



# eGovernment Domain Discussion

**Vice Chair**

**Mr. Tahseen Ahmad Khan**

**Domain Coordinator**

**Mr. Kaushik Srinivasan**

**Date**

**Apr 1-2, 2019**

**Room**

**E3025, Palais Des Nations, Geneva**

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# Agenda – Apr 1, 2019

Time	Topic	Speaker and Comments
11.00 – 12.30	eGov Domain – Update <ul style="list-style-type: none"><li>- Mutual Recognition</li><li>- Blockchain Project</li><li>- Advisory Group on Emerging Technologies</li></ul>	Tahseen Khan, Vice Chair Kaushik Srinivasan, Domain Coordinator Virginia Cram Martos – Project Leader, Blockchain
12.30 – 14.00	Lunch	
14.00 – 15.30	Discussion on proposed project for cross border distributed ledger for exchanging digital preferential certificate of origin	Steve Capell, Expert Member
15.30 – 16.00	Coffee Break	
16.00 – 17.30	Discussion on proposed project on digital ID for Trade	Vijay Kumar/Chris Gough, Expert Member

# Agenda – Apr 2, 2019

Time	Topic	Speaker and Comments
9.00 – 10.30	Discussion on emerging trends in technology such as Quantum Computing and their role in trade facilitation	Working Group
10.30 – 11.00	Coffee Break	
11.00 – 12.30	ePayment Systems and their role in enabling financial inclusion  Artificial Intelligence	Working Group
12.30 – 14.00	Lunch	
14.00 – 15.30	Data Retention and Time Stamping	
15.30 – 16.00	Coffee Break	
16.00 – 17.00	IoT Whitepaper Project	Virginia Cram Martos, Project Leader



# **eGovernment Domain Update – Action Items from Hangzhou Forum**

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# Hangzhou Forum – Action Items

- At the last UN/CEFACT forum at Hangzhou, key cybersecurity related topics pertaining to global trade were discussed.
- These included
  - International Convention on Mutual Recognition
  - Internet of Things
  - Digital ID for Trade
  - Data Retention/Time Stamping
  - Artificial Intelligence for Trade Facilitation
  - GDPR and its implications

# Hangzhou Forum – Action Items

- The Working Group felt that we should continue to pursue work in the following areas
  - Work with UNCITRAL to understand how we can complement each other's work on mutual recognition
  - Begin work on IoT Whitepaper Project (to start after Blockchain project) and study emerging technologies such as Artificial Intelligence in the context of IoT
  - Given that Digital ID systems are now increasingly adopted, a new project on Digital ID for Trade be launched with focus on
    - Studying existing systems such as GLEIF, ID systems in Australia, Germany, India, Italy, One World Identity (Blockchain) and their characteristics
    - Working with UN teams who are responsible for Identity to understand implementations
    - Providing guidance material on adopting digital ID for trade facilitation
  - Launch a project on best practices for Data Retention/Time Stamping to study existing work done by International Librarian Association, International Council on Archives



# **Trusted Transboundary Electronic Interaction/Mutual Recognition**

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# Mutual Recognition

- **International Convention - Trusted Trans-boundary electronic interaction/Mutual Recognition mechanism**
  - This project was taken up to develop a framework convention which is intergovernmental
  - Whitepaper prepared and finalized highlighting need for framework convention
    - [Link to white paper](#)
  - Need for Mutual Recognition also highlighted in the Blockchain Whitepaper
  - During the last forum, it was felt that we need to study what UNCITRAL has done in this context and align our work programme accordingly



# Mutual Recognition

- **International Convention - Trusted Trans-boundary electronic interaction/Mutual Recognition mechanism**
  - UNCITRAL has been doing work related to “Legal Issues related to Identity Management and Trust Services”
    - [Link to document](#) (UNCITRAL Document No - A/CN.9/WG.IV/WP.153)
    - Scope of work includes preparation of text aimed at facilitating cross-border recognition of Identity Management (IdM) and Trust Services
  - Within the scope of Identity Management, the document highlights three broad approaches for mutual recognition of Identity schemes
    - Ex ante legal recognition – Centrally managed evaluation and licensing institutional mechanism to assess IdM schemes and recognize them
    - Ex Post Legal recognition – Mechanism that generally allows exchanges of data and assesses suitability for use of IdM schemes and trust services only in the event of dispute and on the basis of predetermined criteria
    - Mapping based legal recognition – Mapping IdM systems based on a common template.

