



VISY

APMT GOTHENBURG: AUTOMATION IN PHASES

AUTOMATION TRENDS AT INTERMODAL TERMINALS



GATE AUTOMATION AND OCR SOLUTIONS

TOC
EUROPE

Stand G80

APM TERMINALS

Lifting Global Trade



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Expand | your vision

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The future-proof partner for all access control, gate automation, and logistics needs

Process automation environments with AI-based OCR solutions are designed to streamline every part of a terminal for mission-critical operations.

Visy technologies identify and manage all traffic of cargo, vehicles and people in container terminals.

Visy is a pioneer in optical character recognition (OCR), applied AI, and deep learning for camera-based automation solutions.

About Visy

- ✓ Global leader of innovative and flexible **AI-based smart gate and terminal automation solutions**
- ✓ Operating in **25+** countries
- ✓ **500+** sites automated
- ✓ **5 000 000+** access control decisions each day
- ✓ **1 billion+** OCR events processed
- ✓ Innovating since **1994**



Lifting Global Trade.
APM TERMINALS

PSA
The World's Port of Call

DP WORLD
Constanta

DB NETZE

DFDS

storaenso

UPM

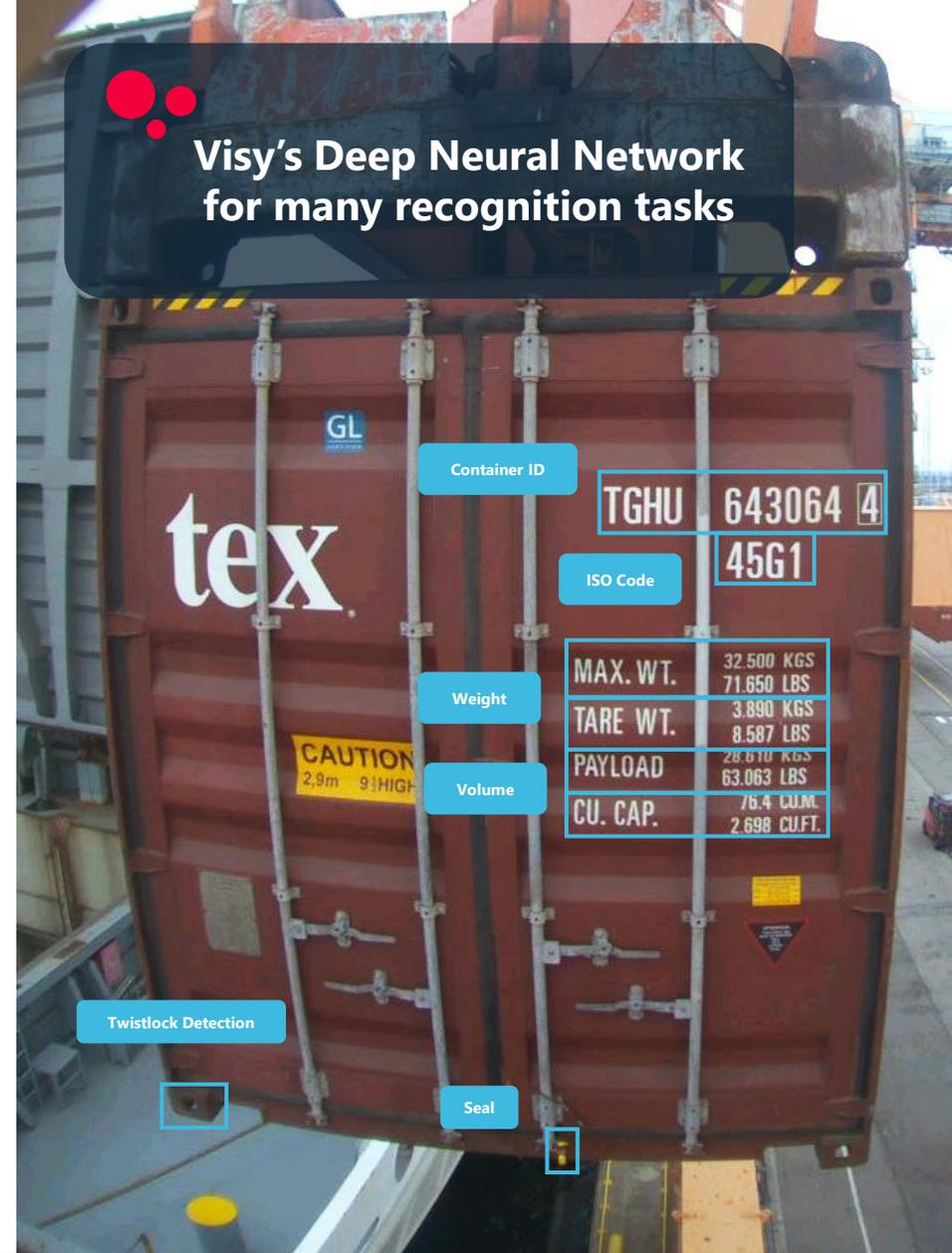


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Visy

Scalable, repeatable, and profitable operations

- ✓ Single platform system – dynamic & streamlined Ops
 - Measurable performance
 - Add and subtract individual modules as required
- ✓ Identify, digitize, share data
 - Extensive interfaces with TOS and other systems
- ✓ If the system can see it, the system can ID it
- ✓ All software made in-house
 - Most advanced AI / deep neural network (DNN)
 - Guaranteed high OCR read rates
 - New disruptive AI technologies (ADDS, TopView, AREA)



APMT Gothenburg

Remarkable CT in Northern Europe

