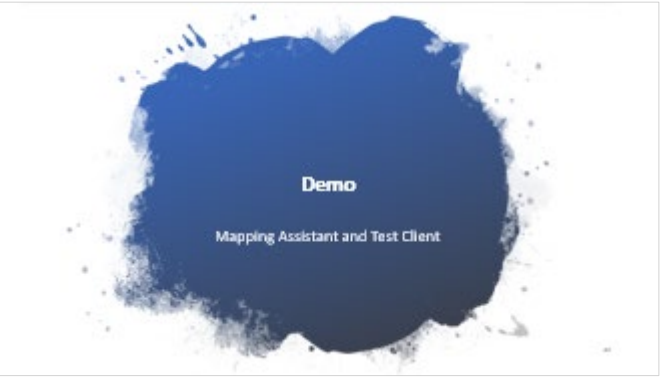
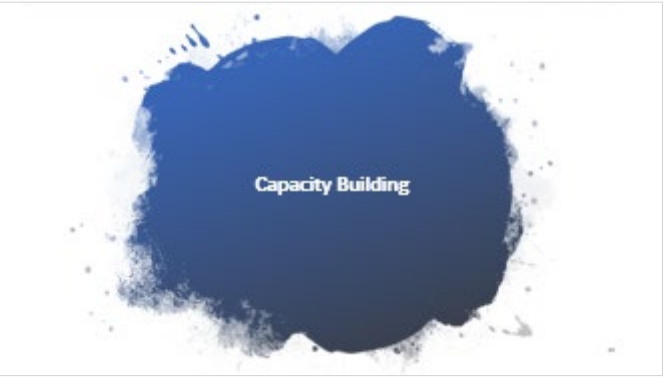
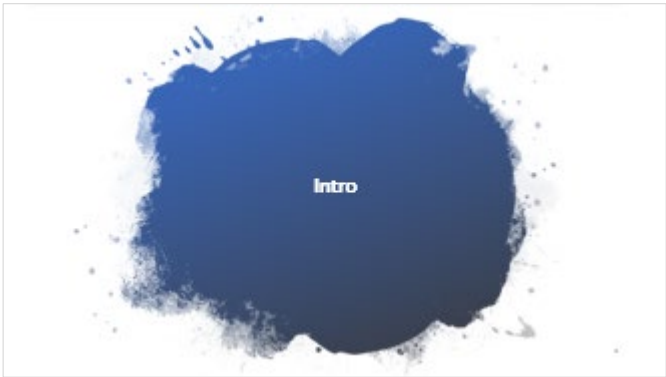


Trade SDMX via UNGP

Markie Muryawan @ UNSD

2019



A large, dark, irregular ink blot with splatters on a white background. The blot is roughly circular but has jagged, uneven edges. It is surrounded by a cloud of smaller, lighter-colored splatters and droplets that fade out towards the corners of the page. The overall effect is that of a fresh ink spill or a splash of paint.

Intro

What is SDMX?