# Mutual Recognition

- **International Convention - Trusted Trans-boundary electronic interaction/Mutual Recognition mechanism**
  - In the context of Trust Services, article 12 MLES, based on a “substantive equivalence” approach requires that no discrimination should arise from the foreign elements on an electronic signature
  - Other mechanisms of cross border recognition relies on bi-lateral or multi-lateral agreements and usage of cross-recognition or cross-certification schemes (as in the case of PKI)
- While mechanisms for mutual recognition exist, practical implementations have been limited

# Mutual Recognition

- Some of the implementations include
  - eIDAS regulation
    - Provides a cross-border common legal framework within the European Union for recognition of electronic ID and consistent recognition of trust services
    - Article 14 provides for recognition of trust service provider that are outside the EU
  - PAA PKI framework
    - Alliance of paperless trade service providers in Asia
    - Driven based on mutual recognition framework that establishes a comparable level of trustworthiness
  - Eurasian Economic Commission
    - Described in the provision on exchange of electronic documents at cross border interaction of public authorities of Eurasian Economic Union member states among themselves

# Mutual Recognition

- **Given that Mutual Recognition is key to achieving cross border paperless trade, working group to discuss the role UN/CEFACT could play in**
  - **Defining key components for establishing and operating cross border mutual recognition**
  - **Highlighting best practices in existing cross border mutual recognition arrangements**
  - **Developing guidance material for reliably establishing “substantive equivalence” in cross border Identity Management and Trust Services schemes**





# **Blockchain Whitepaper Project**

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# Blockchain Whitepaper Project

- The Blockchain Whitepaper project is nearing completion
  - Most of the sections and associated edited and complete which has been submitted to Secretariat for preparation to be submitted to Plenary
  - Sections on Financial Services, Government and Healthcare to be edited by the time of the Forum and some of the case studies require more time (as they require external input to be finalized)
  - These sections and additional case studies will be submitted to the Bureau for approval once they are edited



# Advisory Group – Advanced Technologies

- Based on discussions during eGovernment Domain and Blockchain Whitepaper project team meeting at the UN/CEFACT forum in October 2018, the establishment of an advisory group was proposed to the Bureau in order to advise and support the UNECE secretariat and UN/CEFACT on advanced technologies in trade facilitation and electronic business
- The technologies in question include Blockchain, Internet of Things (IoT) and Artificial Intelligence (AI) – the most recent areas of development in the international supply chain
- For more information about the mandate and terms of reference of the advisory group on advanced technologies in trade and logistics, please refer the document (ECE/TRADE/C/CEFACT/2019/22/Rev.1) available at the [link here](#)



# **Cross border exchange of digital preferential Certificate of Origin**

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# Cross-border distributed ledger for exchanging digital preferential COO (inter customs ledger)

- A preferential Certificate of Origin (CoO) is a document issued by the exporting customs authority that asserts that the goods in a specific shipment comply with the terms of a free trade agreement (FTA)
- At present, preferential CoO are paper documents that are slow and expensive to produce
- Electronically verifiable digital origin evidence will help streamline the process and reduce costs at the border
- The challenges associated with exchanging a digital CoO looked like a problem that Blockchain could solve
- A project has been proposed to tackle this challenge through Blockchain
  - Project Lead/Co-Leads – Steve Capell, Wang Xiang/Hardeep Batra
  - Countries on-board for the project – Australia, China and India
  - Deliverables include
    - BRS/RSM on preferential CoO
    - Guidance material on exchange of documents through Blockchain
    - Reference implementation of the platform

# Cross-border distributed ledger for exchanging digital preferential COO (inter customs ledger)

- Benefits of the inter customs ledger include
  - Maximises autonomy
  - Each jurisdiction manages their own community
  - Transactions are auditable and this drives trust
  - CoO can be transferred and acquitted
  - Localised languages
  - National hosting supports data sovereignty
  - No central funding needed
  - National or provincial implementation feasible
  - Scalable to any bi-lateral or multi-lateral trade
  - Scalable to other certificate types
- Steve Capell will make a presentation highlighting scope and deliverables of the project





