Digital interoperability using UN/CEFACT standards and reference data models and railway data and document exchange digitalization
https://unttc.org/stream/electronic-trade-and-transport-documents-and-data

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UNECE
United Nations Economic for Europe

Multimodal interconnectivity: goals and next steps in the Europe-Asia corridors

1. Multimodal interoperability
2. Compatibility of cargo data exchange E. Asia – W. Europe

- **Legal framework: negotiations – agreements – e-docs recognition**
- **Technological neutrality – suits EDI, XML, JSON API (blockchains)**
- **Call to all stakeholders to collaborate / use standards**
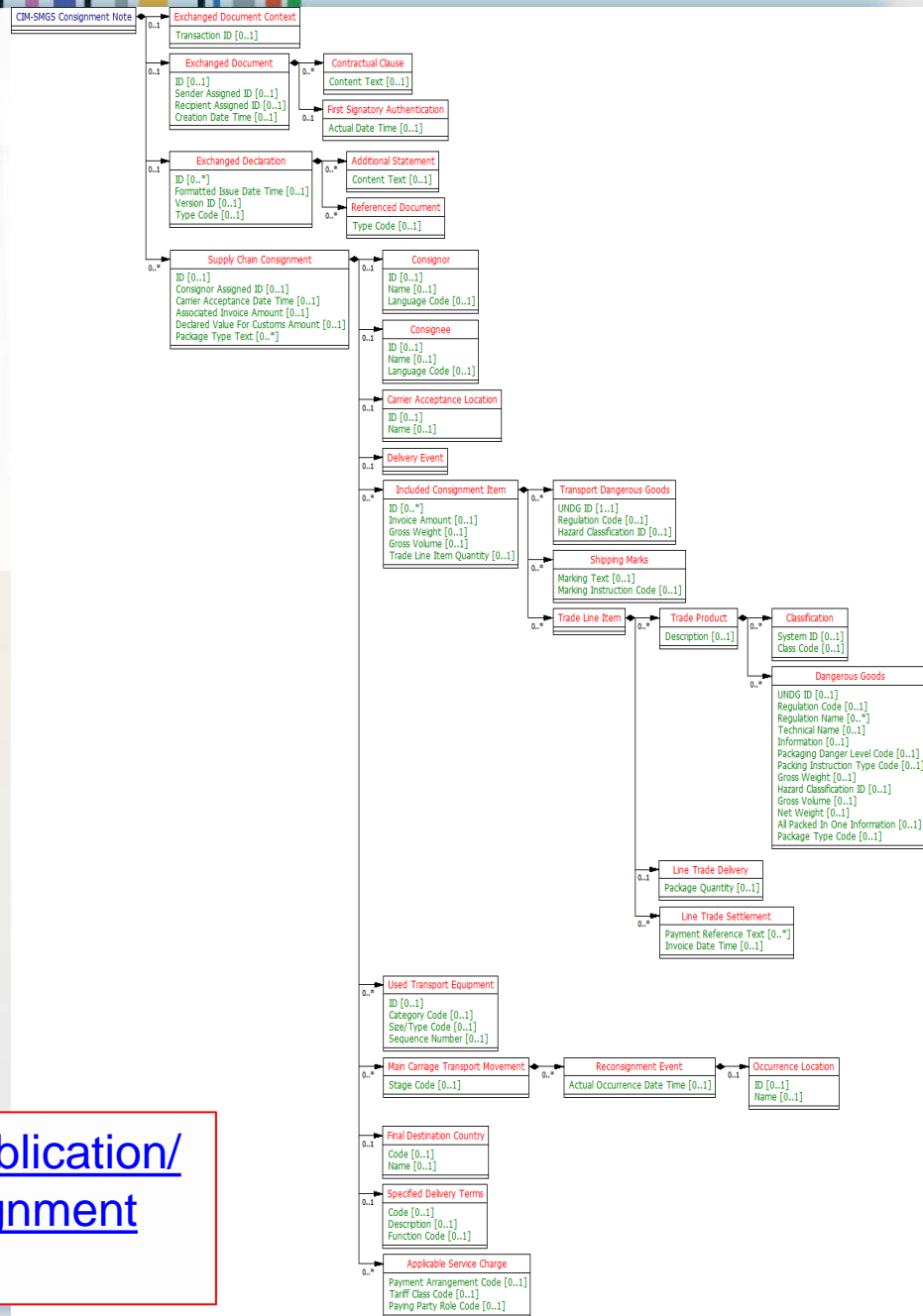- **Move from documents to the exchange of data sets**

