



SMART border

for cargo, passenger and transport - practical implementations and best practices

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13 June 2019 / TechTalk 3 / 14:30 - 15:00

A banner for the WCO IT/TI Conference & Exhibition. The background is dark red with a city skyline and a large, stylized orange and yellow flame-like graphic on the right. Two thick white diagonal lines cross the banner. The text "WCO IT/TI" is in large white letters, with "IT/TI" in a larger font size. Below it, "Conference & Exhibition" is in a smaller white font. At the bottom left, "12-14 June 2019" and "Baku, Azerbaijan" are written in white.

WCO IT/TI

Conference & Exhibition

12-14 June 2019

Baku, Azerbaijan

Nuctech - Introduction

Nuctech Company Limited, originated from Tsinghua University, is a Global Leading security inspection system manufacturer & solutions provider.

Founded in 1997

Staff : 5000+ personnel

Products : Exports to 160+ countries and regions



Original Inventions & Innovations

An Innovation Leader in X-Ray Scanner and Inspection



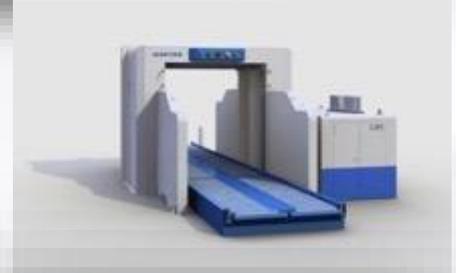
1st Mobile Inspection System



1st Re-locatable Cargo Vehicle Inspection System



1st Liquid Inspection System



Neutron/Dual-Energy X Ray Inspection System



1st Fast Scan System



1st Train Vehicle Inspection System



1st Dual Energy-Dual Angle Inspection System



3-rail Railway Container Inspection System

Comprehensive Product Range

We now have 30+ series and 200+ varieties of security products used in Customs, Civil Aviation, Railway, Urban Transit, Judiciary, and Big Events.



Global Market Share

For Container / Vehicle Inspection Category, Nuctech currently holds the largest market share

| | Company Name | 2016 Share | 2017 Share | Difference |
|---|------------------------------------|-----------------------|-----------------------|-------------------|
| 1 | Nuctech | 41.2% | 39.6% | -1.6% |
| 2 | Rapiscan Systems | 27.1% | 26.7% | -0.4% |
| 3 | Smiths Detection | 14.8% | 10.8% | -3.9% |
| 4 | L-3 Security and Detection Systems | 1.7% | 8.6% | 6.9% |
| 5 | Astrophysics | 3.7% | 3.7% | 0.0% |
| | Others | 11.5% | 10.6% | -0.9% |

Nuctech's SMART CUSTOMS

Revenue

Facilitation

Security

► Systems & Solutions

Customs Mgt System
(ViSight)

Revenue & Tax
(ViTax)

E-Commerce

National Single Window

Port Community System

Cargo Community System

Centralised Command
(ViCentre)

Cargo Tracking
(ViTracking)

Border Post Management
(ViBorder)

