

Trial towards realizing the ultimate use of XBRL for Regtech

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**EUROFILING XBRL WEEK
WARSAW 28-30 MAY 2018**

TODAY'S CONTENTS



- XBRL has become a key element for Regtech. However, the lack of suitable technology has prevented regulators from effective use of XBRL data.
 - In this session, we will introduce the latest challenges to develop a revolutionary breakthrough to realize ultimate use of XBRL potential and then observe the cost reduction process within regulators' business flow.
 - Some future view of AI application for regulatory purpose will be also introduced and enhance the audiences' imagination towards the future Regtech.
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Regulatory Data Format



Monitoring Period	Nature of Data	Popular Data Format
Real Time	Simple, high speed, i.e. event-log	CSV, TEXT
Daily	Slightly complicated, i.e. Transaction messaging	CSV, TEXT, XML
Periodical	Complicated, low speed, i.e. reporting	XML, XBRL
On-demand	Flexible structure, i.e. reporting	HTML, PDF, XML, XBRL, Excel

Regulatory Data Format



Monitoring Period

Nature of Data

Popular Data Format

For high speed & simple data, CSV, TEXT is suitable

i.e. event-log

Daily

Slightly complicated,
i.e. Transaction messaging

CSV, TEXT, XML

For messaging, complicated structured report, XML and
XBRL is suitable

On-demand

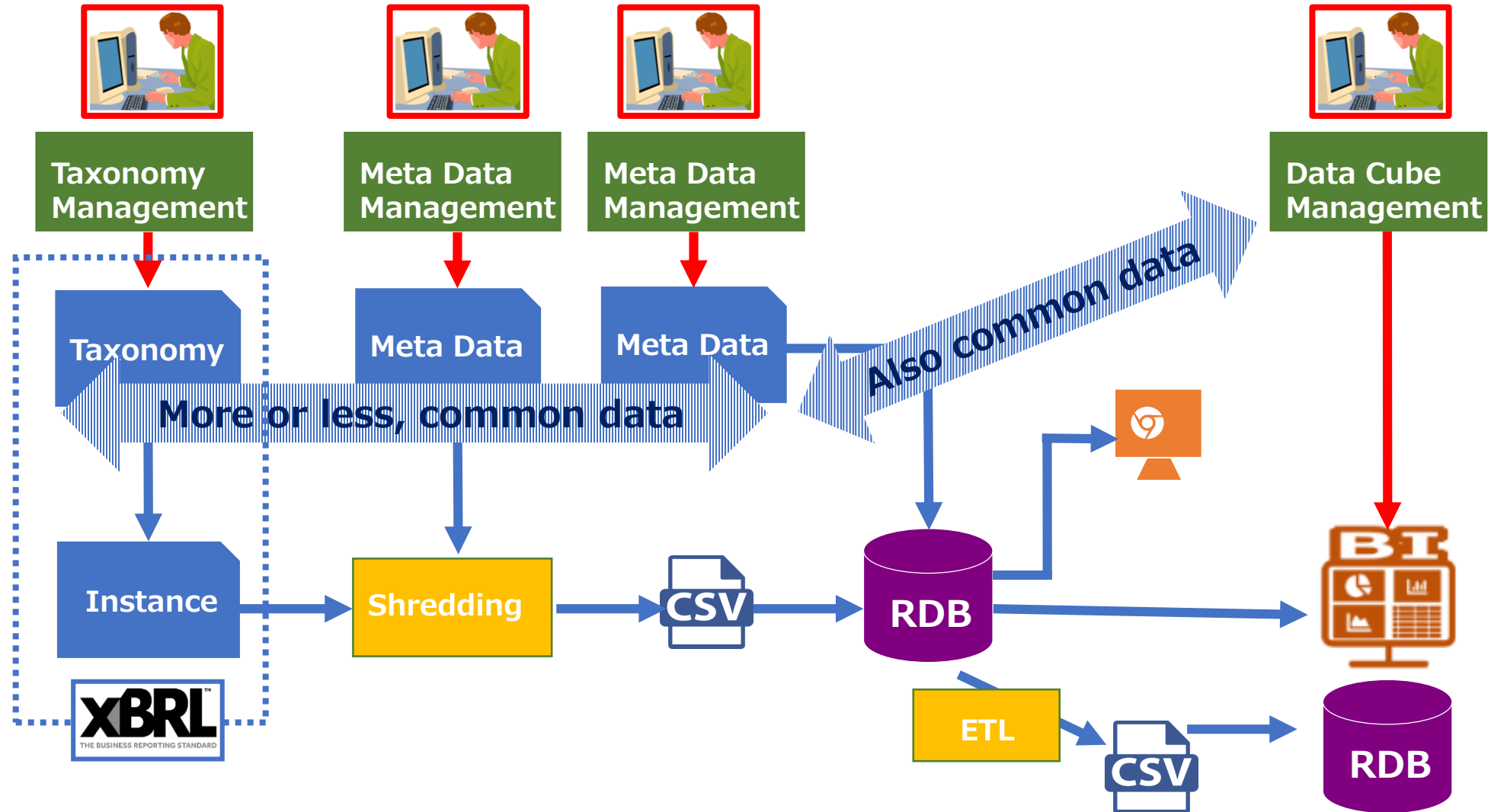
Flexible structure,
i.e. reporting

HTML, PDF, XML, XBRL,
Excel

Limitation of current technology for XBRL



Typical data/work flow in regulators with XBRL



Limitation of current technology for XBRL



Typical data/work flow in regulators



Taxonomy Management



Meta Data Management

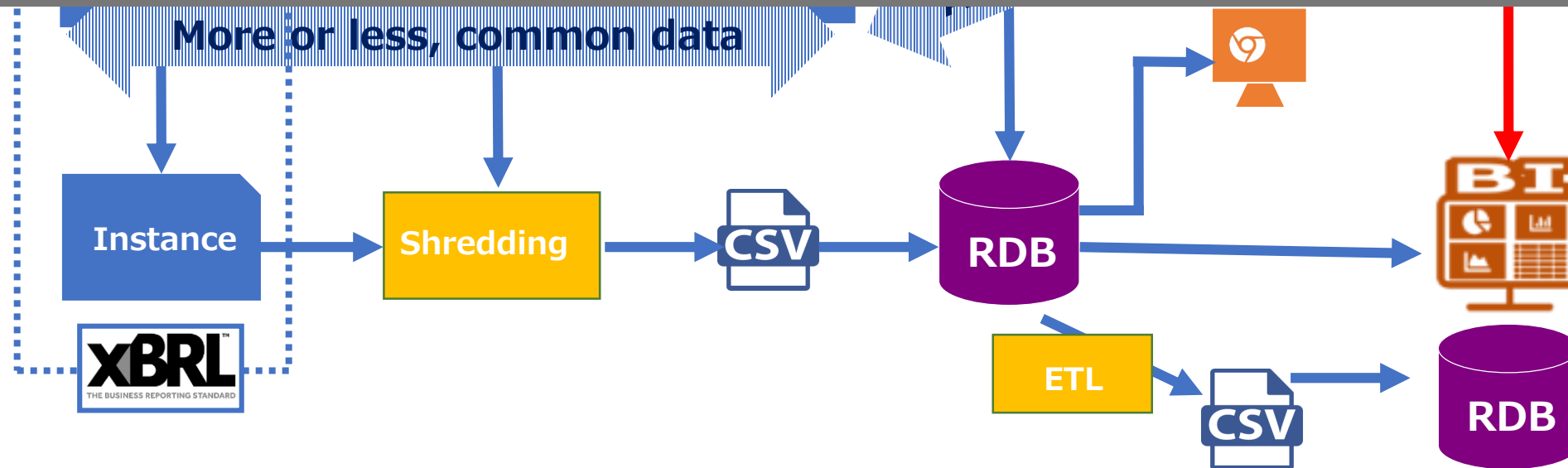


Meta Data Management



Data Cube Management

How to reduce the redundancy in data/work?



Question

Any IT approach to reduce system maintenance cost?



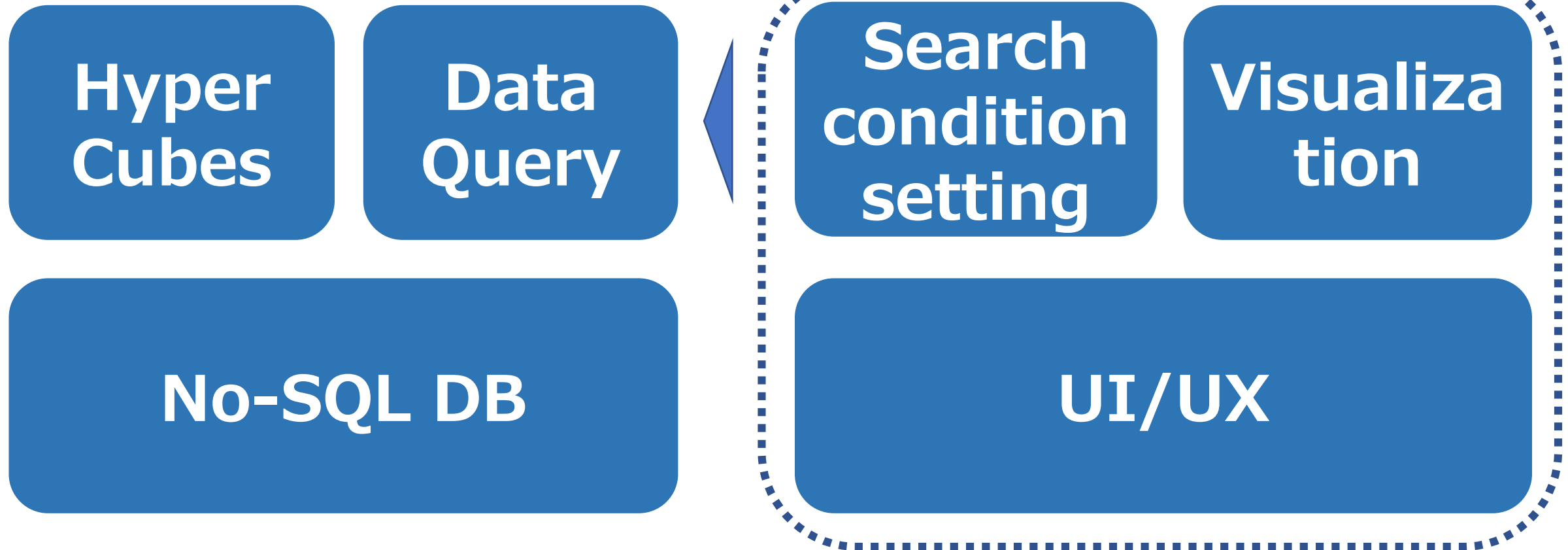
One possible answer is NoSQL Data Base

And some new technologies

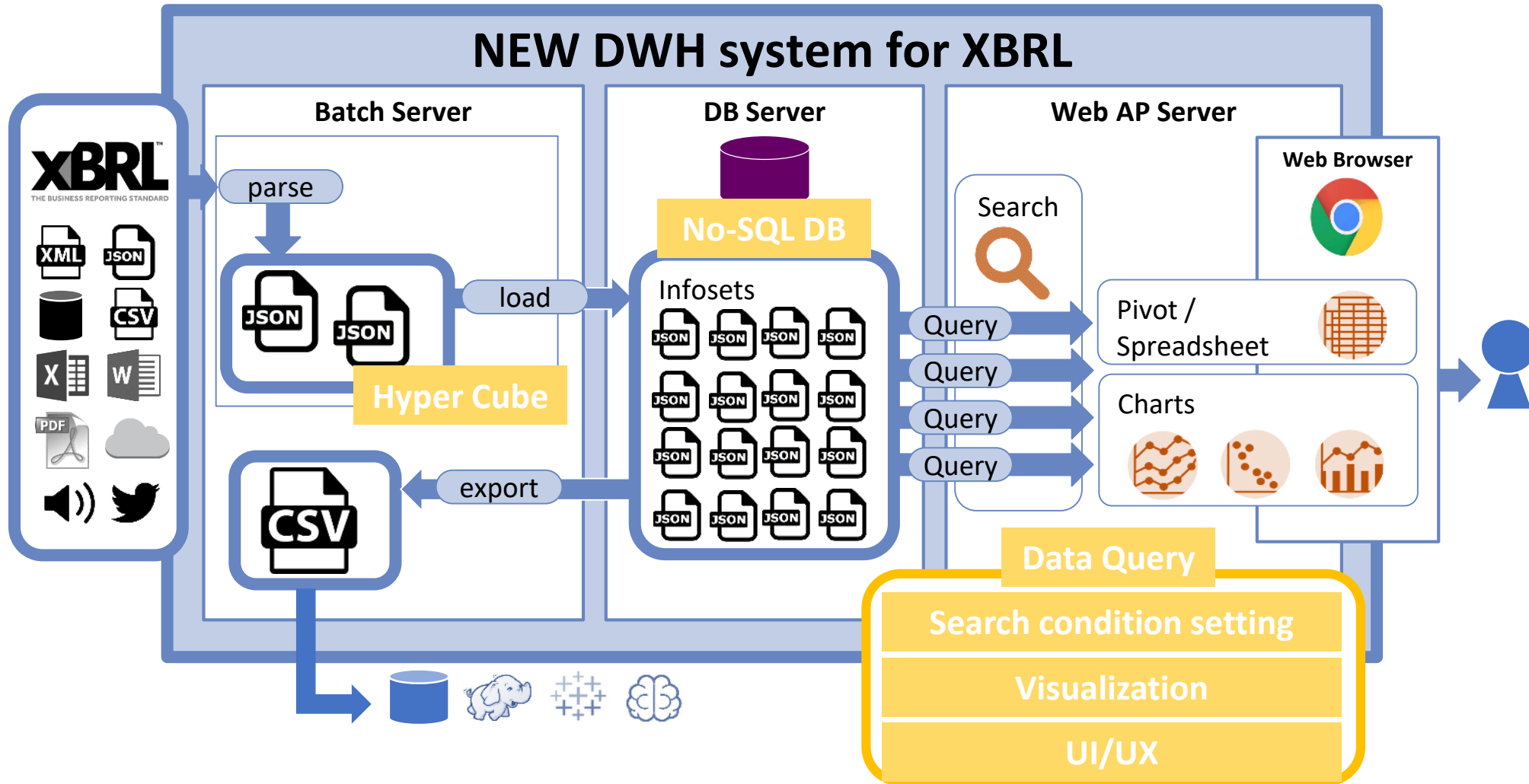
Key Technologies (1)