For example:
the CIM-SMGS railway consignment note referenced to the UN/CEFACT Multi-Modal Transport Reference Data Model, according to the prepared XML schema for CIM-SMGS

Subsets for the CIM-SMGS consignment note and the consignment note under UNECE's work on the Unified Railway Law (URL) developed

MS Excel and UML diagram, XSDs and html publication prepared

Standards for CIM/SMGS wagon list finalized

https://service.unece.org/trade/uncefact/publication/Transport and Logistics/CIM-SMGS Consignment Note/HTML/001.htm

CIM-SMGS Consignment Note

Exchanged Document Context [0..1]
Transaction ID [0..1]

Exchanged Document [0..1]
ID [0..1]
Sender Assigned ID [0..1]
Recipient Assigned ID [0..1]
Creation Date Time [0..1]

Contractual Clause [0..*]
Content Text [0..1]

First Signatory Authentication
Actual Date Time [0..1]

Exchanged Declaration [0..1]
ID [0..*]
Formatted Issue Date Time [0..1]
Version ID [0..1]
Type Code [0..1]

Additional Statement [0..*]
Content Text [0..1]

Referenced Document
Type Code [0..1]

Supply Chain Consignment [0..*]
ID [0..1]
Consignor Assigned ID [0..1]
Carrier Acceptance Date Time [0..1]
Associated Invoice Amount [0..1]
Declared Value For Customs Amount [0..1]
Package Type Text [0..*]

Consignor [0..1]
ID [0..1]
Name [0..1]
Language Code [0..1]

Consignee [0..1]
ID [0..1]
Name [0..1]
Language Code [0..1]

Carrier Acceptance Location [0..1]
ID [0..1]
Name [0..1]

Delivery Event

Included Consignment Item [0..*]
ID [0..*]
Invoice Amount [0..1]
Gross Weight [0..1]
Gross Volume [0..1]
Trade Line Item Quantity [0..1]

Transport Dangerous Goods [0..*]
UNDG ID [1..1]
Regulation Code [0..1]
Hazard Classification ID [0..1]

Shipping Marks [0..*]
Marking Text [0..1]
Marking Instruction Code [0..1]

Trade Line Item [0..*]

Trade Product [0..1]
Description [0..1]

Classification [0..1]
System ID [0..1]
Class Code [0..1]

Dangerous Goods [0..*]
UNDG ID [0..1]
Regulation Code [0..1]
Regulation Name [0..*]
Technical Name [0..1]
Information [0..1]
Packaging Danger Level Code [0..1]
Packing Instruction Type Code [0..1]
Gross Weight [0..1]
Hazard Classification ID [0..1]
Gross Volume [0..1]
Net Weight [0..1]
All Packed In One Information [0..1]
Package Type Code [0..1]

Line Trade Delivery [0..1]
Package Quantity [0..1]

Line Trade Settlement [0..1]
Payment Reference Text [0..*]
Invoice Date Time [0..1]

Used Transport Equipment [0..*]
ID [0..1]
Category Code [0..1]
Size/Type Code [0..1]
Sequence Number [0..1]

Main Carriage Transport Movement [0..1]
Stage Code [0..1]

Reconsignment Event [0..*]
Actual Occurrence Date Time [0..1]

Occurrence Location [0..1]
ID [0..1]
Name [0..1]

Final Destination Country [0..1]
Code [0..1]
Name [0..1]

Specified Delivery Terms [0..1]
Code [0..1]
Description [0..1]
Function Code [0..1]

Applicable Service Charge [0..*]
Payment Arrangement Code [0..1]
Tariff Class Code [0..1]
Paying Party Role Code [0..1]

Reusable publication artefacts

SMGS and CIM/SMGS standard MMT-based generation of publication in various formats possible

Machine and human readbale documentation
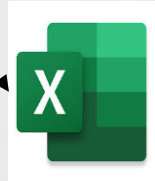
Generating XML schemas from UN/CEFACT standards

