SMARTSTORE

Building the connected, automated and resilient dry bulk terminal

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The challenge is the operating chain, not the individual machine

Dry bulk performance is created across a connected sequence of decisions



GATE

Identity, authorisation and truck flow

QUAYSIDE

Discharge, weighing and positioning

STORAGE

Condition, location and inventory

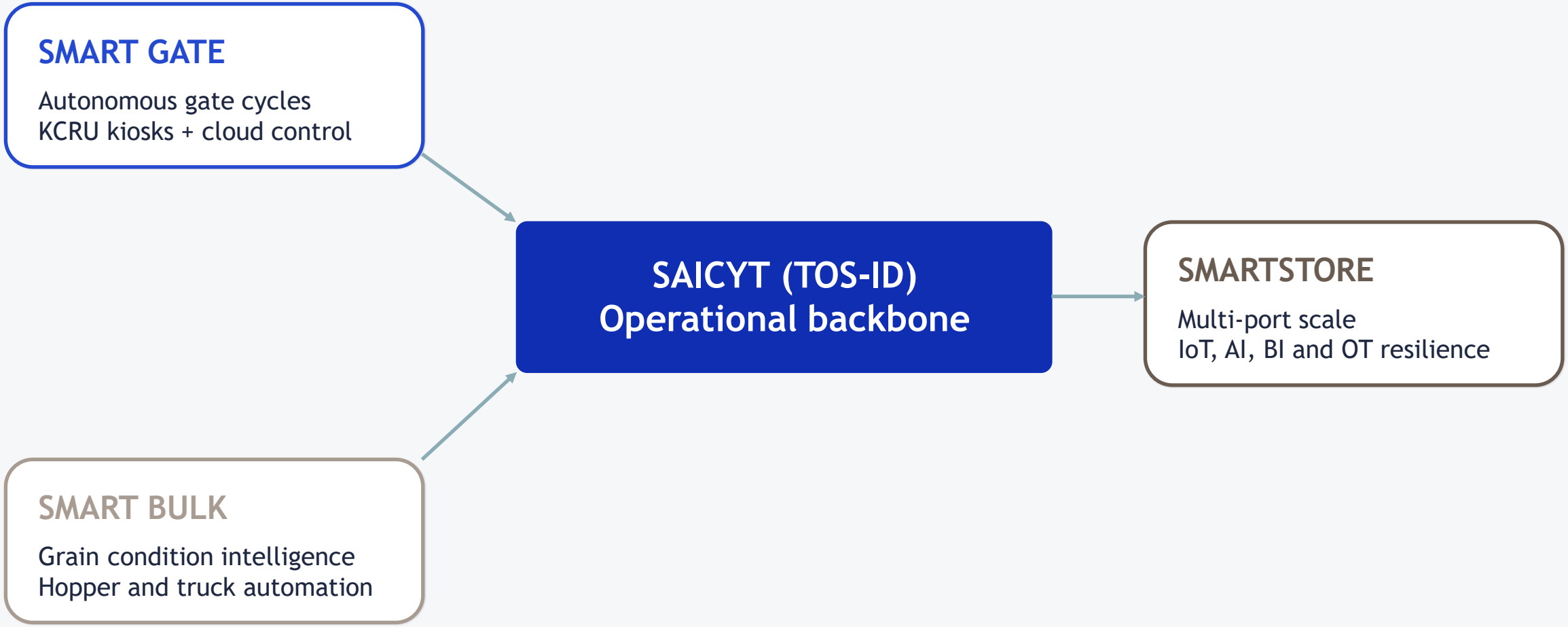
CONTROL

Planning, visibility and resilience

Our response: develop technology around the real workflow, then connect it through a common operational backbone.

