JMBAXi THE PORT SPECIALIST TECHNOLOGIES

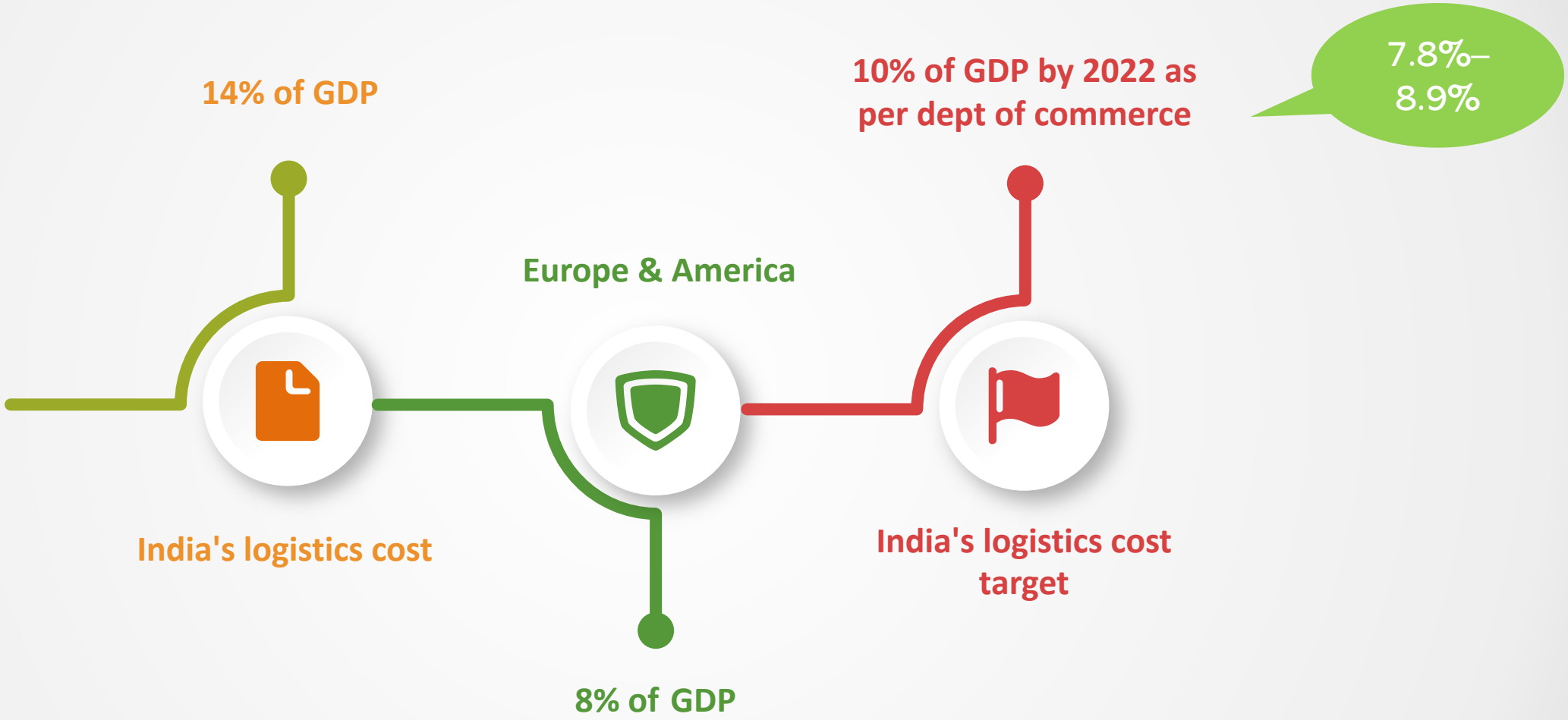
portall TRANSPARENCY ALL THE WAY

Automation in Ports & Terminals

Agenda

- ✓ Why Port Automation
- ✓ History of Port Automation
- ✓ Concept of Smart Ports
- ✓ Automation Examples in Smart Ports
- ✓ Future of Port Automation

Logistics cost of India as percentage of GDP?



