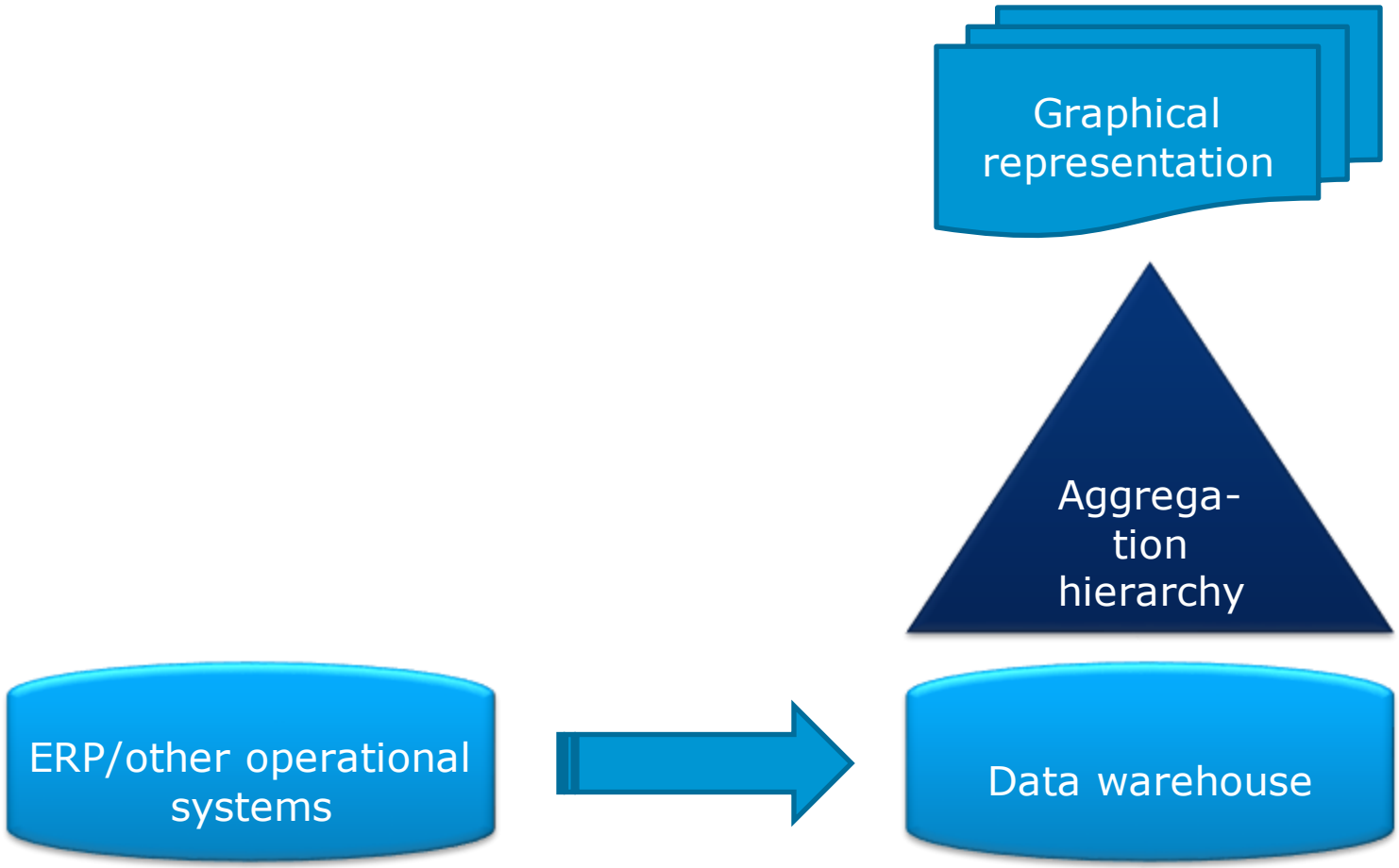
WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