One backbone, three complementary programmes

INNOVATION STRATEGIC SCHEME: SAICYT evolves from terminal control system to a data and automation platform in the bulk terminal



SMART GATE | Remove friction at the terminal boundary

Autonomous initiation and closure of bulk logistics circuits

The constraint

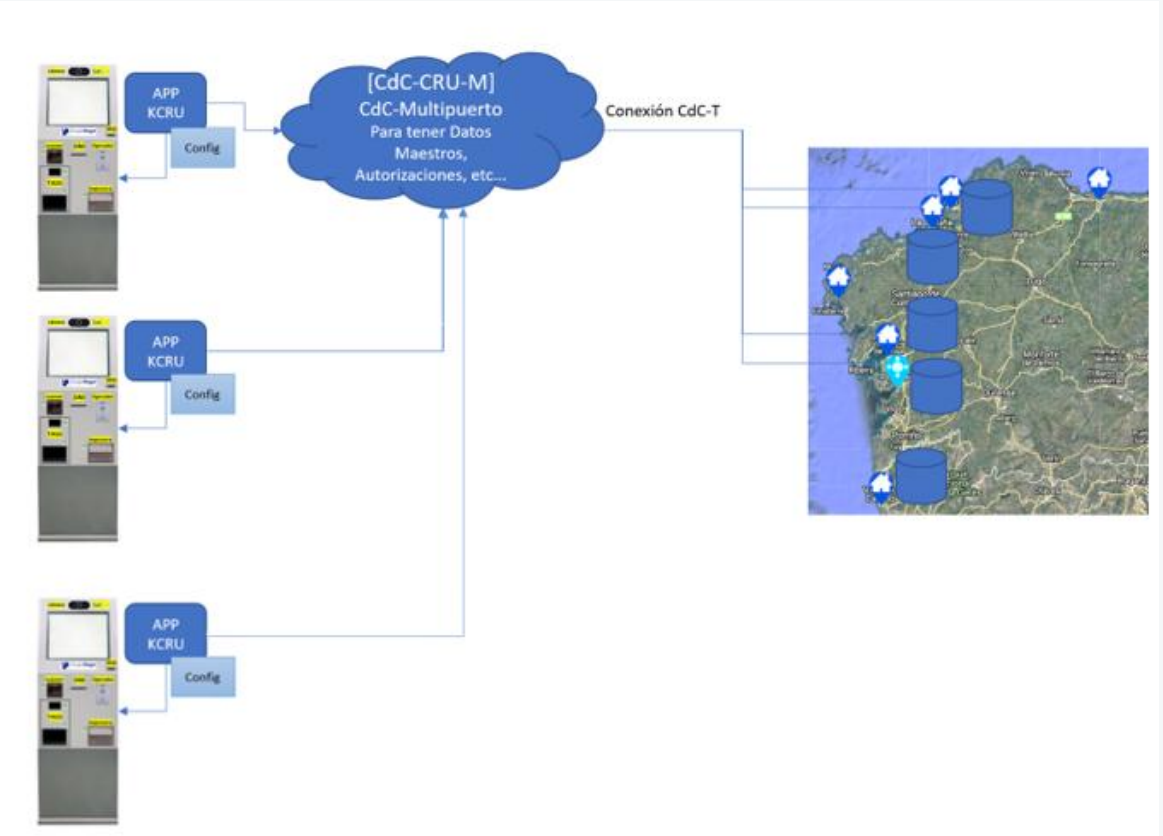
Physical control centres create queues, manual checks and dependencies across departments.

The development

Rugged KCRU self-service kiosk, dual active/passive RFID and a multi-port cloud control centre.

The business value

More autonomous truck flows, standardised control, less waiting and better operational data.