What are the reasons for high logistics cost

1

High Operating cost

1. Non-standardised operations
2. Manpower intensive
3. Rising labour cost
4. Fragmentation of Services

2

Environment concerns

1. Carbon Footprint
2. Emissions
3. Paper based transaction

3

Lack of digitization

1. Reduces efficiency
2. Increased paperwork
3. Human errors

4

High indirect cost

1. Loss of work due to accidents
2. Cost of security incidence
3. Cost of human errors

Automation is the answer ?

History of automation

1 — 1940

Mechanical Port

- Mechanical Operations
- Handicraft Works

2 — 1960

Container Port

- Free Trade Zone
- Industrial Area
- Free Tax Port

3 — 1980

EDI Port

- International Network
- Integrated Centre
- Commercial Area
- EDI Services

4 — 2000

Internet Port

- Global Connectivity
- Port Community
- Logistics Area
- Intermodal Services
- Internet Services

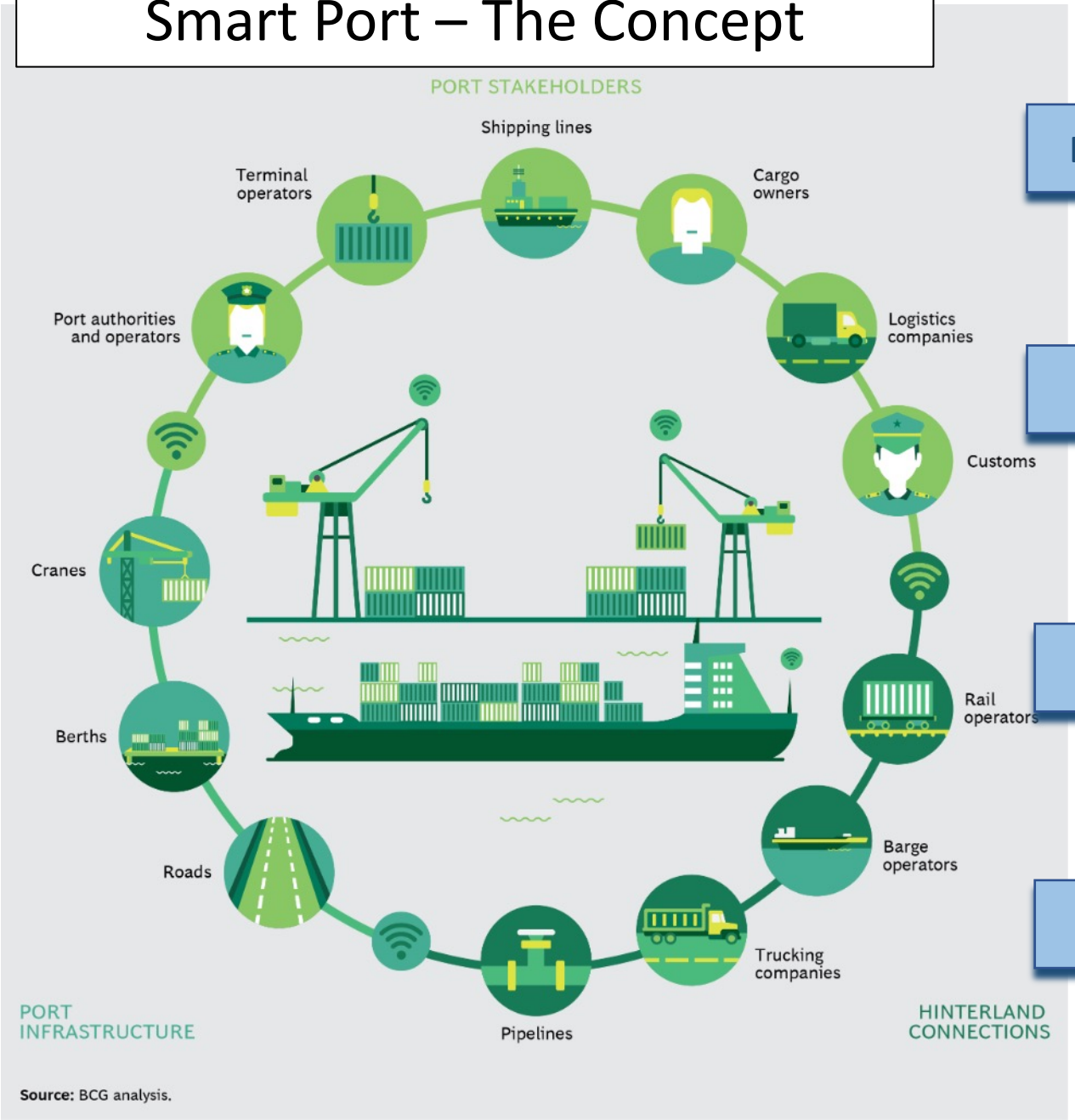
5 — 2020

Smart Port

- Logistics Services
- Smart City
- Smart Hinterland
- Multimodal Services
- Sustainable Port

Evolution of Port Automation

Smart Port – The Concept



Source: BCG analysis.

Ease of Doing Business

- Port Community System
- Single Window Customs
- Xray Scanning
- Bio Metric Access Control

High Productivity

- Smart Cargo Handling System
- Equipment Mgmt. & Control
- Gate Management
- Safety Management Solution

