



International  
Trade  
Centre

TRADE IMPACT  
FOR GOOD

# **WCO UNESCAP: 5th UNNExT Masterclass**

The use of Emerging Technologies to Facilitate Trade  
and enhance the Supply Chain Efficiency



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19 September 2022



# Background to Automation – Border Controls

- ❑ Early 1980's: ICT systems were “digitization” based – converting paper to digital artifacts.
- ❑ 1990's: electronic data exchange capabilities evolved
- ❑ 21<sup>ST</sup> Century: Web-based solutions
- ❑ Digitization meant stand alone systems, inefficient & ineffective
- ❑ Electronic data exchange resolved the ‘silo’ problem – improved multi-agency connectivity and helped data security/integrity
- ❑ Web-based gives greater interoperability and leads to enhanced controls

# Objectives of Automation in the Context of Border Controls

## Better & Wider Connectivity:

- **Internally:** example- customs clearance systems
- **Nationally:** example -tax-customs data exchange, trade single windows, port community systems
- **Internationally:** example - foreign customs administrations, chamber of commerce, quarantine.

# Emerging/Disruptive Technologies

## Definition

A technology that displaces an established technology and “disrupts” the industry or a groundbreaking product that creates a completely new industry.

(Christensen et al. 2016)

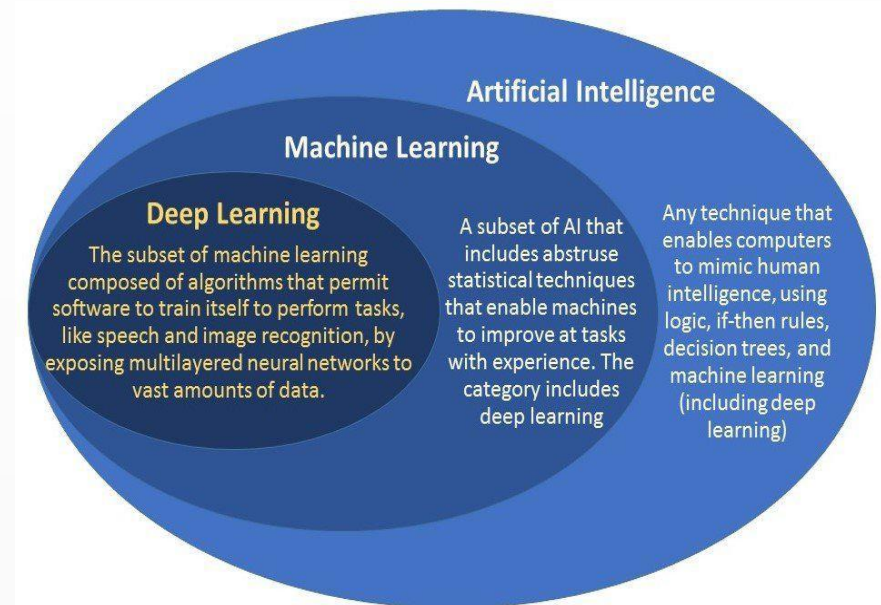


# Artificial Intelligence

**Artificial intelligence (AI)** traditionally refers to an artificial creation of human-like intelligence that can learn, reason, plan, perceive, or process natural language.

**Machine learning (ML)** is a particular approach to AI that makes use of learning algorithms to make inferences from data to learn new tasks, identify patterns, and make decisions with minimal human intervention. ML can be regarded as a method of data analytics that automates predictive analysis.

Use of AI presents a tremendous opportunity given the big data collection in customs



# Artificial Intelligence

## Benefits & Application

- Modeling duties and taxes collection patterns to ensure the appropriate duties and taxes are collected at the border
- Improving the risk management techniques
- Ensuring improved HS classification & applying correct tariff's
- Identifying anomalies – freeing up human resources to other tasks
- Improving cargo selectivity and targeting
- Enhancing scanned image analysis to improve detection efficiency
- Deploying chat boxes with an intelligent knowledge base for better customer service.