EFMD EQUIS ACCREDITED

Business Analytics I

Alexander Prosser

First Generation BI

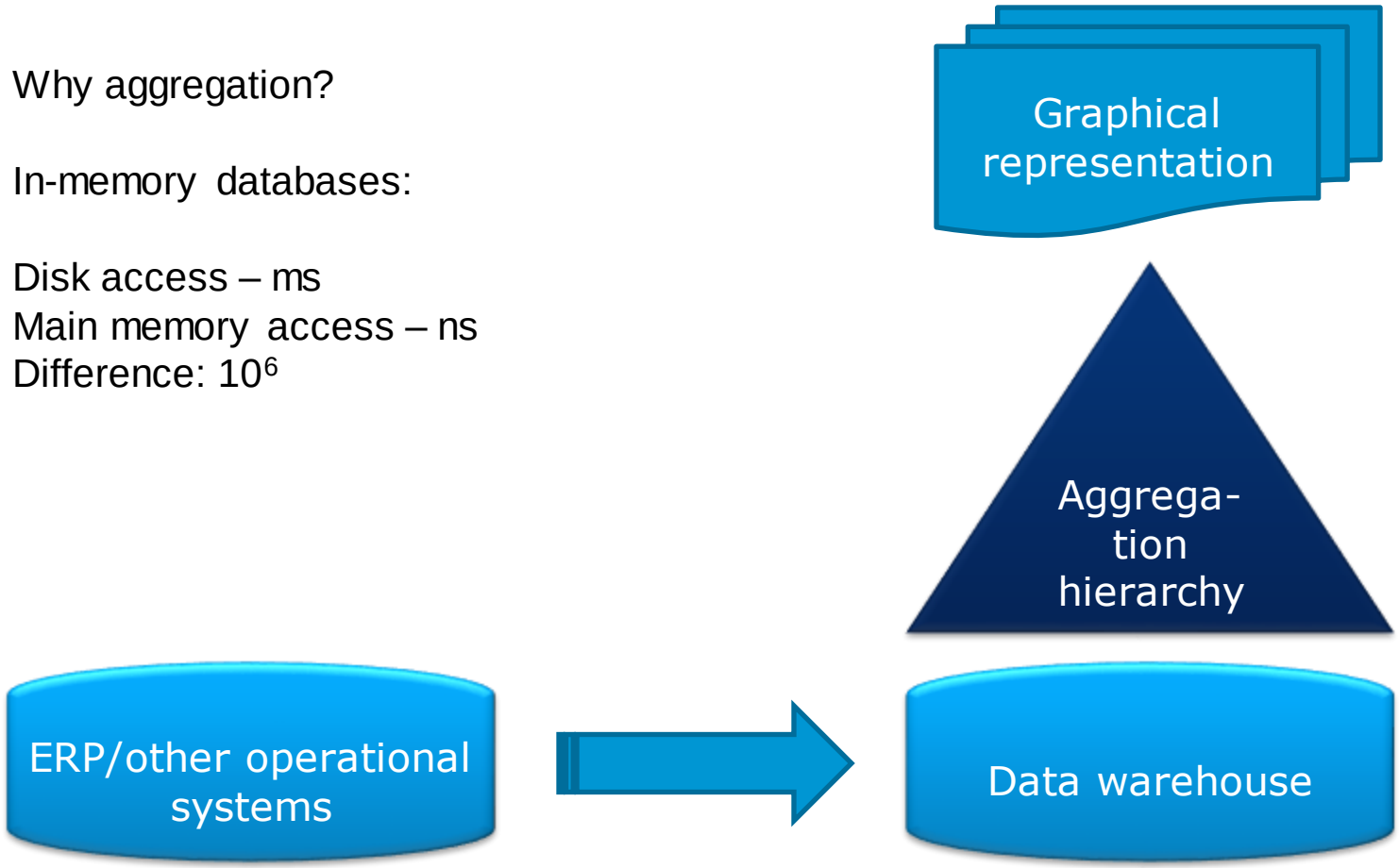


First Generation BI

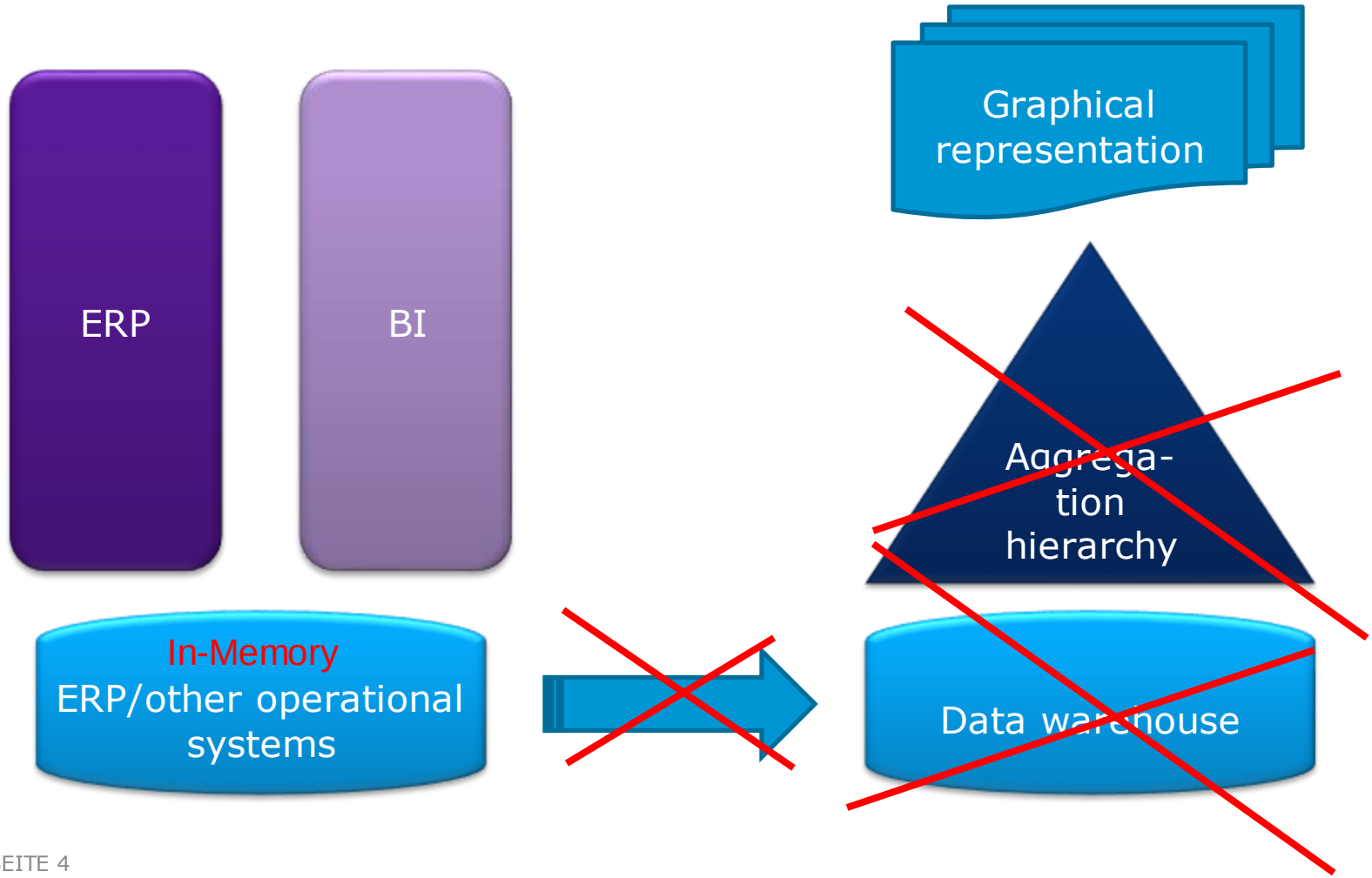
Why aggregation?

In-memory databases:

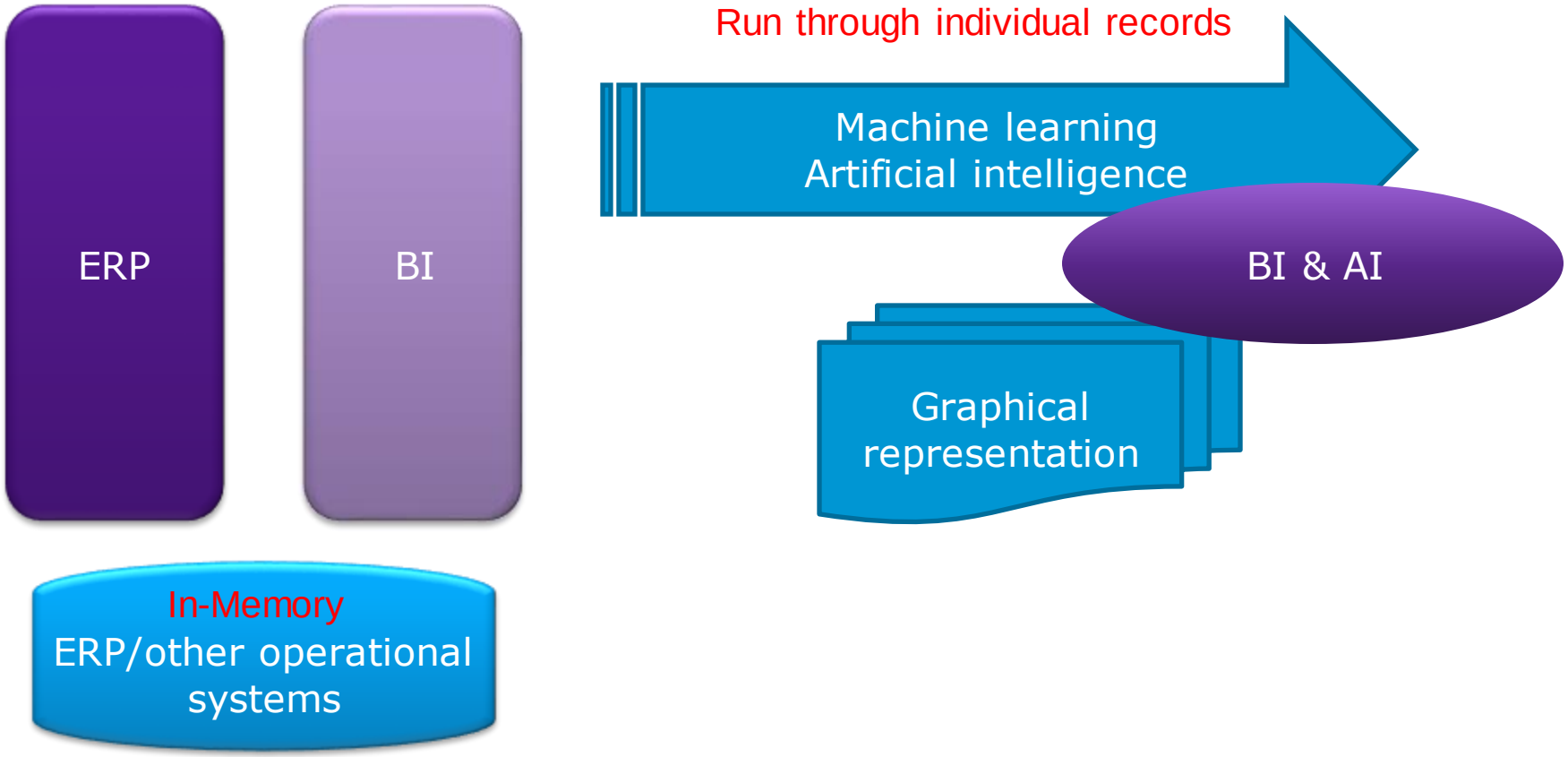
Disk access – ms
Main memory access – ns
Difference: 10^6