- **XML schemas are generated following UN/CEFACT Naming and Design Rules**

- **UN/CEFACT official syntax format output**

- **Generated schemas (as XSD files) can be used directly in various implementation projects**

- **They can also be customized to fit a particular implementation use case**

- **More information about UN/CEFACT semantic standards on: https://unece.org/trade/uncefact/mainstandards**

JSON API Specifications Support for UN/CEFACT Semantic Standards and MMT RDM

- **Possible adoption of UN/CEFACT technical solutions to implement railway data standards**

- **Exported UN/CEFACT JSON schemas can be used in any web APIs**

- **Support for the development of standardized UN/CEFACT web API implementations**

- **More information about UN/CEFACT semantic standards and projects can be found at:**

  UN/CEFACT Collaboration Environment Home (unece.org)

IFTMIN Mapping Report   XLS Guideline Structure

XSD schemas

HTML publication

Best practice example: EU's eFTI, towards a paperless wheelhouse

- Towards a paperless wheelhouse
- EU Harmonized regulation and data sharing infrastructure
- Barge operators, shippers and public administrations share transport information in a trusted secure environment
- Seamless integration of RISCOMEX within multimodal supply chains

Consignment
Cargo Manifest
DGN, Waste
Notification
eFTI Dataset

API

PDF | XML | JSON | EDIFACT | W3C

Shipper Forwarder	Barge Operator	Port Operator Handling Agent	Road Services Operator	Public Infrastructure Manager	Customs and other Agencies
AI	AI			AI	

Source: Rudy Hemeleers
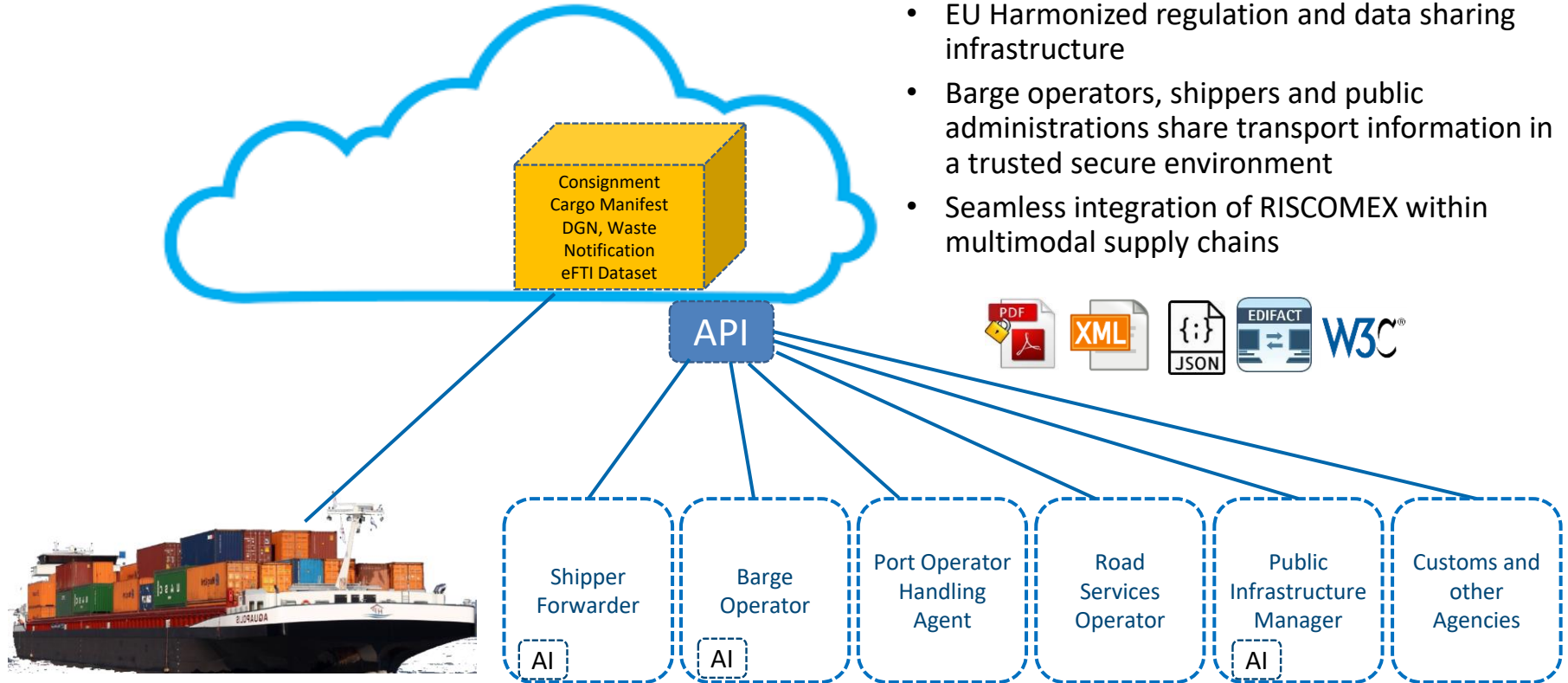
Another example of a pilot: CONVERTER between UN/EDIFACT and the UN/CEFACT Multimodal Transport Reference Data Model (Conceptual diagram)