- ✓ Nordic, deepwater terminal
- ✓ Increase capacity and improve KPIs
 - TTT, Damage Mgt, Customer Service
- ✓ Digitalization; measured operational improvements; environmental responsibility
- ✓ Eventually, automate everything going in/out via road, rail or quay
 - Phase 1 – Road and Rail: 2017-18
 - Phase 2 – STS and RMG's: 2022-23
- ✓ Maersk "One Team" – All parties working together and sharing responsibilities
 - On Spec
 - On Time
 - On Budget



APMT Gothenburg

Phase 1

East (Gate 3) - Import + Depot

- 11. Security IN – Self-service kiosks Lanes 1-2
- 12. OCR Portal IN – Truck Damage Inspection
- 13. Gate IN – Check-In self-service kiosks Lanes 1-5
- 14. Trouble Resolution lanes – 2 Lanes with Self-service kiosks
- 15. Truck Grid – 5 Depot Lanes with small sized driver kiosk
- 16. Truck Grid – 10 Import Lanes with small sized driver kiosk
- 17. OCR Portal OUT – Truck Damage Inspection
- 18. Gate OUT Lanes – Self-service kiosks Lane 1-2. Lane 3 service traffic (inc "Entry not approved"- Exit)

West (Gate 4) - Export + Train

- 21. Security IN – Self-service kiosks Lanes 1-2 + Lane 3 service traffic
- 22. OCR Portal IN – Truck Damage Inspection
- 23. Gate IN – Check-In self-service kiosks Lanes 1-5 + 1 OOG Lane
- 24. Truck Grid – 9 Export Lanes with small sized driver kiosk
- 25. OCR Portal OUT – Truck Damage Inspection
- 26. Gate OUT Lanes 1-3 – Self-service kiosks Lane 1-2. Lane 3 service traffic (OOG) + Lane 4 "Entry not approved"-Exit
- 27. Train OCR Portal IN/OUT



Integration with Navis 4



Bilder ©2023 Aerodata International Surveys, CNES / Airbus, Lantmäteriet/Metria, Maxar Technology

APMT Gothenburg

Phase 1

- ✓ Security-in gate areas
- ✓ Booking in N4 with appointment
- ✓ VAG environment with Enrollment system
 - Driver details, safety training, RFID card
- ✓ LPR and kiosk
- ✓ Confirm Truck Visit Appointment number (TVA)



