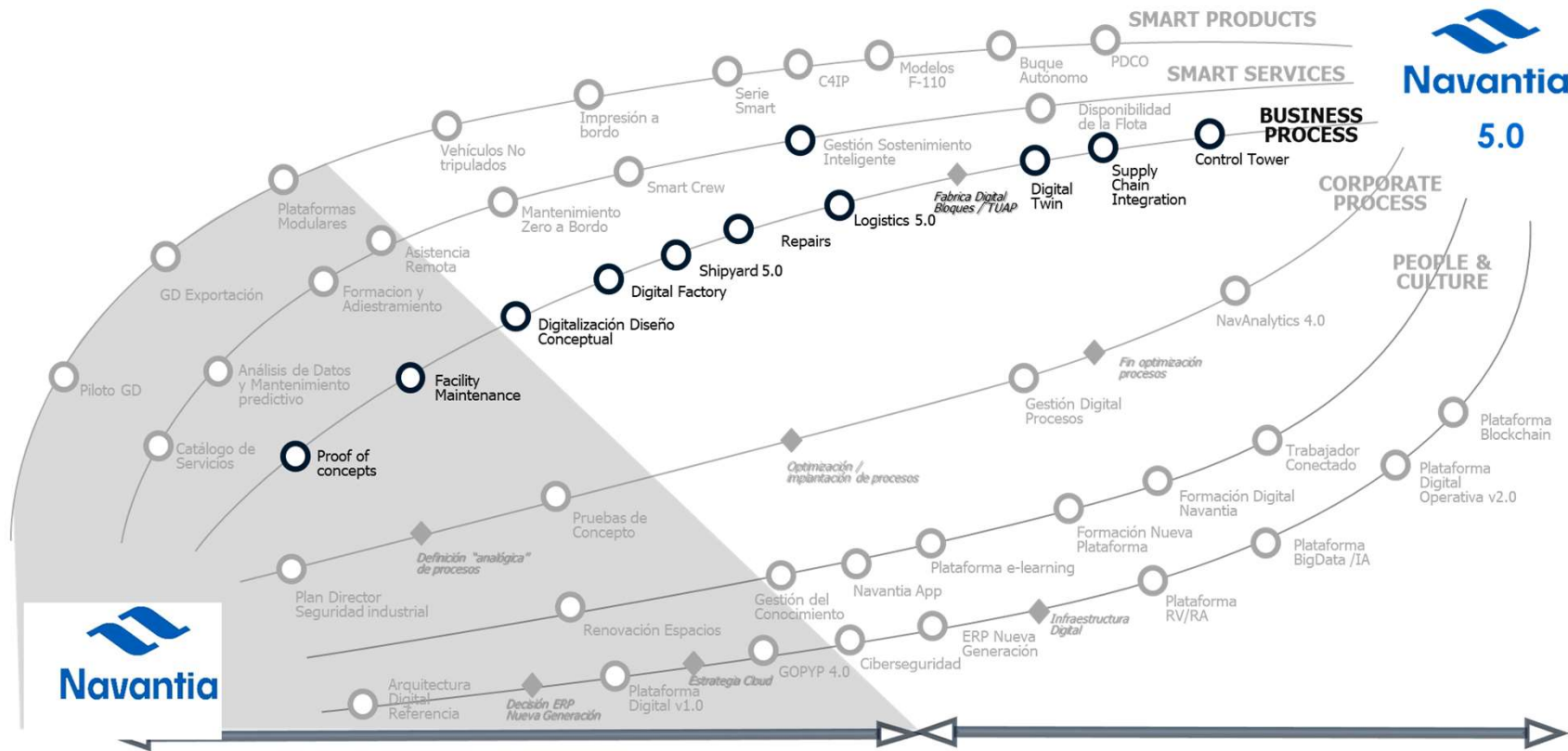


# 14 key enable technologies

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| <b>Artificial Intelligence</b>   | <b>RPAs</b>  | <b>Collaborative Robotics</b>  | <b>Autonomous Vehicle</b>  | <b>Drones</b>  | <b>Additive Manufacturing</b>  | <b>Advanced Materials</b>  |
|   |   |   |   |   |   |   |
| <b>RV/RA</b>   | <b>Big Data Analytics</b>  | <b>Internet of Things<br/>cosas IoT</b>  | <b>Blockchain</b>  | <b>Modeling and Simulation</b>   | <b>Cloud</b>   | <b>5G</b>  |
|  |  |  |  |  |  |  |