SMART GATE | Remove friction at the terminal boundary

Autonomous initiation and closure of bulk logistics circuits





SMART BULK | Automate the truck-loading interface

Sensor-assisted positioning and load-profile verification beneath the hopper



01 POSITION

IoT sensor truck alignment

02 LOAD

Real-time hopper and fill monitoring

03 VERIFY

Detect overfill and uneven profiles

04 CONNECT

Feed operational data back to SAICYT

SMART BULK | Automate the truck-loading interface

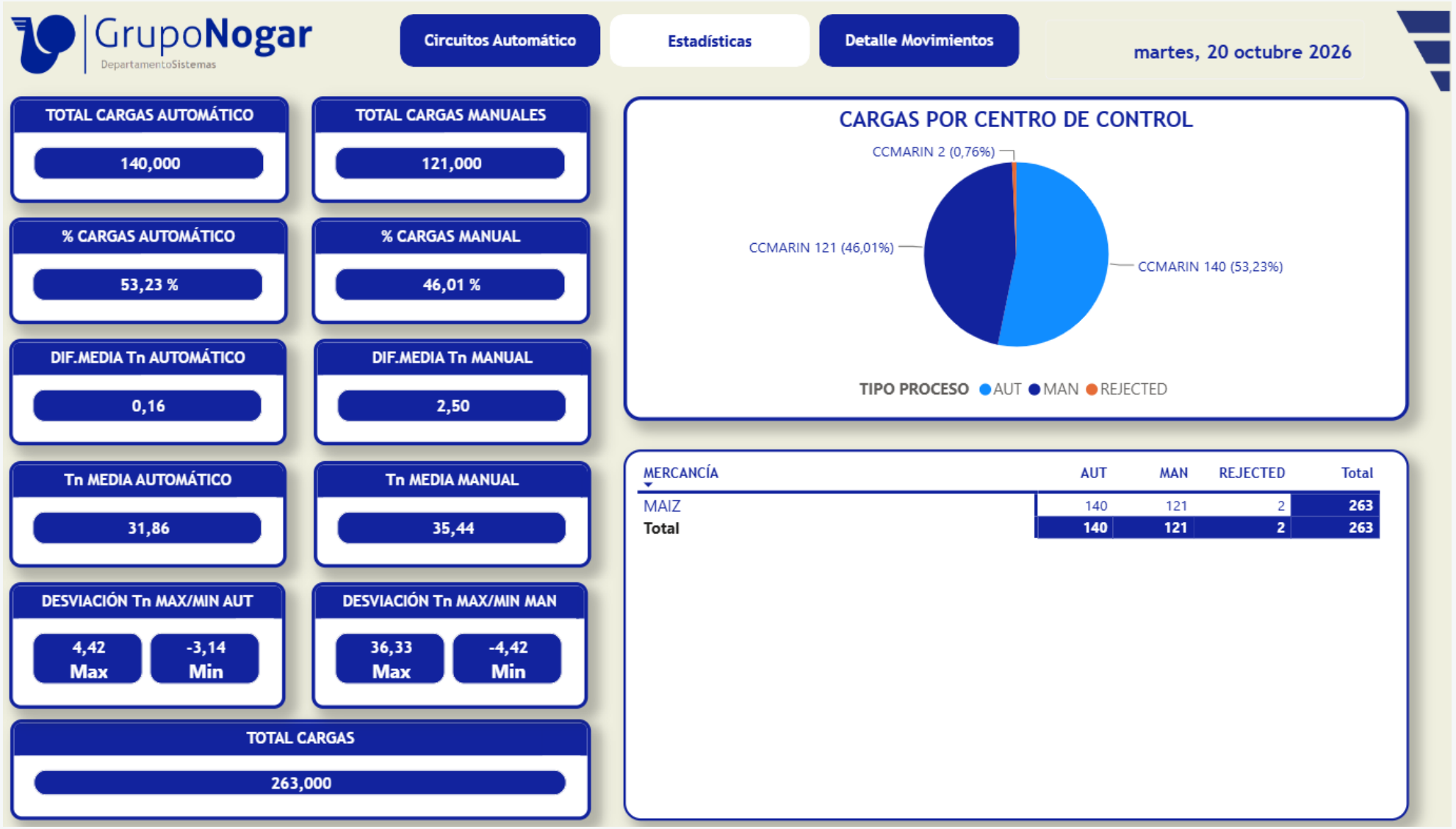
Sensor-assisted positioning and load-profile verification beneath the hopper





SMART BULK | Automate the truck-loading interface

Hopper Automation System. Operational Business Intelligence Report.



SMART BULK | Make the cargo condition visible

From manual sampling to predictive monitoring of stored grain

SENSING STACK

- Contact sensing at depth
- E-Nose and thermal imaging without contact
- Experimental data and physical models
- Machine-learning prediction and alerts