► Strategic Consulting

Trade Facilitation Strategy

Artificial Intelligence

E-Commerce

► Inspection Equipment & Devices



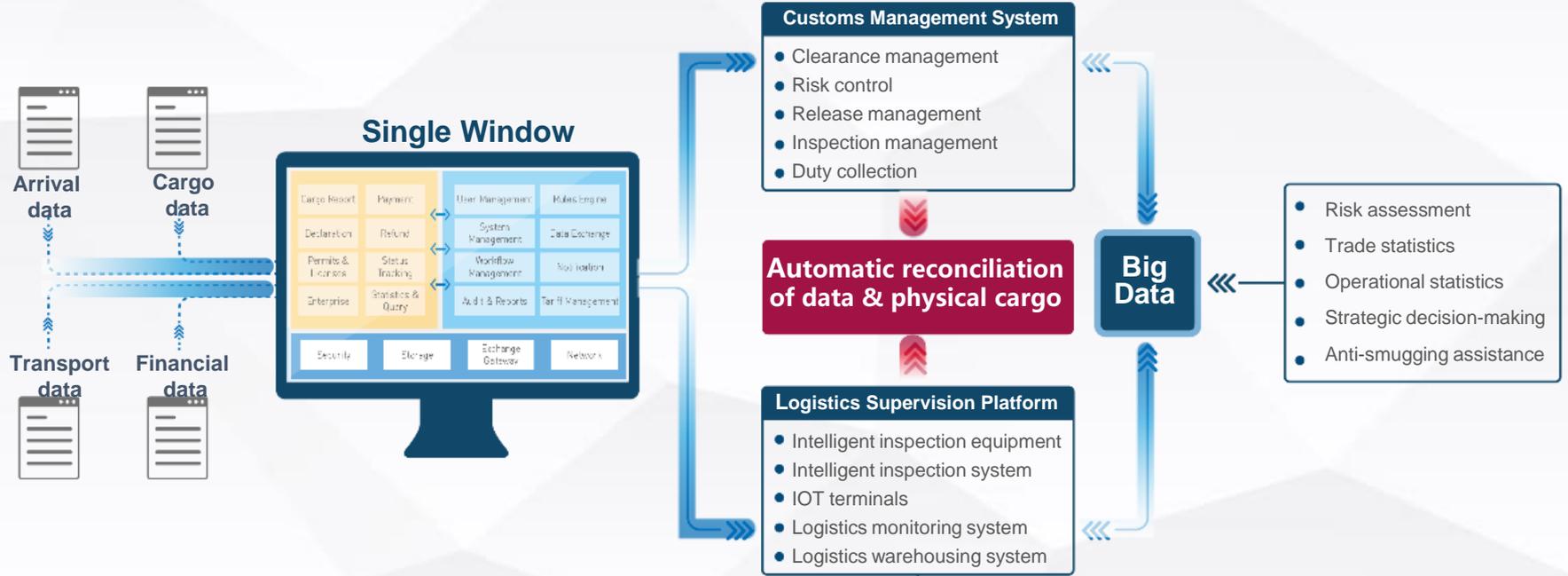
CT / X-Ray Scanners

Smart Gates

E-Seals

Robotics

Integrated SMART CUSTOMS



NUCTECH's Smart Border Solutions



Border Solution

Facilitating People, Vehicles and Cargo



“One-stop” Border clearance

Cargo inspection + Access Control

| | | | | | |
|---|--|--|--|--|-----------------|
| Systems |   |   |   |   | Systems |
| |   |   | | | |
| Equipment |   |   |   |   | Site Facilities |
| |   |   |   | | |
|              | | | | | |

Functionalities of the Vi-Border Solution



Arrival Registration

Arrival Info.
Reg. Checkpoint



X-ray
Scanning Area



Waiting Area



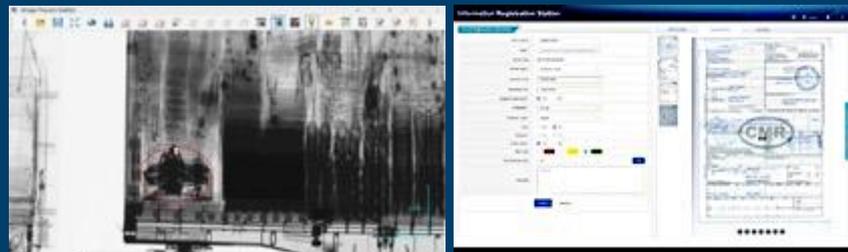
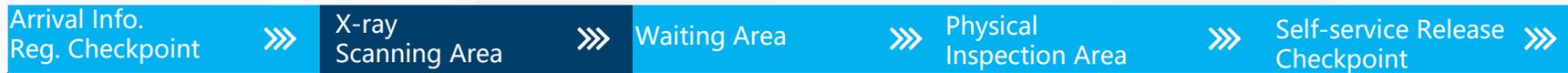
Physical
Inspection Area



