WIPO
Blockchain Workshop

Session 4: Blockchain and Standardization

United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)

Lance Thompson
Head, UN/CEFACT Support Unit
lance.thompson@un.org
UNECE – UN/CEFACT
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UN Economic Commission for Europe (UNECE)

Trusteeship Council	Security Council	General Assembly	Economic and Social Council	International Court of Justice	Secretariat

FUNCTIONAL COMMISSIONS:

- Human rights
- Narcotic drugs
- Crime prevention and criminal justice
- Sustainable development
- Etc…..

REGIONAL COMMISSIONS

Economic Commission for Africa

Economic Commission for Europe

Economic Commission for Latin American and Caribbean

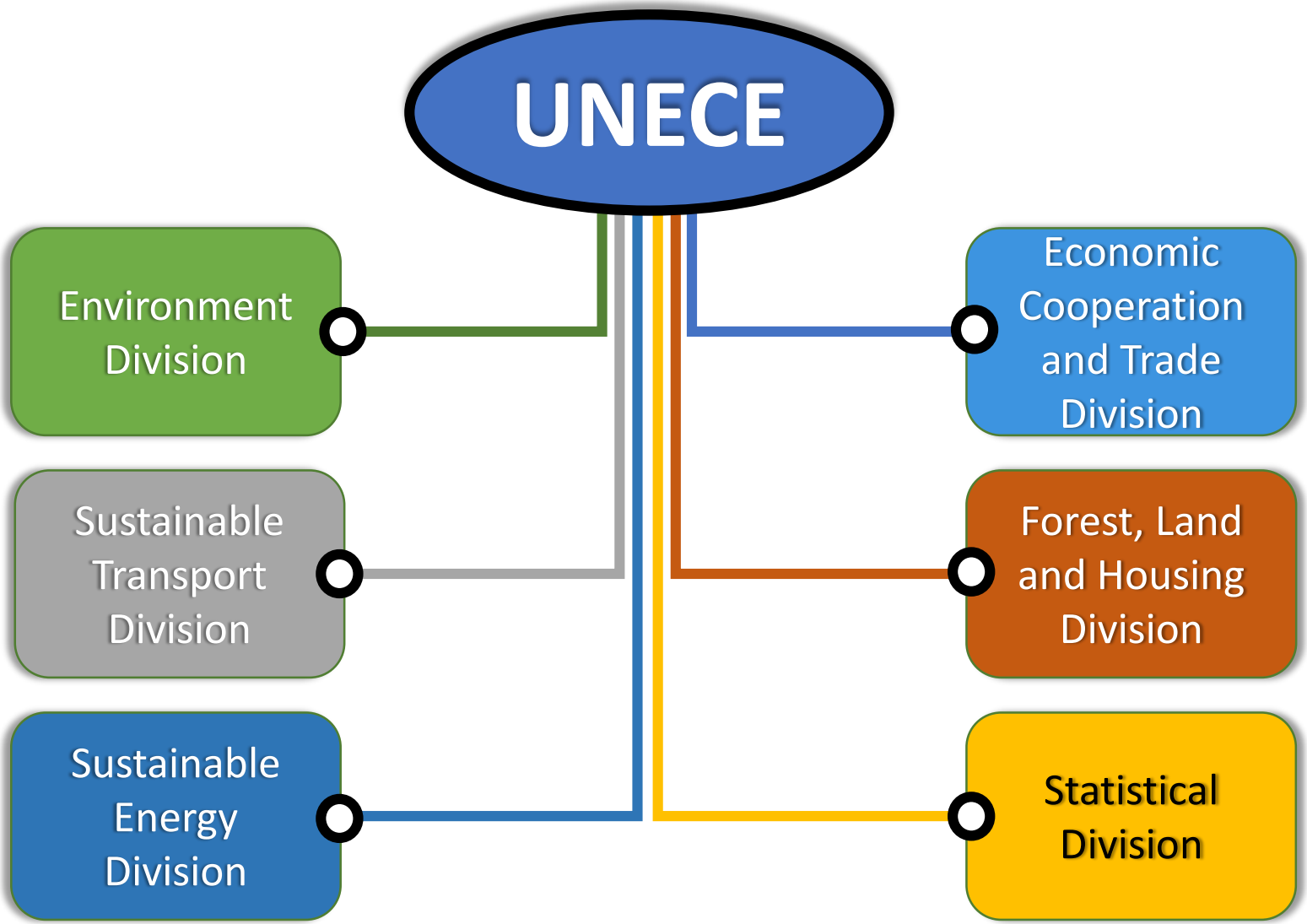
Economic and Social Commission for Asia and the Pacific