# Digital Transformation in Business Processes



# Use cases



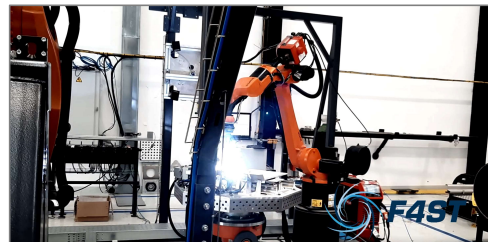
Digitalization



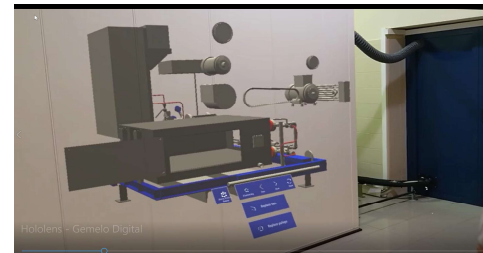
Modelling and simulation



IoT/ Big Data / Analytics



Robotics & Artificial Intelligence



Virtual reality

# Use cases: Digitalization



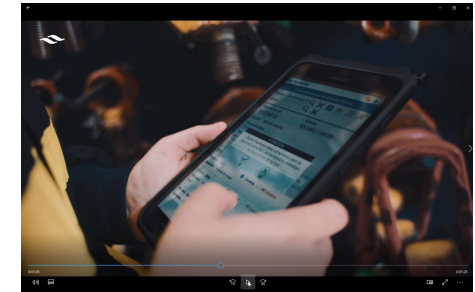
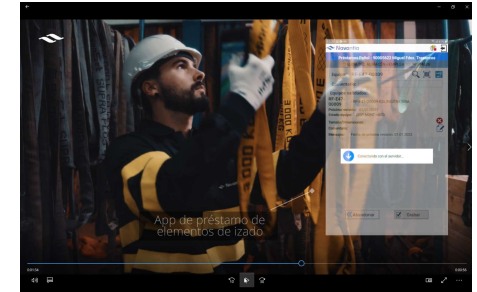
Smart Tag



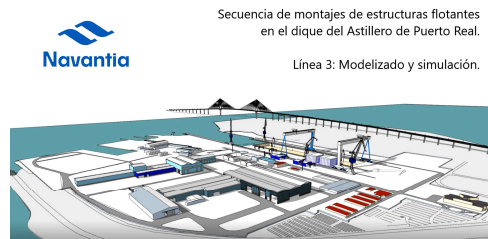
## Traceability and control of accessories

- 575 lifting cranes
- 56.000 lifting accessories
- ~87.500 annual inspections

Smart Tag to manage the inspections and with the relevant information for the control of the accessories: identification, monitoring and traceability



# Use cases: Modelling and Simulation



**Puerto Real  
Shipyard**

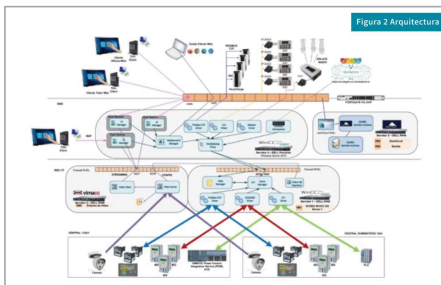
## Simulation for the preparation of offers

- contracts for offshore wind
- construction of jackets: many units in a short time

Check, during the offer phase, the shipyard's capacity to meet the demand requested.



# Use cases: IoT, Big Data & Analytics

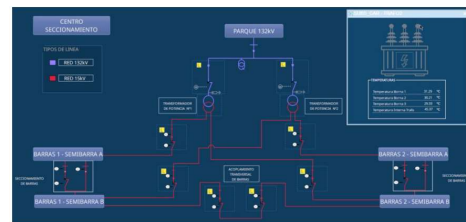
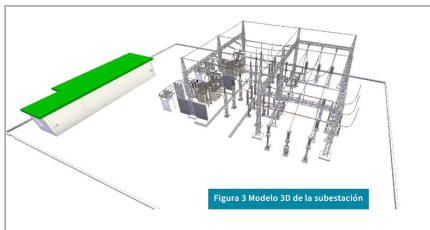
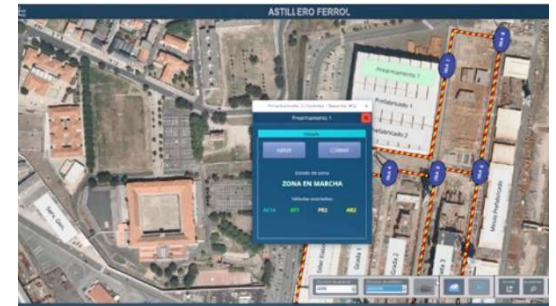


Multilayer and cybersecurity network. Architecture

## Digital Twin for Industrial Management

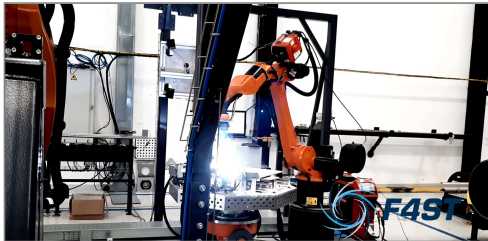


- Real time data and alerts
- Historical information
- Remote control
- Tasks automation



Transformation centers; fire control units; gas and fluid supply networks; data weather conditions (wind speed, temperature, etc.)