xBRL | EUROPE



Key Technologies (2)

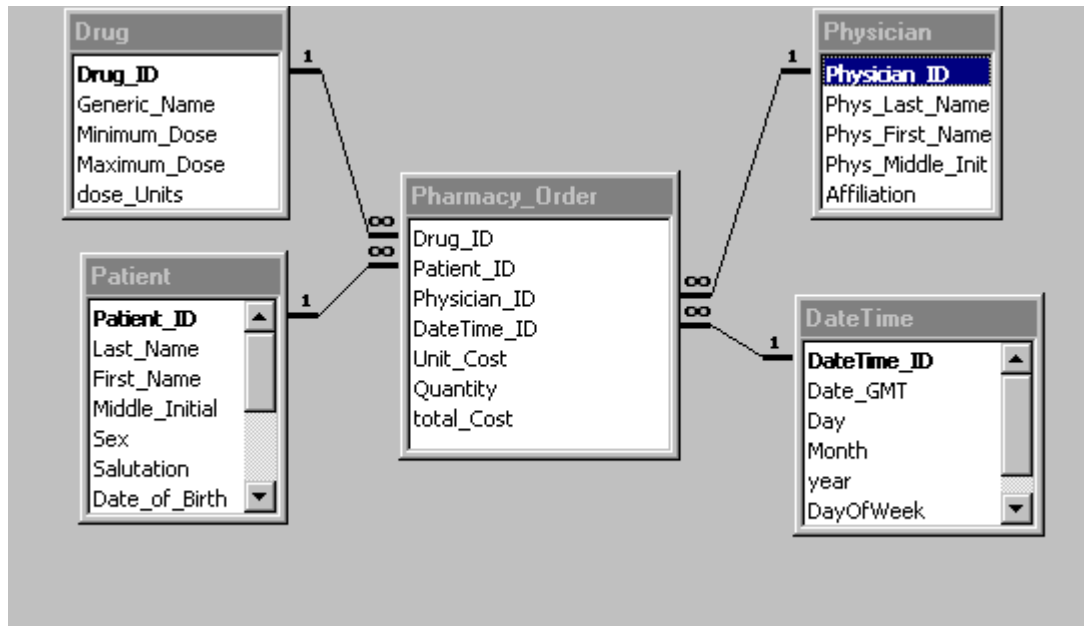


Hypercubes (1)



Current technologies **cannot** cope with the flexibility

Relational Databases / OLAP



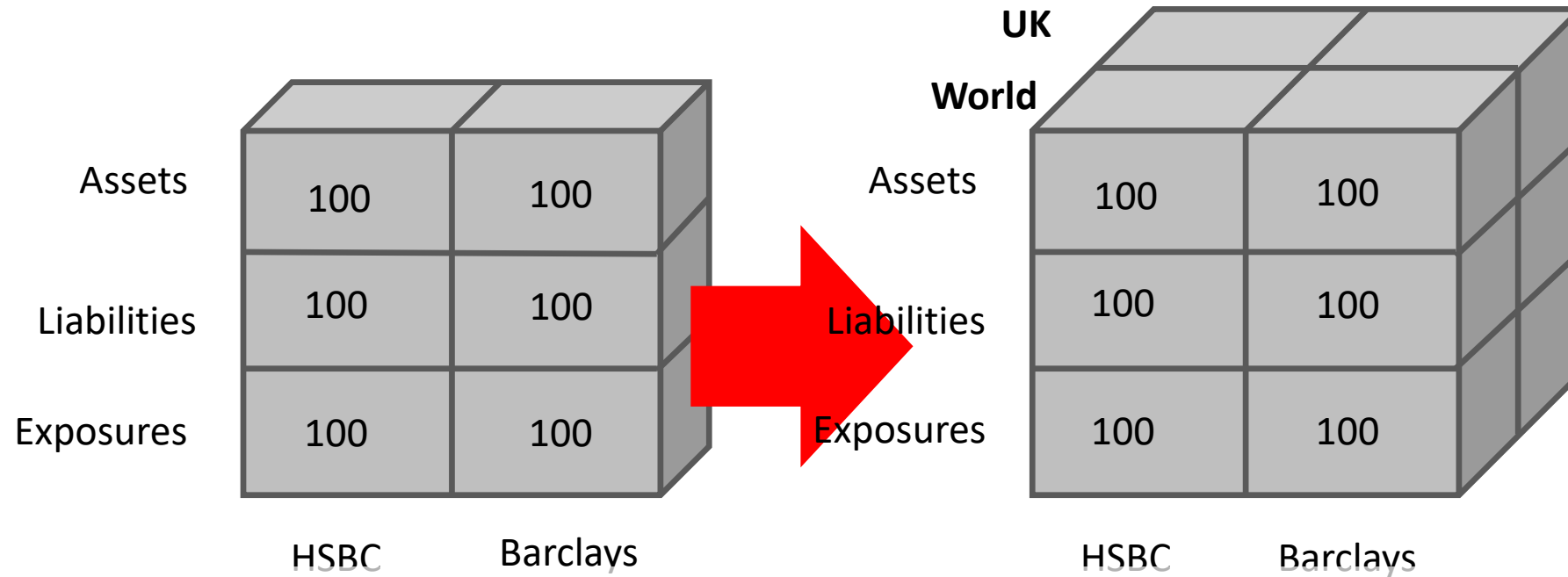
- High rigidity
- Low dimensionality
- No flexibility

✘ Different schema for every taxonomy version

Hypercubes (2)



OLAP – Hypercubes



new Dimension = new physical Hypercube

✗ Increases TCO

✗ No flexibility for the end-user

Hypercubes (3)



