

# **Implementing Statistical Data Metadata Exchange (SDMX) in Centralised Information Management System – Challenges, Solution Design and Benefits**

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The views expressed in this paper are of the authors and not the institution to which they belong

**RBI collect, compile, and disseminate wide range of data**

**245 data templates, applicable to different classes of over 10,000 regulated entities**

**Monetary policy surveys, Government agencies and internal systems**

**Diversity in data characteristics and their diverse usage across departments**

**Steps taken -harmonise the concepts and definitions and rationalise the reporting system**

**Surge in data volume, variety, and velocity in new modern world**

**Technological obsolescence and scalability limitations**

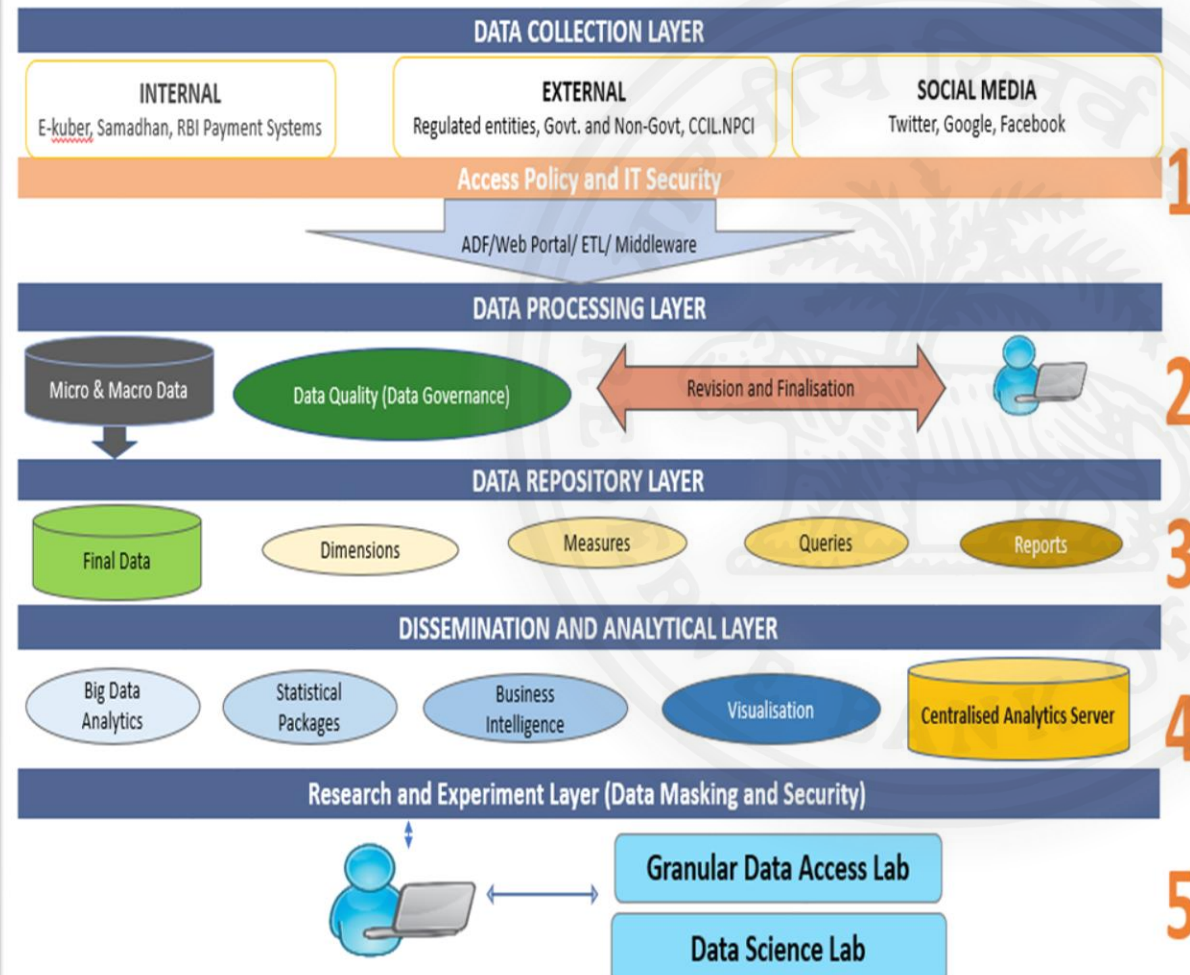
**Comprehensive strategy necessitated :**