Second Generation BI



Second Generation BI



Second Generation BI

“Large main memory”. How large is “large”?

https://www.ibm.com/downloads/cas/VX0AM0EP

Mere example, performance industry standard.

How much is 64 TB?

Average Netflix HD Movie 2 GB => 32k+ movies
Netflix currently offers less than 10k movies or TV shows*

High-quality portrait 1MB => 67m+ photos

… and you can search that content in main memory in a matter of a few seconds

* https://www.businessinsider.com/netflix-movie-catalog-size-has-gone-down-since-2010-2018-2?r=DE&IR=T?r=US&IR=T

Modelling

The technology may have changed, fundamental case modelling has not.

=> Dimensions and facts => Dimensional Fact Modelling

Let us design a BI system

Modeling

STEP 1:

What is the fact I want to analyze ?

What are the key figures representing the fact ?

What do the key figures look like ?

Modeling

Operator	Nominal	Ordinal	Interval	Rational
Sum	No	No	No	✓
Average	No	(✓)	✓	✓
Minimum	No	✓	✓	✓
Maximum	No	✓	✓	✓

Modeling

STEP 2:

What are the axes in my analyses ?

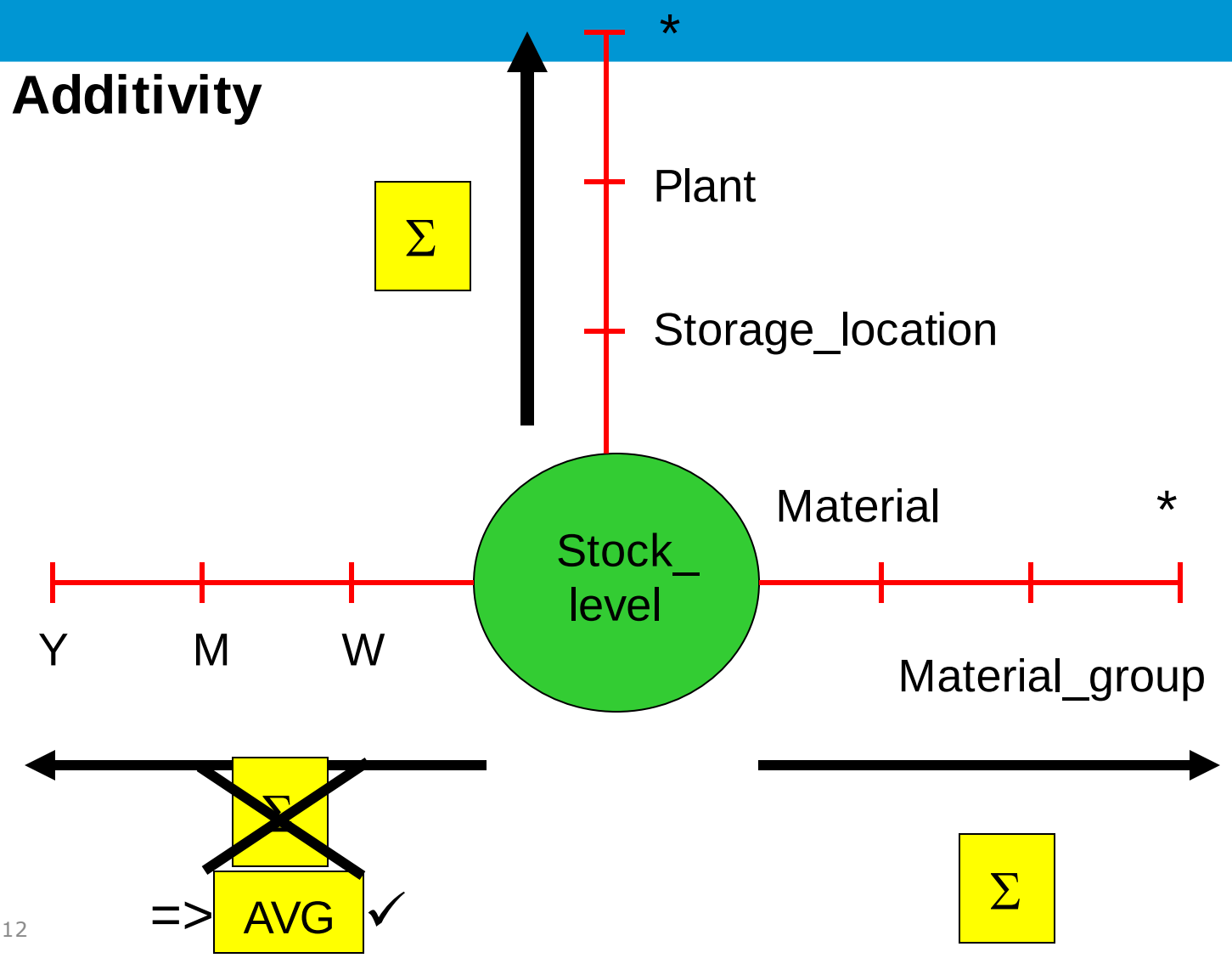
What are their aggregation levels (if any) ?

Modeling

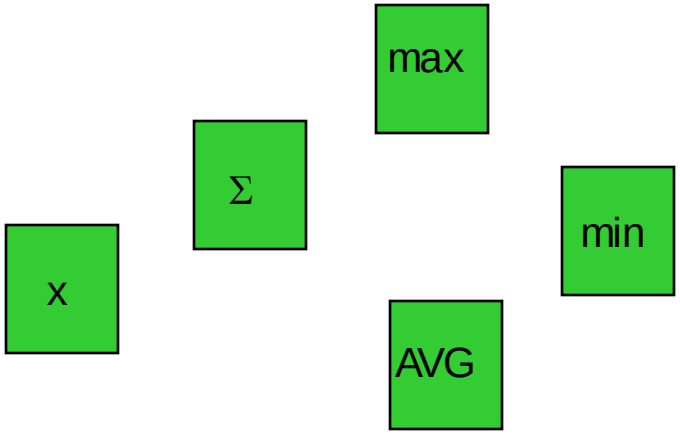
STEP 3:

Are there any restrictions in aggregation ?