# Scanned Image Analytics

- Automated image identification enhances rapid & accurate analysis of scanned images.
- Typical X-ray container scanner scans 35 to 50 containers per hour, while a high-speed parcel scanner can screen 2,500 parcels per hour.
- The analysis of scanner images is a challenging visual task, even for trained officials
- Containers in which a variety of goods is present, the imaged objects are in varying and overlapping shades, complicating their interpretation which increases the risk for undetected illicit cargo.

## Benefits & Use

- Automated Threat Detection (ATD) significantly improved progress in this operational area
- With the Automated Contents Verification (ACV), the classification of goods (HS code) can be automatically assessed from scanned images.

# Data Analytics

The Process of examining raw data to identify patterns and draw conclusions for better strategic decision-making.

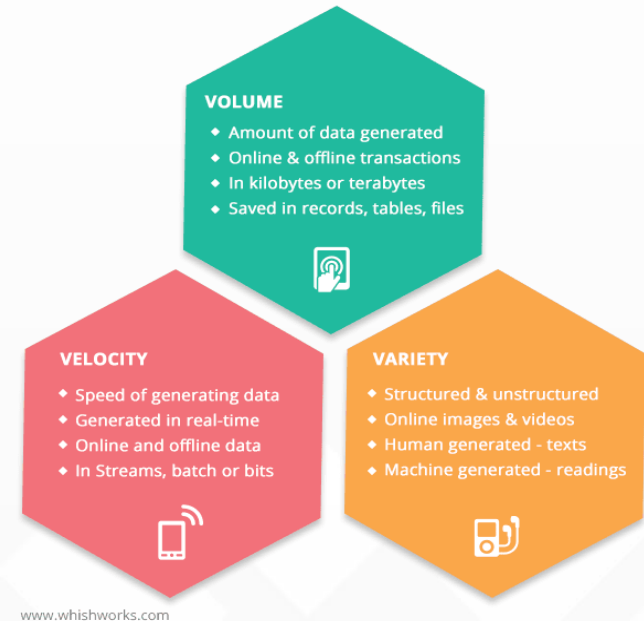
Descriptive analysis: based on historical and incoming data

Diagnostic analysis: Reviewing past performance

Predictive analysis: Analysis of likely scenarios.

Prescriptive analysis: What should be done?  
(recommendations for next steps).

## THE 3Vs OF BIG DATA



## Benefits & Application

- Customs analysis using sophisticated tools to draw data from various sources and loads it into a specially designed data analyzer.
- Advanced risk assessment techniques, better resource utilization, and more complete reporting on overall performance.