Statistical

Data

&

Metadata

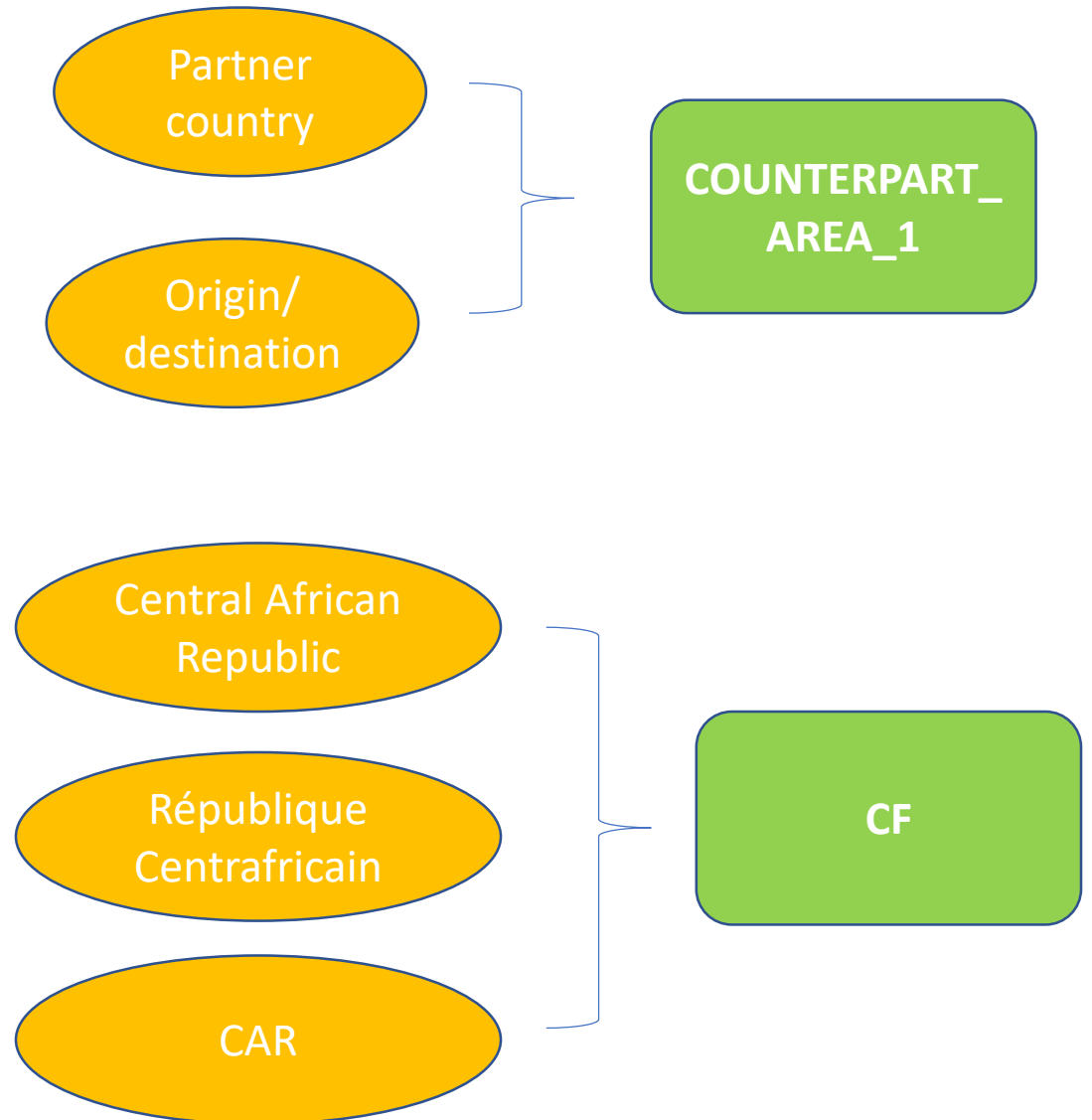
eXchange

- Full **harmonization** of Data
- Full **automation** of Data exchange

“...standardising and modernising (“industrialising”) the mechanisms and processes for the exchange of statistical data and metadata among international organisations and their member countries.”

Harmonization

- Common data set labels/
variable names/ column names
 - ✓ Common set of “**Concept**”
- Common code list for each
Concept (variable/ column/
label)
- Common tools



Harmonization

So basically from this...



To this...



Automation

- From this...



- To this...



Some key terminologies

Concept:

- In Statistical term → a variable.
- In international trade data sets, often a column.
- For example:
 - Mode of transport (TRANSPORT_MODE_BORDER)
 - Unit of measure (UNIT_MEASURE)

SDMX aims to harmonize the concept scheme (a fixed set of concepts with common names and code lists)

Some key terminologies

Measurement: Concept denoting the key observation (FOB, CIF, Net Weight, Quantity)

Dimension: Concept which, together with other concepts uniquely identify the record.

- For example: Commodity code (**COMMODITY_1**)

Attribute: Concept which provide additional information about the record, but is not required to uniquely identify it.

- For example: Unit multiplier (**UNIT_MULT**)

Code list: A list of all acceptable values of a concept.

Some key terminologies

Data Structure

Definition:

- A data model that specifies all concepts, their role, and their code lists or formats

Role	Id	Description	Presentation
Dimension	TRADE_FLOW	Trade flow or sub-flow (exports, re-exports, imports, re-imports, etc.)	CODE LIST: CL_TRADE_FLOW
Dimension	COMMODITY_1	Primary commodity code or commodity group code (its composition includes a prefix that identifies the commodity classification).	CODE LIST: CL_COMMODITY
Dimension	COMMODITY_1_CONF	Commodity code suitable for dissemination when primary commodity code is confidential.	CODE LIST: CL_COMMODITY (restricted to subset of "truncated" codes)
Measurement	OBS_VALUE	The value of a particular variable at a particular period.	na
Attribute	UNIT_MEASURE	The unit in which the data values are measured.	CODE LIST: CL_UNIT_MEASURE
Attribute	COMMENT_OBS	Any comment regarding the observation may go here. For generic codes in CL_UNIT, such as "UT - Unit described in title" use this field to fully specify the unit. Specific units should also be specified.	FREE TEXT

Why SDMX?