Modeling

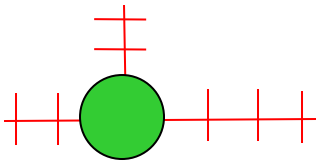

Additivity
*
Plant
Storage_location
Σ
Material
*
Stock_
level
Y
M
W
Material_group
Σ
=>
AVG
✓
Σ

Modeling



These are logical restrictions.

No technology in the world changes that.



	Some dimensions	All dimensions
Some aggregation operator	Semi-additive	Semi-additive
All aggregation operators	Semi -additive	Additive

Modeling

STEP 4:

Do I have parallel hierarchies ?

Modeling

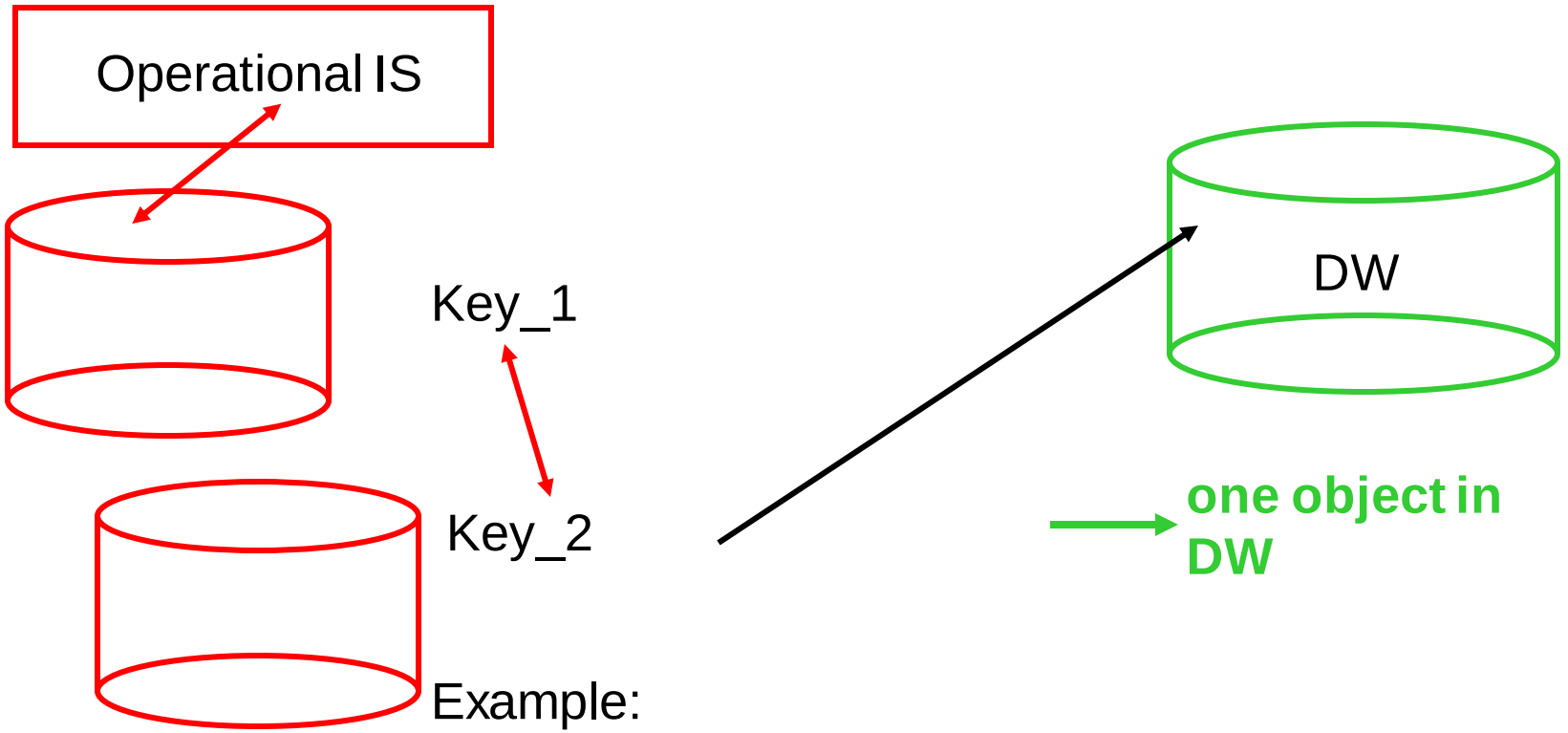
STEP 5:

Where does the data come from ?

Do I need to reconcile data from different sources ?

Modeling

Key Integration

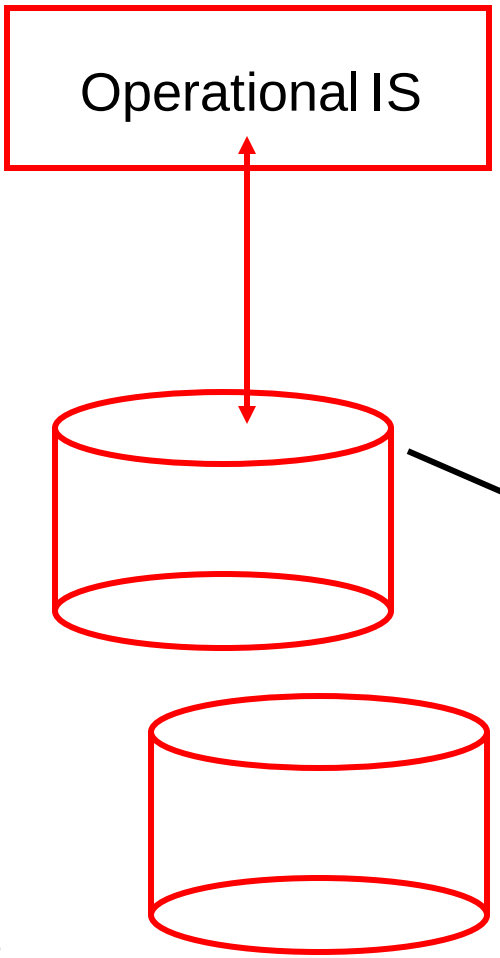


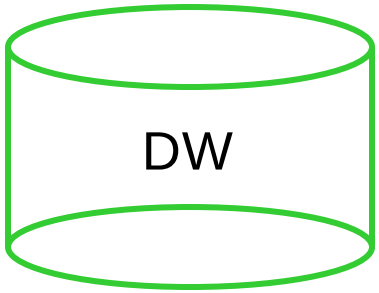
Example:

- Accounts receivable
- Customer
- Transport destination

Modeling

Field Integration





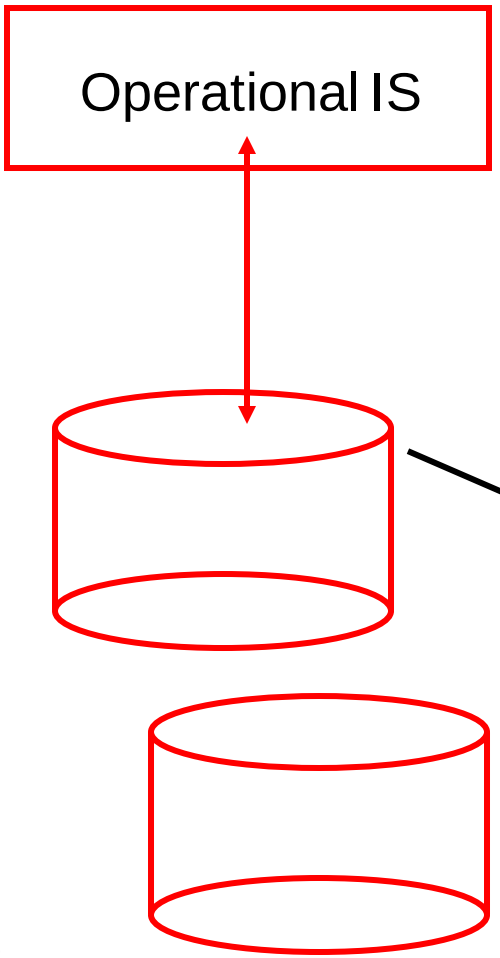
Filter:

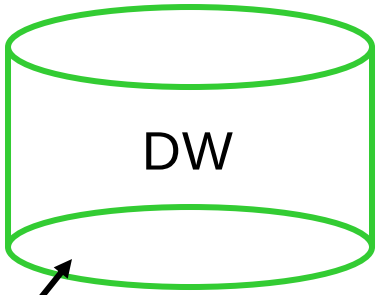
- Currencies
- Measurements
- Scope of figures (eg, gross/net)
- … ?

- All fields available ?

Modeling

Content Integration





Example MM/Procurement:

- Material classes the same ?
- Account assignment the same ?
- Data maintenance discipline/rules the same ?
- … ?

WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

Dimensional Fact Modelling

Case Study: Mobile phone provider helpdesk

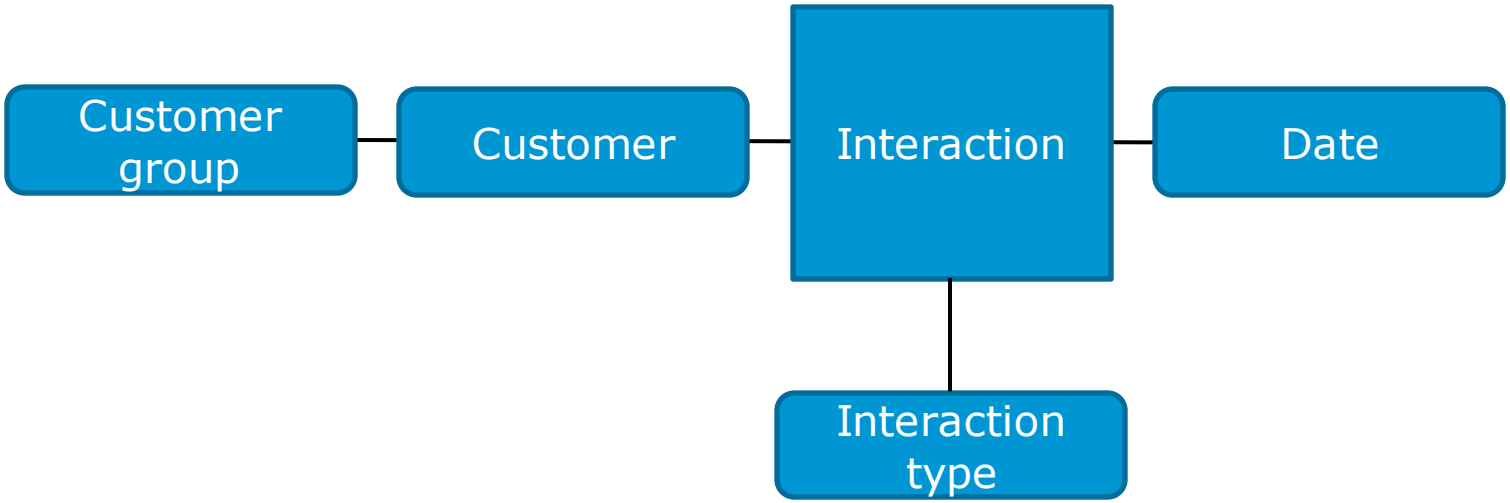
The company looses a large number of customers and wonders why …

Helpdesk calls are to be analysed for customer sentiments towards three topics:

- Price
- Technical quality
- Service quality

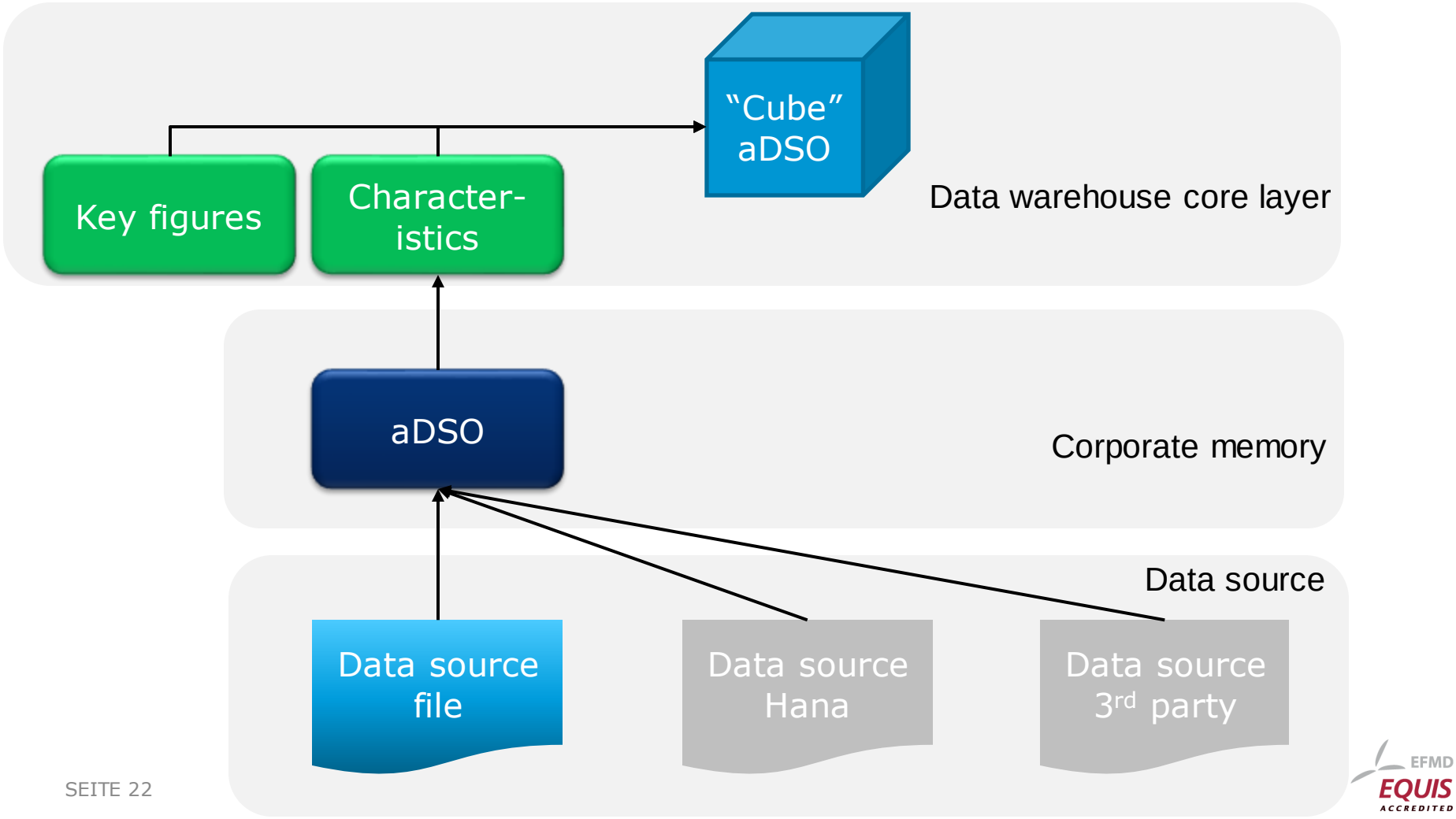
This is a combined task for second-generation BI and AI.