Integration with Navis 4

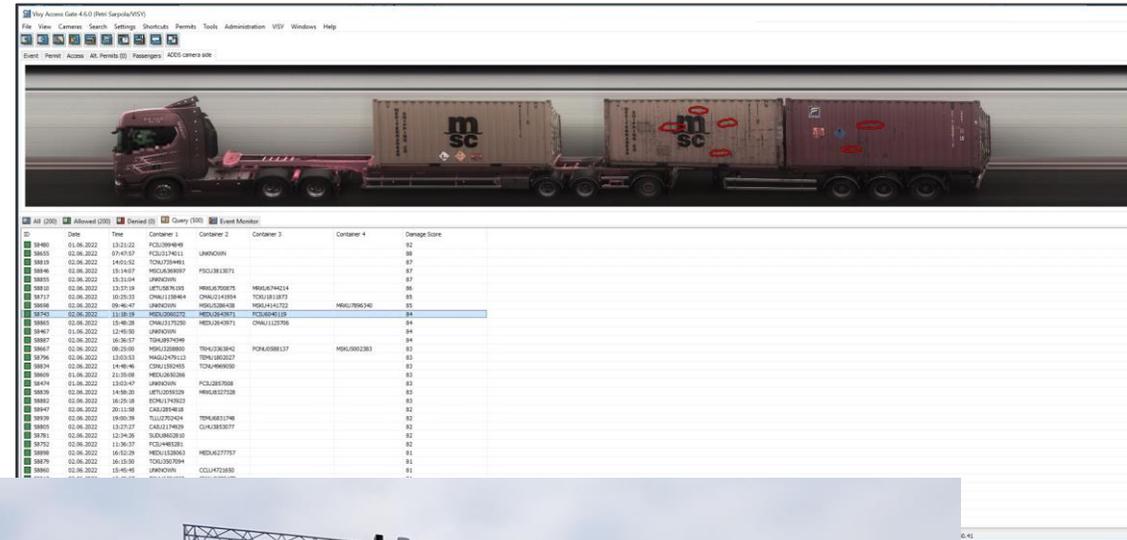
navis[®]

APMT Gothenburg

Phase 1

- ✓ 4 OCR portals: 2 in / 2 out
- ✓ Container ID, LPR, ISO codes, high-res imaging for DI
 - Gate out – seal presence
- ✓ Software tools for clerks to work with images
- ✓ Integration with Navis and data collection for check in / check out