Economic and Social Commission for Western Asia

PROGRAMMES AND FUNDS

- UNCTAD
- UNDP
- UNEP
- UNICEF
- UNCDF
- …….

UNECE Work Areas



UNECE

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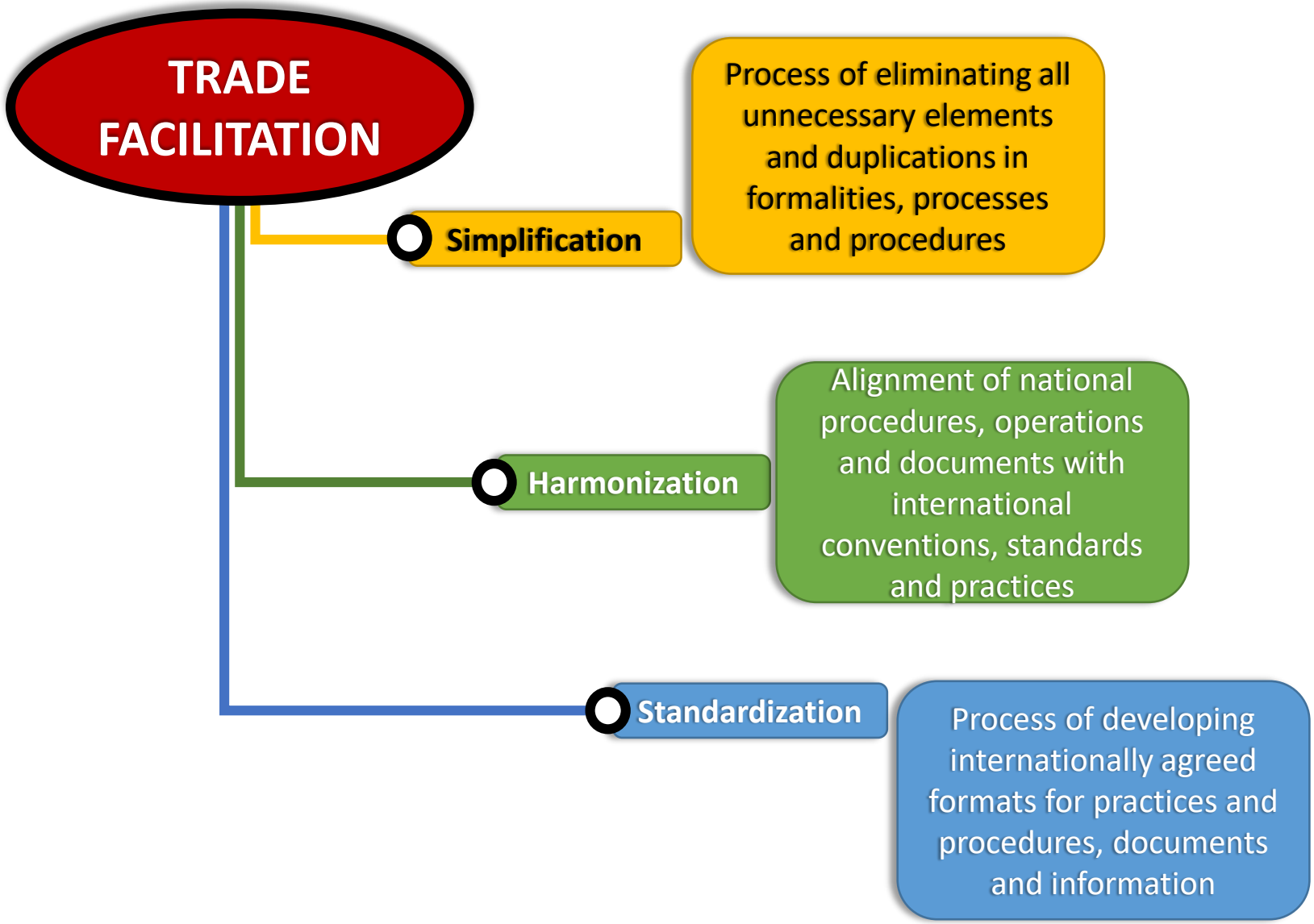
UNECE & Trade Facilitation