Self-service Release
Checkpoint



X-ray Scanning Area



Cargo Clearance Process – Waiting Area

Arrival Info.
Reg. Checkpoint



X-ray
Scanning Area



Waiting Area



Physical
Inspection Area



Self-service Release
Checkpoint

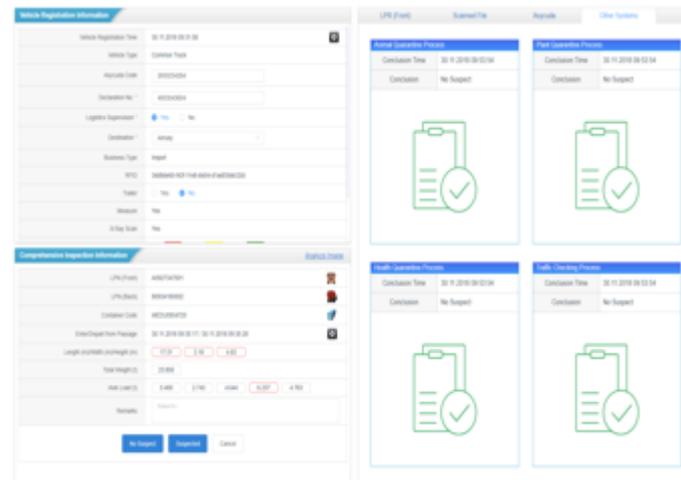


Complete relevant images review and comprehensive inspection

According to the information system, automatically send the release conclusion to LED screen

LED screen guides vehicles to the next step

Cargo Clearance Process – Physical Inspection Area



Self-Service Release Checkpoint

Arrival Info.
Reg. Checkpoint



X-ray
Scanning Area



Waiting Area



Physical
Inspection Area



Self-service Release
Checkpoint



Main Equipment & Facilities



- ✓ Self-service Business Declaration Terminal
- ✓ Smart Luggage Inspection Equipment
- ✓ Human Body Scanning Inspection Equipment
- ✓ Mobile Terminal
- ✓ Face Recognition and Smart Video Tracing
- ✓ Special Inspection Toolkit
- ✓ Micro Measurement Human Body X-Ray Scanner
- ✓ Narcotics Detection Device

Port Kolzhat of Kazakhstan



Vehicle Registration / Self-Service Release Checkpoint



Integrated Measurement Channel



Control Center



Inspection Area

Port Kolzhat Land Border System was implement in Oct 2018 with Pilot runs in early Apr 2019. Following benefits were realized :

Improve Clearance Efficiency > 221%

Before: Vehicles had to stop 10 times with clearance time of 90 mins.

After: Less stops for vehicles; clearance times within 28 mins.

Automatic Collection Data

Information - Vehicle dimensions, container No., Gross Axle Weight, X-ray Image, CCTV video and other information are automatically collected through integrated system.

Visual Traffic Guidance

Vehicles and passengers are automatically guided , for fast access.

Intensify Business Query & Audit

Each step are tracked and timed. Operation log can be audited and data can be mined and analyzed for further process improvements.