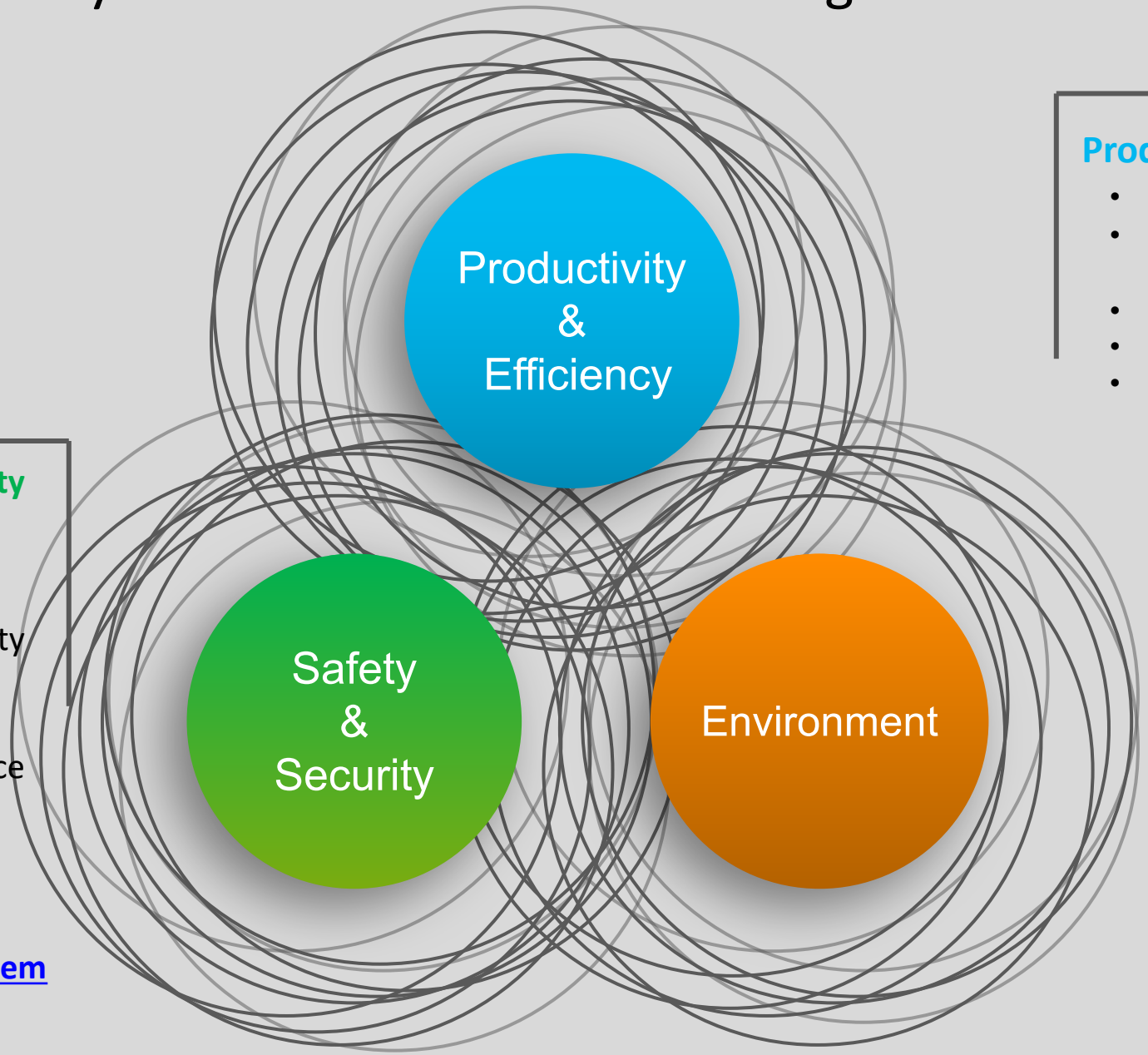
Optimized Traffic

- Truck Appointment System
- Traffic Management Systems

Minimize Impact to Surrounding

- Asset Health Monitoring
- Energy & Environment Management Systems

Smart Port – Key focus themes while investing in technology



Productivity & Efficiency

- Reduce transaction time
- Reduce human errors & intervention
- Real time updates
- Business predictions & Stability
- Resource & cost management

Examples:

1. Ship to shore automation
2. Yard automation
3. Gate automation
4. E-invoice

Safety & Security

- Intrusion detection
- Headcount management
- People & equipment safety
- Reduces accidents
- Information security
- Maintains a safe workplace

Examples:

1. **Video analytics**
2. **People tracking**
3. **Automated mooring system**

Environment

- Emissions management and improved air quality.
- Electrification and sources of renewable energy.
- Greenhouse gas / carbon measurement, foot printing, monitoring and management (reduction strategy)