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# Proposed Project on Digital ID for Trade



# Digital ID for Trade

- Digital ID systems which allow an entity to prove their identity online are opening new possibilities for cross-border trade by eliminating trade barriers and paperwork
- Many forms of ID exist today which are largely physical and do not provide level of trust required for online trade.
- Digital ID schemes that are well implemented
  - Allow users to establish their identity as part of an online transaction
  - Enable electronic Notaries or Trusted Authorities to verify this identity
  - Provide confidence to relying parties that could include both consumers and businesses
  - Ensure safe access and transfer of online information
  - Facilitate compliance with required regulatory regimes

# Digital ID for Trade

- The practices vary from every country to country, and may have several local jurisdictional IDs.
  - There are also recognized private identity systems, or those which are independently functioning as a non-profit and accepted in a larger region.
  - There are also many forms of ID exist today which are largely physical and do not provide level of trust required for online trade.
- A project has been proposed to study existing digital ID systems in the context of trade facilitation
  - Proposed Project Lead/Co-Lead – Vijay Kumar, Chris Gough
- Scope of work includes studying and presenting best practices from existing digital ID systems that can act as a guide for future implementation

# Digital ID for Trade

- Case Studies
  - Global Legal Entity Identifier Foundation
    - Supports the implementation of Legal Entity Identifier standard for entities dealing with financial institutions
  - eIDAS Regulation
    - EU regulation for electronic identification and trust services for electronic transactions in the European Union
    - Separate chapters for Electronic Identification and Trust Services
    - While Trust Services are mutually recognized across EU, eID schemes require notification by Countries for mutual recognition
  - AADHAAR programme - India
    - World's largest biometric identity program using a central Identity provider operated by the Government that has been effective at enabling financial inclusion

# Digital ID for Trade

- Case Studies
  - E-Residency program by Estonia
    - Allows non-Estonian citizens to get a digital ID which allows them to use Estonian public and private services
    - Operate a platform called X-Roads that creates interoperability between different databases
  - Australia DigitalID program
    - Ability to authenticate using a digital ID for availing online services



