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DATA LAKE

30 October 2016

Thaveewat Khanan

2603615 Organization Data Management

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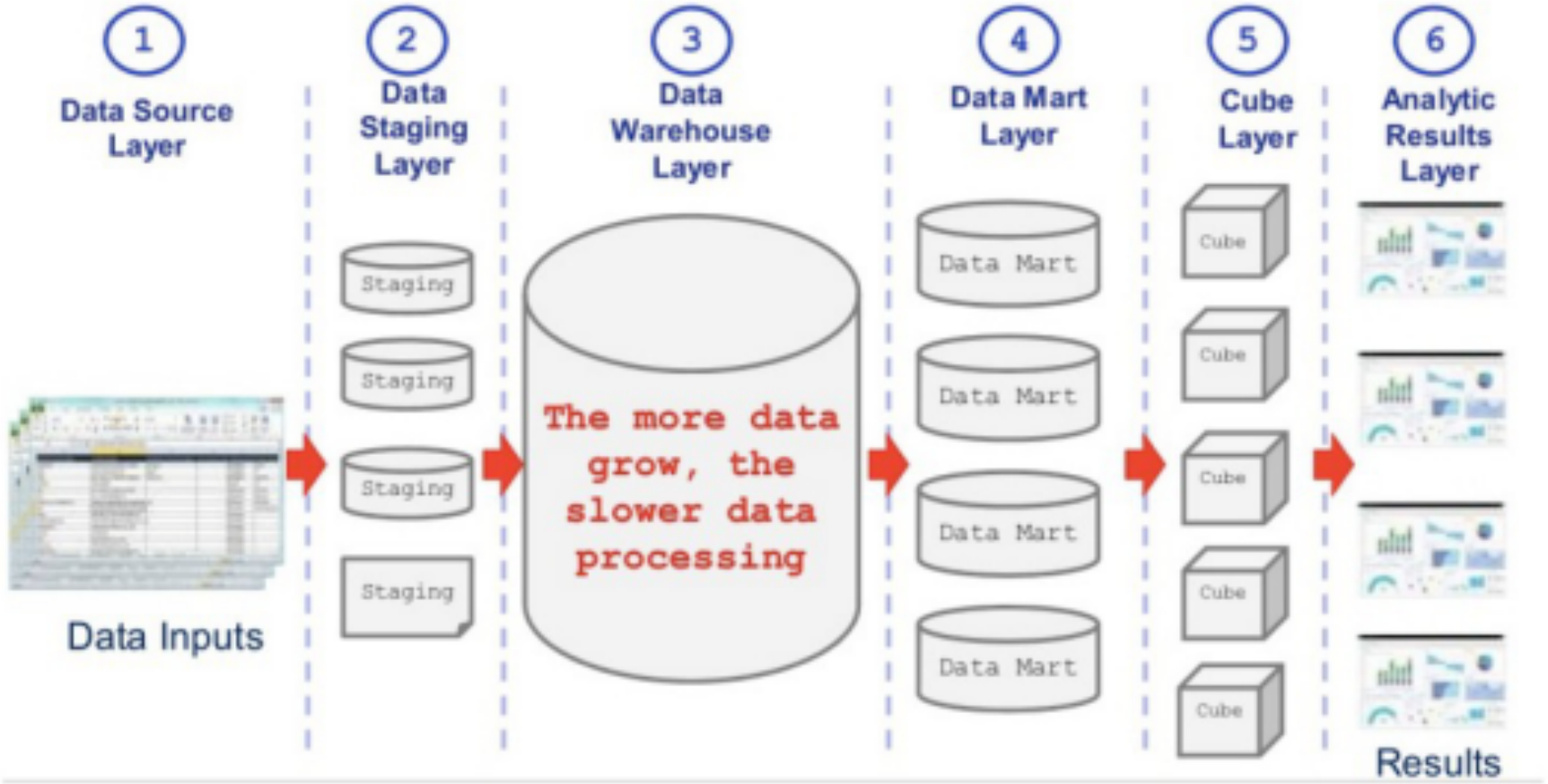
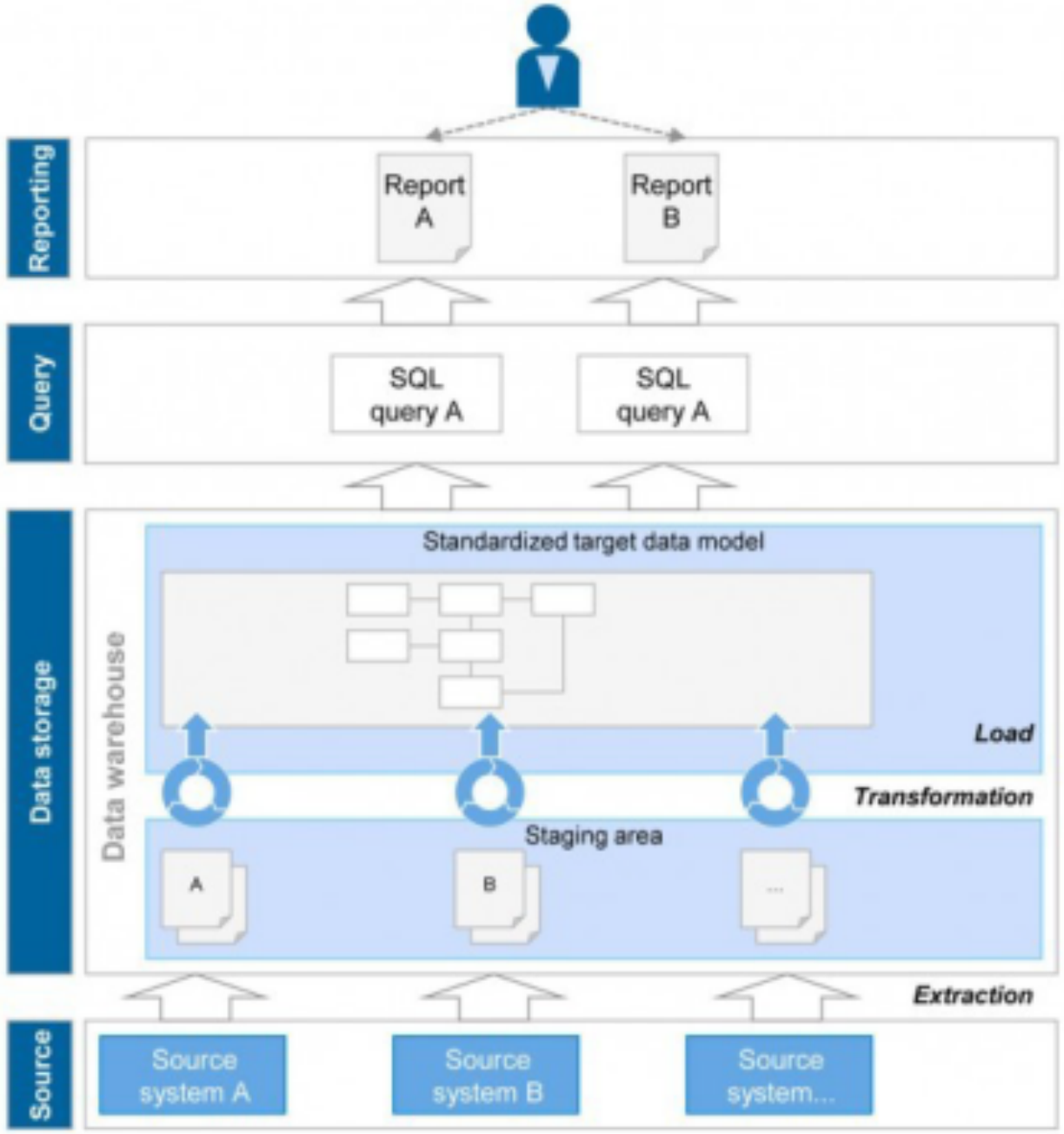
Data Warehouse