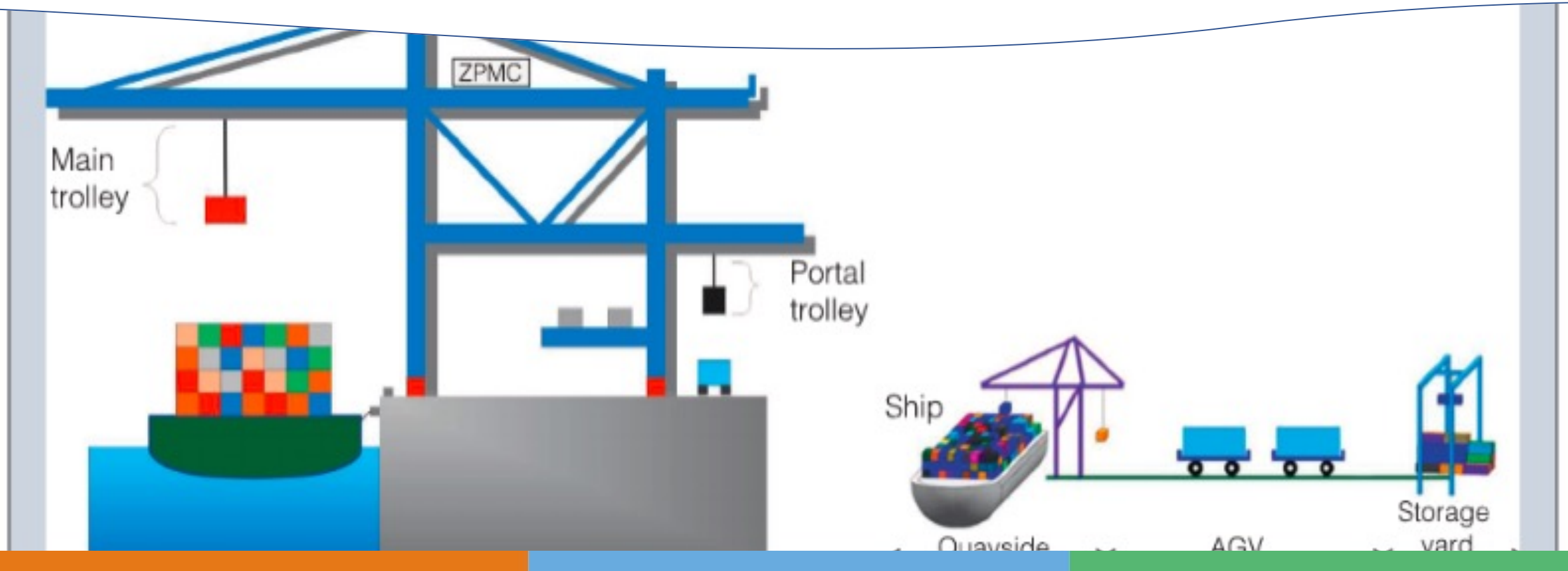
Examples: Smart Lighting

Automated Mooring Systems

- Rope Free , automated Mooring System
- Uses Vacuum Technology
- Works Under Multiple Environment Conditions
- Reduces Human Errors
- Increased Efficiency