Business aim

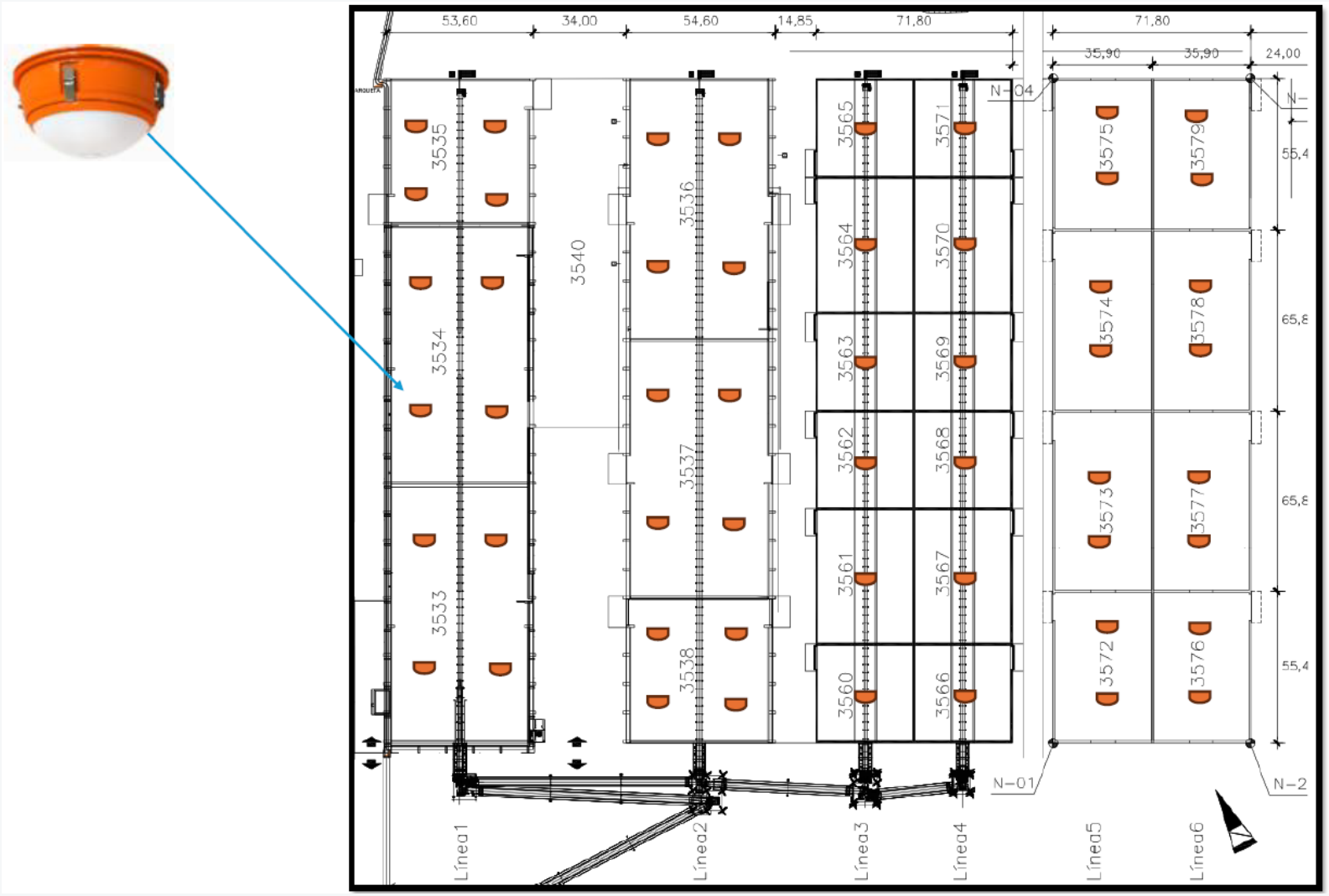
Detect safety risk earlier, protect product quality and reduce manual inspection effort.



SMART BULK | Make the cargo condition visible

From manual sampling to predictive monitoring of stored grain. No contact sensing (multi gas detection system)





SMARTSTORE | Scale from pilots to a connected portfolio

A multi-port operating model combining automation, data and resilience

OPERATIONS

Kiosks, tablets, port machinery monitoring, weighing, IoT sensoring and automated assets

DATA & INTELLIGENCE

IoT, AI recommendations, BI, predictive maintenance and energy metering

PLATFORM

Cloud SAICYT, ERP integration, BIM/GMAO and interoperability

RESILIENCE

OT cyber security, virtualisation, monitoring and continuity

The aim is not more technology. It is a dependable operating system for a network of terminals.