- To overhaul entire value chain of data, from collection, modelling, storage, retrieval and usage by the end-user.**
- Implement Data Lake (big-data Hadoop technology).**
- Adopt international standard facilitating the exchange of statistical data and metadata.**



# Centralised Information Management System (CIMS)– The Big Shift

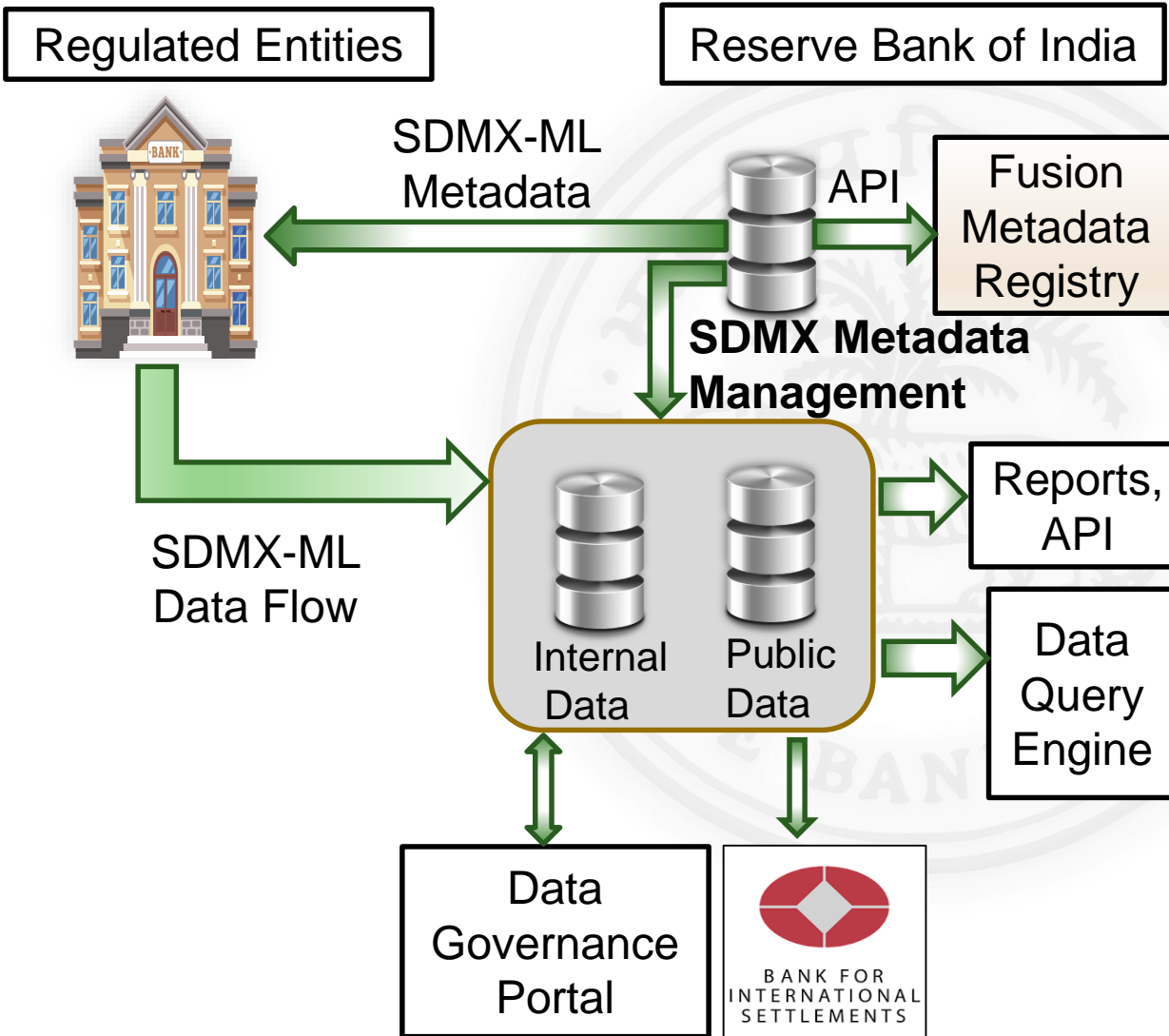
## Conceptual Architecture



## CIMS major features are:

- Automation of data transmission**
- Development of state-of-the-art SDMX data architecture;**
- Management of high volume structured and unstructured data using Bigdata open-source technology like Hadoop;**
- Development of integrated data analytics, visualization, and data dissemination**

# SDMX – Implementation Design



## Salient features are:

- Flexible metadata driven data collection and storage architecture was built with technical mapping tables
- 300,000 data series estimated from 1155 DSDs.
- Unique code Data Model Identification (DMID) was allotted to each data series.
- Web-based software module developed to manage and maintain all SDMX artefacts such as DSDs, Code Lists etc.