- Increases Safety

Automated Ship to Shore Cranes

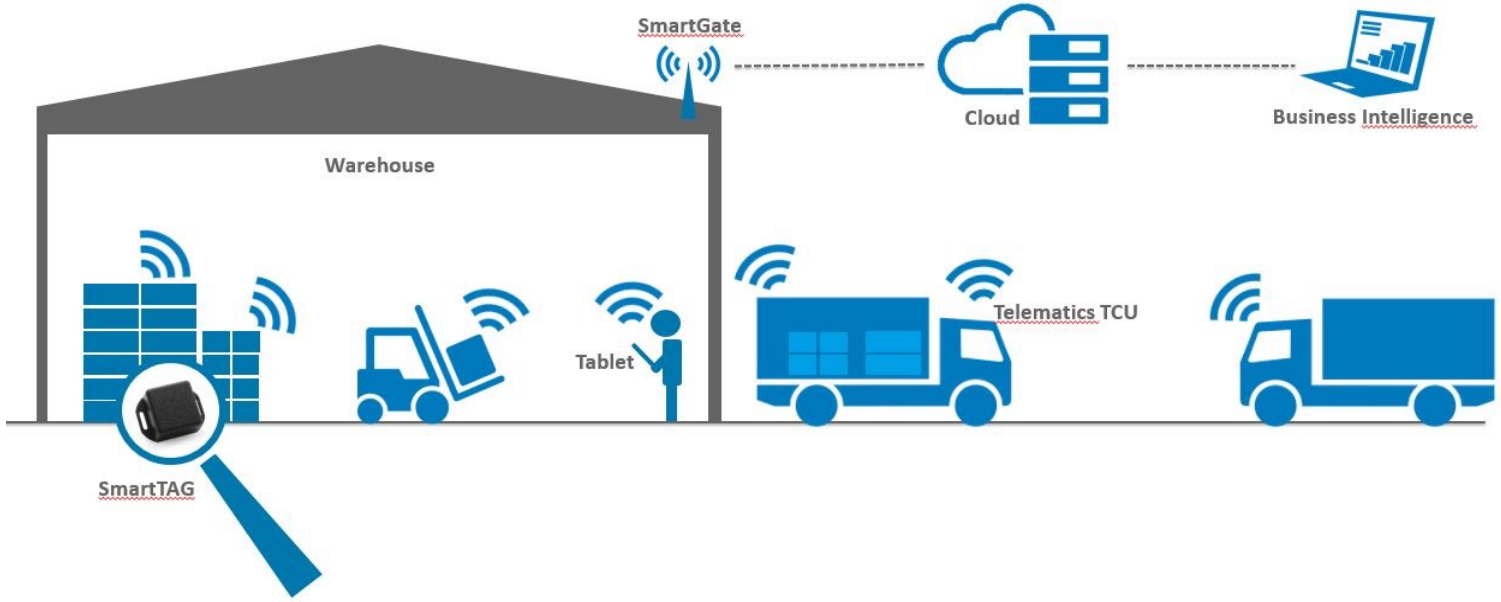
Uses IOT	Used Largely in Container Industry	Reduces Human Error
Unmanned Horizonal Transportation	Increases Crane Productivity	Can be remote operated