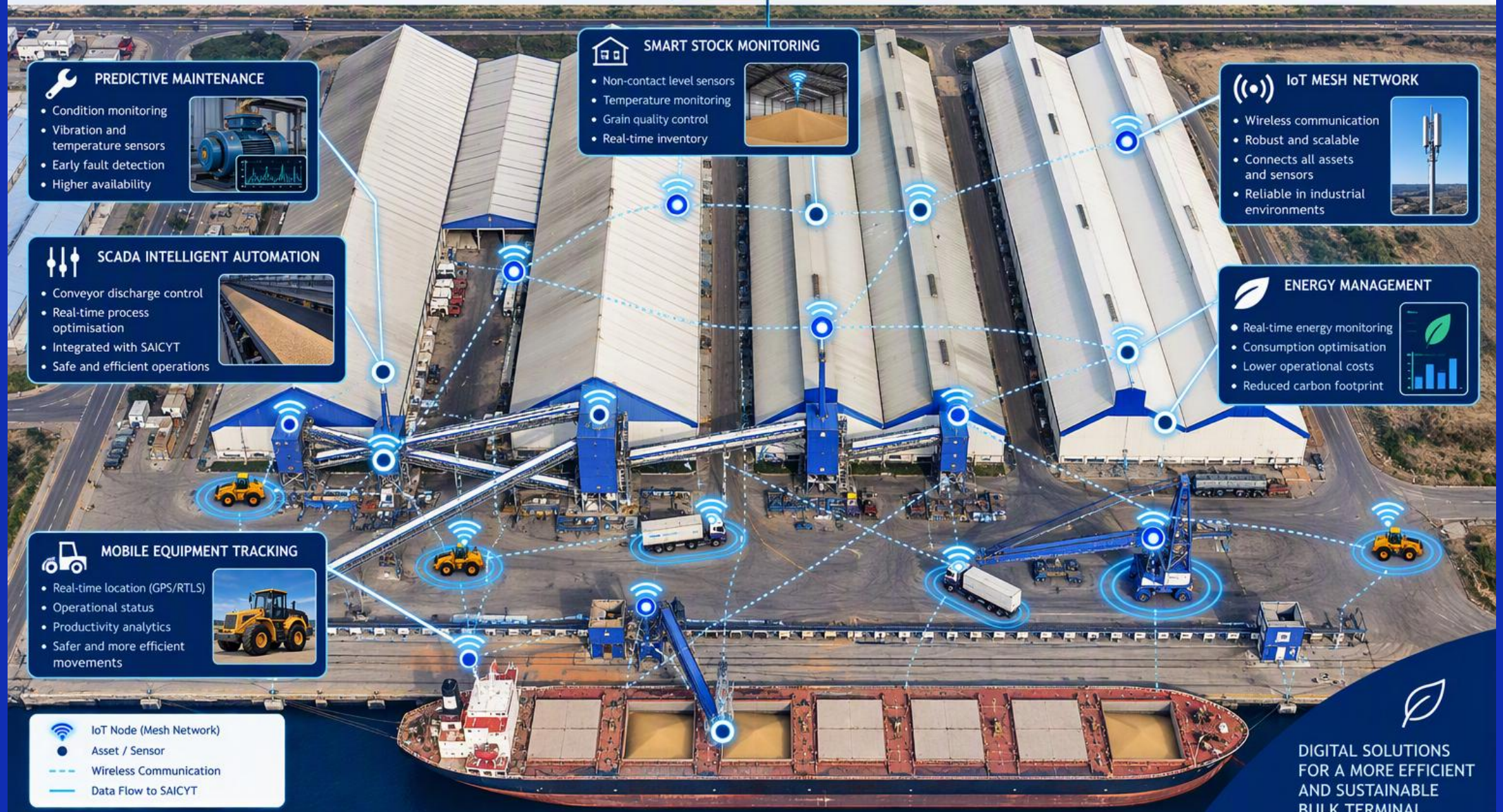
GrupoNogar
Galigrain, s.a.u.

ERP
Business Management
Planning | Procurement | Commercial
Finance | Sustainability

SAICYT
PORT OPERATIONS PLATFORM
Integrating people, assets and data
Real-time operations | Analytics | Decision support

EXTERNAL STAKEHOLDERS
Port Authority | Customers
Regulators | Supply Chain Partners

ONE PLATFORM CONNECTED TERMINAL A MORE EFFICIENT AND SUSTAINABLE TOMORROW



DIGITAL SOLUTIONS FOR A MORE EFFICIENT AND SUSTAINABLE BULK TERMINAL

The end-to-end digital thread

Every operational event becomes a usable, governed data point



Common backbone: SAICYT | Cloud | ERP | BI | OT security

What deployment in a live terminal teaches us

Four principles for moving from prototype to operating capability

START WITH THE SHIFT

Design around the operator, truck driver and controller workflow, not around the technology catalogue.