IFTMIN

CIM/SMGS

CIM

SMGS

…
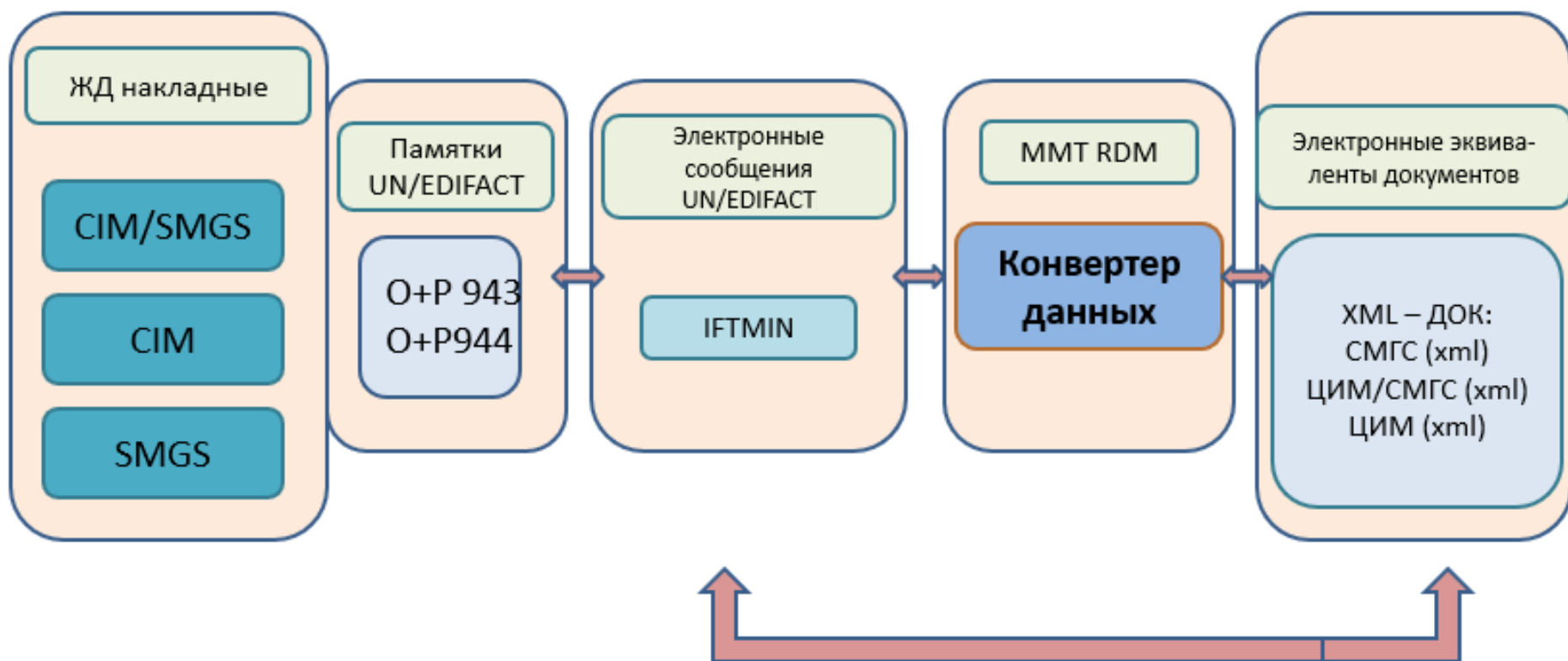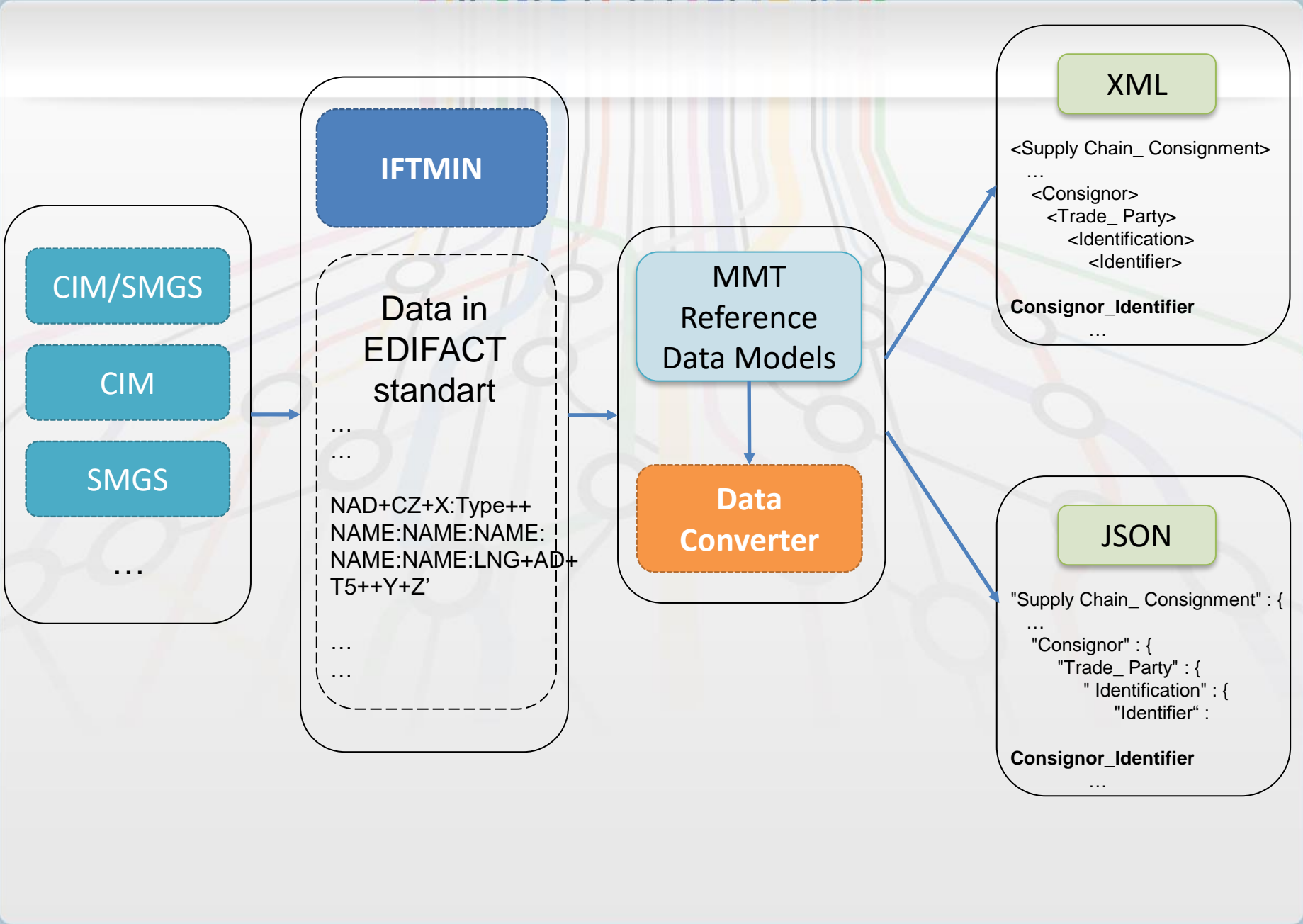
Data in EDIFACT standart

…
…

NAD+CZ+X:Type++
NAME:NAME:NAME:
NAME:NAME:LNG+AD+
T5++Y+Z'