# Digital ID for Trade

- India Stack using AADHAAR

**Consent Layer**

Modern privacy data sharing framework

**Cashless Layer**

Real time electronic payment systems at low cost

**Paperless Layer**

Supporting Qualified eSignatures at low cost

**Presenceless Layer**

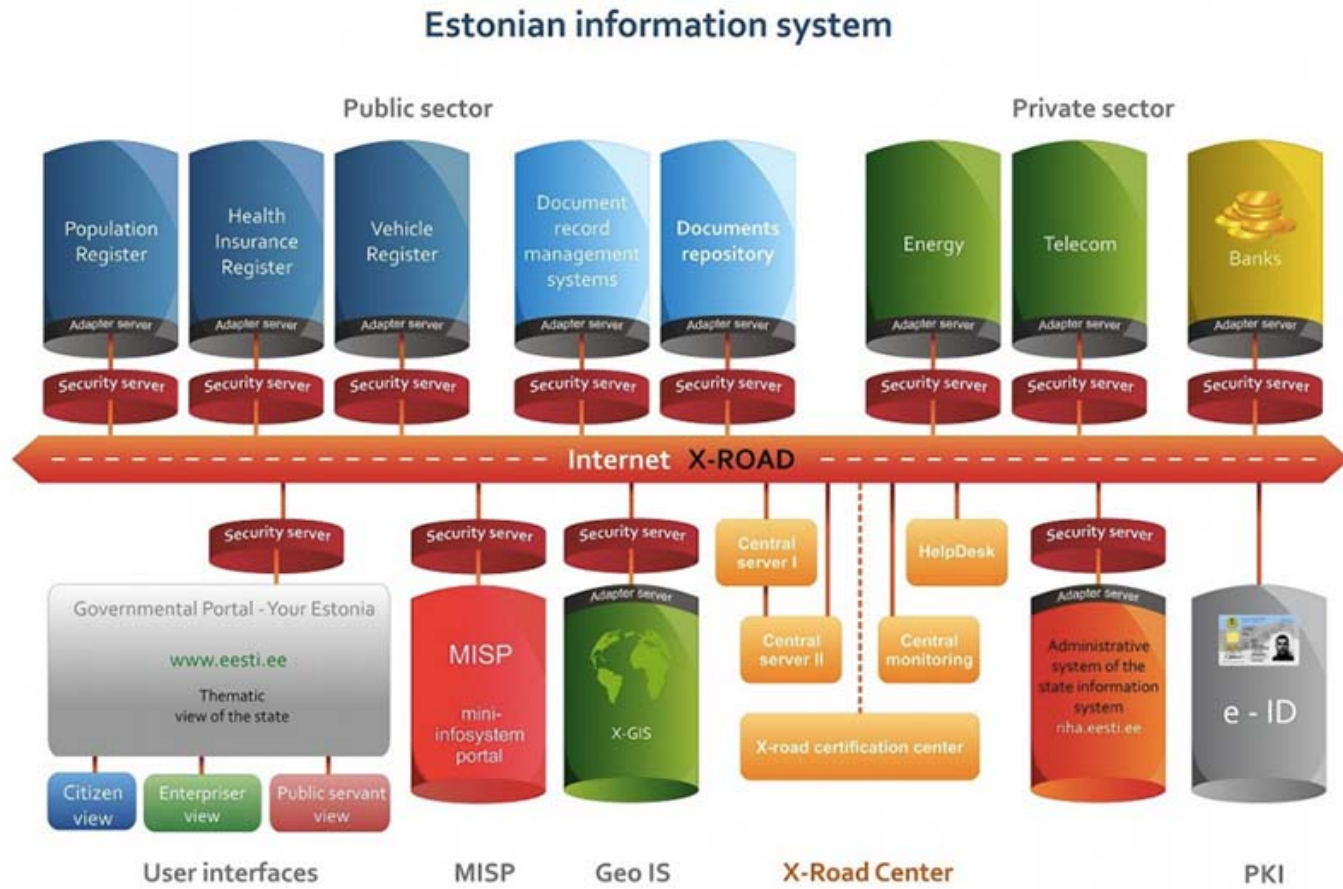
Unique digital biometric identity and authentication for over a billion users





# Digital ID for Trade

- Estonia Information System – X-Road



# Digital ID for Trade

- Case Studies
  - Gov.UK Verify
    - Public private programme that allows UK citizens to access government services online through authentication via identity providers
  - DigID - Netherlands
    - Central authentication system for Dutch residents who are accessing government services online
  - Sweden BankID
    - A public private service that provides citizens access to 300 public and private services using an eID system where the digital identities are issued by Banks and Telco

# Digital ID for Trade

- Proposed focus areas
  - Identity attributes
  - Standards for defining Identifier (ISO 6523, PEPPOL, OASIS)
  - Scope of identification (Individuals, Businesses, Relationships between the two), Assets such as Shipments, Consignments
  - Standardization of ID Verification procedures and methodologies
  - Federated vs Unified Identity Schemes
  - Data exchange formats
  - Authentication, Authorization, Validation
  - User Experience
  - Cross border regulatory compliance
  - Mutual recognition issues
  - Cyber Security Issues
  - Use Cases

# Digital ID for Trade

- Proposed high level project deliverables
  - Green paper on case studies of existing digital ID systems and their implementation methodologies in the context of cross border paperless trade
  - Guidance material for developing digital ID systems to facilitate cross border paperless trade
- Working group to discuss the deliverables and come up with next steps





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# **Emerging Trends in technology and their role in trade facilitation**



# Emerging Trends in technology

- Gartner's top trends in technology that are likely to have a major impact include Quantum Computing, 5G, Augmented Reality, Autonomous Things
- <https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2019/>
- These trends are likely to have a major direct impact on trade facilitation
  - Cyber security will be reshaped as a result of Quantum computing
  - 5G will redefine communications and allow the use of IoT in everyday life
  - Autonomous things with Artificial Intelligence could be a game changer in logistics, transportation and other sectors

# Emerging Trends in technology

- Introduction video on Quantum Computing
  - <https://www.youtube.com/watch?v=WVv5OAR4Nik>
- Mobility in the age of Quantum Computing
  - Global logistics will become a USD 15.5 trillion market
  - Each year, 17 million containers are moved, 70 mn cars are manufactured
  - The scale and number of factors influencing a typical logistics operation are too many
  - This results in many problems such as delays, lost revenue and sunk costs