Fast & Easy

Data transmission is automatic, no ad-hoc transformation needed

Reduced response burden

All parties transmitting and receiving data according to same standards

Error minimization

Harmonization of concepts and code lists

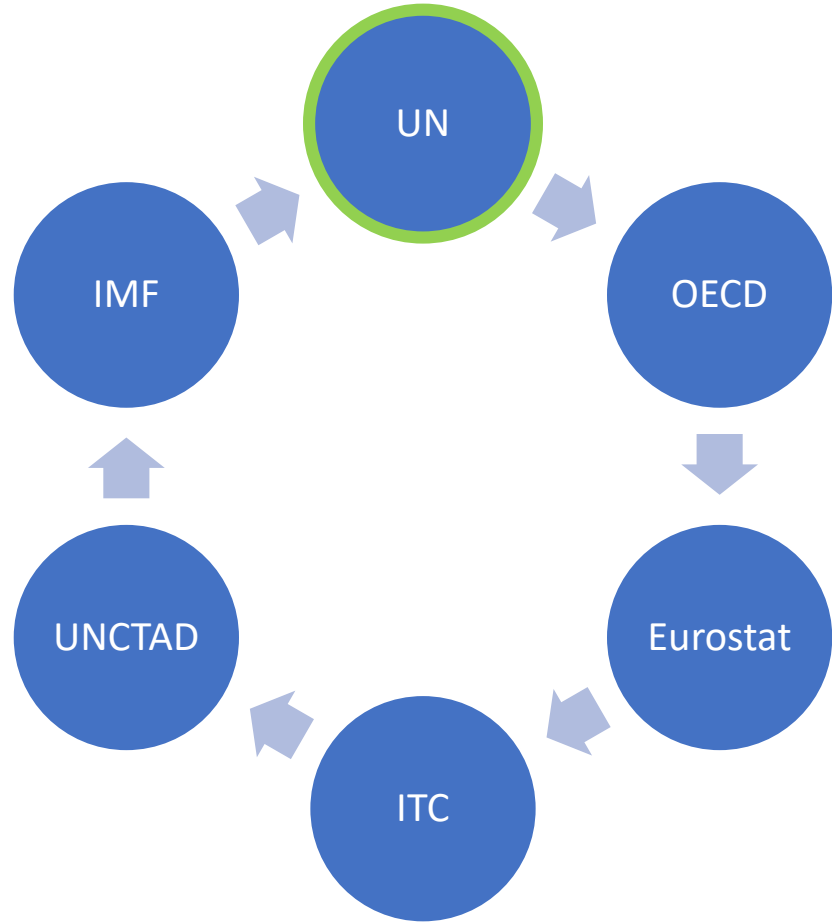
Improved security

Better tools to ensure security and confidentiality



Governance

SDMX-IMTS Working Group



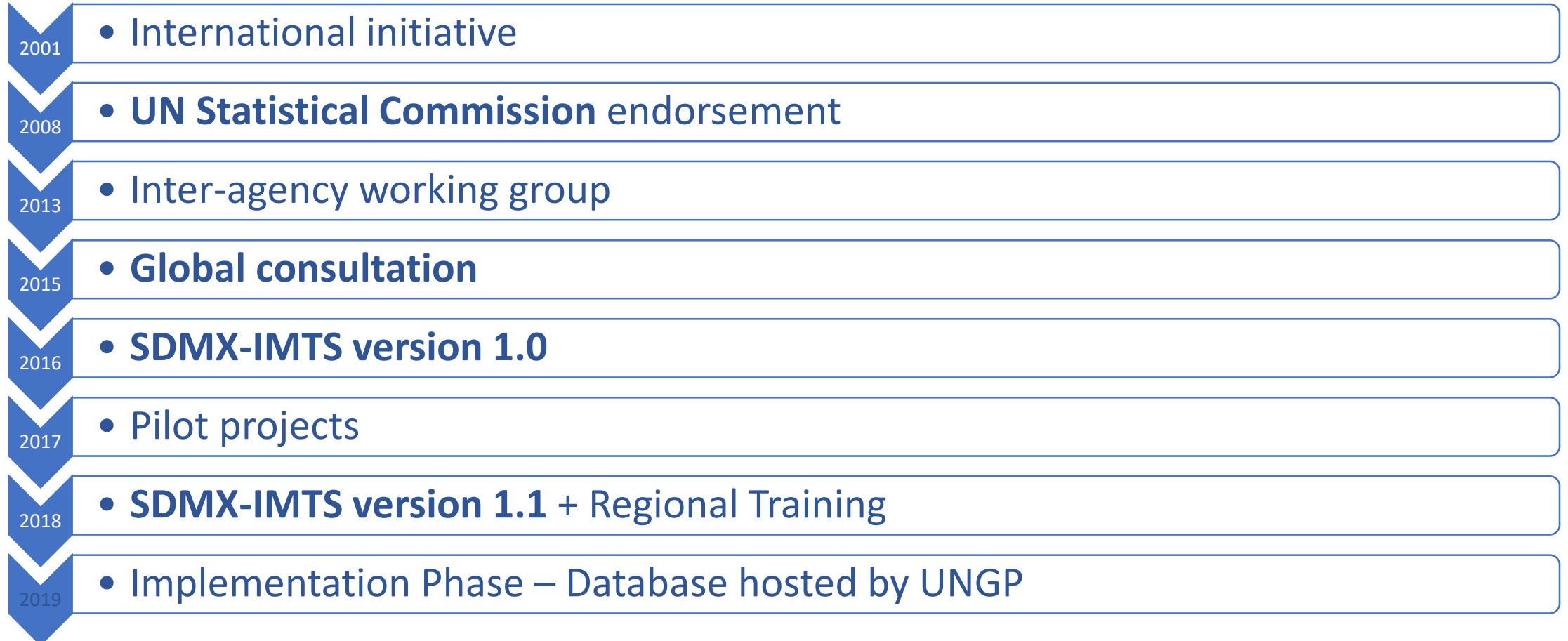
What do we want

For the transmission of global IMTS data and metadata:

- ✓ Uniform structures/ **data model**;
- ✓ Common **concept definitions** and;
- ✓ Harmonized **code lists**

And that everyone uses it!

Brief Timeline



Maintenance Agreement: Who's who

Name	Ownership	Maintenance	Major Stakeholders	Update(s)
IMTS	OG-IMTS (formerly SDMX-IMTS Working Group) (Eurostat, UNSD, OECD) Informing ITC, IMF and UNCTAD	UNSD	Task Force – International Trade Statistics	Annual and fast-track

Maintenance Agreement: How

- Code lists split into three categories
 - ✓ *SDMX Cross-Domain Code Lists (CDCLs)*
 - ✓ *Code lists based on SDMX Cross-Domain Code Lists or National Accounts (NA), Balance of Payments (BOP) and Foreign Direct Investment (FDI) SDMX*
 - ✓ *IMTS owned code lists (IMTS)*
- Maintenance depends on those categories

Code list ID	Concept(s)	Source/Maintenance	Type
CL_FREQ	Frequency	SDMX.CL_FREQ (2.0)	CDCL
CL_AREA	Reference area	BoP DSD CL_AREA 1.8 + IMTS (1.1)	MES-E
CL_TRADE_FLOW	Trade flow	IMTS (1.1)	IMTS
CL_COMMODITY	Commodity code	IMTS (1.1)	IMTS
CL_COMMODITY_CUSTOM_BREAKDOWN	Custom commodity breakdown ID	IMTS (1.1)	IMTS
CL_TRANSPORT_MODE	Mode of transport at the border	IMTS (1.0)	IMTS
CL_CUSTOMS_PROC	Customs or statistical procedure	IMTS (1.0)	IMTS
CL_ACTIVITY	Economic activity	IMTS (1.0)	IMTS
CL_TRANSFORMATION	Transformation	SNA CL_TRANSFORMATION 1.2	MES
CL_MEASURE	Observation (measure) type	IMTS (1.1)	IMTS
CL_UNIT_MULT	Unit multiplier	SDMX.CL_UNIT_MULT (1.1)	CDCL
CL_UNIT	Unit of measure	BoP DSD CL_UNIT v1.9 + IMTS (1.1)	MES-E
CL_TRADE_SYSTEM	Trade System	IMTS (1.0)	IMTS
CL_PARTNER_TYPE	Type of primary partner area	IMTS (1.0)	IMTS
CL_OBS_STATUS	Observation Status	SDMX.CL_OBS_STATUS (2.1)	CDCL