Case Study: Data model

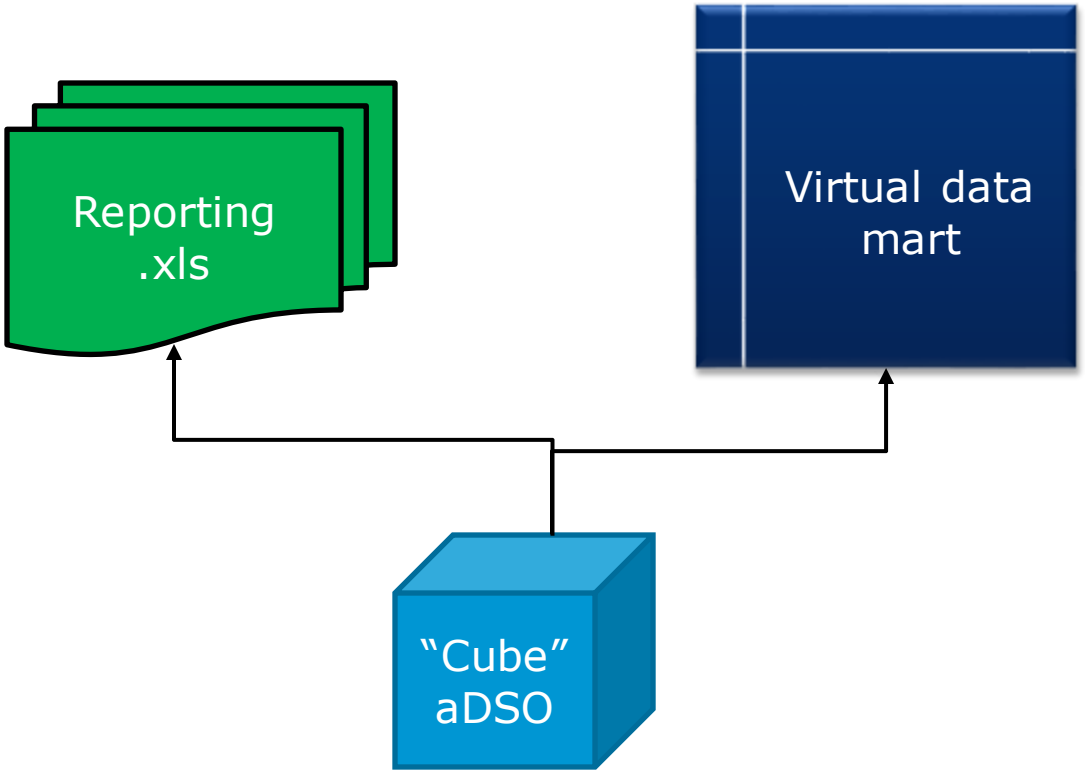


Download the data …

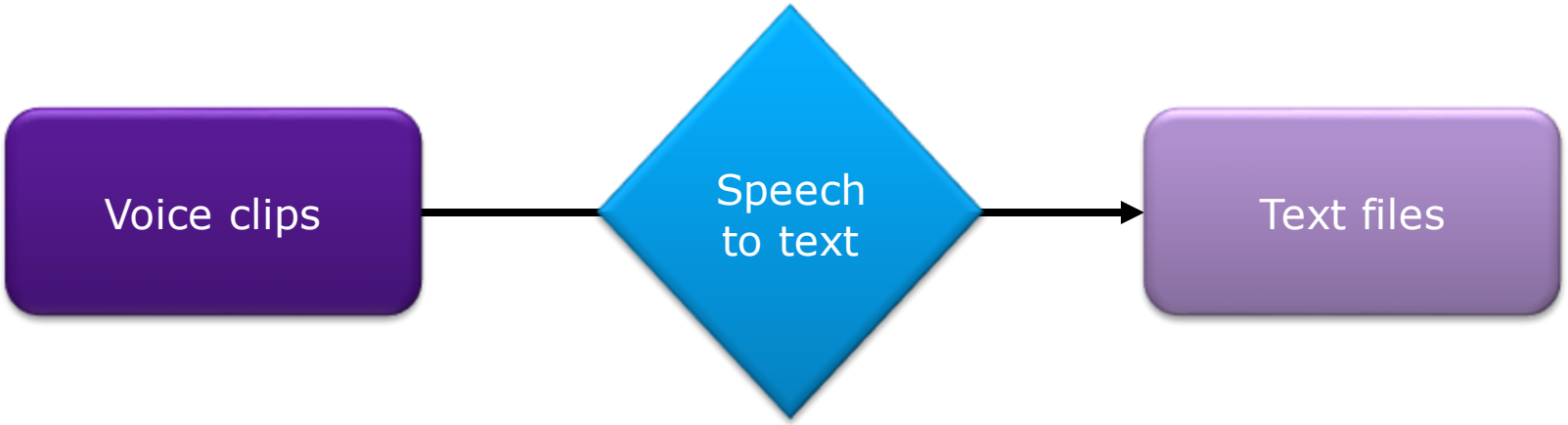
Case Study: Data flow



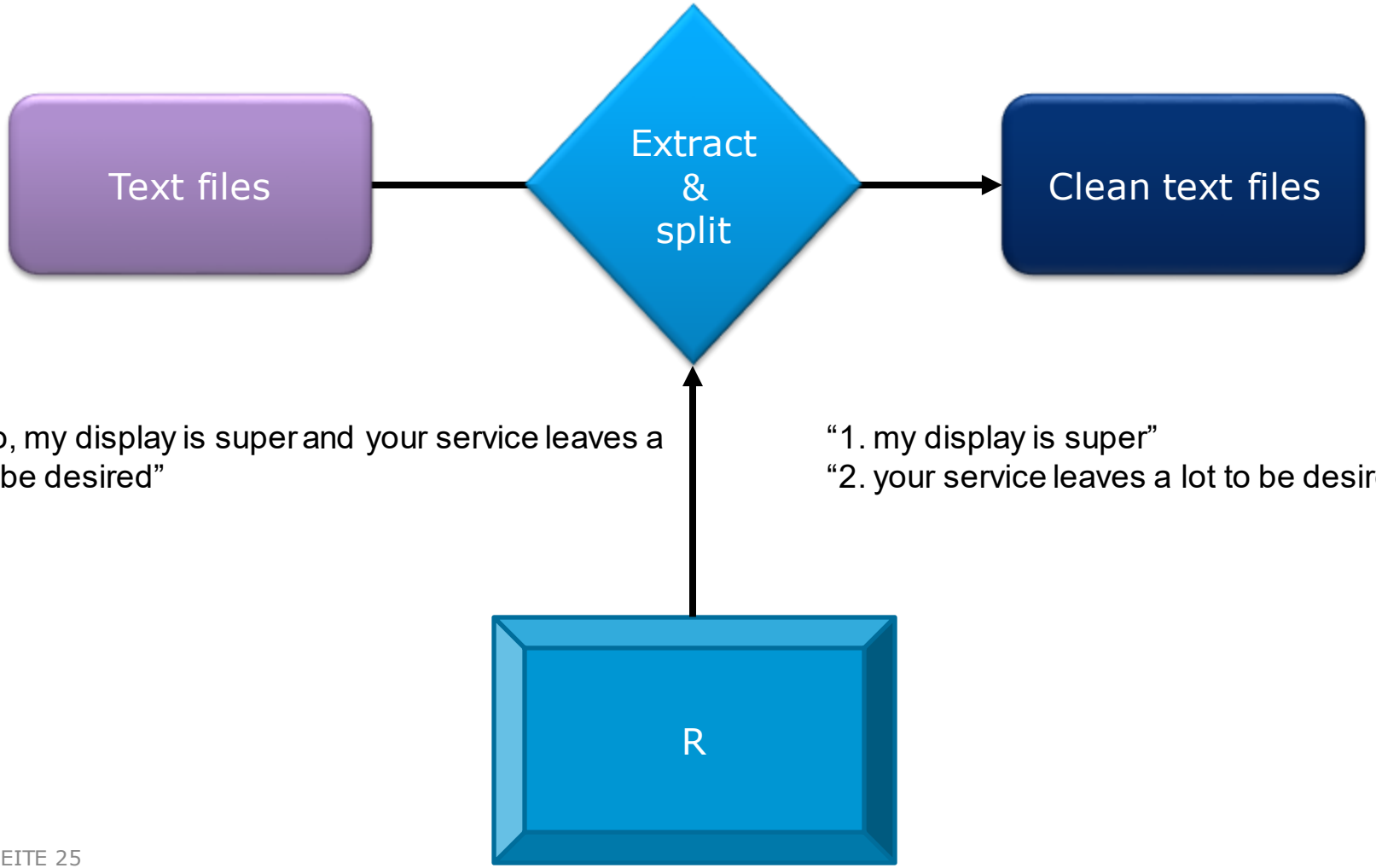