Current NoSQL technologies **cannot** cope with the analytical requirements

NoSQL / Hadoop



- Unlimited flexibility
- Unlimited characteristics
- No data semblance

✘ Data without rules is not interpretable

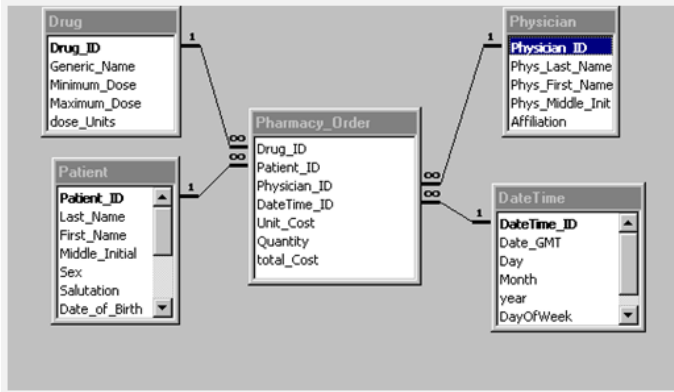
✘ No instant analytics = No flexibility + high TCO

Hypercubes (4)

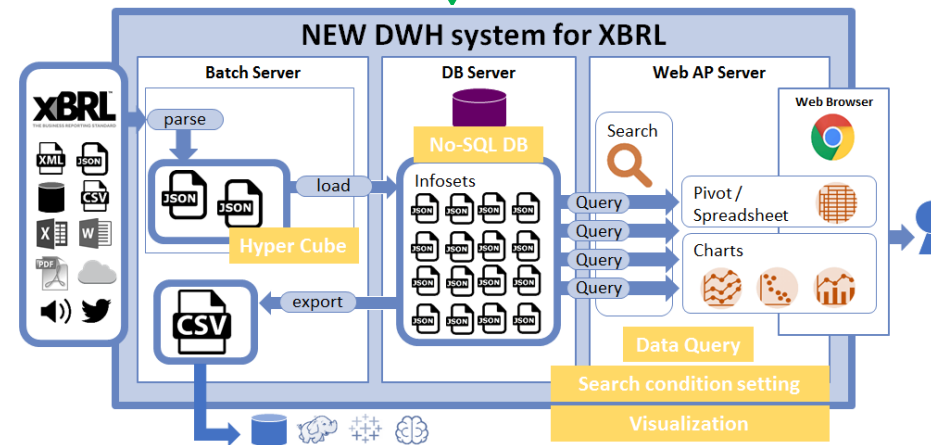


Sweet spot between the extremes

Relational Databases / OLAP



NoSQL / Hadoop

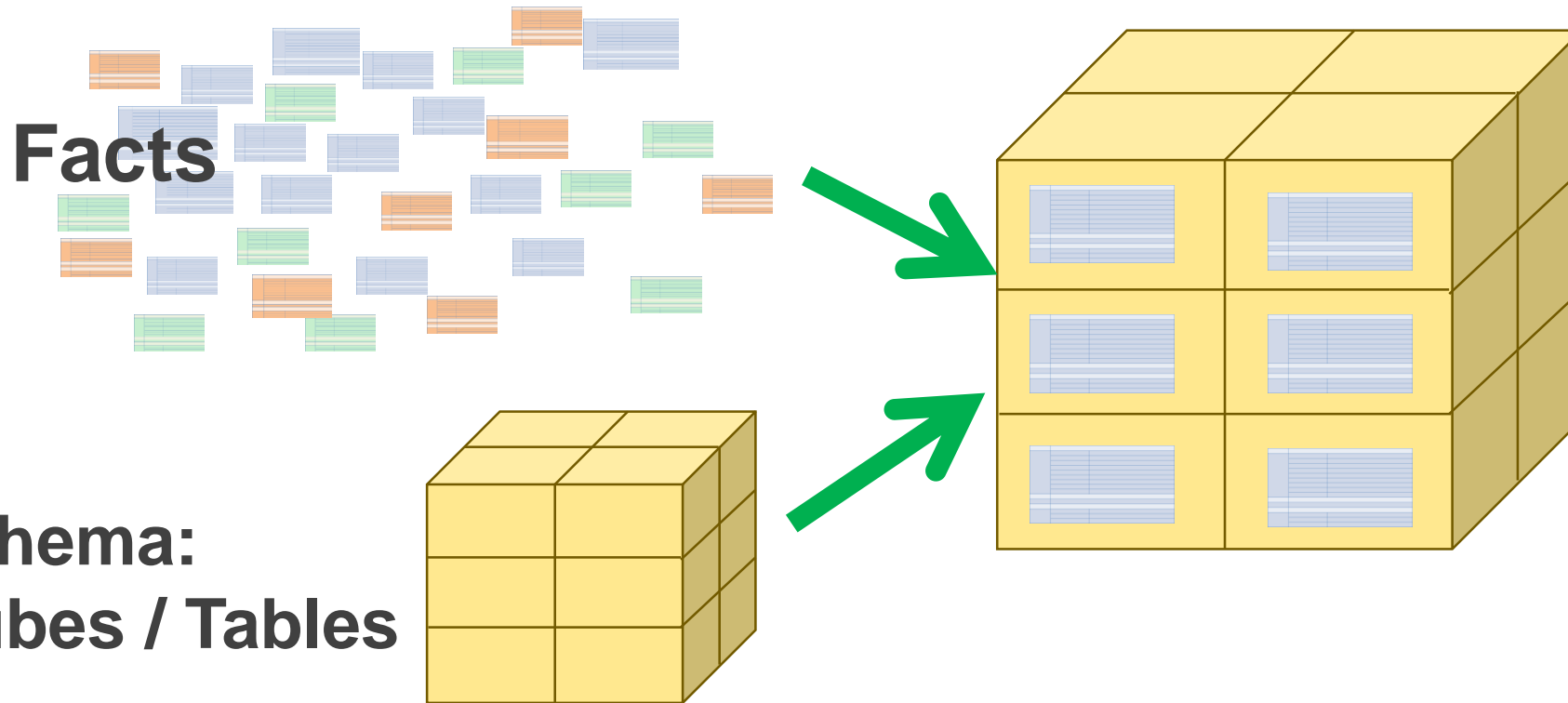


- ✓ Flexibility + semblance of data
- ✓ Taxonomy = schema (low maintenance)
- ✓ User decides which schema to use

Hypercubes (5)