…
…

MMT Reference Data Models

Data Converter

XML

```
<Supply Chain_ Consignment>
  …
   <Consignor>
    <Trade_ Party>
     <Identification>
      <Identifier>
```

Consignor_Identifier
          …

JSON

```
"Supply Chain_ Consignment" : {
  …
   "Consignor" : {
     "Trade_ Party" : {
       " Identification" : {
         "Identifier" :
```

Consignor_Identifier
          …

Summary

- **The analysis and re-use of the UN/CEFACT global semantic standards in various implementation projects is encouraging for achieving multimodal interoperability**

- **Illustrating that these data exchange standards and artefacts are easy to operate and ready to be used for implementation**

- **Availability of human and machine-readable artefacts**

- **Further guidance can be found in the brochure "Building electronic documents from MMT": https://cmsdroff.gitbook.io/standards-guide/building-electronic-documents-from-mmt/getting-started**

TRADE FACILITATION IMPLEMENTATION GUIDE

UNECE — United Nations Economic for Europe

MMT
Trade_ Party. Identification. Identifier

PATH: BSP Master/Specified. Supply Chain_ Consignment/ Consignor. Trade_ Party/ Identification. Identifier

SMGS
Consignor code
C.2

CIM/SMGS
Consignor code
C.2

CIM
Consignor code
C.2

IFTMIN

Example message

No.	Tag	Example
01	UNA	UNA:+.? '
		UNA:+,? '
02	UNB	UNB+UNOC:3+NO0987654321:30+7080003248890++CONSIGNOR++1++1'
03	UNH	UNH+1234+IFTMIN:D:04A:UN:BIG14'
04	BGM	BGM+610+70123451234567898+1'
05	CTA	CTA+BK+:EDI dep./ Eva HW'
06	COM	COM+eva.hw@bring.com:EM'
07	DTM	DTM+137:20100810:102'
08	DTM	DTM+234:20100810:102'
09	MOA	MOA+22:4530:NOK'
10	FTX	FTX+PRD+++1020:X'
11	FTX	FTX+SSR+++1076:ME01NO'
12	FTX	FTX+TRR+++DAVA'
13	FTX	FTX+DEL+++Call 911 before delivery'
14	FTX	FTX+AAR+++0022'
15	CNT	CNT+11:9:PCE'
16	GDS	GDS+11'
	SG2	
17	TOD	TOD+5+CC'
	SG2	
18	TOD	TOD+6++EXW:INCOTERMS2010'
19	LOC	LOC+1+3000::139:Drammen+NO'
	SG3	
20	RFF	RFF+CMR:70701020000000034'
	SG3	
21	RFF	RFF+IV:867'
22	DTM	DTM+171:20100923:102'
	SG8	
23	TDT	TDT+20++3++BCS::87'
24	TSR	TSR+ALY'
	SG9	
25	LOC	LOC+202+1000::87:Bring Logistics, Os
	SG11	
26	NAD	NAD+CZ+10009999999::87++Bring IKT:X+E

Partnerships for the standards / pilot projects:

- **SMGS and CIM/SMGS consignment notes and other railway documents**

- **Asia-Western Europe Converter (UN/EDIFACT – XML)**

- **IMO/FAL documents in ports**

- **FIATA multimodal bill of lading**

- **ICAO Documents/Air Cargo**

- **Pilot projects (digital twins) Belarus-Serbia; Ukraine – Azerbaijan; IMO/FAL in the ports of Ukraine**