Cross Border / Transit



Transit Tracking Platform

Transit Logistics Tracking & Monitoring



In-transit monitoring
Smart Security Lock

AI
Intelligent image and document comparison

Customs issues release notice

Cargo arrival

E-Lock

In transit

Inspection & Sorting



Cargo Storage



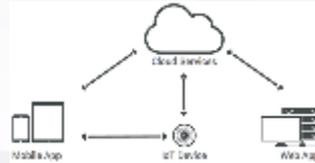
WMS

Delivery

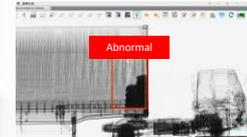
Way Forward

- Smart Borders is only part of the **Border & Cargo Security Transport Chain**
- A **holistic approach** is required – **Integrated Solutions / Infrastructure** and **Business Model** are critical for comprehensive smart border / cargo transit management
- Leveraging on new technologies are the way forward –

- **IoT Device / Cloud**



- **Artificial Intelligence**



- **Blockchain & Smart Contracts**



Artificial Intelligence , Image Mining



Challenge

- No classification by vehicles type and model
- No classification by cargo type
- No classification by sized items type
- No classification by sized items location



Library sorted by vehicles type and model



Hatchback # VW Golf



Minivan # VW Transporter



SUV # MB ML



Library sorted by cargo type (HS codes)



Potato chips HS 1105



Apples HS 0808



Library sorted by sized items type and location



Drugs # Truck # Floor



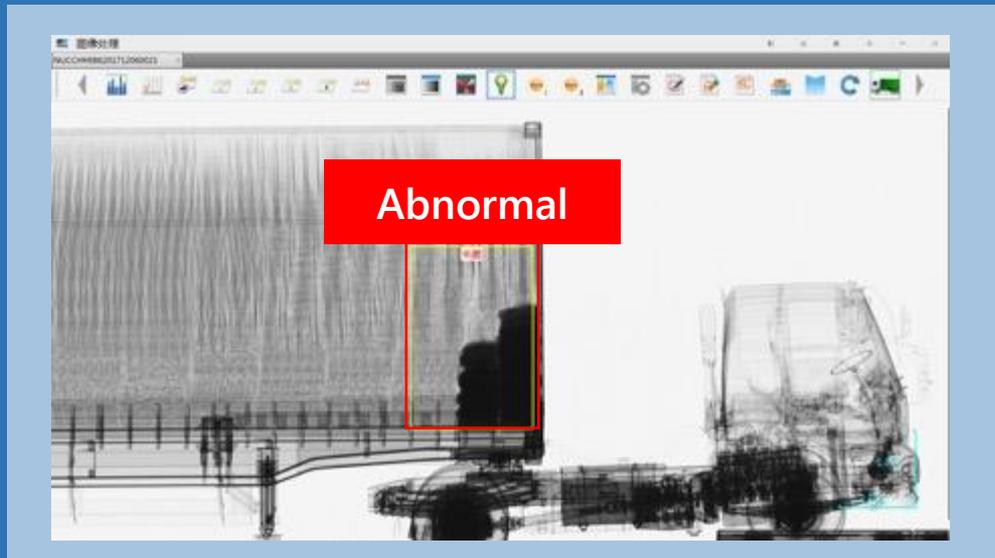
Tabaco # SUV # Tank

Nuctech's Artificial Intelligence Platform

wiScan is an NUCTECH's Artificial Intelligent Platform. It is designed to reduce interpreter burden and speed up the whole analysis process.