How it works: Hypercube querying



✓ Schema stored separately

✓ No data migration cost

✓ Gives full control to the end-user

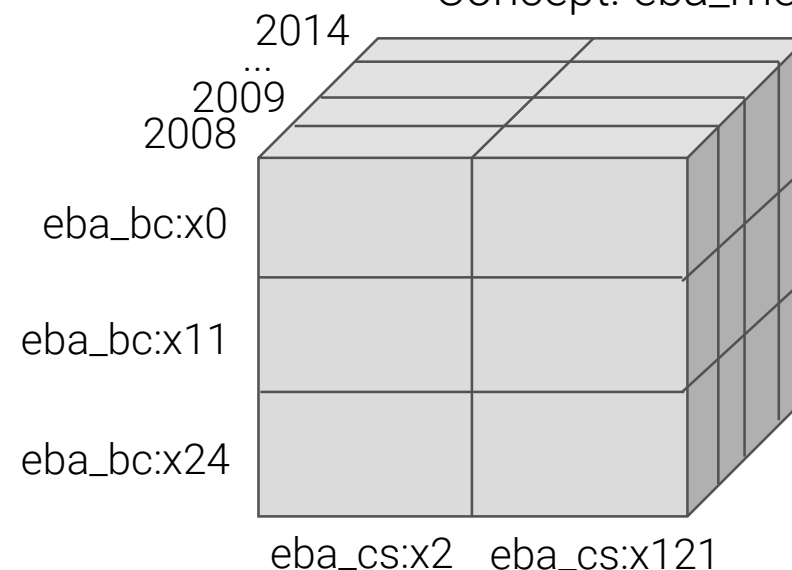
MODEL SEPARATION ENABLES MULTIPLE DATA ACCESS STRATEGIES



Additional dicers:

- Entity: 123456
- Concept: eba_met:md13

C 10.01 - Credit risk: Equity - IRB approaches to capital requirements - TOTAL						
		Columns				
		Internal rating system	Original exposure pre conversion factors	Credit Risk Mitigation(CRM) techniques with substitution effects on the exposure		
		PD assigned to the obligor grade or pool (%)		Unfunded credit protection	(-) Substitution of the exposure due to CRM (-) Total outflows	
			(-) Guarantees	(-) Credit derivatives		
		010	020	030	040	050
Total IRB Equity Exposures	010	%	€€	€€	€€	€€
PD/LGD approach: Total	020	115093 %	114997 €€	113782 €€	113780 €€	113784 €€
Simple risk weight approach: Total	050	%	115001 €€	113783 €€	113781 €€	113785 €€
060 Breakdown of total exposures under the simple risk weight Approach by risk weights:						
190%	070	%	114998 €€	€€	€€	€€
290%	080	%	114999 €€	€€	€€	€€
370%	090	%	115000 €€	€€	€€	€€
Internal models approach	100	%	114996 €€	€€	€€	€€
Equity exposures subject to risk weights	110	%	€€	€€	€€	€€



✓ Form Centric Data Access

✓ Data Centric Data Access

MODEL SEPARATION ENABLES MULTIPLE DATA ACCESS STRATEGIES



Additional dicers:

- Entity: 123456
- Concept: eba_met:md13

C 10.01 - Credit risk: Equity - IRB approaches to capital requirements - TOTAL			
			Columns
	Internal rating system	Original exposure pre	Credit Risk Mitigation(CRM) techniques with substitution effects on the

Select * from `corep2.7.0.0::C10.01`
where `rc-code`=`010`

Simple risk weight approach: Total	050	%	115004	115763	115761	115763
			€ES	€ES	€ES	€ES
060 Breakdown of total exposures under the simple risk weight Approach by risk weights:						
190%	070	%	114998	€ES	€ES	€ES
			€ES	€ES	€ES	€ES
290%	080	%	114999	€ES	€ES	€ES
			€ES	€ES	€ES	€ES
370%	090	%	115000	€ES	€ES	€ES
			€ES	€ES	€ES	€ES
Internal models approach	100	%	114996	€ES	€ES	€ES
			€ES	€ES	€ES	€ES
Equity exposures subject to risk weights	110	%	€ES	€ES	€ES	€ES

✓ Form Centric Data Access

2014

Select * from facts
where xbrl:entity = 123456
and xbrl:concept = „eba_met:md13“
and eba_dim:BCC = „eba_bc:x0“

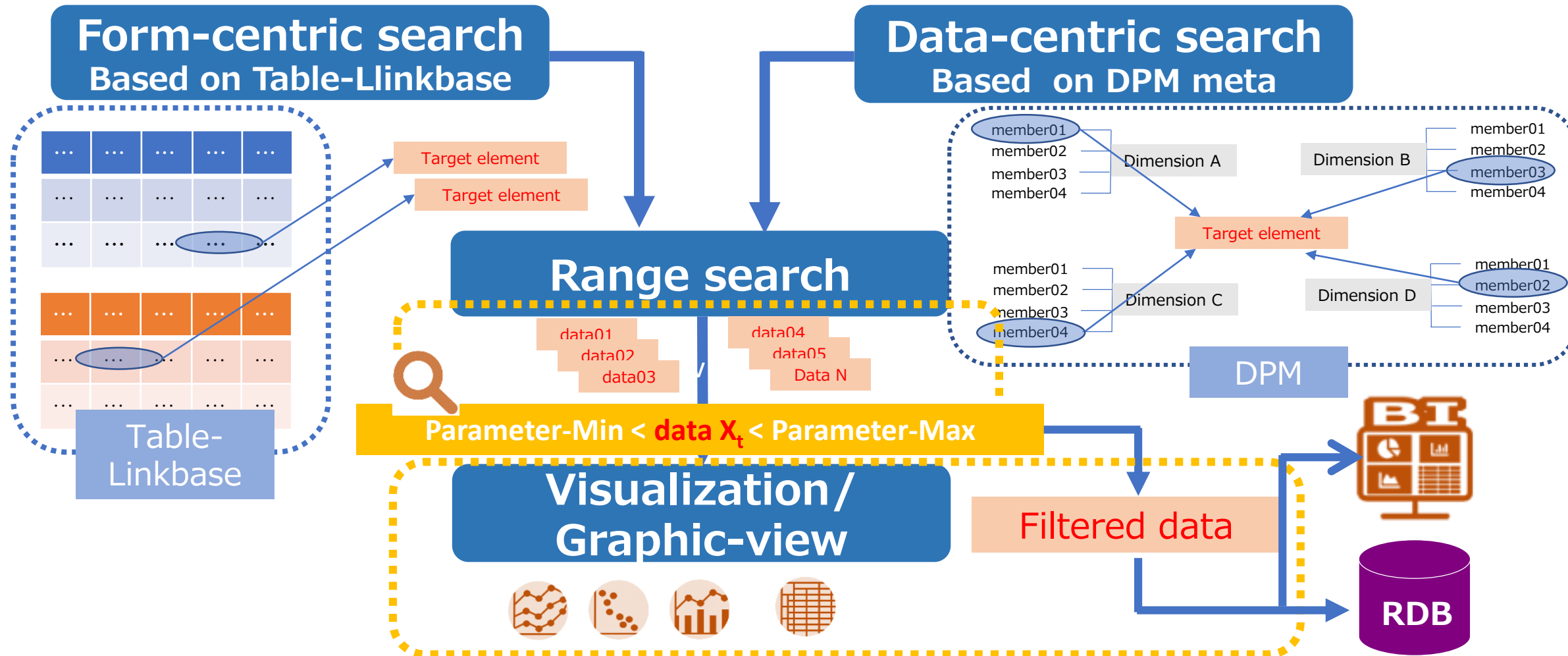


✓ Data Centric Data Access

Advanced data search & visualization



Combination of two types of data approaches and range search, visualization/graphic-view



Advanced data search & visualization



Combination of two types of data approaches and range search, visualization/graphic-view

Form-centric search
Based on Table-Linkbase

Data-centric search
Based on DPM meta

The most important feature is all these functions are free from maintenance burden, even when new taxonomy based data is coming!