Integration with Navis 4



APMT Gothenburg

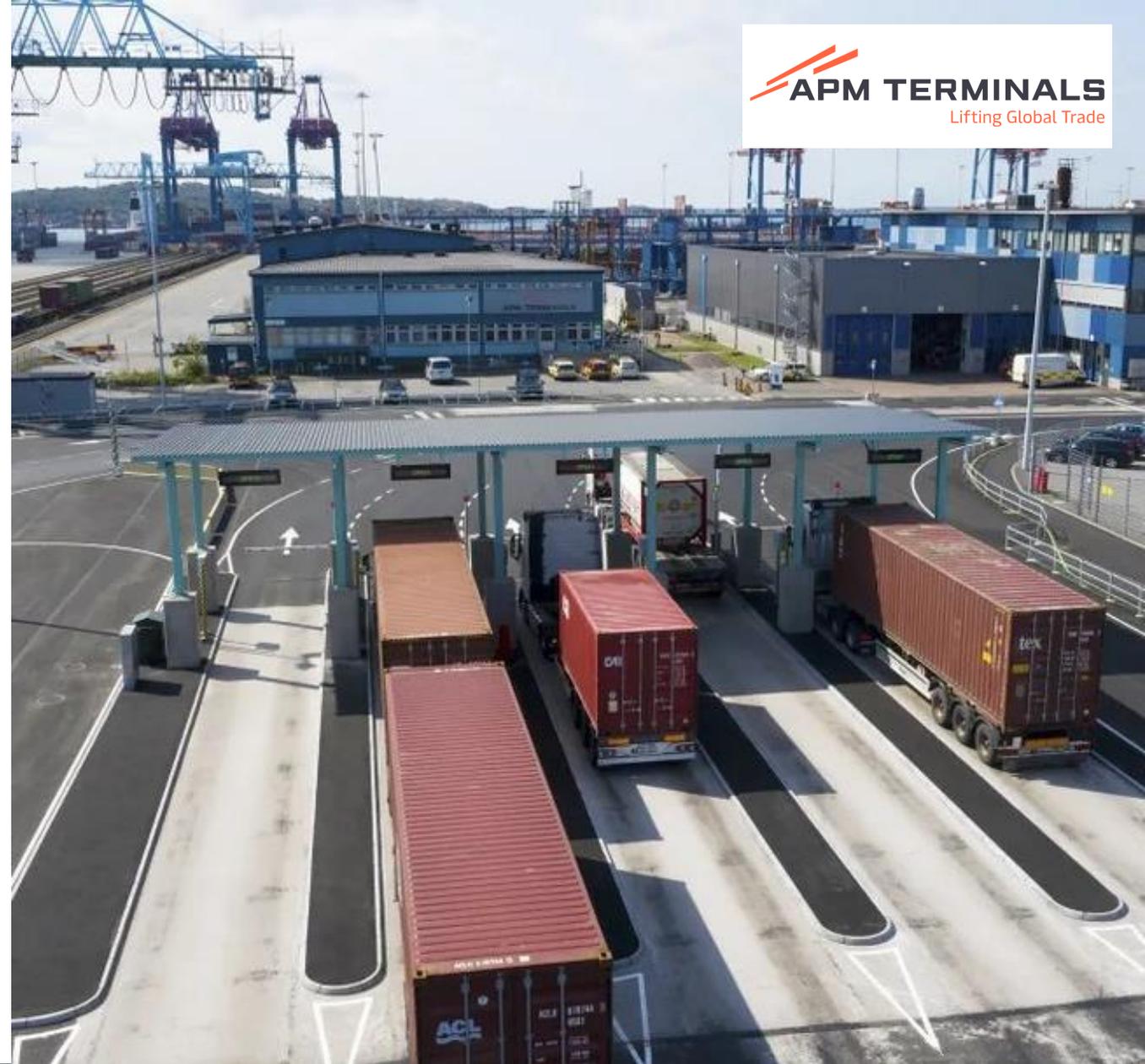
Phase 1

- ✓ Main gate area
- ✓ Display boards and kiosks
- ✓ Swipe RFID card at kiosk, OCR from portal, integration with N4
- ✓ RFID to ID the driver and prepopulate kiosk info
- ✓ Option to print ticket for driver
- ✓ VAG counts number of trucks in terminal and can hold at gate if required

Integration with Navis 4



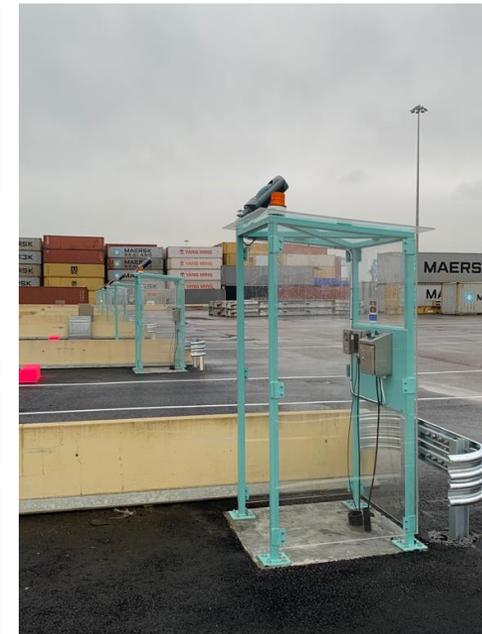
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Phase 1