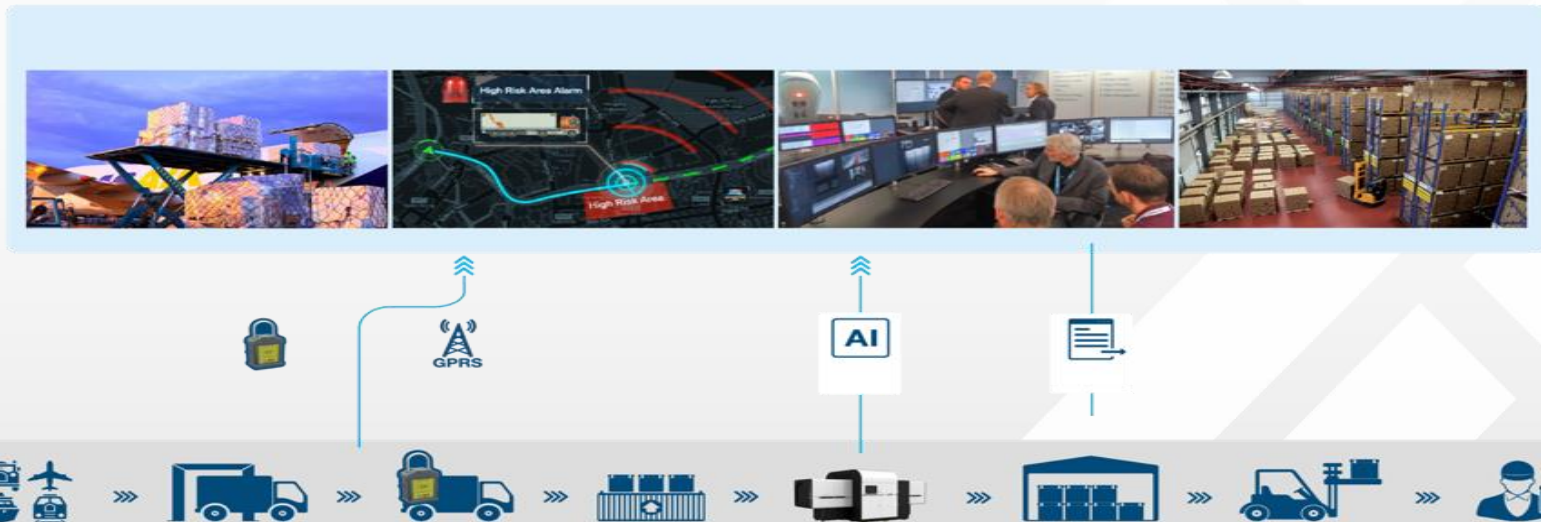


# Internet of Things (IoT)

- Tracking devices using a combination of “radio-frequency identification” (RFID) and satellite navigation systems (e.g GPS).
- Pinpointing to within 30 centimeters.

## Benefits & Application

- GPS tracking monitors transit cargo movement in real time and deters cargo diversion.
- Smart seals give automatic alerts
- RFID devices (tags) attached to cargo or pallets are very useful for inventory monitoring
- RFID devices improve speed of carnet/ vehicle verification & registration



# Augmented Reality (AR) & Virtual Reality (VR)

- AR an “interactive experience” of a real-world environment which is enhanced by computer-generated perceptual sensory information.
- VR a “simulated experience” that places the user in a created/virtual world similar to or completely different from the real world.



## Benefits & Application

- Remote and Joint inspections including cargo and border posts
- Using AR to access and visualize data (including images and videos) in real time during the inspection or audit would save time for stakeholders
- Simulated training in mock environments (for example, imitations of an airport customs counter) creates realistic and immersive experiential situations to support training.

# Blockchain (BC)

- A blockchain is a decentralized, distributed record or “ledger” of transactions in which the transactions are stored in a permanent and near inalterable way using cryptographic techniques.
- Blockchain enables many parties to collectively work on transactions and share information securely at the same time.
- Any log records of modification/processing of information are easily verifiable



## Benefits & Application

- Distributed ledger technologies (DLT), allows border agencies & others to share data over a distributed ledger secured through cryptography.
- All parties keep the same ledger of records and activities, and any change to the ledger is automatically updated in the ledger of all parties.
- Very secure- attempts forgery are easily detected
- KCS piloted the use of blockchain solutions in customs operations, such as the import/export clearance process, e-commerce imports, and cross-border information exchange.

# Technology and Trade Facilitation

Digital technologies  
are a key instrument  
of trade facilitation!



Digital technologies can:

- ✓ Improve **Processing, verification, coordination, transportation and logistics**
- ✓ **Decrease** financial intermediation and exchange rate costs
- ✓ Facilitate **MSME's participation** in world trade

# Benefits of established and innovative technological solutions

*Non-tariff trade costs can amount to a 134% tariff on products in high income country and **219% tariff in developing countries***

***Hindering factors for MSMEs:** lack of transparency; complex procedures; information access; access to distribution networks; lack of skills and technology; logistics costs; access to finance*

✓ **Reduction in Trade Costs**

✓ **Enhanced cross-border cooperation and coordination**

✓ **Towards a 'facilitation of business' mindset**

# Digitalisation requires investing in a *culture* of technology

- **Regulation underpins use of technologies:** regulatory issues **are not automatically solved** with technology
  - Comprehensive adjustments and legislation are needed for digital solutions
  - E.g. e-document recognition agreements, applicable jurisdiction and liability in databases, data privacy...
- **Technical interoperability cannot be an afterthought**
  - Paper documents can be copied and sent, digital documents require specific e-bridges or hubs
  - Several technological platforms are likely in different countries
- **Digitalisation is a prerequisite for the use of new technologies**
  - Advantages of new technologies can be an incentive for further digitalisation