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UN/CEFACT – UN Centre for Trade Facilitation and Electronic Business

Objectives

- Simple, transparent and effective processes for global business
- Efficient and automated exchange of information

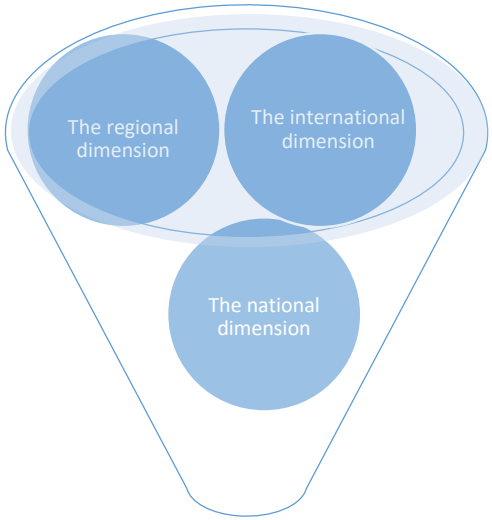
Key tools

- Global trade facilitation recommendations
- eBusiness standards
- Guidelines

Means

- Public-Private Partnership – over 500 experts
- Meet virtually practically every weeks

Trade facilitation is discussed at three levels: all complementary



UN/CEFACT – Semantic Hub for Standardization

Commercial Procedures

- Establish sales contract
- Order goods
- Advise on delivery
- Request payment

Transport Procedures

- Establish transport contract
- Collect, transport and deliver goods
- Provide waybills,
- Goods receipts, etc.

Regulatory Procedures

- Obtain im/export licenses etc.
- Provide Customs Declarations
- Provide cargo Declarations
- Apply security measures
- Clear goods

Financial Procedures

- Provide credit rating
- Insurance
- Execute payment
- Issue statements

UN/CEFACT Deliverables

- **Deliverables**
  - Internationally agreed Recommendations and Standards
  - Common Libraries
  - Common Directories

UN/CEFACT Work on Blockchain

- White Paper on Trade Facilitation Processes
  - Presenting the functionalities blockchain offers that can't be achieved by other means
- White Paper on Standards
  - Considering relationships with current standards
  - Studying what new standards are necessary
- Sectoral Use Cases
  - Presenting 31 case studies in 10 Industry sectors
  - Work in progress

Blockchain opportunities

- Blockchain has the potential to deliver significant improvements to trade and electronic business transactions because :
  - Immutable and verifiable transactions recorded in a blockchain can allow the elimination of paper in areas where today it is still required;
  - Automated (and immediate) reconciliation algorithms can facilitate faster payments
  - The tracing of digital assets through 100s or 1000s of transactions can support the tracking of sensitive goods and digital rights (for example IPR)
  - Immutable “original” electronic certificates, licenses and declarations can be linked with goods through digital twins in order to facilitate regulatory procedures.