Case Study: Reporting



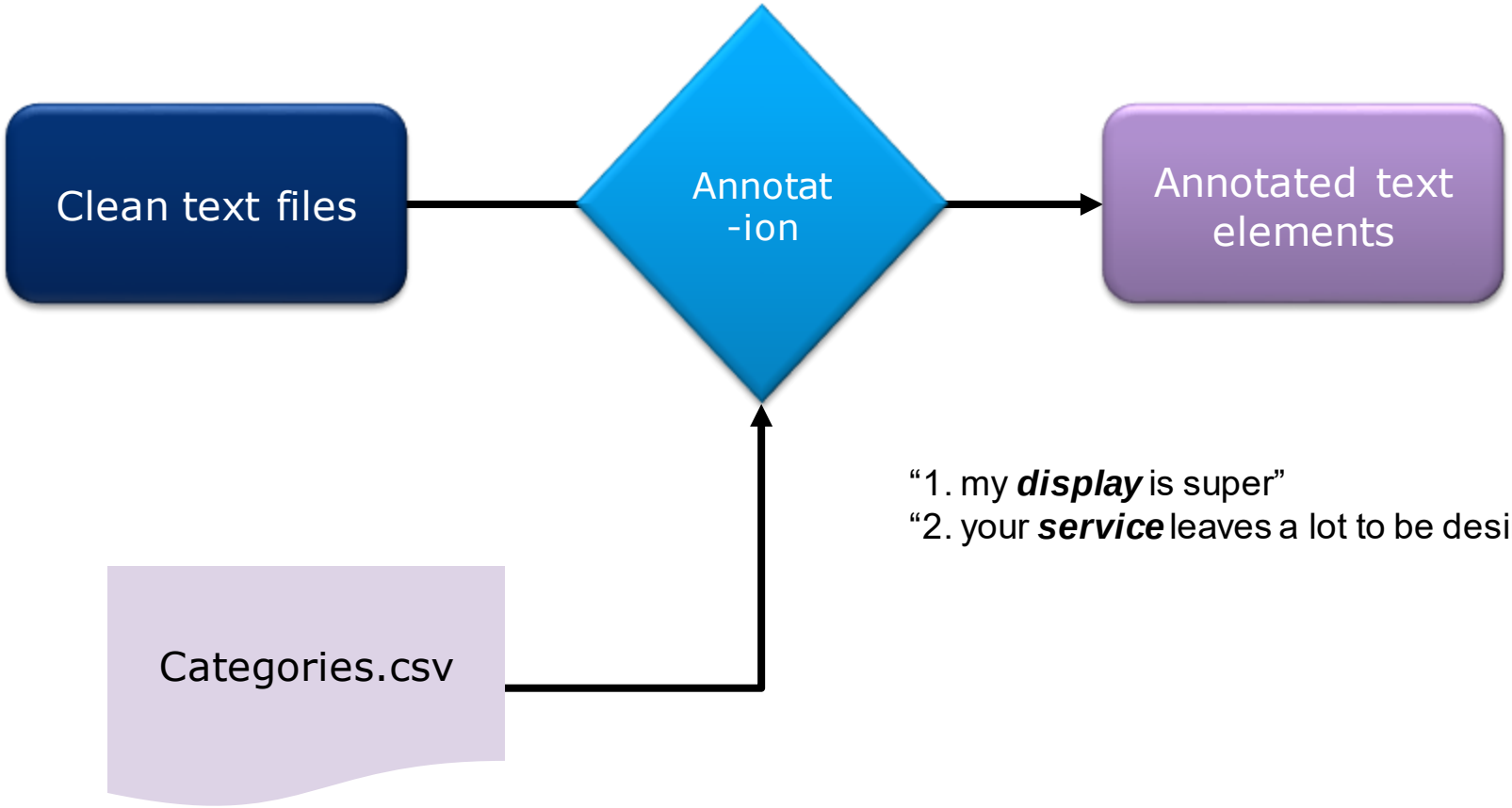
Case Study: Voice data analysis



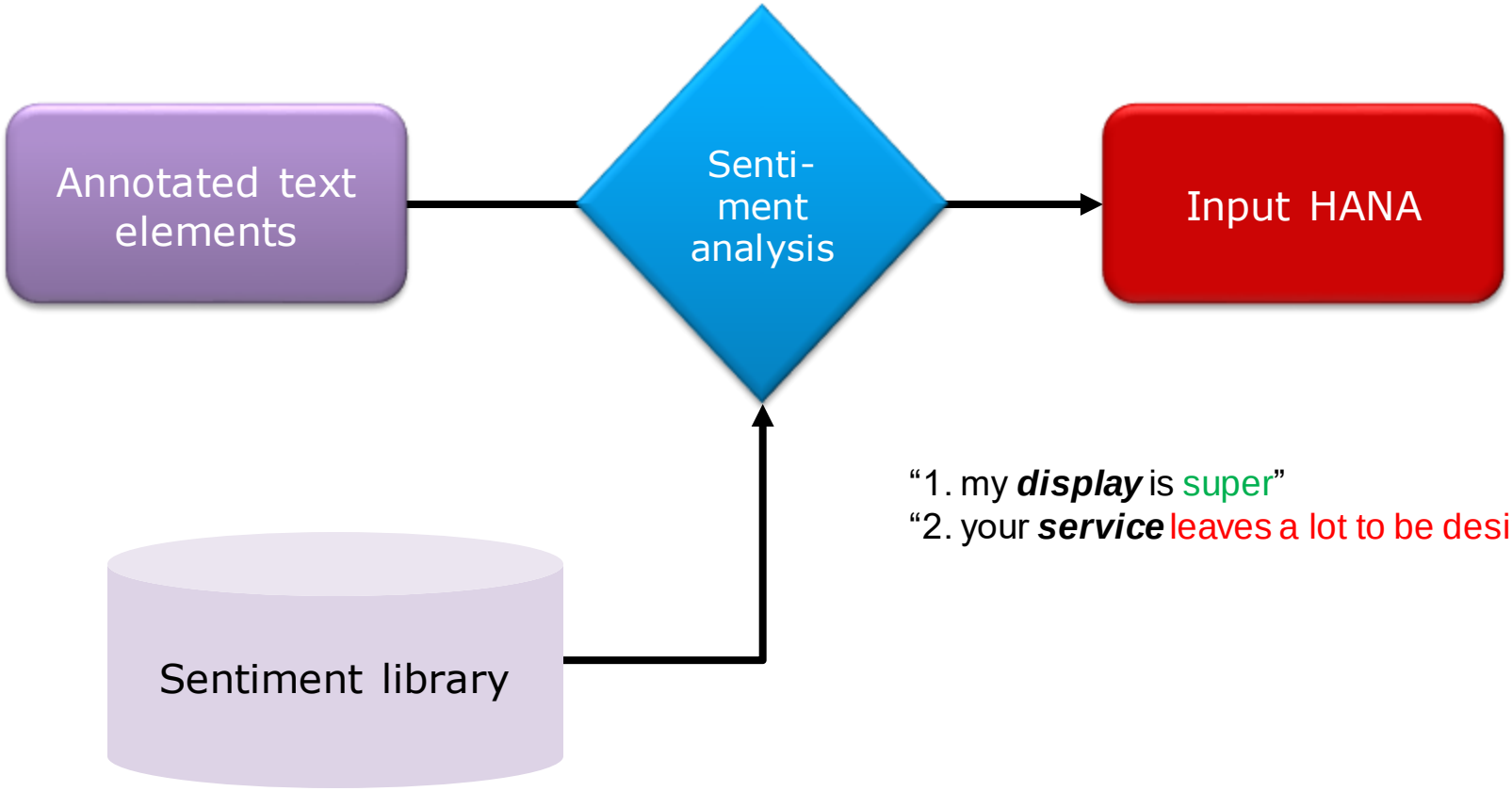
Case Study: Voice data analysis