# ITC's Work on cross-border paperless trade

Digital solutions to improve the efficiency of the whole supply chain

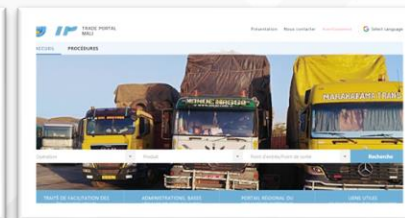
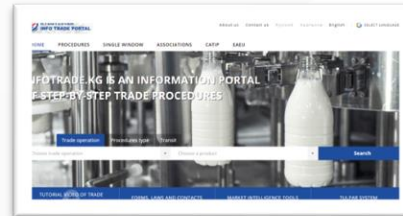
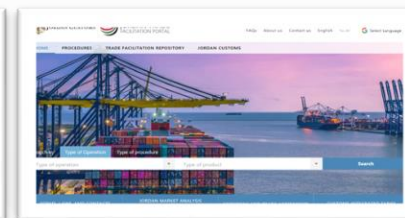
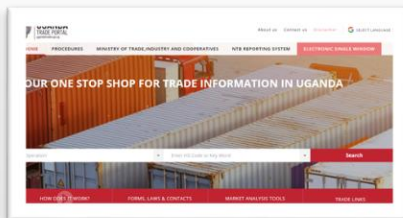
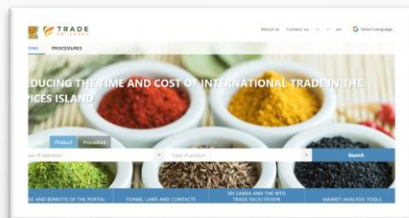


# Trade facilitation Portals

## Making cross-border formalities easily accessible

Already implemented in **over 20 countries**

In collaboration with UNCATD,  
interfaced with Global Trade  
Helpdesk





# Trade Facilitation Repository

Easy access to generic trade related information

- Duties and taxes
- Fees and charges
- Rules for the classification or valuation
- Rules of origin
- Restrictions or prohibitions
- Tariff quotas
- Penalty provisions
- Procedures for appeal or review
- Trade agreements
- Institutions
- Forms and administrative documents
- Laws and regulations

## Repository of the TF Portal



Import and export procedures



Duties and taxes related to import or export



Fees for services related to import, export, or transit



Rules for the classification and evaluation of goods



Restrictions or prohibitions relating to import, export, or transit



Penalties for violations related to import, export, or transit procedures



Appeal and review procedures



Rules of origin and free trade agreements

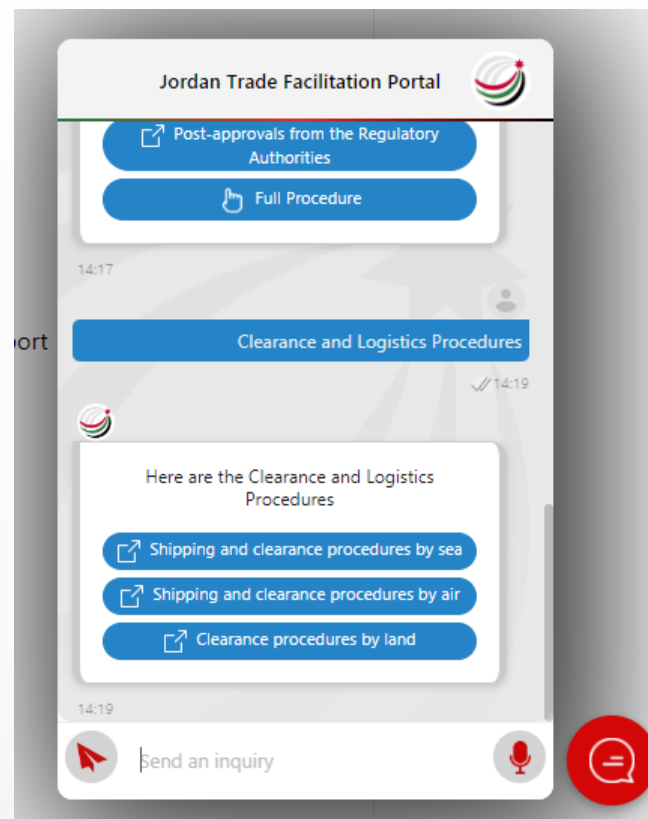


Tariff quotas

# Online Enquiry Point

Chatbot service providing direct answers to enquiries.