Top Concerns from Traditional Data Warehouse Architecture

1. A lot of data duplication lead to cost of data store/storage issue
2. Very slow of data processing and need to restart/roll back the job if any failed
3. Data security issue due to keep data too many copies and various formats

Data Warehouse : ETL



Source: BIG DATA IN BANKING: DATA LAKE INSTEAD OF DATA WAREHOUSE?

How Data Lake Works?

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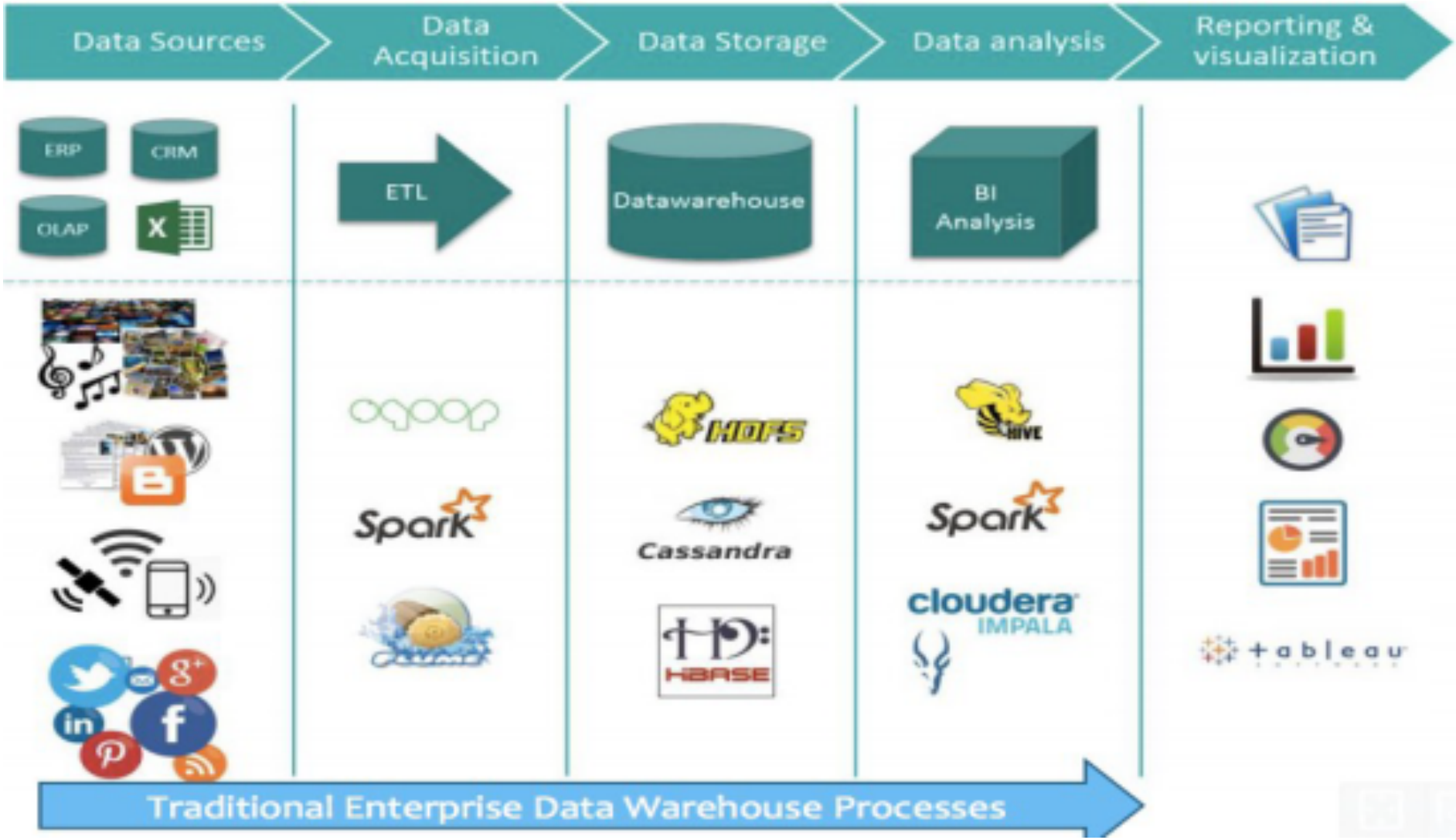
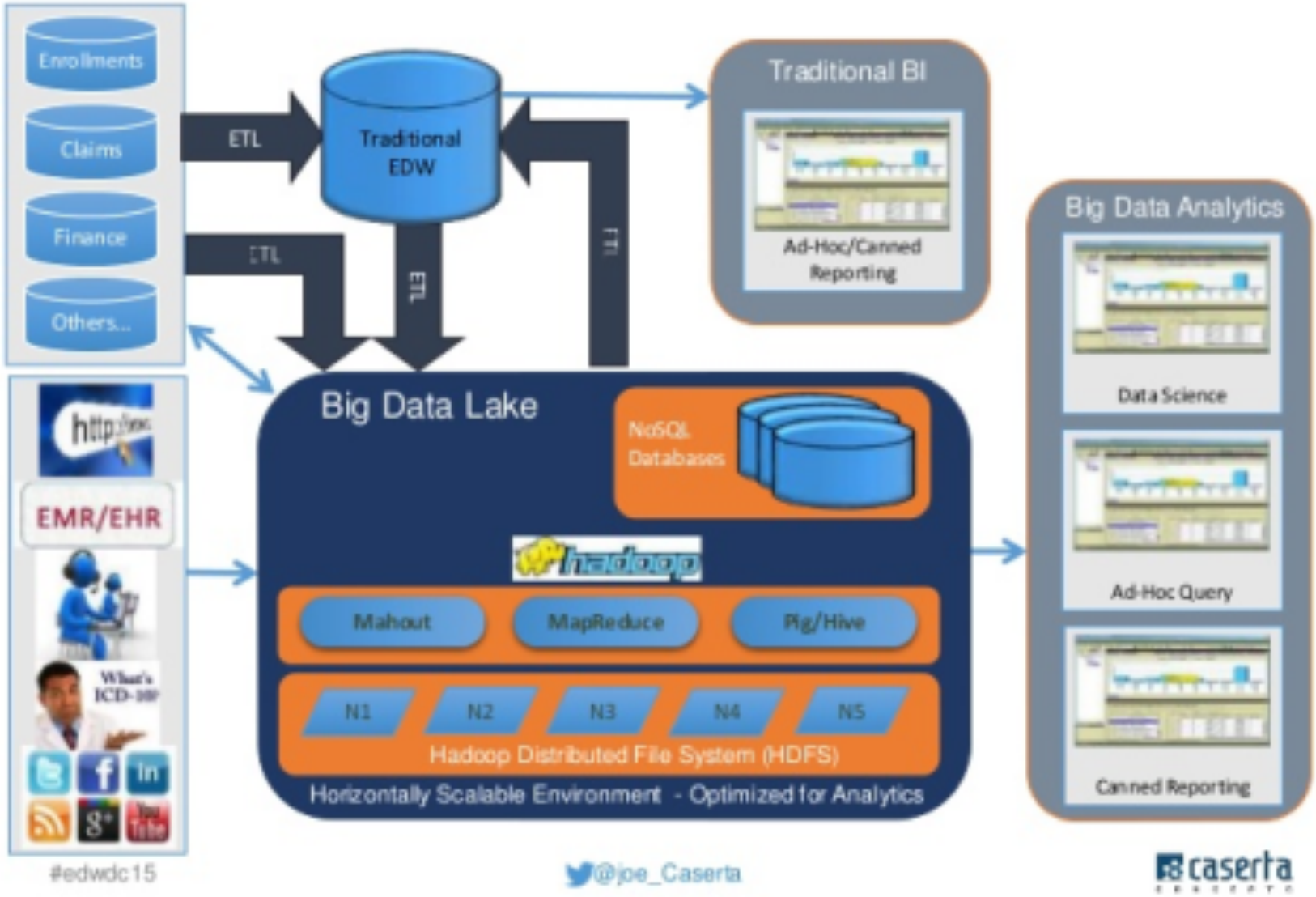