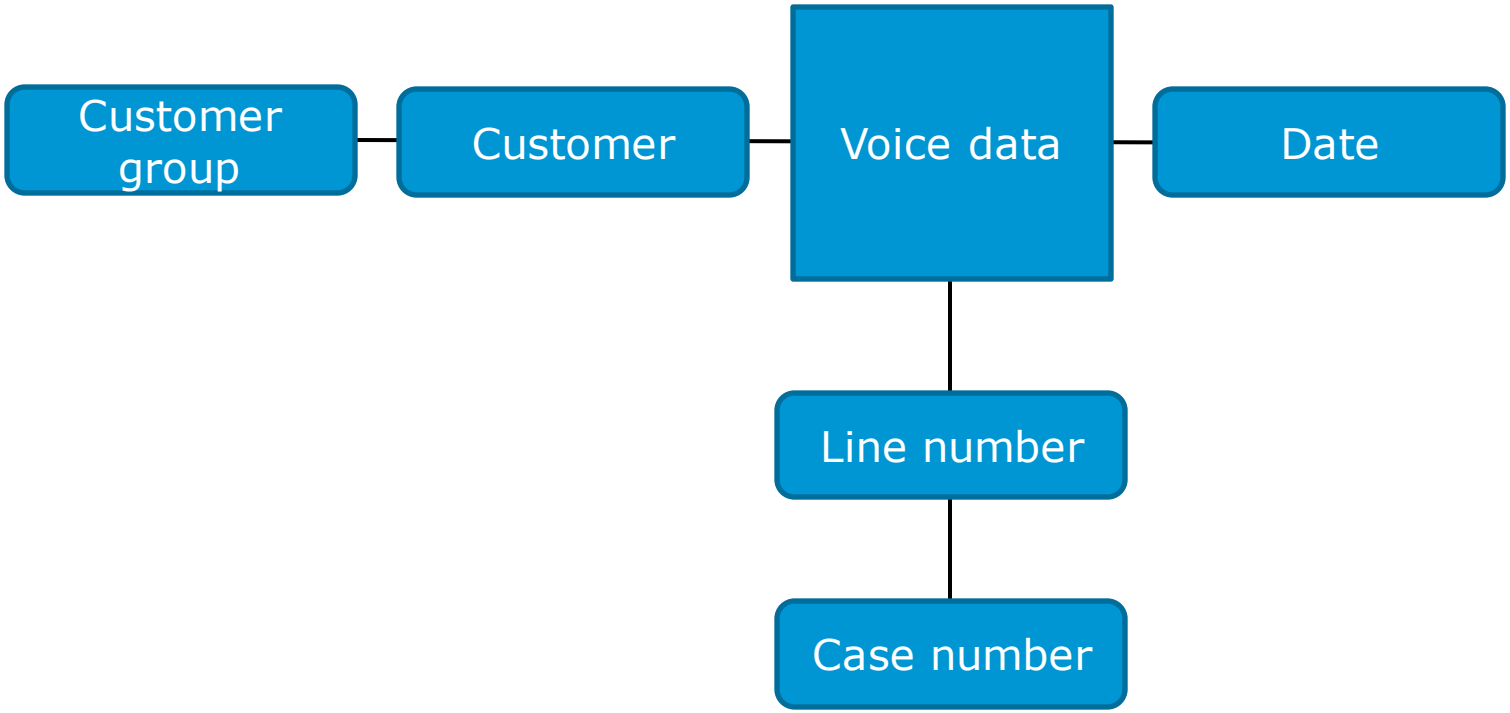
Case Study: Voice data analysis



Case Study: Voice data analysis



Case Study: Model voice data



Case Study: Integrated model