Global IMTS Data Structure Definition

This is Seychelles monthly trade data

Year	CPC7	Transport	HS	Flow	Partner	Qty	SU	NetWeight	USDValue
2017	4000000	1		I		22.22	KG	22.22	5.77
2017	4000000	2		I		1.8	KG	1.8	95.41
2017	4000000	2		I		6.96	NM	6.96	68.19
2017	4000000	2		I		12.03	KG	12.03	13.63
2017	4000422	1		I		6	KG	6	22.29
2017	4000000	1		I		259.03	KG	259.03	3151.51
2017	4000000	1		I		118.25	KG	118.25	280.72
2017	4000000	1		I		125	KG	125	545.56
2017	4000000	2		I		25	KG	25	532.42
2017	4000000	2		I		21.68	KG	21.68	507.86
2017	4000PER	2		I		290	KG	290	371.39
2017	4000000	2		I		1.62	KG	1.62	806.94
2017	4000000	2		I		12.3	KG	10.5	679.97
2017	4000422	2		I		1	NM	23.25	10.26
2017	4000000	2		I		2	NM	10.61	4.86
2017	4000000	1		I		24	KG	82.47	283.07
2017	4000000	1		I		6	NM	7.73	82.89
2017	4000000	2		I		3	NM	9.44	4.12
2017	4000000	1		I		597.09	KG	597.09	5431.38
2017	4000000	1		I		119	KG	119	269.9
2017	4000000	2		I		2	NM	6.08	68.2
2017	4000000	1		I		5865	NM	1468.84	5040.3

All columns in this table are **Concepts**.

This is Seychelles monthly trade data

Year	CPC7	Transport	HS	Flow	Partner	Qty	SU	NetWeight	USDValue
2017	4000000	1		I		22.22	KG	22.22	5.77
2017	4000000	2		I		1.8	KG	1.8	95.41
2017	4000000	2		I		6.96	NM	6.96	68.19
2017	4000000	2		I		12.03	KG	12.03	13.63
2017	4000422	1		I		6	KG	6	22.29
2017	4000000	1		I		259.03	KG	259.03	3151.51
2017	4000000	1		I		118.25	KG	118.25	280.72
2017	4000000	1		I		125	KG	125	545.56
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2017	4000000	2		I		21.68	KG	21.68	507.86
2017	4000PER	2		I		290	KG	290	371.39
2017	4000000	2		I		1.62	KG	1.62	806.94
2017	4000000	2		I		12.3	KG	10.5	679.97
2017	4000422	2		I		1	NM	23.25	10.26
2017	4000000	2		I		2	NM	10.61	4.86
2017	4000000	1		I		24	KG	82.47	283.07
2017	4000000	1		I		6	NM	7.73	82.89
2017	4000000	2		I		3	NM	9.44	4.12
2017	4000000	1		I		597.09	KG	597.09	5431.38
2017	4000000	1		I		119	KG	119	269.9
2017	4000000	2		I		2	NM	6.08	68.2
2017	4000000	1		I		5865	NM	1468.84	5040.3

Qty, NetWeight and USDValue are **Measurement.**

This is Seychelles monthly trade data

Year	CPC7	Transport	HS	Flow	Partner	Qty	SU	NetWeight	USDValue
2017	4000000	1		I		22.22	KG	22.22	5.77
2017	4000000	2		I		1.8	KG	1.8	95.41
2017	4000000	2		I		6.96	NM	6.96	68.19
2017	4000000	2		I		12.03	KG	12.03	13.63
2017	4000422	1		I		6	KG	6	22.29
2017	4000000	1		I		259.03	KG	259.03	3151.51
2017	4000000	1		I		118.25	KG	118.25	280.72
2017	4000000	1		I		125	KG	125	545.56
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2017	4000000	2		I		21.68	KG	21.68	507.86
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2017	4000000	2		I		1.62	KG	1.62	806.94
2017	4000000	2		I		12.3	KG	10.5	679.97
2017	4000422	2		I		1	NM	23.25	10.26
2017	4000000	2		I		2	NM	10.61	4.86
2017	4000000	1		I		24	KG	82.47	283.07
2017	4000000	1		I		6	NM	7.73	82.89
2017	4000000	2		I		3	NM	9.44	4.12
2017	4000000	1		I		597.09	KG	597.09	5431.38
2017	4000000	1		I		119	KG	119	269.9
2017	4000000	2		I		2	NM	6.08	68.2
2017	4000000	1		I		5865	NM	1468.84	5040.3

SU is an **attribute**, rest are **dimensions**.

SDMX-IMTS DSD: Dimension

FREQ	Frequency
TIME_PERIOD	Reference period
REF_AREA	Reference area
TRADE_FLOW	Trade flow
COMMODITY_1	Commodity code
COMMODITY_1_CONF	Confidentialized commodity code
COMMODITY_2	Commodity code
COMMODITY_2_CONF	Confidentialized commodity code
COMMODITY_CUSTOM_BREAKDOWN	Custom commodity breakdown

SDMX-IMTS DSD: Dimension (cont.)