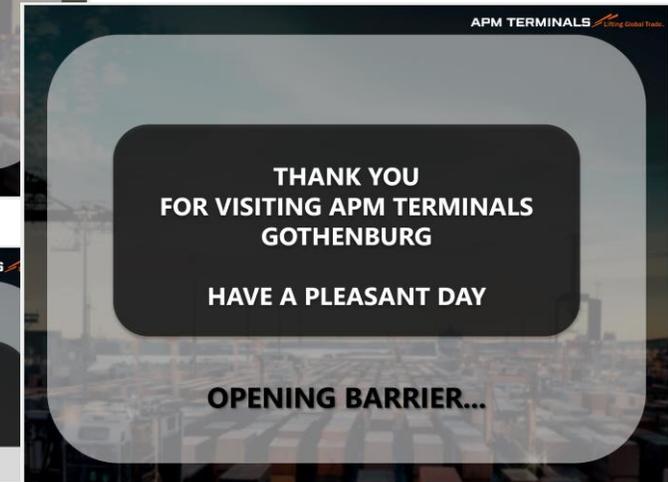
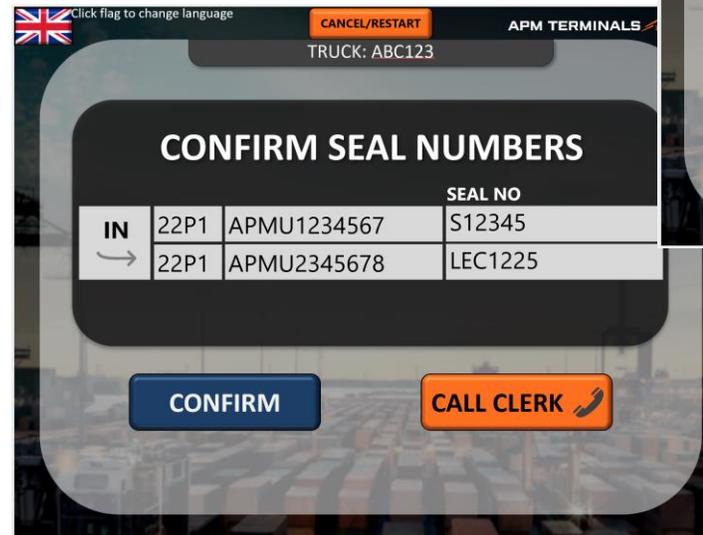
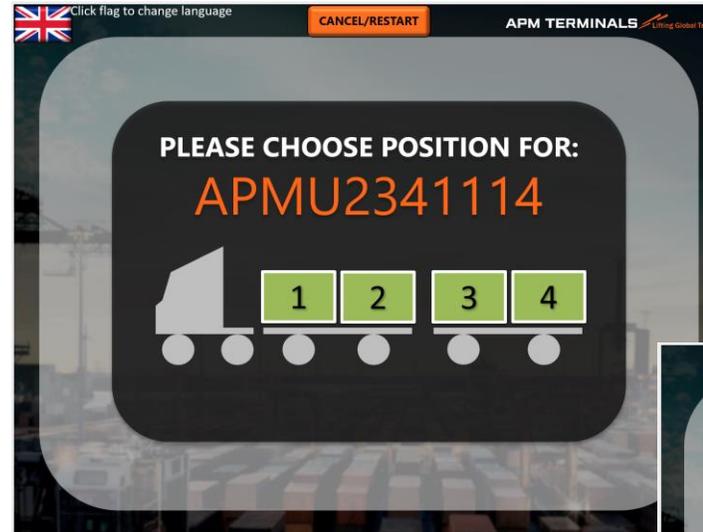
- ✓ Kiosk design for gates and yard
- ✓ Simple design to minimize time and driver interaction
- ✓ Security gate and Main Gate: Touch screen, Intercom, RFID, printer
- ✓ Yard: Intercom, PIN pad
 - Safety checks for driver



APMT Gothenburg

Phase 1

- ✓ Kiosk software for all use cases
- ✓ Driver Enrollment
- ✓ Truck Visit Appointment number (TVA)
- ✓ Validate info with Navis
- ✓ Trouble shooting at lane or exception handling area
- ✓ All combinations possible: multiple workorders for full/empty, import/export
- ✓ Kiosks & OCR = TTT and reduce CO2



APMT Gothenburg

Phase 1

- ✓ 1 Bi-directional, Rail OCR portal
- ✓ Faster and more accurate data exchange
- ✓ Exception handling for operations
 - Expected manifest in N4 vs actual
- ✓ Visy Train Gate user application for imaging containers and cargo
- ✓ The system automatically digitizes
 - Container IDs
 - Wagon IDs
 - IMO and ADR labels
 - High-res images for damage inspection



APMT Gothenburg

Phase 2

- ✓ 2 RMG's
- ✓ 7 STS Cranes (not 8)
- ✓ Strict principles of digitalization, measured operational improvements, environmental responsibility
- ✓ Maersk "One Team" – All parties working together and sharing responsibilities
 - On Spec
 - On Time
 - On Budget