Blockchain opportunities

- The most valuable Blockchain applications for trade are based on Smart Contracts within a secure environment.
- Smart contracts usually require that blockchains process external information, from the IoT or other "oracles"
- For example, if a sensor inside a container indicates that its temperature has exceeded a permitted level, a smart contract could send a request for an inspection or trigger an insurance payment.

Blockchain and the SDGs

- Some Blockchain implementations can be used to support SDGs for example:
  - The establishment of identities
  - Tracking information linked to identities
  - The distribution of resources
  - Tracing goods and their content/origin

- Briefing note on Blockchain for the United Nations Sustainable Development Goals
  - http://www.unece.org/fileadmin/DAM/cefact/cf_plenary/2018_plenary/ECE_TRADE_C_CEFACT_2018_25E.pdf

Blockchain challenges

- Cannot reasonably expect that all exchanges in a single operation be centralized on a same blockchain
- Issues of interoperability on several levels
  - Semantics
  - Syntax
  - Trust
- Scalability

UN/CEFACT brings it all together

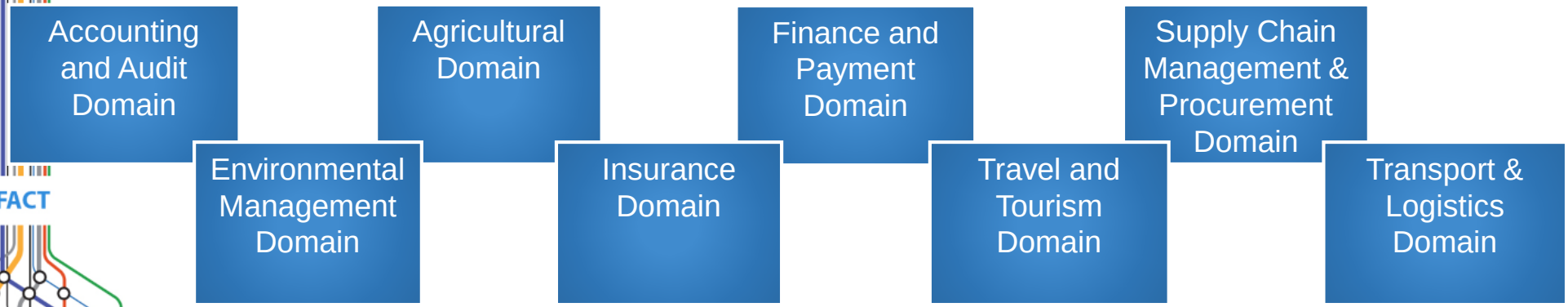
- Under the United Nations umbrella
  - Non-competitive; inclusive by nature; free to participate and free for use
- Base semantic definitions
  - Developed in an open, public-private partnership
  - Mature, robust and trusted; developed over twenty years
  - Covers the entire international supply chain; all sectors and all countries
- Base technical specifications
  - Reused by many organizations, promoting interoperability
- International code lists
- Standard messages and processes