COUNTERPART_AREA_1	Primary partner area
COUNTERPART_AREA_1_CONF	Confidentialized primary partner area
COUNTERPART_AREA_2	Additional partner area
COUNTERPART_AREA_2_CONF	Confidentialized additional partner area
TRANSPORT_MODE_BORDER	Mode of transport at the border
TRANSPORT_MODE_BORDER_CONF	Confidentialized mode of transport at the border
CUSTOMS_PROC	Customs or statistical procedure
ECONOMIC_ACTIVITY	Economic activity
TRANSFORMATION	Transformation
MEASURE	Type of measure

SDMX-IMTS DSD: Attributes

UNIT_MULT

Unit multiplier

UNIT_MEASURE

Unit of measure

COMMENT_OBS

Comments to the observation value

TRADE_SYSTEM

Trade System

COMMODITY_CUSTOM_BREAKDOWN_CODE

Custom commodity breakdown code

COMMODITY_CUSTOM_BREAKDOWN_DESC

Custom commodity breakdown description

COUNTERPART_AREA_1_TYPE

Type of primary partner area

COUNTERPART_AREA_2_TYPE

Type of additional partner area

COUNTERPART_AREA_1_ANNOTATION

Annotation of primary partner area

COUNTERPART_AREA_2_ANNOTATION

Annotation of additional partner area

OBS_STATUS

Observation Status

Challenges for Trade statistics

- Original commodity code may be longer than code list element.
- Need to retain multiple commodity classifications revisions.
- Multiple measures not supported properly in current version.
- DSD large in size.
- No way to “turn off” unused dimensions.

Example

DSD with basic data

Role	Id	Use Case 1: FOB value
USAGE NOTES:		This record transmits the FOB value as the measure. Other measurements may also be transmitted by setting the MEASURE accordingly. Often different MEASURES will have different natural scales, as illustrated by the changes in UNIT_MULT.
Dimension	FREQ	A
Dimension	TIME_PERIOD	2010
Dimension	REF_AREA	DE
Dimension	TRADE_FLOW	X
Dimension	COMMODITY_1	HS12_010410
Dimension	COMMODITY_1_CONF	HS12_010410
Dimension	COMMODITY_2	_X
Dimension	COMMODITY_2_CONF	_X
Dimension	COMMODITY_CUSTOM_BREAKDOWN	209000
Dimension	COUNTERPART_AREA_1	GH
Dimension	COUNTERPART_AREA_1_CONF	GH
Dimension	COUNTERPART_AREA_2	ES
Dimension	COUNTERPART_AREA_2_CONF	ES
Dimension	TRANSPORT_MODE_BORDER	T_3
Dimension	TRANSPORT_MODE_BORDER_CONF	_X
Dimension	CUSTOMS_PROC	C_TOTAL
Dimension	ECONOMIC_ACTIVITY	_X
Dimension	TRANSFORMATION	N
Dimension	MEASURE	V_FOB
Measurement	OBS_VALUE	300
Attribute	UNIT_MULT	6
Attribute	UNIT_MEASURE	EUR
Attribute	COMMENT_OBS	
Attribute	TRADE_SYSTEM	S
Attribute	COMMODITY_CUSTOM_BREAKDOWN_CODE	010410209000
Attribute	COMMODITY_CUSTOM_BREAKDOWN_DESC	Live sheep, female
Attribute	COUNTERPART_AREA_1_TYPE	P3
Attribute	COUNTERPART_AREA_2_TYPE	P2
Attribute	COUNTERPART_AREA_1_ANNOTATION	
Attribute	COUNTERPART_AREA_2_ANNOTATION	
Attribute	OBS_STATUS	A

2010 Annual Exports of HS 010410 (according to HS 2012) from Germany to Ghana (Last Known Destination) with Spain as the Second Partner (Country of Consignment). The transmitted value is FOB and the amount is 300 million Euros. Mode of Transport is by land.

Data transformation for SDMX

REFERENCE	PERIOD	FREQ	FLOW	PARTNER	COMMODITY	MODE_TR	QTY	QTY_UNIT	NET_WEIGHT	NTWEIGHT_UNIT	CIF
Turkey	201701	M	M	Netherlands	970000	Road	500	items	200	kg	2624

- QTY, NET_WEIGHT and CIF are all **Primary Measures**.
- As per SDMX standard, each of them will have to be specified by their values (**OBS_VALUE**), nature of that value (**MEASURE**, e.g. CIF), and unit of the measure (**UNIT_MEASURE**, e.g. Turkish Lira), in addition to all other dimensions and mandatory attributes.
- So in this case, we create **3** rows from this one row.

REFERENCE	PERIOD	FREQ	FLOW	PARTNER	COMMODITY	MODE_TR	QTY	QTY_UNIT	NET_WEIGHT	NTWEIGHT_UNIT	CIF
Turkey	201701	M	M	Netherlands	970000	Road	500	items	200	kg	2624