# SDMX – Data Mapping (Template → SDMX)

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1.0.0	01/01/2021	Publish					
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Section 1: Assets and Liabilities							
Part-A: ASSETS (Amount Outstanding at end of Month)				Domestic Operations			
				Total			
I. Cash Funds				1			
I.1 Cash on Hand	7	8		10	11	12	
I.2 Balances/Deposits with RBI/Central Banks	13	14		16	17	18	
II. Due from Banks in India	19	20	21	22	23	24	
II.1 Balances in Current a/c's (Annexure 1-A)	25	26	27	28	29	30	
II.2 Money at call and short notice	31	32	33	34	35	36	
II.3 Placements/ Time Deposits	37	38	39	40	41	42	
II.4 Loans and advances	43	44	45	46	47	48	
III. Due from FIs/Central Counter Parties (CCPs) in India	49	50	51	52	53	54	
III. 1 Due from FIs in India	55	56	57	58	59	60	
III. 2 Due from CCPs in India (incl. CBLO Lending)	61	62	63	64	65	66	
III. 3 CBLO Lending Repayable within 15 days	67	68	69	70	71	72	
III. 4 CBLO Lending Repayable beyond 15 days	73	74	75	76	77	78	
IV. Due from Overseas Banks	79	80	81	82	83	84	
IV.1 Balances in current accounts (Annexure 1-B)	85	86	87	88	89	90	

[ELEMENT];

LNA(3.0)

#

[CODELIST DIMENSION];

LN\_LI | DUEFRMBANKS\_LNA;

AREA\_OPERATION | DOM\_OP;