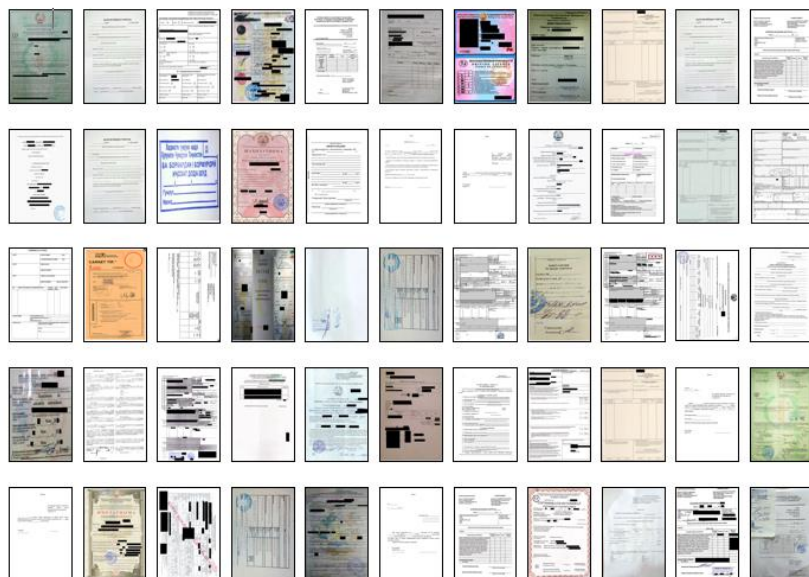
Traders can choose among the suggested options or send their enquiries via written or audio messages.





# Simplified Trade Formalities

Results of business process re-engineering in Kenya: reducing the time and cost of exporting coffee beans



Steps

89



59

Time period  
(days)

38-235



17-100

Fees and  
charges

Ksh 83K



Ksh 32K

Documents

62



44

# Digital solutions for paperless trade

Moving documentation, money - and even trucks! – online



Drafting laws for recognition of electronic documents

Implementing IT systems to automate formalities

Establishing online mechanisms to submit customs declarations and supporting documents

Introducing electronic payment to collect fees and charges

Piloting electronic queues for trucks at border crossings

# Digital solutions for paperless trade

## Digitalization of certificate of origin (CO) processes

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**Digitization captures all steps, from pre-registration to request, review, approval, issuance and payment**

# Electronic Queue Management

## Benefits:

- Resolve the issue of traffic congestions at border checkpoints
- Improve transparency, planning and coordination among various stakeholders at the border
- Contribute to modernization and digitization of cross-border operations



# ITC offers a comprehensive range of trade facilitation services



## **Greater efficiency of customs and border procedures**

We support the modernization and digitization of cross-border procedures



## **Logistics efficiency in e-commerce**

We assist in improving trade logistics activities and the e-commerce ecosystem



## **Transparency of border requirements and procedures**

We enhance access to information and documentation requirements for exporting/importing



## **Improved traders' compliance**

We improve private sector's capacity to efficiently comply with border rules



## **Cooperation among border actors**

We promote public-private dialogue and generate ways to improve inter-agency coordination



## We engineer customs reforms from design to implementation to feedback analysis, building upon private sector needs



Single window



Post-clearance audit



Border agency cooperation



Integrated Risk management



Authorized economic operators



Pre-arrival processing



Advance rulings



Average release time



Acceptance of copies



Consultation mechanism



Electronic payments



Procedures for appeal

# Thank you for your attention

## If ITC can help, contact us!

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