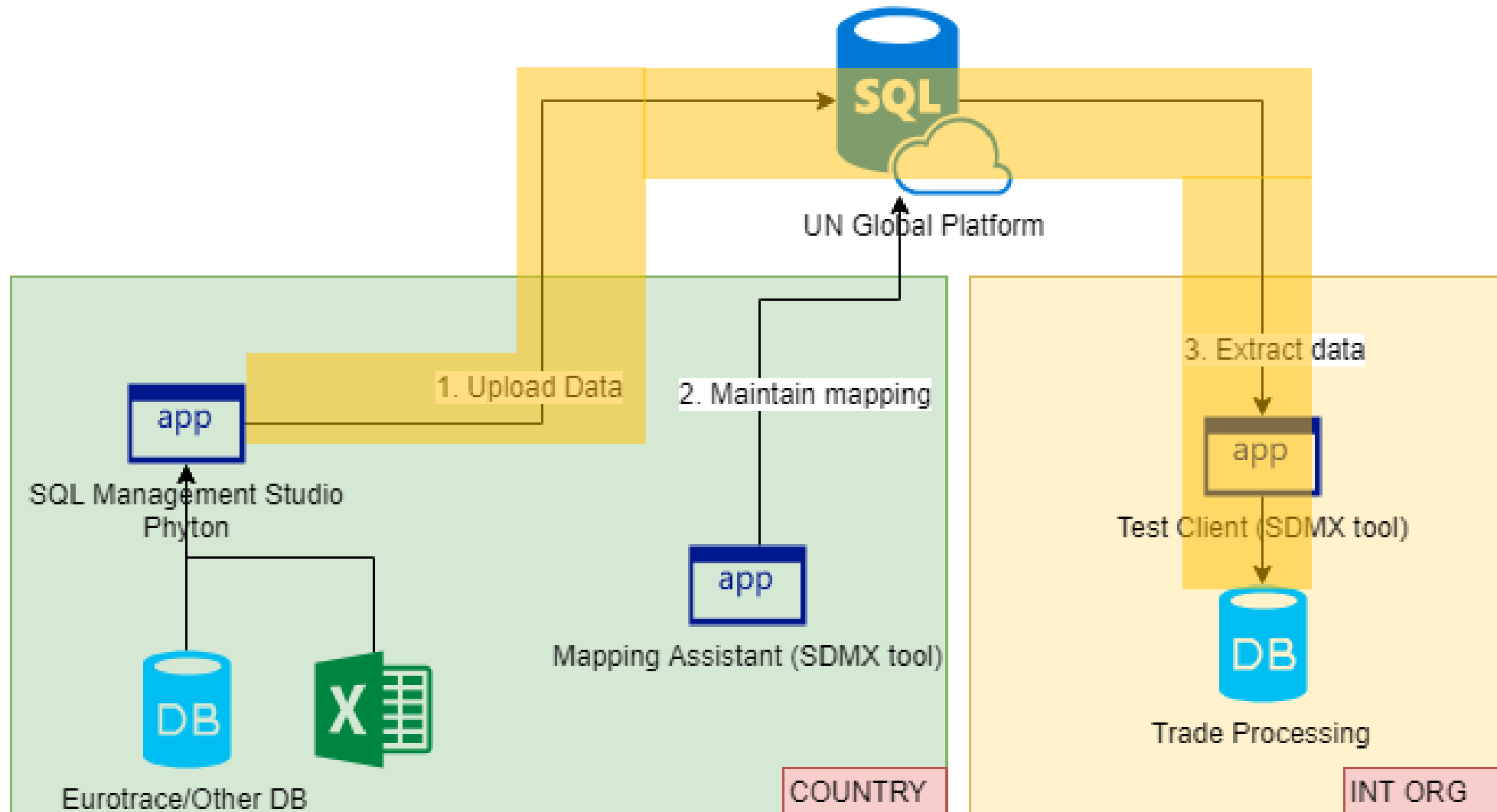


REFERENCE	PERIOD	FREQ	FLOW	PARTNER	COMMODITY	MODE_TR	MEASURE	OBS_VAL	UNIT
Turkey	201701	M	M	Netherlands	970000	Road	QTY	500	items
Turkey	201701	M	M	Netherlands	970000	Road	NET_WEIGHT	200	kg
Turkey	201701	M	M	Netherlands	970000	Road	CIF	2624	lira

A large, dark, irregular ink blot with the text 'UNGP' centered inside it. The blot has a textured, splattered appearance with some lighter areas and small droplets around the edges. The text is in a clean, white, sans-serif font.

UNGP

Use UNGP as Secured Storage of Data and Mapping



	HS Code	SITC	Description	Country	Unit	Quantity	Free on board (in Mauritian I
1	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	2	194488
2	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	2	277840
3	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	2	222272
4	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	1	139230
5	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	2	222272
6	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	2	139230
7	01012900	0015029	Other pure bred animals	BE - Belgium	Unit - Unit	3	194922
8	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	1	101256
9	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	1	13783
10	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198
11	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198
12	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	1	101256
13	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198
14	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198
15	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	1	101256
16	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198
17	01012900	0015029	Other pure bred animals	GB - United Kingdom	Unit - Unit	2	177198

Step 1. Upload (regular frequency)

Transcoding dialog

Connection: Id:

Code match
 Description Match
 Synchronize
 Show expression Hide assigned codes

Mapping between:

Local database columns:

SDMX DSD Components:

Transcoding rules

Column	Local database columns	Component
Column _variable_		Component MEASURE
QUANT_KGR :		W_N : Net Weight
SUP_QUANT :		QTY : Supplementary quantity
VALUE_EUROS :		V_CIF : CIF-type value
▶▶		(none)

Step 2. Mapping

IMTS

1.2

UN

Component Information DSD Codes

	NAME
TRANSPORT_MODE_BORDER	Mode ...
TRANSPORT_MODE_BORDER...	Confid...
TAXES_PROC	Custom...
ACTIVITY	Econo...
TRANSFORMATION	Transf...
MEASURE	Observ...
PERIOD	Time P...