Global Trade – Semantic Anchors

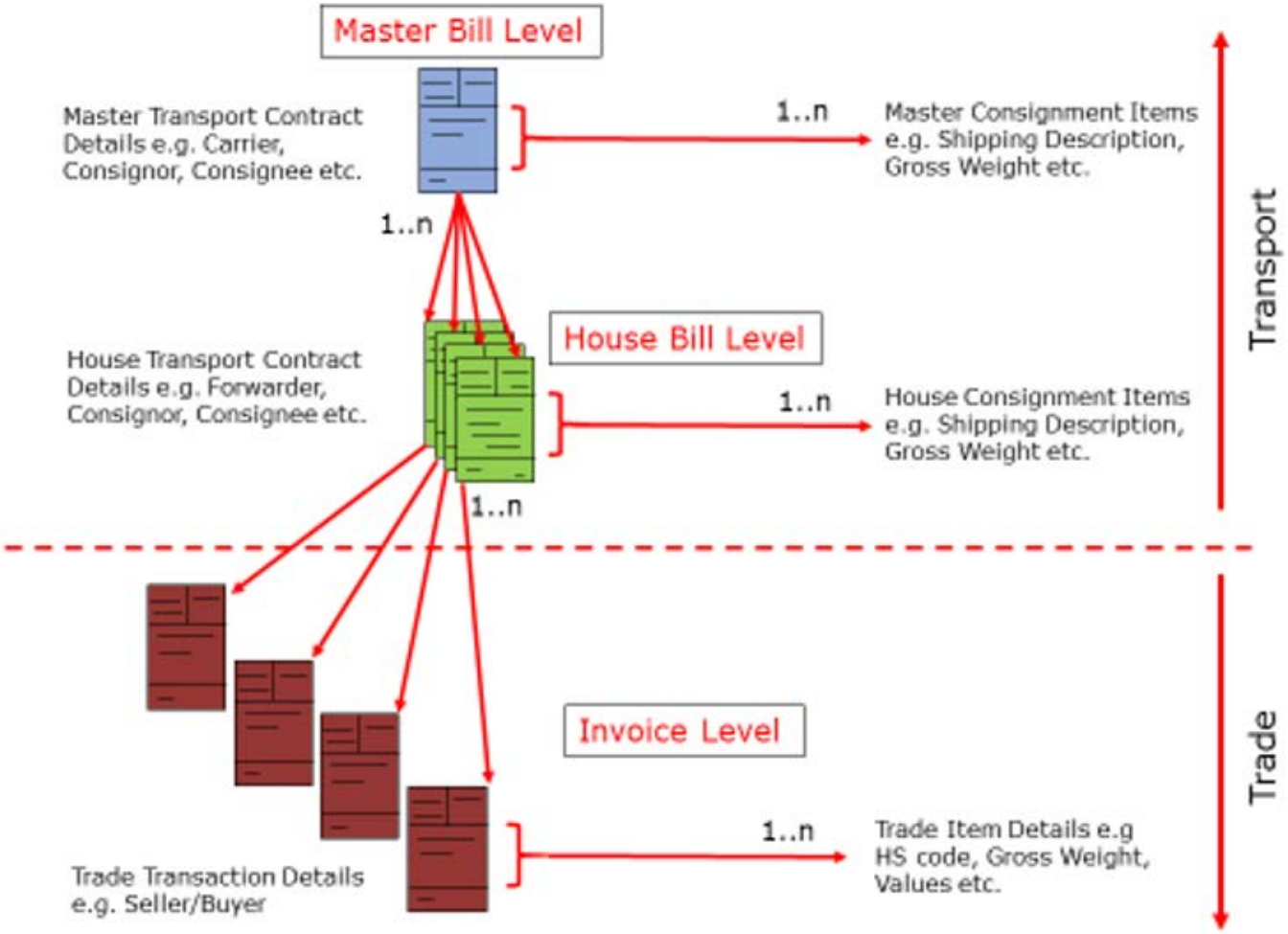
- **Shipment (Trade Delivery)**
- A shipment is an identifiable collection of one or more Trade Items (available to be) transported together from the Seller (Original Consignor/Shipper) to the Buyer (Final/Ultimate Consignee):
  - A Shipment can only be destined for one Buyer
  - A Shipment can be made up of some or all Trade Items from one or more Sales Orders
  - A Shipment can have only one Customs UCR
  - A shipment may form part or all of a Consignment or may be transported in different Consignments.
- **Consignment**
- A consignment is a separately identifiable collection of Consignment Items (available to be) transported from one Consignor to one Consignee via one or more modes of transport as specified in one single transport service contractual document:
  - A Consignment can only have one Transport Service Buyer
  - A Consignment can only have one Transport Service Provider
  - A Consignment can only have one Consignor
  - A Consignment can only have one Consignee
  - The Transport Service Buyer can be either the Consignor or the Consignee
  - A Consignment is made up of one or more Consignment Items
  - A Consignment can be made up of some or all Trade Items (aggregated into Consignment Items) from one or more Shipments