Automated Yard Management

- Geo Mapping with Yard Locations
- Enables Auto update of Container Location
- Uses RFID
- Assists in Vehicle Load Optimization
- Better Yard Inventory Control
- Reduces Truck Turn Around Time
- Can be integrated with Automated Vehicles

Automated Gate



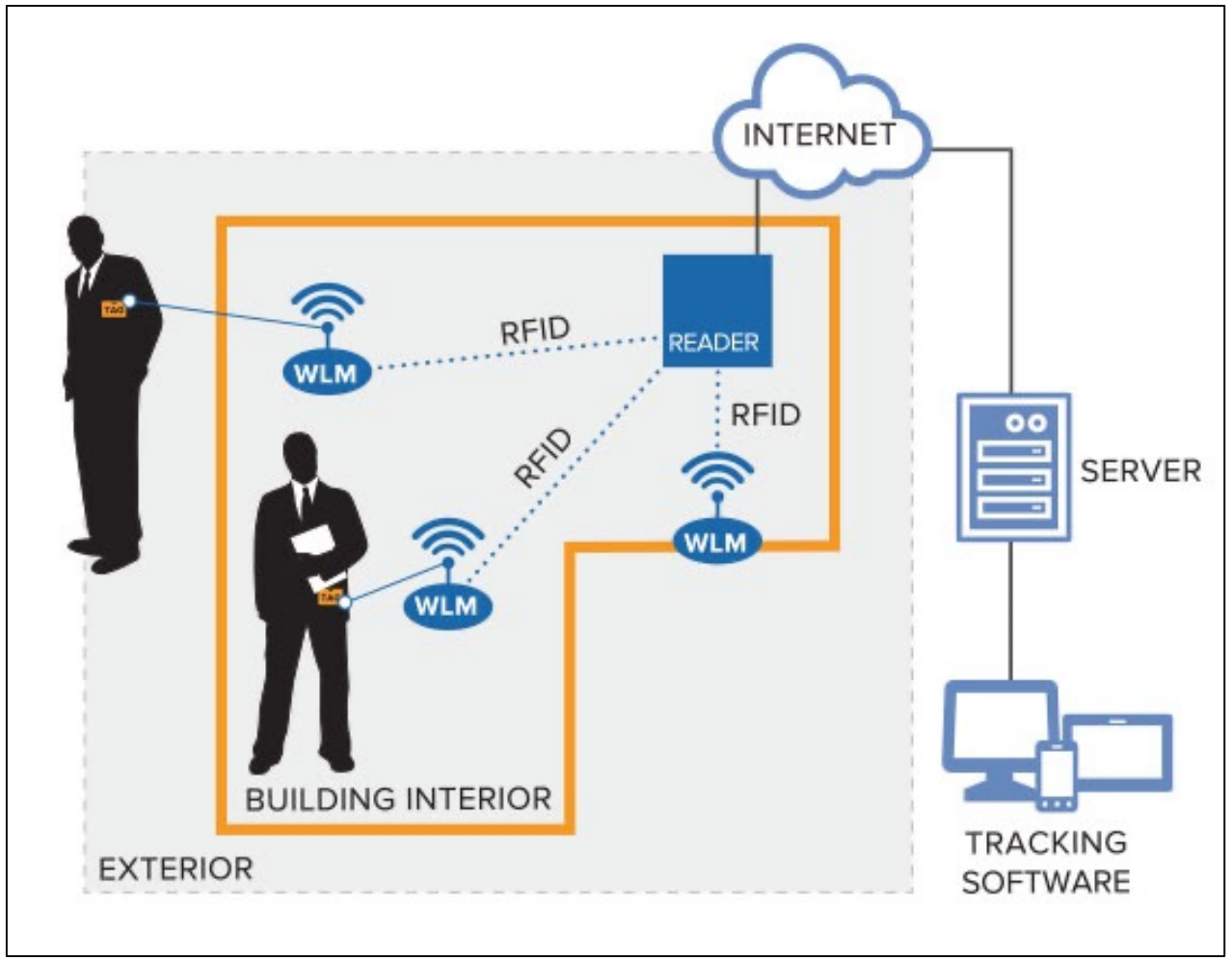
- Use of RFID/OCR camera for capturing data
- Integrated with TOD
- Cameras to capture container Damage
- Barcode readers for document reading
- Camera for Seal Verification
- Can be integrated with Vehicle Booking system
- Increases Gate Efficiency