Source: www.clearpeak.com

Today's business environment requires Big Data



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Data Lake isn't just a technology
It is an architecture

Data Lake: Definition

Is a huge repository

Is not Hadoop

is not a database, it uses various NoSQL and In-Memory databases.

Stores large volumes of both unstructured and structured data.

Is a data scientist's favorite hunting ground.

Data Lake cannot be implemented in isolation.

Data Lake: Key Benefits

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Scale as much as you can

Plug in disparate data sources

Acquire high-velocity data: Store in native format

Don't worry about schema

Unleash your favorite SQL

Advanced algorithms

Administrative resources

Data Lake v.s. Data WareHouse

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Complementary to EDW (not replacement)	Data lake can be source for EDW
Schema on read (no predefined schemas)	Schema on write (predefined schemas)
Structured/semi-structured/Unstructured data	Structured data only
Fast ingestion of new data/content	Time consuming to introduce new content
Data Science + Prediction/Advanced Analytics + BI use cases	BI use cases only (no prediction/advanced analytics)
Data at low level of detail/granularity	Data at summary/aggregated level of detail
Loosely defined SLAs	Tight SLAs (production schedules)
Flexibility in tools (open source/tools for advanced analytics)	Limited flexibility in tools (SQL only)

Data Lake Maturity & Risks

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More Data Sources

More Applications

More Business Units

More Users

Without proper governance mechanisms
Data lakes risk turning data swamps

Data Lake Governance

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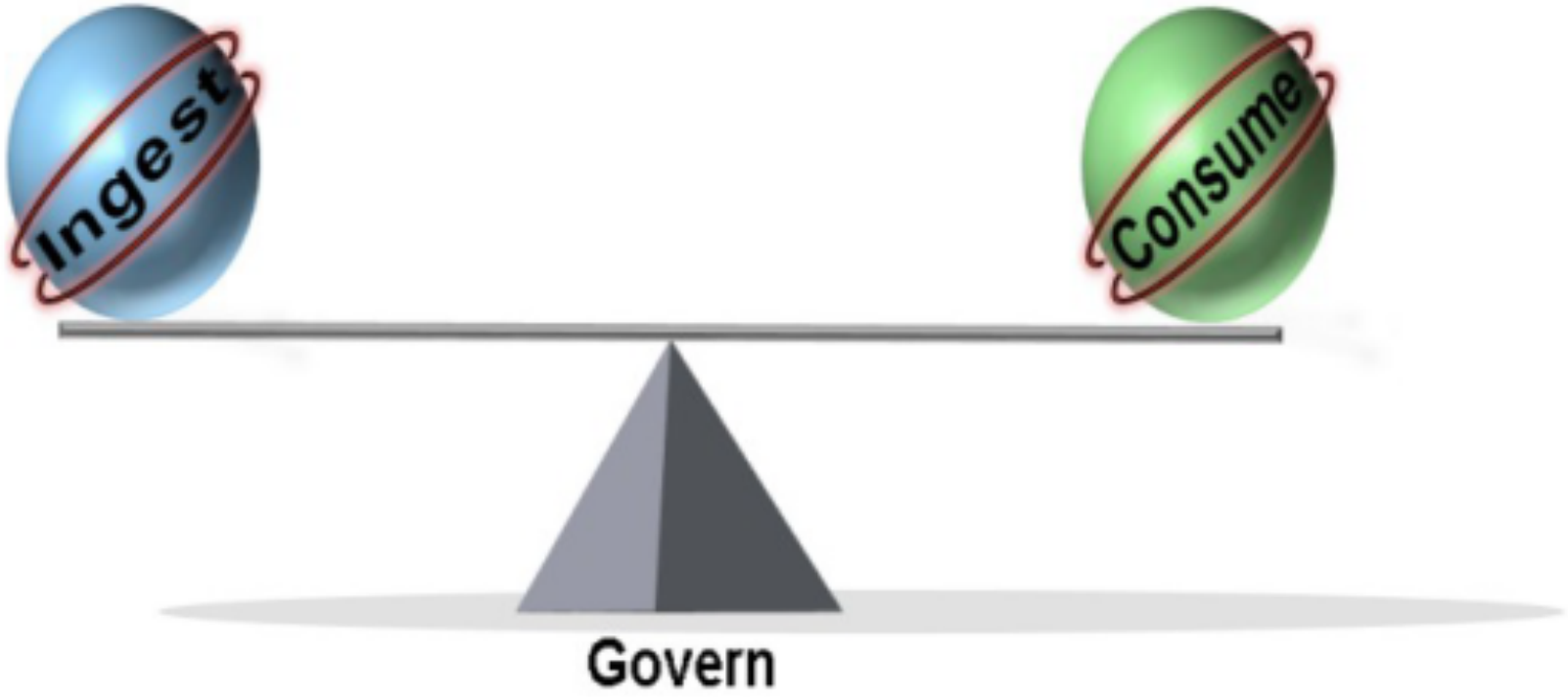

Source: What is “Just-Enough” Governance for the Data Lake?