UN Core Component Library (UN/CCL)

- One of the key deliverables of UN/CEFACT
- Defines all terms related to trade, providing a common semantic content of data and a common format
- Contains over a thousand reusable core components provided in a business context
- Also integrates requirements from other organizations such as the WCO, SWIFT, GS1, CITES, US Government, German Government etc.
- Syntax neutral
- Can be used to develop messages in specific syntaxes such as EDIFACT or XML etc.



International Supply Chain Contracts



UN/CEFACT evolution

- From Document centric to Process driven artefacts *(Contextualized Business Artefacts)*
- Supports Document centric & Process driven workflows
- Standardized syntax-neutral data exchange structures, based on common Master data exchange structure

  (from which complete documents and/or snippets of documents can be created in any chosen syntax e.g. XML, JSON or UN/EDIFACT etc.)

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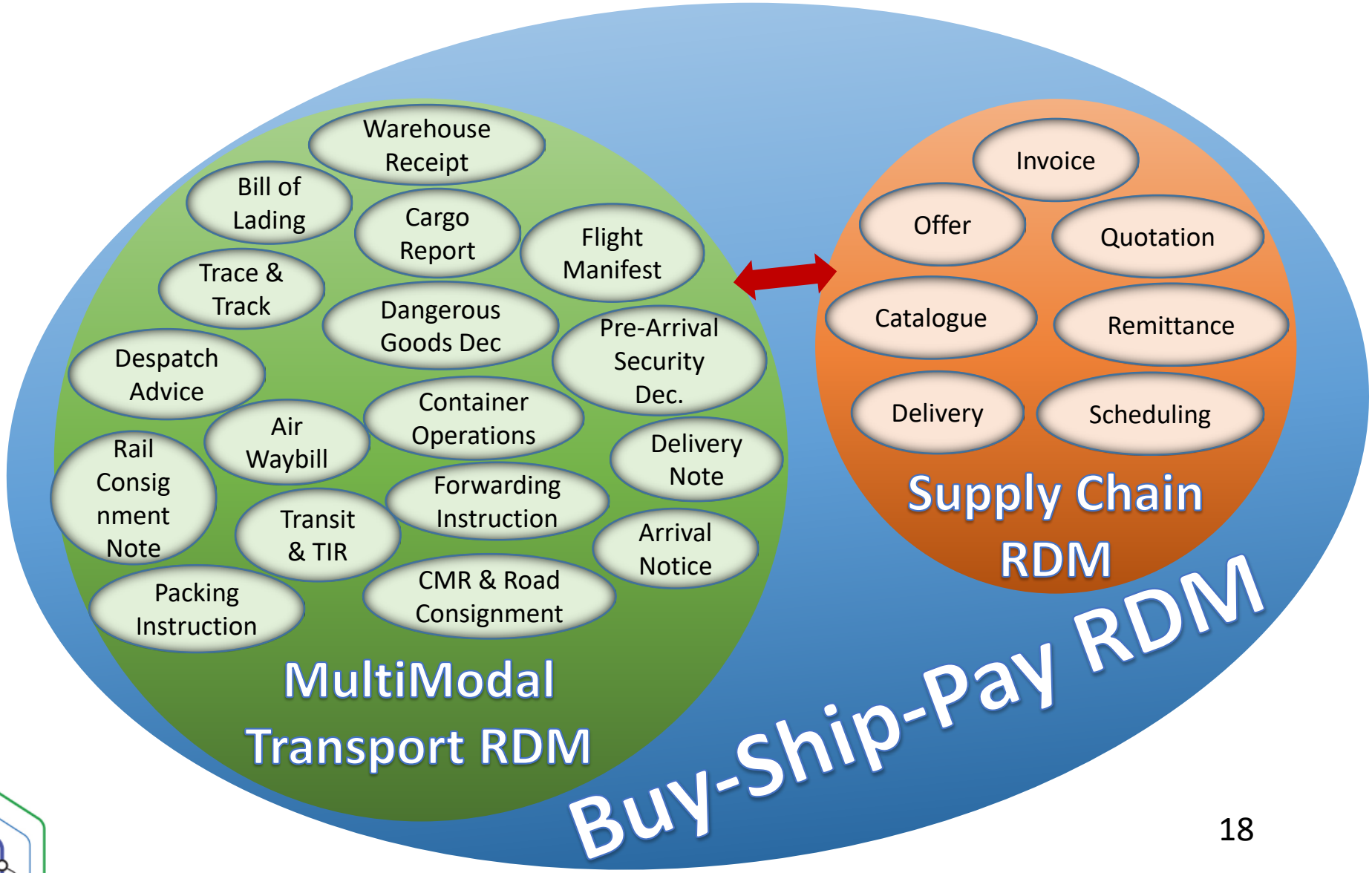
Reference Data Models