- **Digitalization of SMGS consignment notes in the Kazakhstan-Turkmenistan-Iran corridor is possible.**
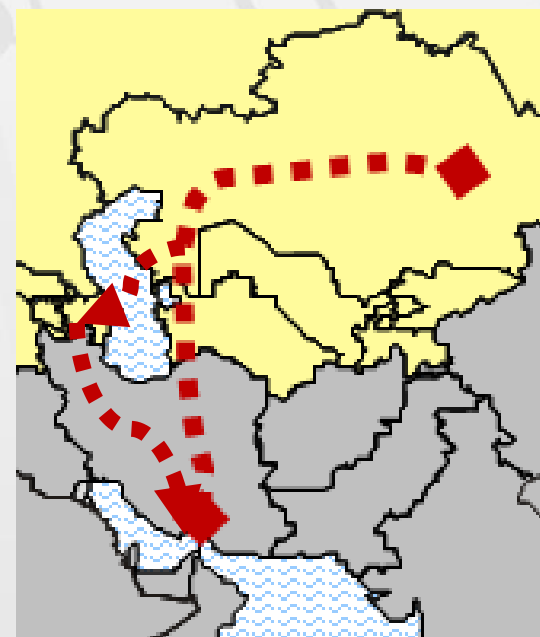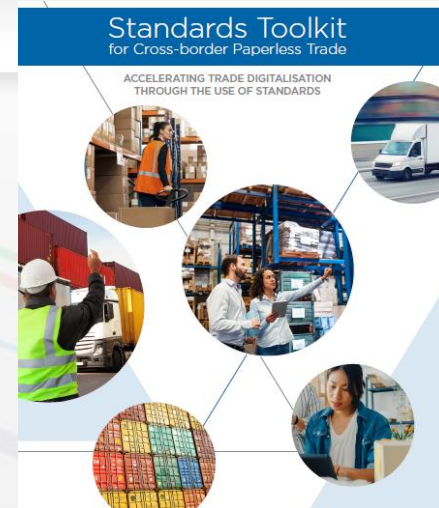
Pilot testing: mapping data from transport (business documents) to Customs IT systems