# Emerging Trends in technology

- Key challenges in logistics
  - Route Planning
  - Traveling Salesman problem (shortest time and cheapest cost for route across  $N$  cities where each city must be visited once)
  - Flight scheduling
  - Traffic decongestion/flow optimization
- These are classical optimization problems which is difficult to solve using a classical machine
- Quantum computers can be used to effectively solve complex big data problems in logistics



# Emerging Trends in technology

- Impact of 5G in Supply Chain and Logistics
  - Supply Chain involves a lot of moving parts and goods usually change hands multiple times during transit
  - Keeping track of responsibility, ownership and insurance is an important challenge that is currently tackled manually
  - With 5G networks, goods can be fitted with 5G connected sensors which can transmit item's location, temperature, humidity etc automatically as often as required in a reliable manner
- Other use cases for 5G networks
  - Transportation – 5G could allow enhanced vehicle to vehicle communication which could be crucial to safety in the world of driverless vehicles
  - Manufacturing – ability to control and monitor production operations in « smart factories » that employ robots
  - Education – 5G will pave the way for better augmented reality and virtual reality experiences which can provide immersive educational experiences

# Emerging Trends in technology

- Autonomous Things
  - Video of autonomous robots based Warehouse
  - [https://www.youtube.com/watch?v=4DKrcpa8Z\\_E](https://www.youtube.com/watch?v=4DKrcpa8Z_E)
- A framework for assessing autonomous things based on Gartner research ([link here](#)) could include
  - Understanding the type
    - Robotics, Vehicles, Drones, Appliances, Agents
  - Applicability to environments
    - Sea, Air, Land or Digital
  - Evaluating level of capability, coordination and intelligence



# Emerging Trends in technology

- As per Gartner research ([link here](#)) In order to evaluate the capability, coordination and intelligence, the following aspects may be looked into
  - Capability
    - Human Assisted
    - Partial Automation
    - Conditional Automation
    - High Automation
    - Full Autonomy
  - Coordination
    - Isolated
    - Independent
    - Connected
    - Collaborative
  - Intelligence
    - Dumb and Static
    - Semi-start and dynamic
    - Individually Smart and Dynamic
    - Collective smart with dynamic hive interaction

# Emerging Trends in technology

- Given the convergence of physical, virtual and intelligent world, it is a great opportunity for working group to
  - Discuss the impact of these trends on supply chain and global trade
  - Assess the role UN/CEFACT standards could have in furthering use of such technology
  - Evaluate if further work needs to be undertaken to study these technologies



# ePayment Systems

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# ePayment Systems

- Innovation in payment systems is critical in enabling financial inclusion
- Some of the key aspects in enabling financial inclusion (as published in World Bank's draft on Payment Aspects of Financial Inclusion are
  - Legal and Regulatory Frameworks
  - Financial and ICT infrastructure
  - Cost effective payment product design
  - Omni-channel access points
  - Promoting Financial Literacy
  - Large volume, recurrent payment systems
- Today's payment systems make use of intermediaries to route payments. This makes cross border payments
  - More expensive
  - Subject to additional counter party and settlement risk
  - Time delays to payments

# ePayment Systems

- Some of the innovations in ePayment systems that enabled cheaper and faster payments include
  - Peer to Peer transactions
  - Distributed Ledger based remittances
  - Mobile wallets
  - Near Field Communications
  - Convergence of payment and identity systems



# ePayment Systems

- Case Study – DLT based remittances - Ripple
  - How ripple works? [Link to video](#)
  - Ripple enables peer-peer server architecture to move money between two parties using a set of trusted gateways
  - Uses a native currency called XRP which provides liquidity for converting from one currency to another
- Case Study – Peer to Peer Payments - Singapore
  - Introduced a platform called PayNow that enables instant peer-peer transfer between customers of two participating banks by entering a mobile or personal identifiable number
  - In 2018, PayNow Corporate was launched to allow businesses to pay and receive funds instantaneously
  - Launched SGQR which combined multiple QR codes into a single SGQR code
    - [Link to video](#)