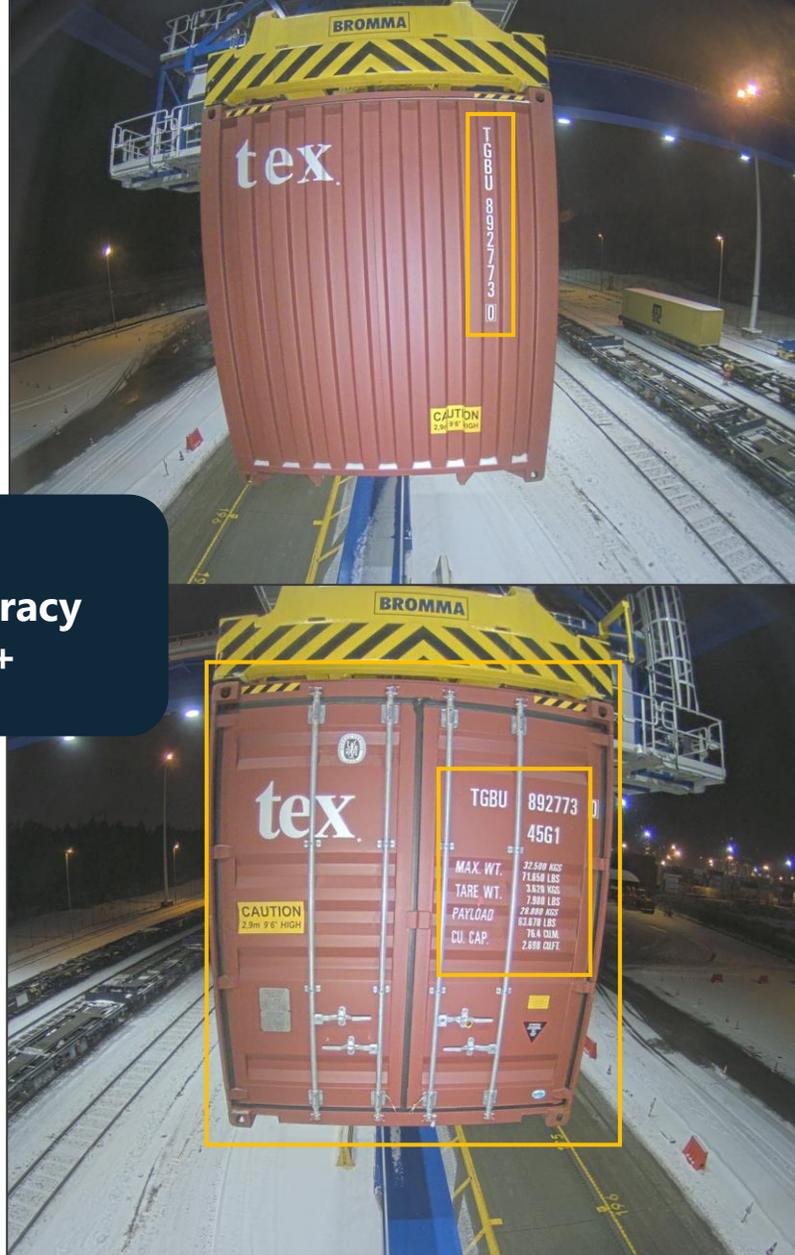
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Phase 2

- ✓ OCR for 2 Liebherr RMGs for rail cargo
- ✓ System images short sides and captures container IDs, ISO codes, and door direction
- ✓ The data is made available in the Visy Crane Gate application
- ✓ Digitalization of all rail moves synchronized with Visy Train Gate and N4
- ✓ Faster handling times and clean data