Video Analytics

- Motion Detection
  Anomaly Detection
  Trip Tracking

- Traffic Density
- Reduces Accidents

People Tracking



- Sensor Based
- Advanced Analytics
- Prevents Accidents
- Improved Handling During Emergencies
- Anonymous or Interactive

SMART Lighting

- Energy efficient LED lighting system reduces carbon footprint and long-term operation costs
- Operational integration with real time data allows lighting control as and when required
- Air pollution monitoring integrated into the lighting network
- Extension of WiFi services through the smart light network.

E-Invoicing

- Structured invoice data issued in Electronic Data Interchange (EDI) or XML formats
- Structured invoice data issued using standard Internet-based web forms
- Get paid faster, increase visibility, go global

1

Get paid faster

Send invoices and we'll convert them into the formats your customers prefer, making it easy for them to pay promptly.

2

Increase visibility

Increase control over your accounts receivables with a simple way to track invoice status and identify issues.

3

Go global

Benefit from built-in compliance support with country-specific VAT/tax regulations.

Key outcome of smart port

Outcome
Better Control Over Port Emissions
Saving of Time and Resources
Improved Stability
Ease of doing business
Process automation
Increase in efficiency & productivity
Real time data without manual intervention
Better customer experience
Statistics & predictive analysis

JM BAXI
THE PORT SPECIALIST
TECHNOLOGIES
portall
TRANSPARENCY ALL THE WAY

FUTURE

- Block Chain
- IOT's
- AI & ML
- Data Analytics
- Drones
- BOTS

DIGITAL Supply Chain PLANNING

- Knowledge Management Systems
- Supply chain Analytics
- Digital Business Networks/ clouds
- Cognitive Planning
- Blockchain
- Embedded Computer Technology

DIGITAL Demand PLANNING

- Collaborative planning
- Big Data & Demand Sensing
- Forecasting using Artifical Intelligence
- Data Capture Technology
- Multi Channel order Management
- Social media and digital platform

DIGITAL SOURCING

- Digital Inventory management
- E-commerce
- E – Auction
- Supplier Portal

DIGITAL LOGISTICS

- GPS tracking
- RFID
- Transportation
- Dynamic Inventory Management
- Capacity and load matching
- Wireless updates
- Drones
- Track and Trace

INDUSTRIE 4.0

SMART MANUFACTURING

- 3D printing
- Robots & Automation
- Digital Assets
- Smart Machines
- IIOT & Twin Machines
- Digitalized Engineering

© Symbios Consulting

Smart port technologies around the world

The Port of Moerdijk, the fourth largest seaport in the Netherlands, has adopted connected intelligent street lighting to improve public safety and meet sustainability goals

Digital twin and APICA: Antwerp Port Information and Control Assistant
Using all of the data, video images and 3D models it has available, the Port of Antwerp is building a digital copy of the port, which will enable users to retrieve a whole host of useful information.

Smart containers now communicate information about their location via relay antennas. This technology transforms containers into smart connected objects, enabling multimodal transportation partners to prepare for the container's arrival in port.

Marseille port, France is building a blockchain for its operations along on MeRS corridor,

Germany's Port of Hamburg, which recently adopted a smartPort initiative. The port extended technological assistance to other stakeholders by improving logistics, adding intelligent railway points through sensors, harnessing shore power from renewable energies and even providing an option to find free parking spaces.

JM BAXI

THE PORT SPECIALIST

TECHNOLOGIES

portall

TRANSPARENCY ALL THE WAY