# ePayment Systems

- Working group to discuss and evaluate if further work needs to be done in this area to support trade facilitation

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# Artificial Intelligence in Trade Facilitation

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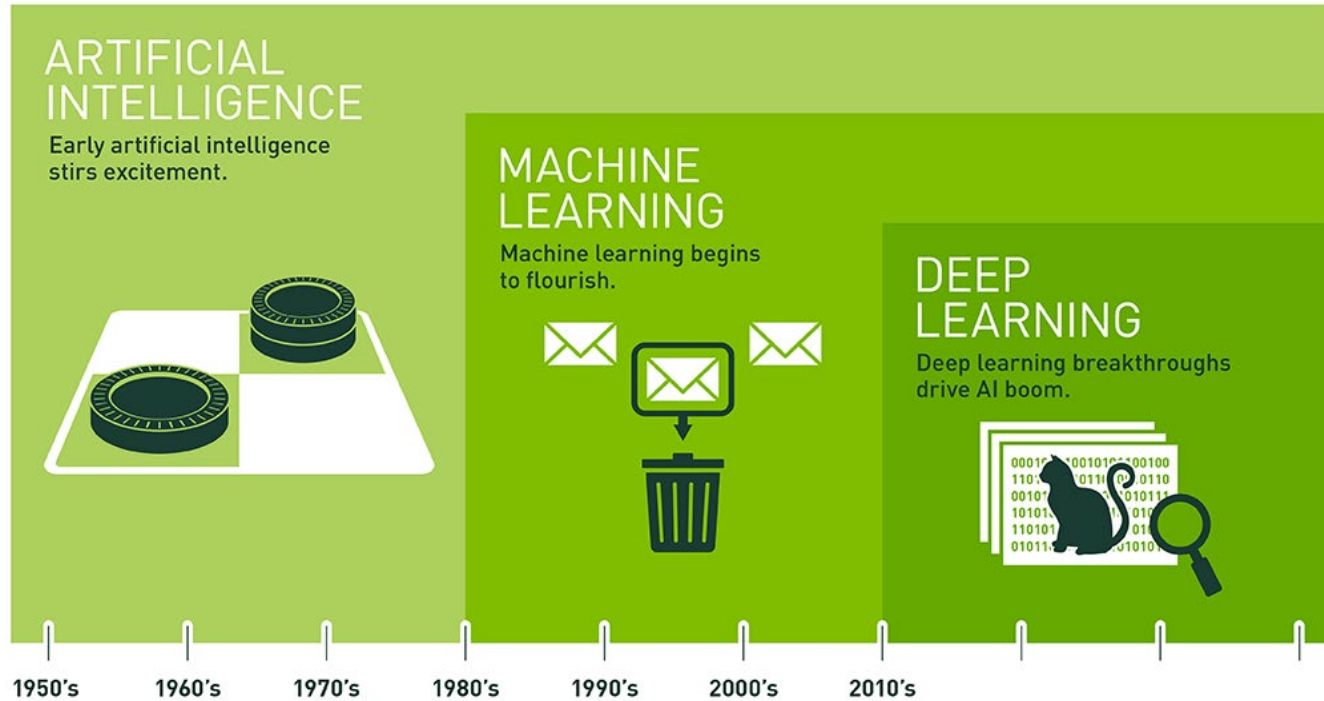


# Artificial Intelligence in Trade Facilitation

- Artificial Intelligence for Trade Facilitation
  - Cross-border trade results in huge volume of structured and unstructured data as part of the buy-ship-pay process
  - Manual processes and analysis of data result in huge turn around times. Key areas include
    - Trade Negotiations
    - Trade Operations (customs, supply chain)
    - Trade transactions (letters of credit, trade finance)
  - Data driven decision making using Artificial Intelligence and Machine Learning can significantly speed up trade processes with reduced errors
  - These could include
    - Statistical and Predictive Models
      - For forecasting demand, fraud detection etc
    - Natural Language Processing
      - Mining text data (invoices, payments etc)
    - Computer Vision
      - Running analytics on images, videos

# Artificial Intelligence in Trade Facilitation

- Evolution of Artificial Intelligence



Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

# Artificial Intelligence in Trade Facilitation

- Deep Learning Systems make use of neural networks which maps set of relationships between input and output similar to how a human brain works
- Deep learning systems continuously learn and adjust learning models to form new insights