Data Governance

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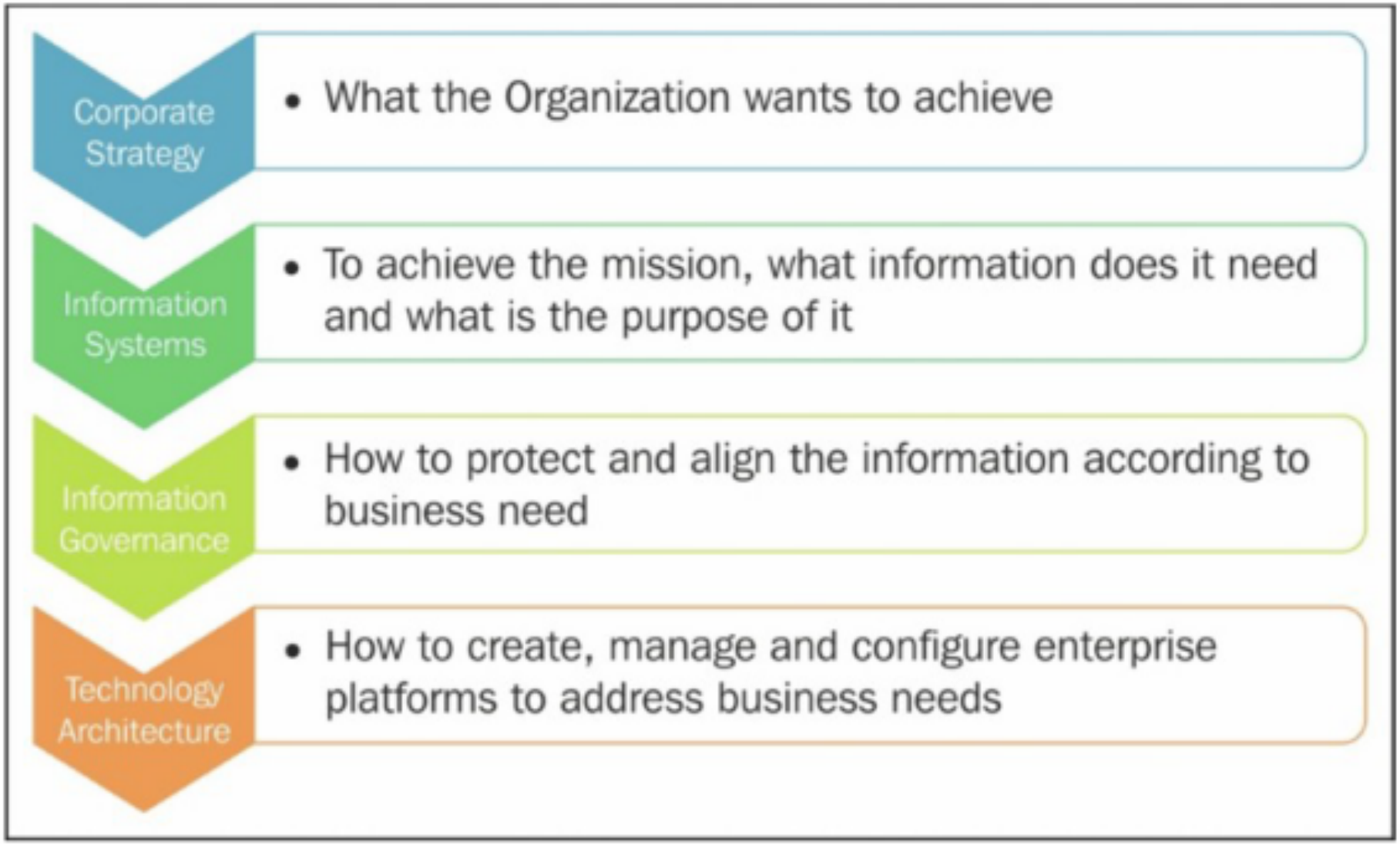

Source: Data Lake Development with Big Data

Data Lake Governance

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Fundamental Capabilities

- **The definition of the incoming data from a Business use perspective**
- **Documentation of the context, lineage, and frequency of the incoming data;**
- **Security level classification of the incoming data;**
- **Documentation of creation, usage, privacy, regulatory, and encryption business rules which apply to the incoming data.**