# Use cases: Robotic & AI



Innovation Cell

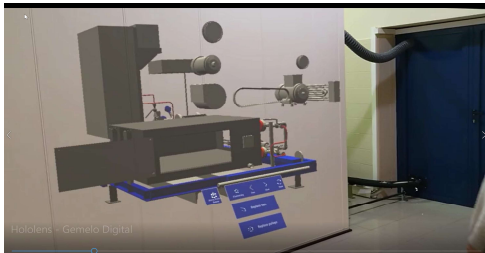
## Innovation and robotics center in Ferrol Shipyard

- I+D initiatives that combine robotic and artificial intelligence to maximize the automation of welding processes





# Use cases: Virtual Reality



## Integration and interaction with a digital twin

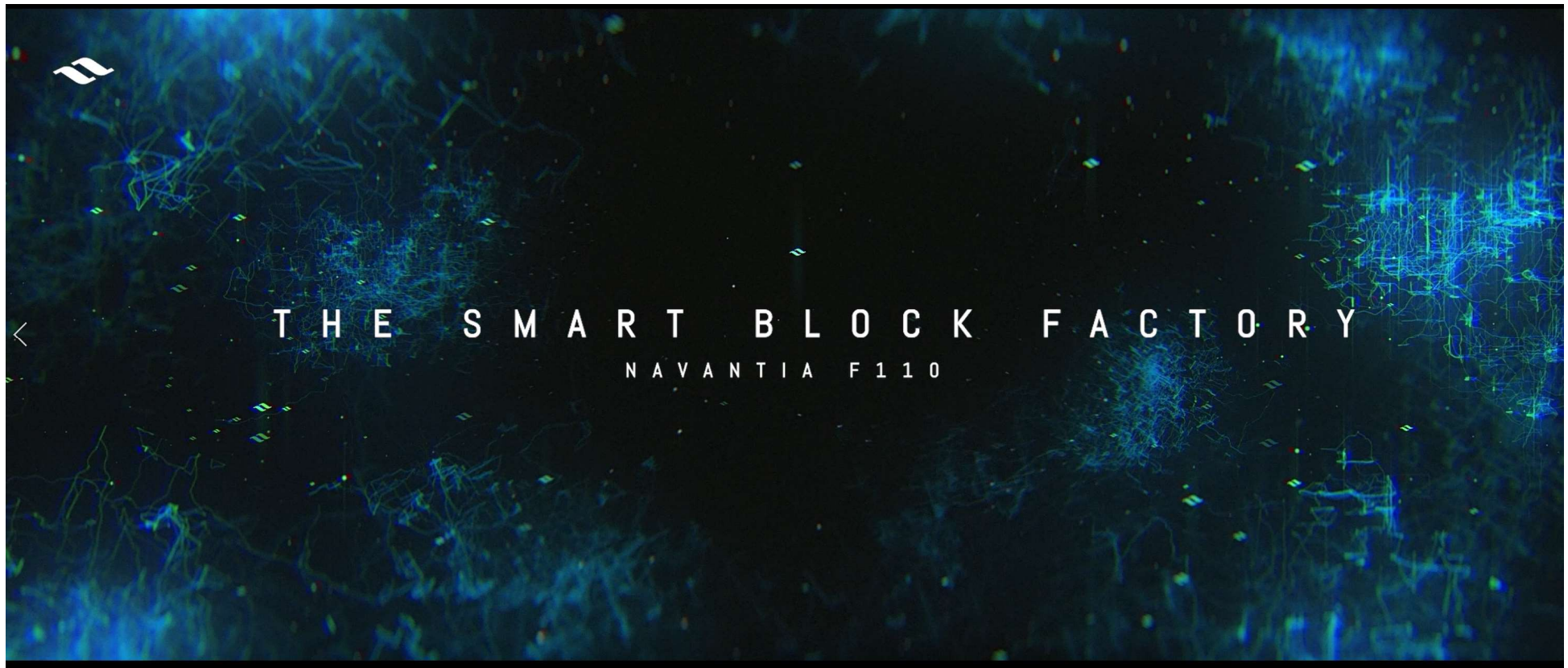
- **Visualization of parts and components**
- **Real time information**
- **Guided maintenance tasks**



**Experiencias compartidas entre  
dispositivos HoloLens 2**

Integración con gemelo digital en entorno real

# Navantia 5.0: Reinventing shipbuilding industry





# THANKS FOR YOUR ATTENTION

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