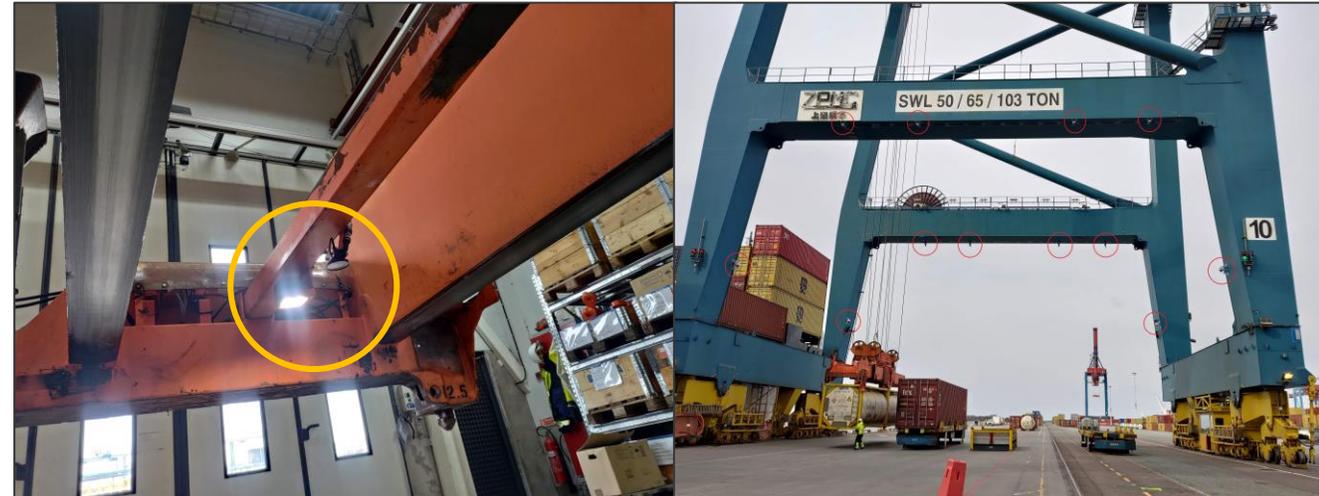
**OCR accuracy
rate 99%+**



APMT Gothenburg

Phase 2

- ✓ 2 x NOELL, 2 x Liebherr, 3 x ZPMC
 - 4G or Fiber
- ✓ TopView takes images of the roof & LaneView images long and short sides
- ✓ Digitizes container IDs, ISO codes, and door orientation
- ✓ Visy ADDS for detecting container damage
- ✓ Verify box location for N4
- ✓ GMPH has significantly improved and **OCR recognition rate for container ID is over 99%**



Visy Crane Gate 4.13.0 (Petri Sarpola/Visy)

File View Cameras Search Settings Shortcuts Tools Administration Windows Help

Event Permit Access Alt. Permits (0) Passengers Top Containers Exceptions



ID	Time Stamp	Date	Time	Checkpoint	Container 1	Container 2	ISO 1	ISO 2	Bund...	Dam...	Dam...	Com...	Even...	Orien...	Orien...	Move...
534547	18.04.202...	18.04.2023	13:00:23	K11 - ZPMC	MRSU7962806 / 2261	MRSU1896054 / 2261	2261	2261		Yes	100			Normal	Normal	Load
534546	18.04.202...	18.04.2023	12:54:05	K11 - ZPMC	SUDU7695980 / 2261	MRSU8974094 / 2261	2261	2261		Yes	100			Normal	Normal	Load
534545	18.04.202...	18.04.2023	12:52:01	K11 - ZPMC	MRSU4324215 / 45G1		45G1				0			Normal		Load
534544	18.04.202...	18.04.2023	12:50:16	K11 - ZPMC	HASU4995804 / 45G1		45G1			Yes	56			Normal		Load
				ZPMC	MRSU3173686 / 45G1		45G1				0			Normal		Load
				MC	SUDU8691377 / 45G1		45G1				0			Normal		Load
				MC	CADU4826667 / 45G1		45G1				0			Normal		Load

Integration with Navis 4



Data Collection

Visy Deep Neural Network (DNN)

- ✓ Process automation depends on digitizing accurate data to share with 3P systems
- ✓ Visy DNN analyzes images and shares data faster and more accurately than a human
- ✓ Sample pics are raw OCR reads from Visy systems; the DNN correctly reads damaged box ID's
- ✓ Exception handling events should be true errors, not OCR misreads
- ✓ If not at 99%, there is a problem with the system



Decrease Truck
Turnaround
Times: 56 to 25
mins

Digitized all
data
collection
processes

Increase STS
Gross Moves
per Hour in all
cranes and
moves

Shorter handling
times reduced
carbon emissions
by 688 tonnes in
2020

APMT GOTHENBURG

OUTCOME FOCUS

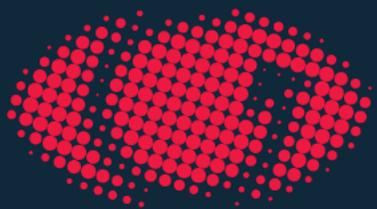
OCR read
rates over
99% correct

APMT - Future

Aarhus in 2 phases

- ✓ Full circle with happy customer
- ✓ "APMT One Team" meeting all site requirements
- ✓ Current gate automation system with VAG, OCR portals and kiosks like Gothenburg – went live in Sept 2020
- ✓ On-Going project for STS OCR (8) like Gothenburg
- ✓ Focus is safety and automation





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