# Artificial Intelligence in Trade Facilitation

- Artificial Intelligence and IoT
  - When combined with other systems such as IoT and Blockchain, Artificial Intelligence systems can be powerful in facilitating cross-border trade
  - An example of using AI and IoT in logistics
    - [Link to video](#) - Toyota
    - [Link to video](#) – Boston Dynamics

# Artificial Intelligence in Trade Facilitation

- Points to discuss
  - Any other implementation examples of use of AI in Trade Facilitation
  - How easy is it to build sustainable AI/Deep Learning solutions for objects such as Food?
  - Working group to debate this topic and discuss next steps



# Data Retention and Timestamping

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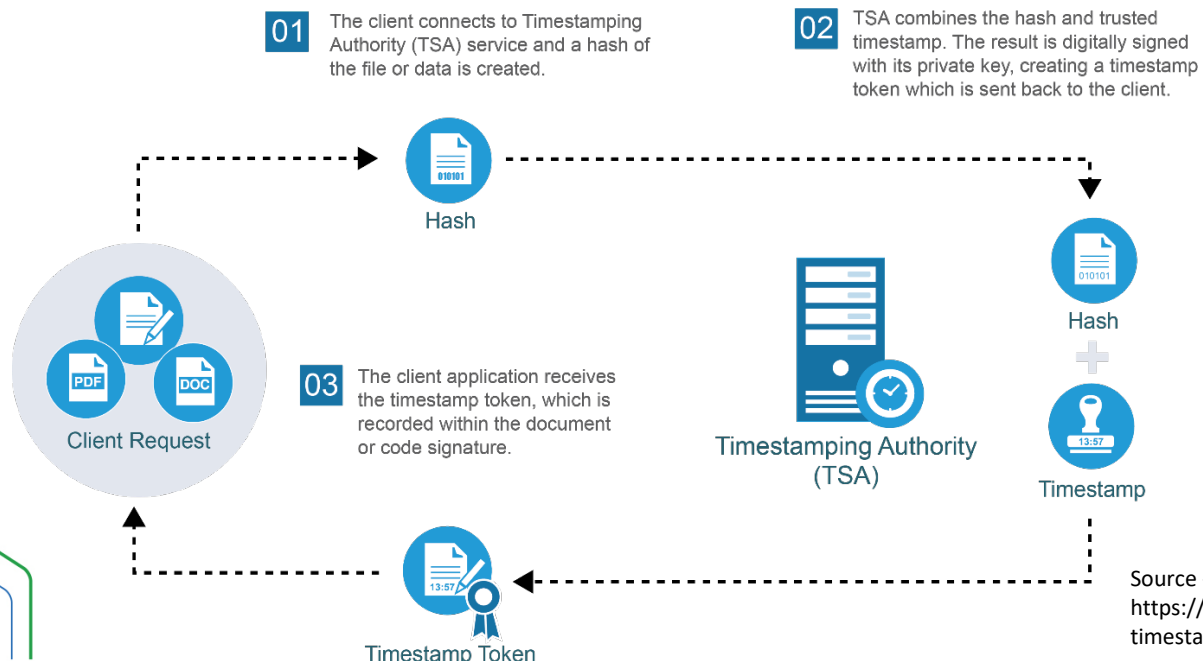


# Data Retention

- According to IDC, we will create 1800 new exabytes of data this year
- Organizations are generally required to implement proper information management tools and systems which can store, manage, secure, classify and retrieve information when needed for business or legal purposes
- Some of the key issues include
  - Ability to find records quickly based on appropriate roles and entitlements
  - With rapid growth in volume of data, storage systems have undergone massive change. Tools required to access data stored in older storage systems may no longer be supported
  - Ensuring compliance in record keeping and how to decide what to keep and what to destroy?
  - Users spend an enormous amount of time in retrieving necessary data be it on emails or in physical documents
  - This results in huge wasted time for employees

# Time Stamping

- Timestamping is a valuable component of electronic signing practices enabling organizations to record when a digital item – such as a message, document, transaction was signed
- In the context of trade facilitation, a number of trade documents have to be archived for several years
- If these documents are electronically signed, then there may be a need to use a trusted timestamping service to provide the validity of the signature well into the future
- How timestamping works?