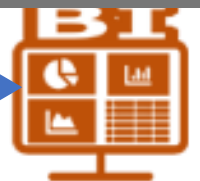
Table-Linkbase

Parameter-Min < data X_t < Parameter-Max

Visualization/Graphic-view



Filtered data



Achieved Capabilities

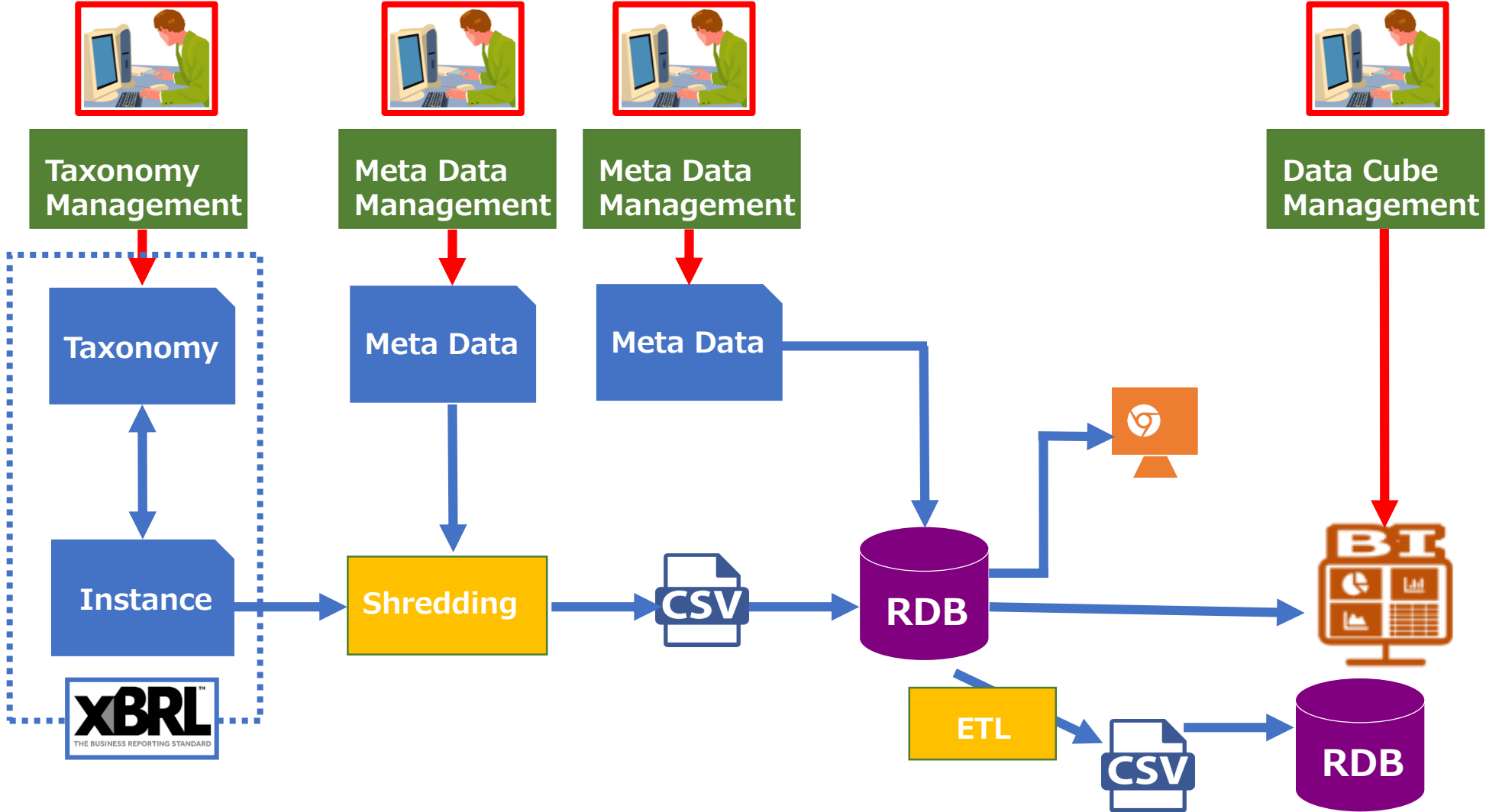


**Maintenance
cost
reduction**

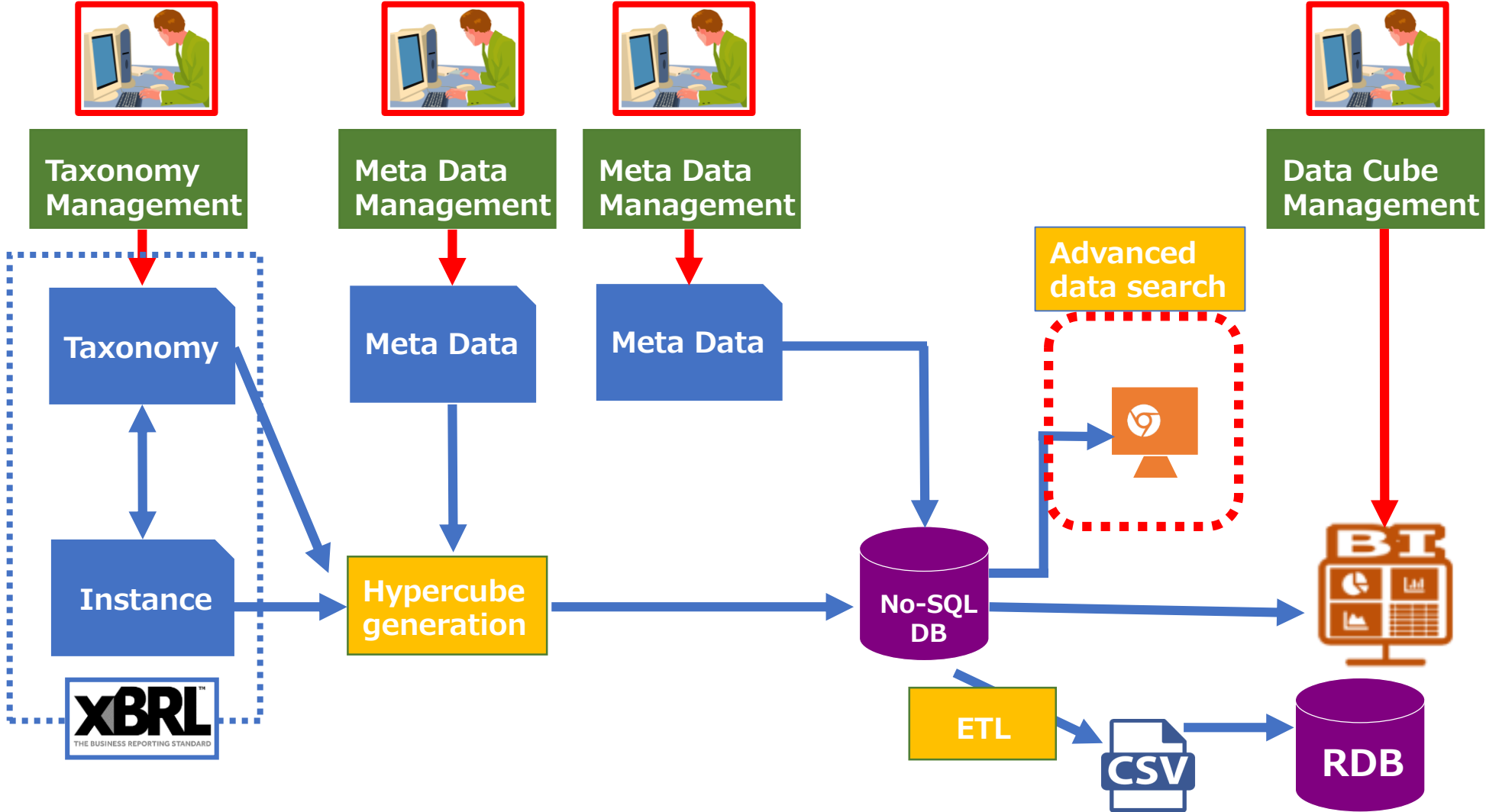
**Flexible data
search from
multiple
dimensions**