Suspicious Area Alarm

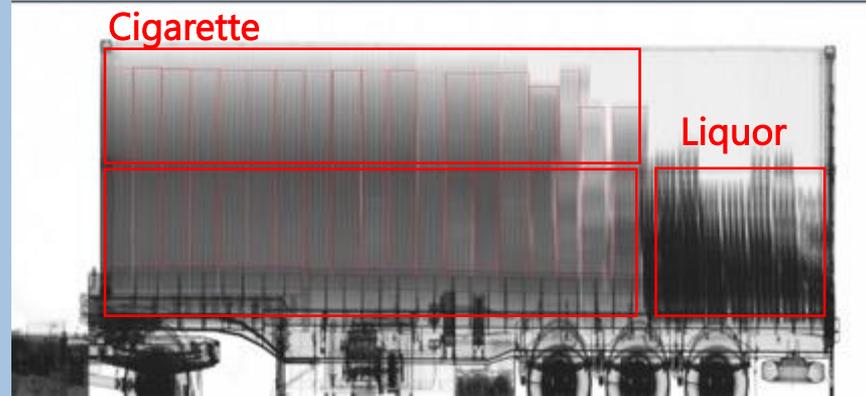
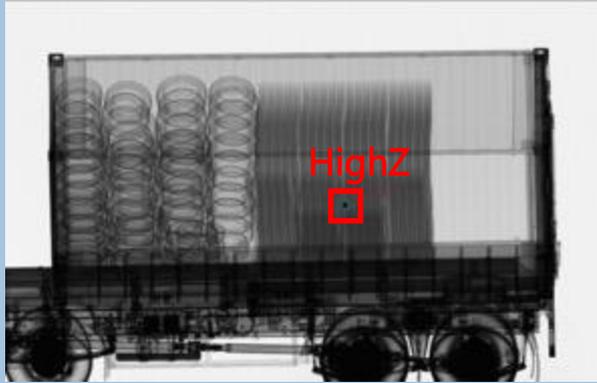


For abnormal detection, wiSpot can detect inconsistent vein and find the items hidden in the container, or identify whether the container is empty as it is declared.



Clue

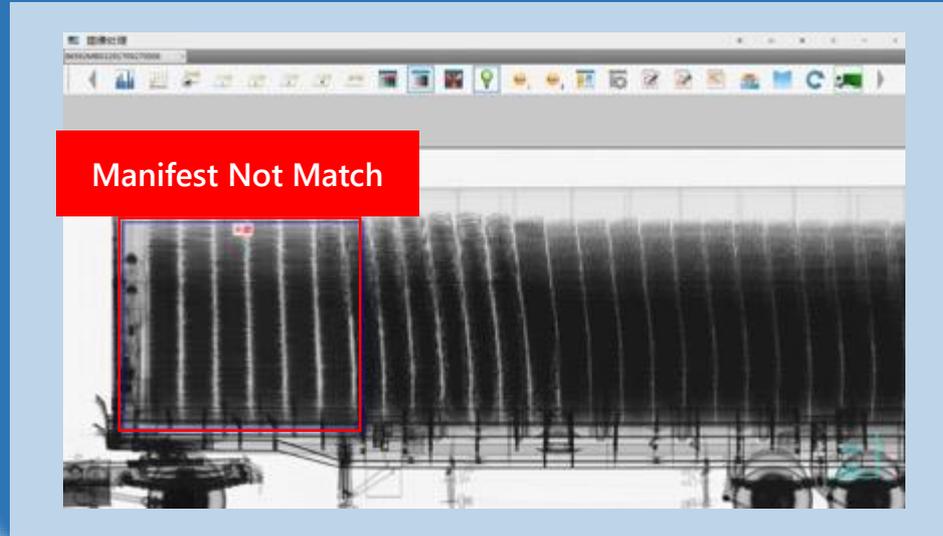
Multiple Designated Contrabands



For certain contrabands detection, wiClue can automatically locate some certain contrabands. e.g. cigarettes, bottled liquor, high atomic number material and illegal weapons.



Match Image with Manifest Description



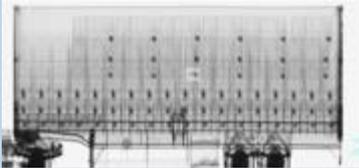
Where manifest data are provided, wiLabel can help the operators to check whether cargo in containers matches with the information in customs declaration.



Reference for Images without Manifest



The scanned image or manifest data of similar cargos can be retrieved from a database for quick reference.



Manifest

Refrigerator

Refrigerator

Refrigerator

Refrigerator

Similarity

96%

94%

87%

82%

wiScan+ Customization

wiScan can be customized for specific requirements.

We need :

Scanning Image

Manifest Information

Inspection Conclusion



We do :

Data Mining

Deep Learning

Follow-up Training

Thank You