Benefits of UN/CEFACT Standards

- Blockchain implementations can benefit from existing UN/CEFACT standards
  - Semantics standards such as Core Component Library (CCL)
  - Controlled vocabulary
  - Complex data structures e.g. EDI Messages
  - Extensible Marked-up Language Naming & Design Rules (XML NDR)
  - Business Exchange models in multiple areas (Transport, Logistics, Commercial, Finance …)
  - Modelling methodologies and standards
    - (Business Requirement Specifications and Requirement Specification Mappings)

- All deliverables at https://unece.org/cefact/

New UN/CEFACT Project

- Cross-border Inter-ledger exchange for Preferential Certificates of Origin using Blockchain
  - B2G and G2G exchanges covered
  - Looking at key issues to consider while creating, administering and using such platforms
  - Need for standards

Blockchain challenges

Not all Blockchains and DLTs are equal, they vary in:

- **Vulnerability** (to hacking and other system failures)
- **Robustness** (how well they handle problems such as flawed code or being hacked)
- **Cost** (transaction cost, sometimes referred to as «gas»)
- **Speed and ability to scale up** (to large transaction volumes)
- **Degree of Privacy** (no anonymity vs pseudo anonymity vs total anonymity)

Blockchain challenges

- Use of this technology has an implied computational cost
  - Distributed ledger (duplication of data on multiple platforms)
  - Implementation of authentication technology (Digital signature/Public Key Infrastructure signatures)
  - Implementation of hash technology
  - Current implementations are energy – and computing power - intensive
- May create a barrier
  - For developing/transitioning economies
  - For MSMEs
- May force investment in non-core aspects of an economic operator's business