Data mapping

	A	B	C	D	E	F	T	U	V	W	X	Y	Z	AA	AB
1								WCO v3.11.0				EUCDM v6.2			
2	RDM Path	Unique UN Assigned ID	ABI	Business Name	CCL DEN (Dictionary Entry Name	Definition	WCO ID	WCO name	WCO XML Na	WCO Path	WCO format	EUCDM name	EUCDM Format	EUCDM Ref ID6	EUCDM Ref XML
42	BSP	UN01004566	AS	Mobile Telephone	Trade Contact.	The mobile									
43	BSP	UN01001256	BBI	Complete Number	Universal	The text string of									
44	BSP	UN01004569	AS	Email Address	Trade Contact.	The email URI									
45	BSP	UN01001253	BBI	URI	Universal	The Uniform									
46		UN01004159	AS	Road Consignment	BSP Master.	A supply chain	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
47	BSP Master/Specified.	UN01004173	BBI	Gross Weight	Supply Chain	A measure of the	131	Total gross weight	Total	Declaration/Consignment/House	n..16,6	Total gross mass	n..16,6	18 03 001 000	Total gross weight
48	BSP Master/Specified.	UN01004175	BBI	Gross Volume	Supply Chain	A measure of the	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
49	BSP Master/Specified.	UN01004181	BBI	Associated Invoice	Supply Chain	A monetary value									
50	BSP Master/Specified.	UN01004189	BBI	COD Amount	Supply Chain	The monetary	n/a				n/a	n/a		n/a	n/a
51	BSP Master/Specified.	UN01004196	BBI	Consignment Item	Supply Chain	The number of									
52	BSP Master/Specified.	UN01012578	BBI	Cargo Insurance	Supply Chain	Cargo insurance									
53	BSP Master/Specified.	UN01012579	BBI	Transshipment	Supply Chain	The indication of									
54	BSP Master/Specified.	UN01004212	AS	Consignor/Sender	Supply Chain	The consignor	30A	Consignor		Declaration/Consignment/Consig		Consignor		13 02 000 000	consignor
55	BSP Master/Specified.	UN01004595	BBI	ID	Trade Party.	A unique identifier	R021	Consignor, coded	ID	Declaration/Consignment/Consig	an..35	Identification number	an..17	13 02 017 000	consignorIdentification
56	BSP Master/Specified.	UN01004598	BBI	Name	Trade Party.	The name,	R020	Consignor - name	Nam	Declaration/Consignment/Consig	an..70	Name	an..70	13 02 016 000	consignorName
57	BSP Master/Specified.	UN01009017	BBI	Language Code	Trade Party.	A code specifying	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
58	BSP Master/Specified.	UN01004602	AS	Defined Contact	Trade Party.	A trade contact	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
59	BSP Master/Specified.	UN01001642	BBI	Person Name	Trade Contact.	The name,	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60	BSP Master/Specified.	UN01004564	AS	Telephone	Trade Contact.	Telephone	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
61	BSP Master/Specified.	UN01001256	BBI	Complete Number	Universal	The text string of									
62	BSP Master/Specified.	UN01004566	BBI	Mobile Telephone	Trade Contact.	The mobile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
63	BSP Master/Specified.	UN01001256	BBI	Complete Number	Universal	The text string of									
64	BSP Master/Specified.	UN01004569	AS	Email Address	Trade Contact.	The email URI	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
65	BSP Master/Specified.	UN01001253	BBI	URI	Universal	The Uniform									
66	BSP Master/Specified.	UN01004573	AS	Note	Trade Contact.	A note specified									
67	BSP Master/Specified.	UN01002522	BBI	Content Text	Note. Content.	A content,									
68	BSP Master/Specified.	UN01004603	AS	Postal Address	Trade Party.	The postal	04A	Address		Declaration/Consignment/Consig		Address		13 02 018 000	consignorAddress
69	BSP Master/Specified.	UN01004534	BBI	ID	Trade Address.	A unique identifier	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
70	BSP Master/Specified.	UN01004535	BBI	Postcode	Trade Address.	A code specifying	245	Postcode identification		Declaration/Consignment/Consig	an..17	Postcode	an..17	13 02 018 021	consignorAddressPos
71	BSP Master/Specified.	UN01004543	BBI	Street Name	Trade Address.	A name,	239	Street and number/P.O. Box	Line	Declaration/Consignment/Consig	an..256	Street and number	an..70	13 02 018 019	consignorAddressStr
72	BSP Master/Specified.	UN01004544	BBI	City Name	Trade Address.	The name,	241	City name	City	Declaration/Consignment/Consig	an..35	City	an..35	13 02 018 022	consignorAddressCity
73	BSP Master/Specified.	UN01004546	BBI	Country Code	Trade Address.	The unique	242	Country	Coun	Declaration/Consignment/Consig	a2	Country	a2	13 02 018 020	consignorAddressCou
74	BSP Master/Specified.	UN01004547	BBI	Country Name	Trade Address.	A name,	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
75	BSP Master/Specified.	UN01004549	BBI	Country Sub-	Trade Address.	A name,	243	Country sub-entity name	Coun	Declaration/Consignment/Consig	an..35	Sub-division	an..35	13 02 018 027	consignorAddressSul
76	BSP Master/Specified.	UN01004611	AS	Tax Registration	Trade Party.	A tax registration	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
77	BSP Master/Specified.	UN01004487	BBI	ID	Tax	The unique	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
78	BSP Master/Specified.	UN01011071	AS	Trader Registration	Trade Party.	A governmental									
79	BSP Master/Specified.	UN01011029	BBI	ID	Government	An identifier for									
80	BSP Master/Specified.	UN01011031	BBI	Type Code	Government	A code specifying									
81	BSP Master/Specified.	UN01011036	BBI	Country Code	Government	The identifier of									
82	BSP Master/Specified.	UN01004213	AS	Consignee	Supply Chain	The consignee	27A	Consignee	consi	Declaration/Consignment/Consig		Consignee		13 03 000 000	
83	BSP Master/Specified.	UN01004595	BBI	ID	Trade Party.	A unique identifier	R015	Consignee, coded	ID	Declaration/Consignment/Consig	an..35	Identification number	an..17	13 03 017 000	consigneeIdentificatio
84	BSP Master/Specified.	UN01004598	BBI	Name	Trade Party.	The name,	R014	Consignee name	Nam	Declaration/Consignment/Consig	an..70	Name	an..70	13 03 016 000	consigneeName
85	BSP Master/Specified.	UN01009017	BBI	Language Code	Trade Party.	A code specifying	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
86	BSP Master/Specified.	UN01004602	AS	Defined Contact	Trade Party.	A trade contact	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
87	BSP Master/Specified.	UN01001642	BBI	Person Name	Trade Contact.	The name,	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
88	BSP Master/Specified.	UN01004564	AS	Telephone	Trade Contact.	Telephone	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
89	BSP Master/Specified.	UN01001256	BBI	Complete Number	Universal	The text string of									

Data mapping

Thank you!

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