**High speed
range search**

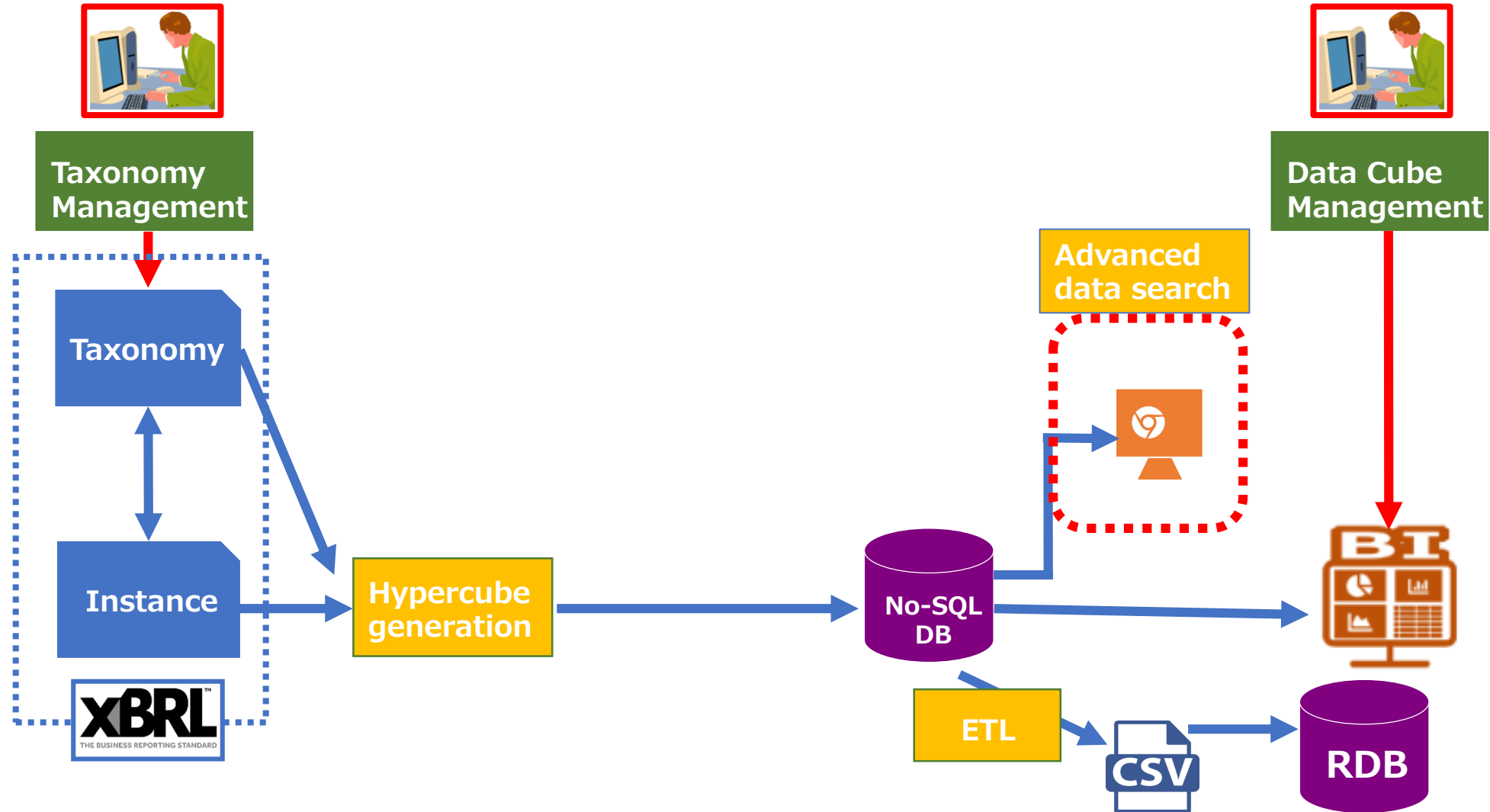
Cost reduction



Cost reduction



Cost reduction



Towards the Regulatory Process Automation

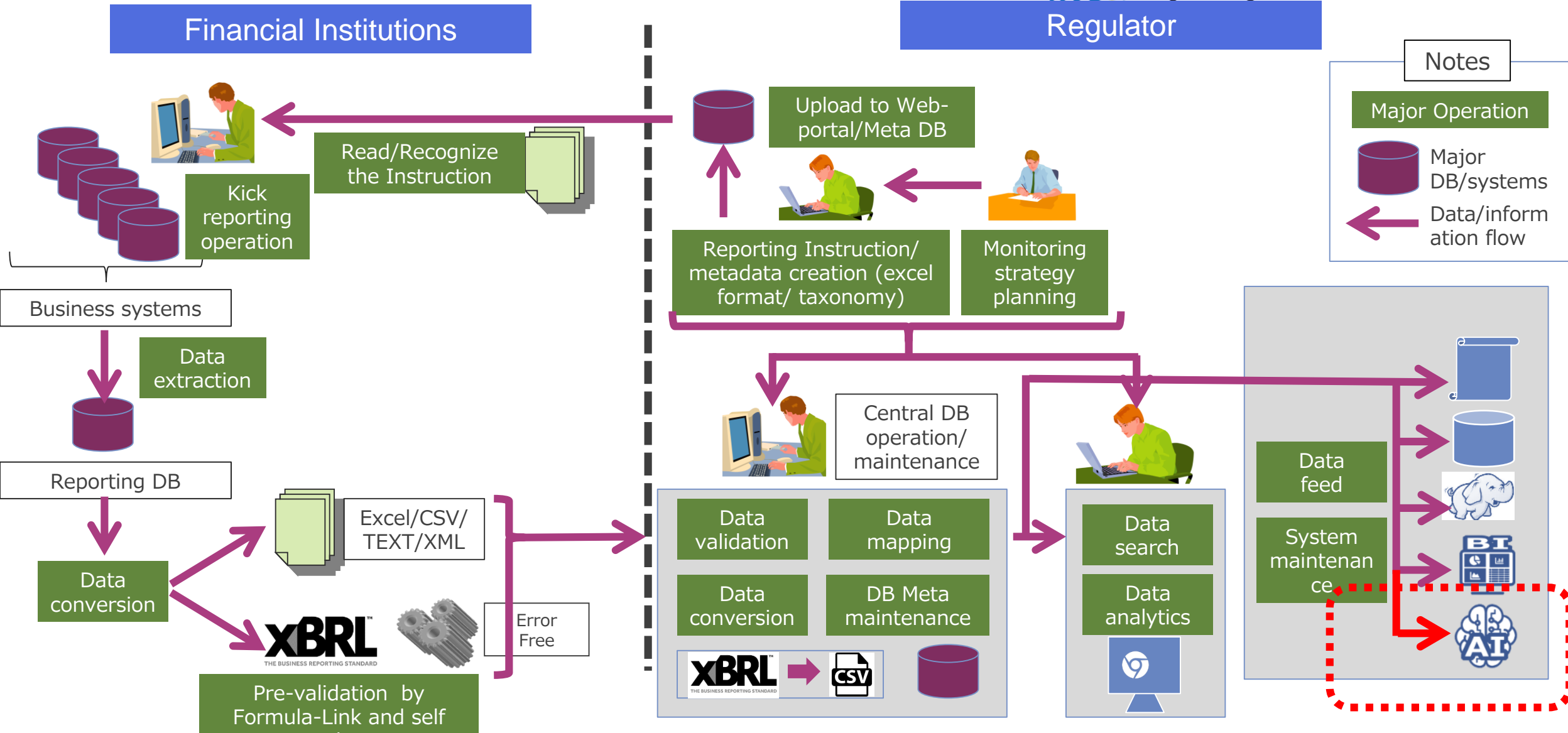
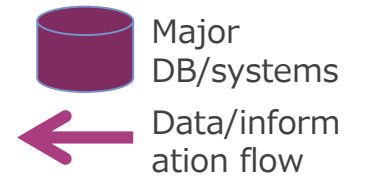