Save Cancel

Comtrade Category Scheme

- TRADE_C
 - Trade Data Flow
 - Trade Dataflow Ver.2

SDMX Component Constrains

[All Constrains] Clear all constrains

Clear Component Constraints

Result as Sdmx Data

Close

```
<Series FREQ="A" REF_AREA="MU" TRADE_FLOW="M" COMMODITY_1="HS17_010190" COMMODITY_2="SITC4_0015" COMMODITY_1_CONF="_X"
COMMODITY_2_CONF="_X" COMMODITY_CUSTOM_BREAKDOWN="00" COUNTERPART_AREA_1="FR" COUNTERPART_AREA_1_CONF="_X"
COUNTERPART_AREA_2="_X" COUNTERPART_AREA_2_CONF="_X" TRANSPORT_MODE_BORDER="_X" TRANSPORT_MODE_BORDER_CONF="_X"
CUSTOMS_PROC="_X" ACTIVITY="_X" TRANSFORMATION="_Z" TIME_PERIOD="2018" COMMODITY_CUSTOM_DESC="Other asses" COUNTERPART
_TYPE="_X" COUNTERPART_AREA_2_TYPE="_X">
  <Obs MEASURE="V_CIF" OBS_VALUE="53220" UNIT_MULT="0" UNIT_MEASURE="MUR" OBS_STATUS="A" />
  <Obs MEASURE="V_FOB" OBS_VALUE="16108" UNIT_MULT="0" UNIT_MEASURE="MUR" OBS_STATUS="A" />
</Series>
<Series FREQ="A" REF_AREA="MU" TRADE_FLOW="M" COMMODITY_1="HS17_010190" COMMODITY_2="SITC4_0015" COMMODITY_1_CONF="_X"
COMMODITY_2_CONF="_X" COMMODITY_CUSTOM_BREAKDOWN="00" COUNTERPART_AREA_1="ZA" COUNTERPART_AREA_1_CONF="_X"
COUNTERPART_AREA_2="_X" COUNTERPART_AREA_2_CONF="_X" TRANSPORT_MODE_BORDER="_X" TRANSPORT_MODE_BORDER_CONF="_X"
CUSTOMS_PROC="_X" ACTIVITY="_X" TRANSFORMATION="_Z" TIME_PERIOD="2018" COMMODITY_CUSTOM_DESC="Other asses" COUNTERPART
_TYPE="_X" COUNTERPART_AREA_2_TYPE="_X">
  <Obs MEASURE="V_CIF" OBS_VALUE="380454" UNIT_MULT="0" UNIT_MEASURE="MUR" OBS_STATUS="A" />
</Series>
<Series FREQ="A" REF_AREA="MU" TRADE_FLOW="M" COMMODITY_1="HS02_00228" COMMODITY_2="SITC4_0011" COMMODITY_1_CONF="_X"
COMMODITY_2_CONF="_X" COMMODITY_CUSTOM_BREAKDOWN="00" COUNTERPART_AREA_1="KE" COUNTERPART_AREA_1_CONF="_X"
COUNTERPART_AREA_2="_X" COUNTERPART_AREA_2_CONF="_X" TRANSPORT_MODE_BORDER="_X" TRANSPORT_MODE_BORDER_CONF="_X"
CUSTOMS_PROC="_X" ACTIVITY="_X" TRANSFORMATION="_Z" TIME_PERIOD="2018" COMMODITY_CUSTOM_DESC="Live bovine cattle,other than pu
breeding cattle" COUNTERPART_AREA_1_TYPE="_X" COUNTERPART_AREA_2_TYPE="_X">
  <Obs MEASURE="QTY" OBS_VALUE="1483" UNIT_MULT="0" UNIT_MEASURE="UT" OBS_STATUS="A" />
  <Obs MEASURE="V_CIF" OBS_VALUE="56122181" UNIT_MULT="0" UNIT_MEASURE="MUR" OBS_STATUS="A" />
</Series>
```

Step 3. Extract

Generate Data Execute SDMX Query With REST Execute SDMX Query With Web Service

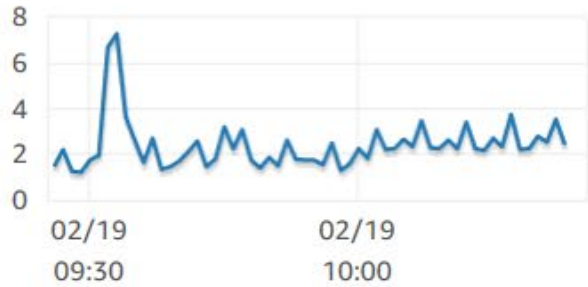
Common SDMX Tools

- a) **DSD Wizard** for generating DSD in XML format
- b) **Mapping Assistant** for connecting input database (hosted by UN Global Platform) and global DSD by applying mapping rules
- c) **SQL Server Management Studio** for running queries against the input database
- d) **Python** to prepare and upload new / revised data
- e) **Test Client and SDMX Web Services** for integrating Mapping Assistant for windows and web output, respectively
- f) **Eurotrace** for testing generic SDMX output modules
- g) **XML Explorer** for opening/viewing large XML files (DSD)
- h) **Fusion Registry Community Edition** to manage large trade DSDs

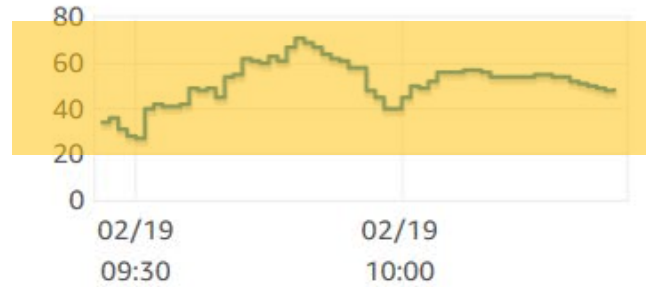
Legend: tradesdmx

DB Status during Workshop

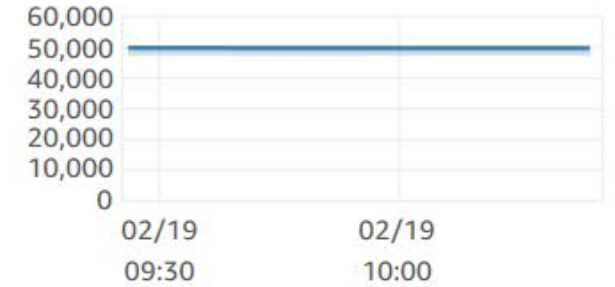
CPU Utilization (Percent)



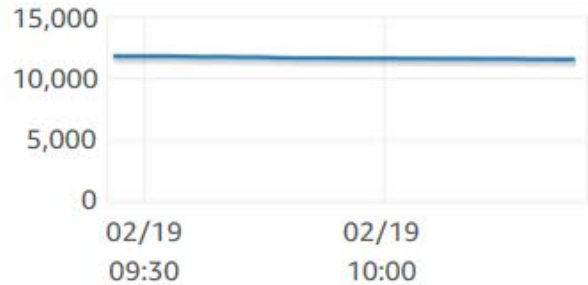
DB Connections (Count)