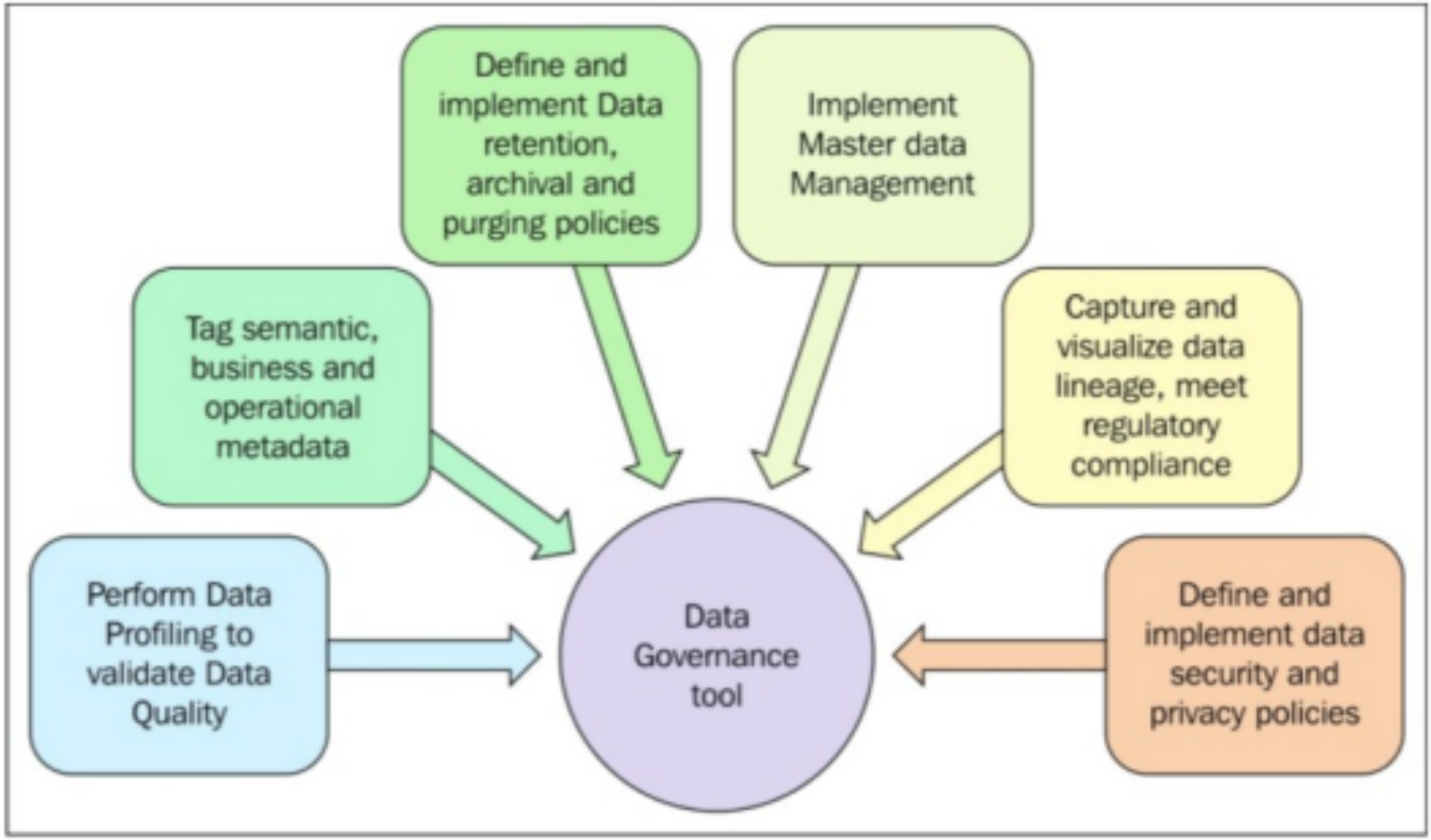
Source: What is “Just-Enough” Governance for the Data Lake?

What can it do for my Data Lake

- Where did my data come from ? How is it being transformed ?
- Track usage, resolve anomalies, visualize, optimize and clarify data lineage Search and access data
- Assess data quality and fitness for purpose
- Govern who can/cannot access the data
- Data life cycle management, archiving and retention policies
- Auditing, compliance

Source: Data Governance in the Hadoop Data Lake

Data Governance Tools



Source: Data Lake Development with Big Data

Summary

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- Big Data: Data lake instead of data warehouse?
- Data Lake is not only a technology, it is an architecture
- Data Lake components: Data acquisition (intake), Data management, Data Storage, Data consumption (Discovery)
- Data Lake governance is very important