EDGE + CLOUD

Local autonomy protects continuity; cloud centralisation enables scale, standards and portfolio visibility.

DATA QUALITY FIRST

AI and prediction depend on reliable sensing, clear ownership and disciplined operational records.

CYBER BY DESIGN

Connected equipment increases the attack surface; OT segmentation and monitoring must grow with automation.

The connected control tower is the destination

Operate multiple terminals with common standards and local resilience



REAL-TIME VISIBILITY

Cargo, assets, energy and flows

REMOTE SUPPORT

Exception management across terminals

PREDICTIVE CONTROL

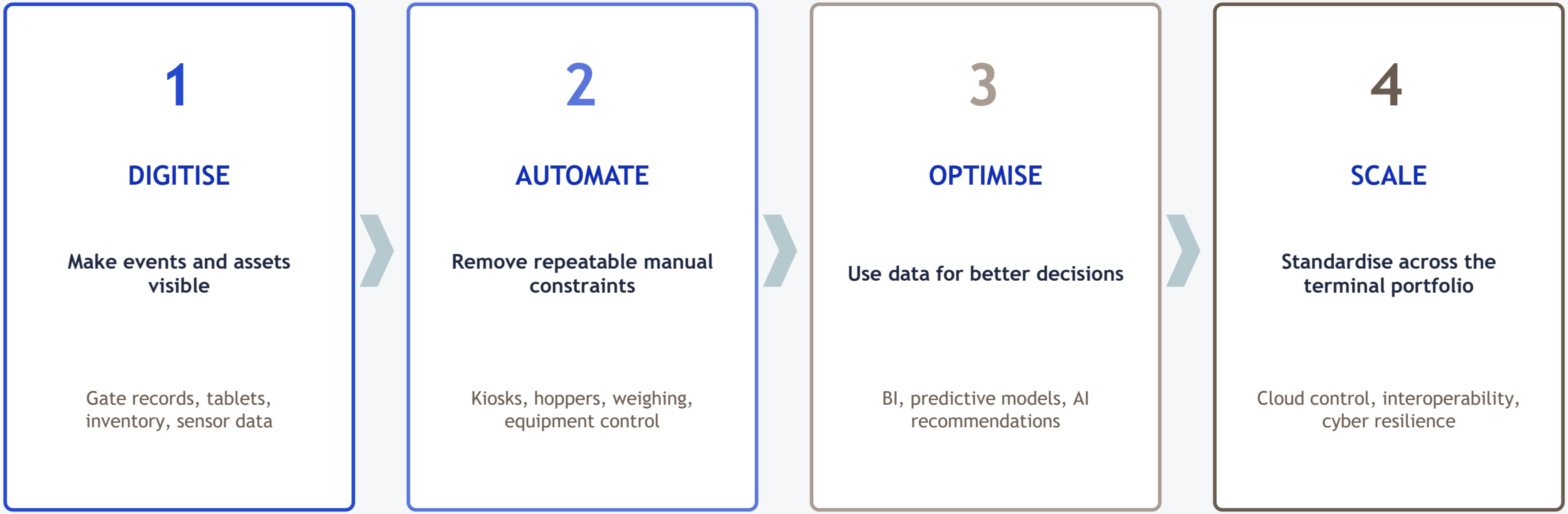
Maintenance, cargo condition and planning

SECURE CONTINUITY

Local fallback, OT security and monitored infrastructure

A practical roadmap: digitise, automate, optimise, scale

Technology maturity must follow operational maturity



The sequencing reduces risk: prove value in operations, then industrialise the architecture.

THE TAKEAWAY

The SMARTSTORE terminal is not a collection of devices.

It is an operating model in which people, equipment and data work as one system.

VISIBLE | CONNECTED | PREDICTIVE | RESILIENT

Thank you | Questions

Javier Sánchez | Galigrain SAU