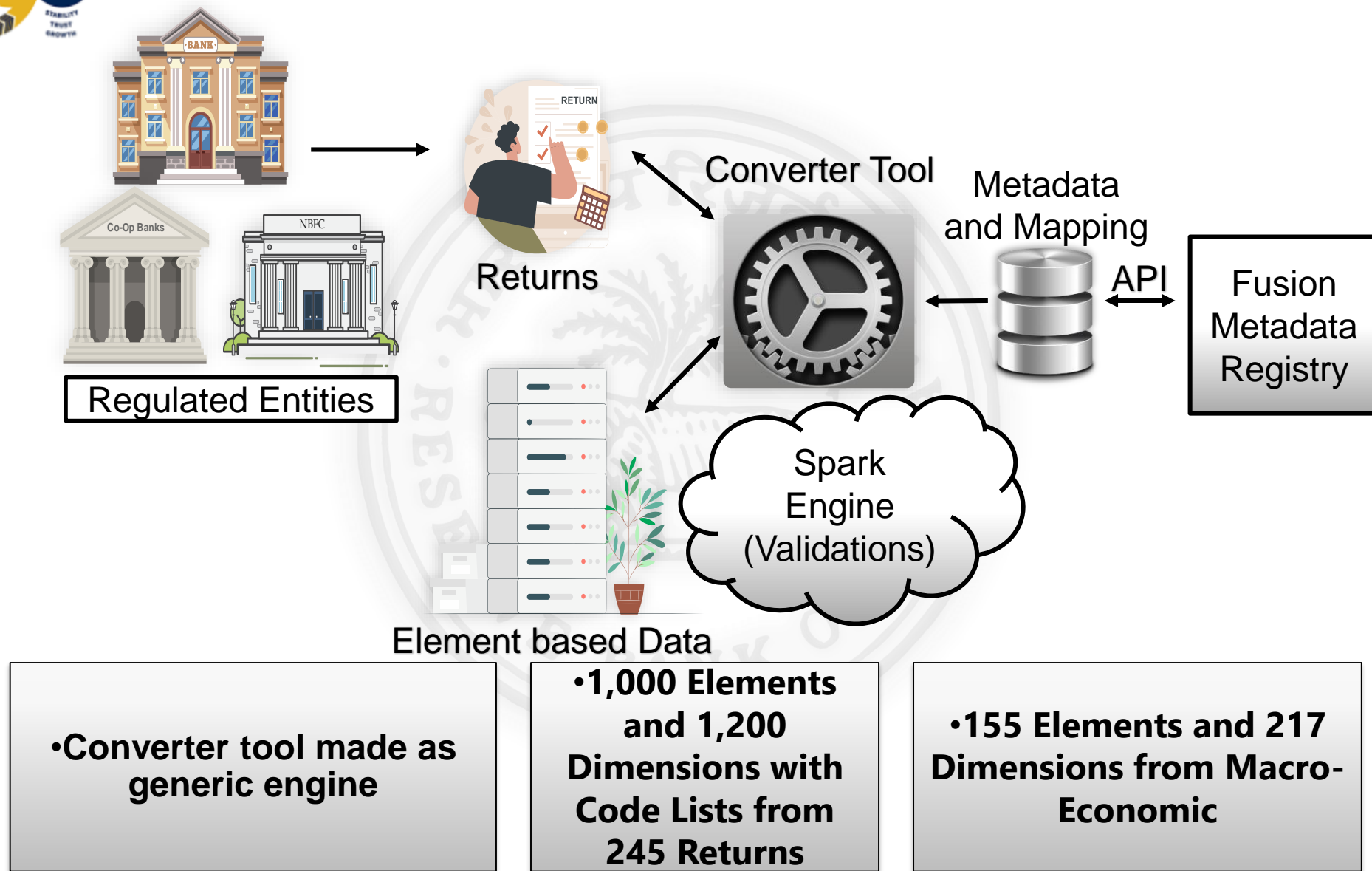
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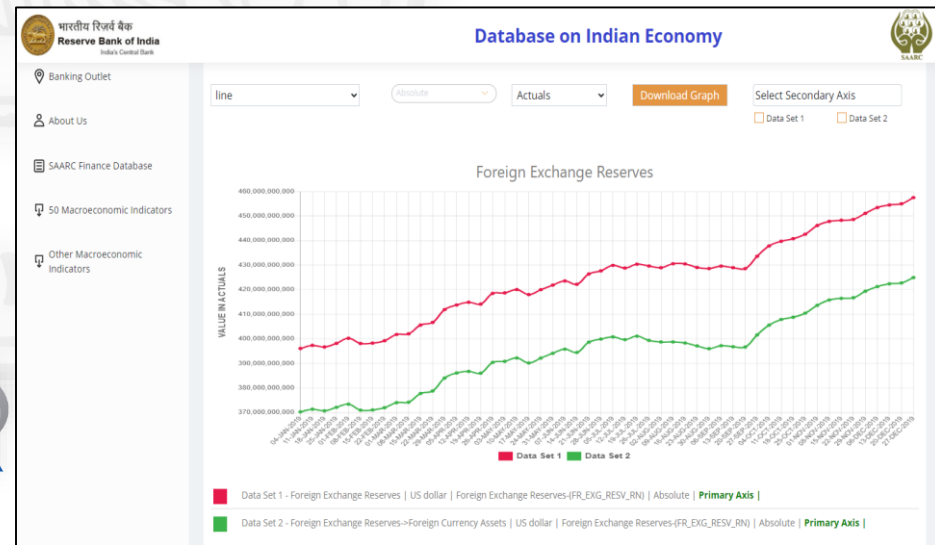
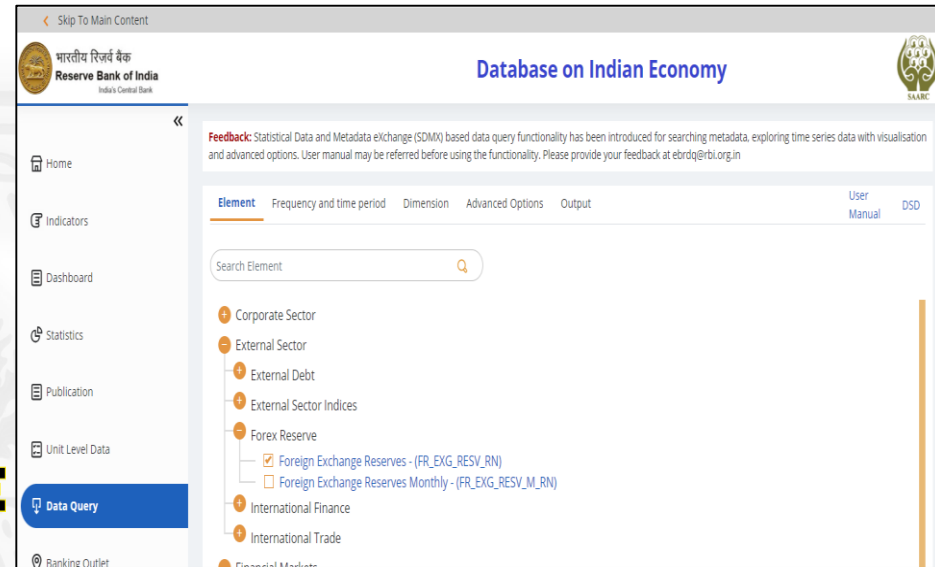
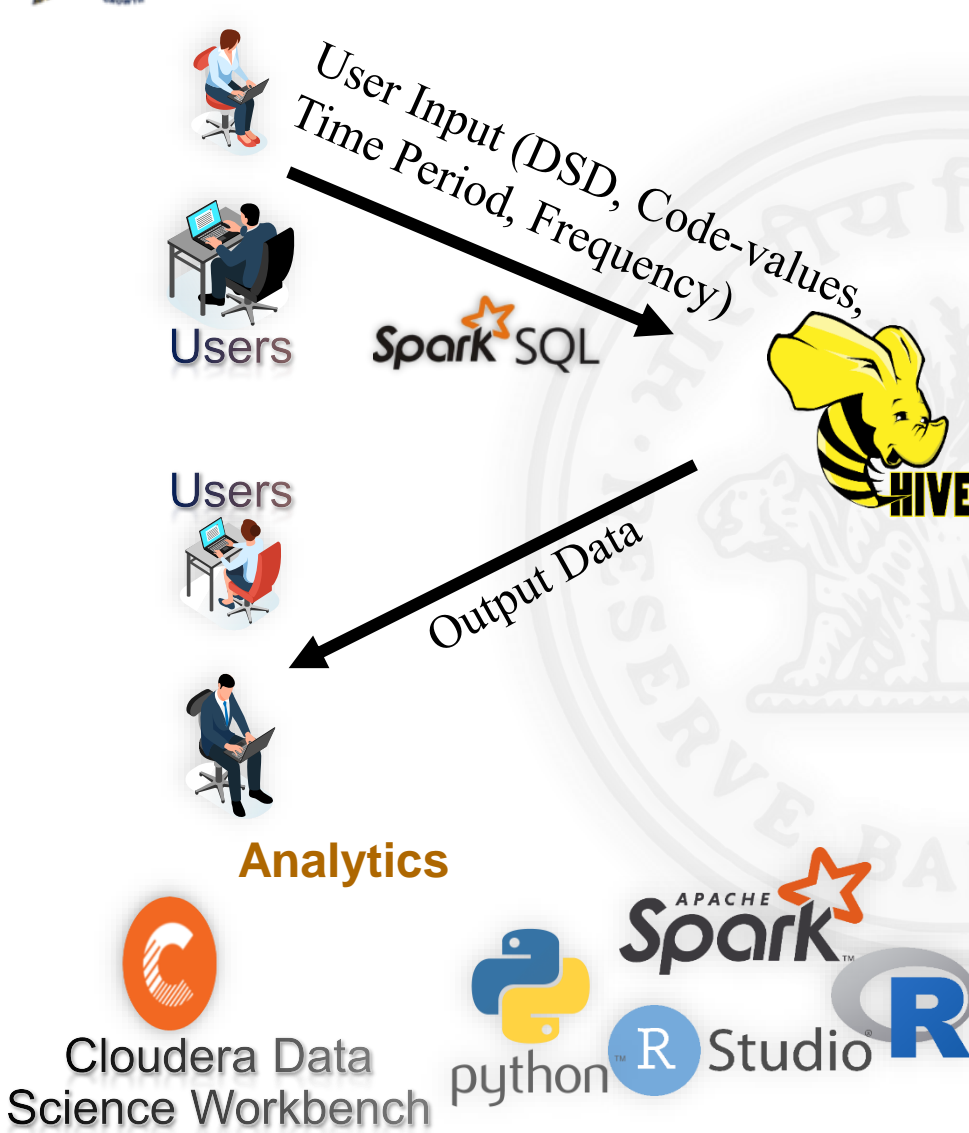
# SDMX – Novel Conversion tool







# SDMX – Data Query engine





# Implementation Challenges

- 300,000 data cells were required to be analysed to identify the underlying measures and a unified dimension tables
- Manpower with knowledge in proper understanding of the data model as well as business requirement is scarce and in sufficient strength available to the project
- Regulatory institution domain is diverse in size, business focus and technological maturity.
- Necessary to design a tool for conversion of data from one format to other, in both directions.
- Challenges were overcome by creating innovative solutions such as splitting the DSDs, dummy dimensions , hierarchy in SDMX manager module, converter tool etc.





# Concluding observations

- A data conversion tool developed for generating SDMX time series data using mapping tables helps in minimising the transition time.

SDMX standard helped to build a simple database architecture for building data repository which can be used for data query, data visualisation and advanced statistical analysis.

- CIMS has been in operation since June 2023. Different cohorts of regulated entities such as scheduled commercial banks (SCBs), urban co-operative banks (UCBs) and non-banking financial companies (NBFCs) were progressively onboarded for reporting on the new CIMS system.

- Reserve Bank has conducted numerous training sessions for officials of regulated entities, complemented by one-to-one handholding sessions to ensure that they are able to report the data in the new CIMS system, without facing much difficulty

**Thank You**