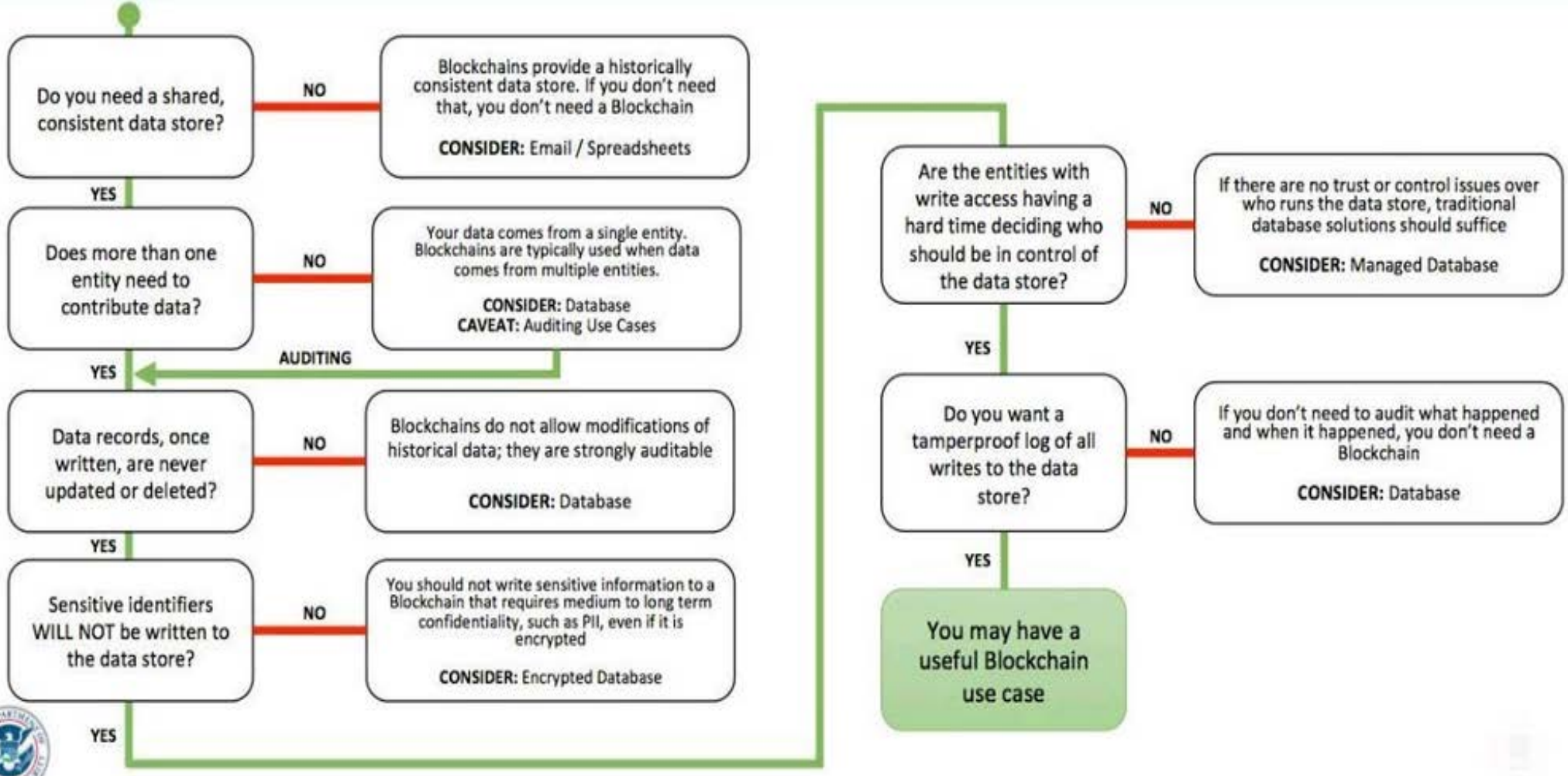
Blockchain challenges

- The chosen method of authentication should be “as reliable as was appropriate for the purpose for which the data message was generated or communicated, in the light of all the circumstances, including any relevant agreement.”

- Blockchain is a very high level of reliability and not all data transactions require the highest level of reliability

UN/CEFACT Recommendation 14 (2014), paragraph 37.
Article 7.1, UNCITRAL “Model Law on Electronic Commerce with Guide to Enactment 1996 with additional article 5 bis as adopted in 1998” United Nations, New York, 1999, p.5-6.

Blockchain – when to use



Source: US Dept. of Homeland Security, author unknown, Sebastien Meunier, published on Medium, https://medium.com/@sbmeunier/when-do-you-need-blockchain-decision-models-a5c40e7c9ba1

More information on UN/CEFACT

All UNECE and UN/CEFACT Recommendations, codes, standards and publications are available for free on our website at:

- www.unece.org/
- www.unece.org/trade
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- tfig.unece.org

Email: lance.thompson@un.org

Thank you

Lance Thompson
Head, UN/CEFACT Support Unit
lance.thompson@un.org
UNECE – UN/CEFACT
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