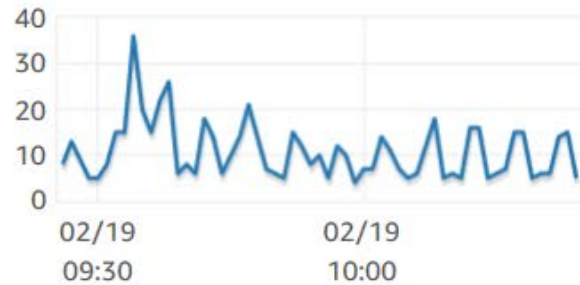
Free Storage Space (MB)



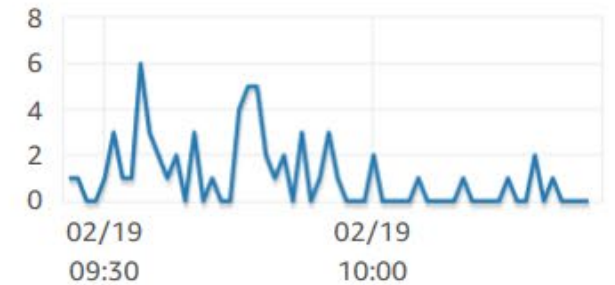
Freeable Memory (MB)



Write IOPS (Count/Second)



Read IOPS (Count/Second)





Capacity Building

Concerns identified in the consultation

Inconsistency

Differences with existing (national) standards

Impracticality

Huge data volumes

IT system

Need for investment to upgrade/build

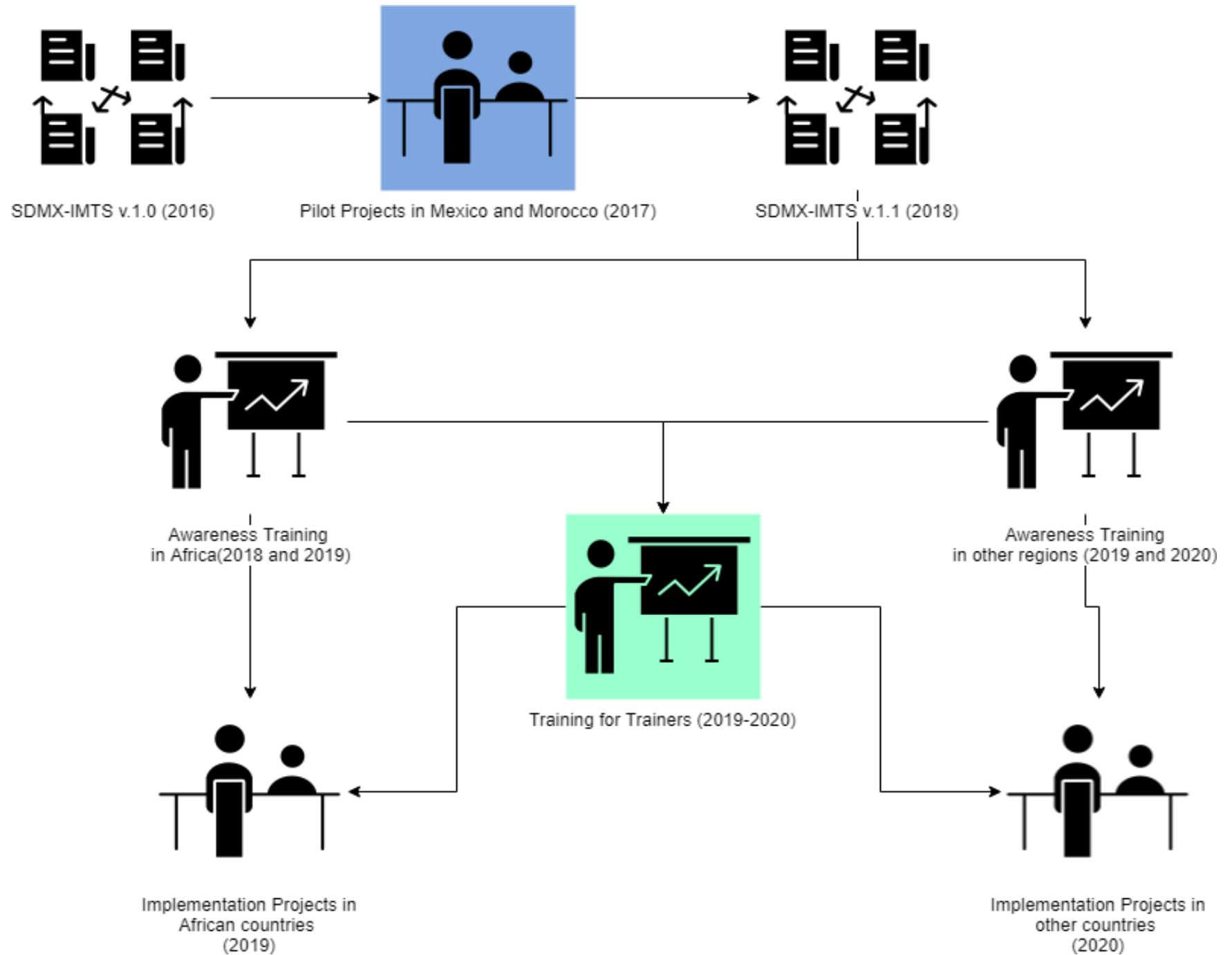
Knowledge

Lack of understanding

Confidentiality

Capacity to make records confidential

So far



Finally: Capacity Building Strategies

- ✓ *Awareness Training programmes*
- ✓ *Training for Trainers programmes*
- ✓ *Implementation Projects*
- ✓ *Legal Framework*
- ✓ *Tools Development*
- ✓ *Cross-standard Fertilization*
- ✓ *Manuals and Guidelines*
- ✓ *E-learning module*



Demo

Mapping Assistant and Test Client