Financial Institutions

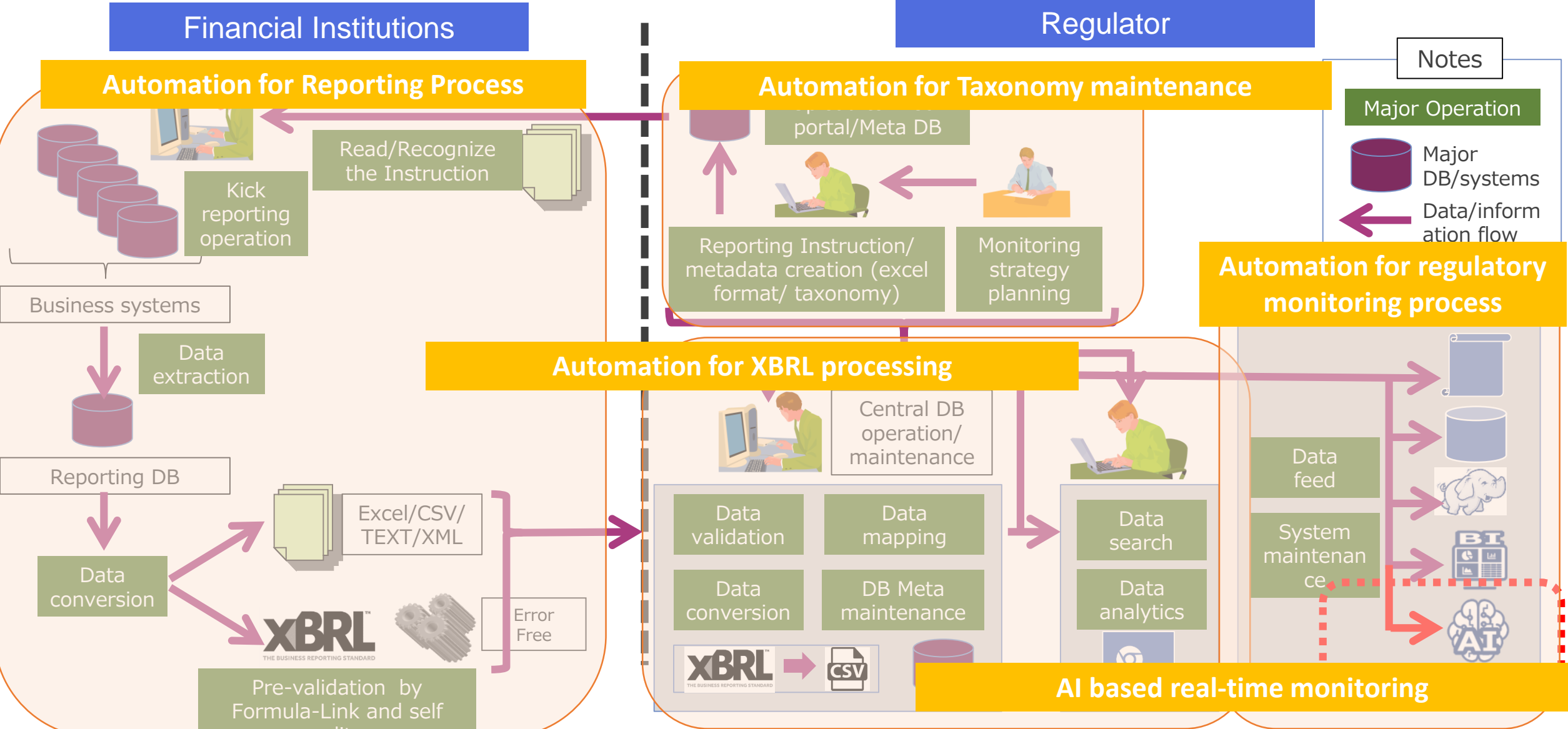
Regulator

Notes

Major Operation



Again, towards the Regulatory Process Automation



Our journey is still continuing



THANK YOU



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