Source - <https://www.globalsign.com/en/blog/what-is-timestamping-how-does-it-work/>

# Data Retention/Time Stamping

- Cross border trade results in huge volume of data generated most of which today is physical in nature and is based on local laws
- Data Retention/Time Stamping standards can aid in the preservation of physical and electronic data and in addressing some of the challenges that organizations are faced with
- At the Hangzhou forum, it was decided that the working group study existing work done by International Librarian Association, International Council on Archives on best practices as part of UN/CEFACT project
- Working group to discuss and decide next steps



# IoT Whitepaper Project

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# IoT Whitepaper Project

- IoT is recognized as an important topic in the context of trade facilitation
- Therefore, a project was launched with the following deliverables
  - UN/CEFACT Standards use in IoT applications
  - Use of IoT in Trade Facilitation
  - This project has been approved by the Bureau
  - Project Lead – Virginia Cram Martos
  - Chief Editor – Kaushik Srinivasan

# IoT Whitepaper Project

- The scope of the project includes
  - Introduction
  - What is IoT?
  - Elements of an IoT ecosystem – Identification, Sensing, Computation, Communication, Services, Semantics \*
  - Challenges in the Use of IoT (including cyber security)
  - Use of Blockchain with IoT
  - Use of Artificial Intelligence with IoT
  - IoT Application Areas
    - Supply Chain and Transportation
    - Agriculture
    - Energy
    - Healthcare Services
    - Government Services
  - Technology Trends Redefining IoT – 5G, Autonomous Things
  - Annex - Use Cases and Case Studies
- All those that are interested in working on the project, please send an email to Virginia ([crammartos@triangularity.net](mailto:crammartos@triangularity.net)) or Kaushik ([kaushik@emudhra.com](mailto:kaushik@emudhra.com))



# Conclusion

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# Conclusion

- Next Steps
  - Mutual Recognition
    - Continue work on International Convention on Mutual Recognition to understand how we can complement UNCITRAL's work on Mutual Recognition through a project
  - Project on cross border exchange of Digital Certificate of Origin using Blockchain
    - Issue Call for participation
    - Study ASEAN single window and other systems that are currently operational in Latin America
    - Look at following aspects as part of scope
      - Legal aspects of exchanging data even with minimal on-chain information
      - Key management



# Conclusion

- Next Steps
  - Proposed Project – Digital ID for Trade
    - Prepare project proposal with the following deliverables for submission
      - Whitepaper on case studies of existing digital ID systems and their implementation methodologies in the context of cross border paperless trade
      - Guidance material for developing digital ID systems to facilitate cross border paperless trade
    - Study following aspects as part of scope
      - Identification scope – entities, things?
      - Whose needs are we addressing?
      - Systems such as GLEIF, XBRL based identity
      - Ability to define trustworthiness of an entity
      - Existing implementations such as Thai Digital ID
      - Distinction between Identity and Credentials
      - Ability to define authorization scopes as part of a request for identity information

# Conclusion

- Next Steps
  - Emerging Technologies such as Quantum Computing
    - Study Quantum Computing, 5G and Autonomous Things first in the context of the IoT Whitepaper project
    - Study cyber security issues around Quantum Computing to evaluate further work in this area over the next 12-18 months
  - ePayment Systems
    - Cross border electronic payment systems require further study to understand how they can enable financial inclusion
    - Processes to enable Trade Finance which still require physical documents such as Bill of Lading
    - UNCITRAL model law on Electronic Transferrable Records be studied in the context of electronic documents for such processes
    - To evaluate whether new standards/framework are required to facilitate the implementation of the model law

# Conclusion

- Next Steps
  - Artificial Intelligence in Trade Facilitation
    - Pursue this initially in the context of IoT Whitepaper project
    - Over time pursue a separate project to put best practices in the use of AI technology for Trade Facilitation
  - Data Retention/Time Stamping
    - Pursue data retention in the context of a separate project by studying best practices and putting some guidance material
    - Time Stamping to be pursued as part of Mutual Recognition project
  - IoT Whitepaper Project
    - Issue Call for Participation





# eGovernment Domain Discussion

**Thank you**

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