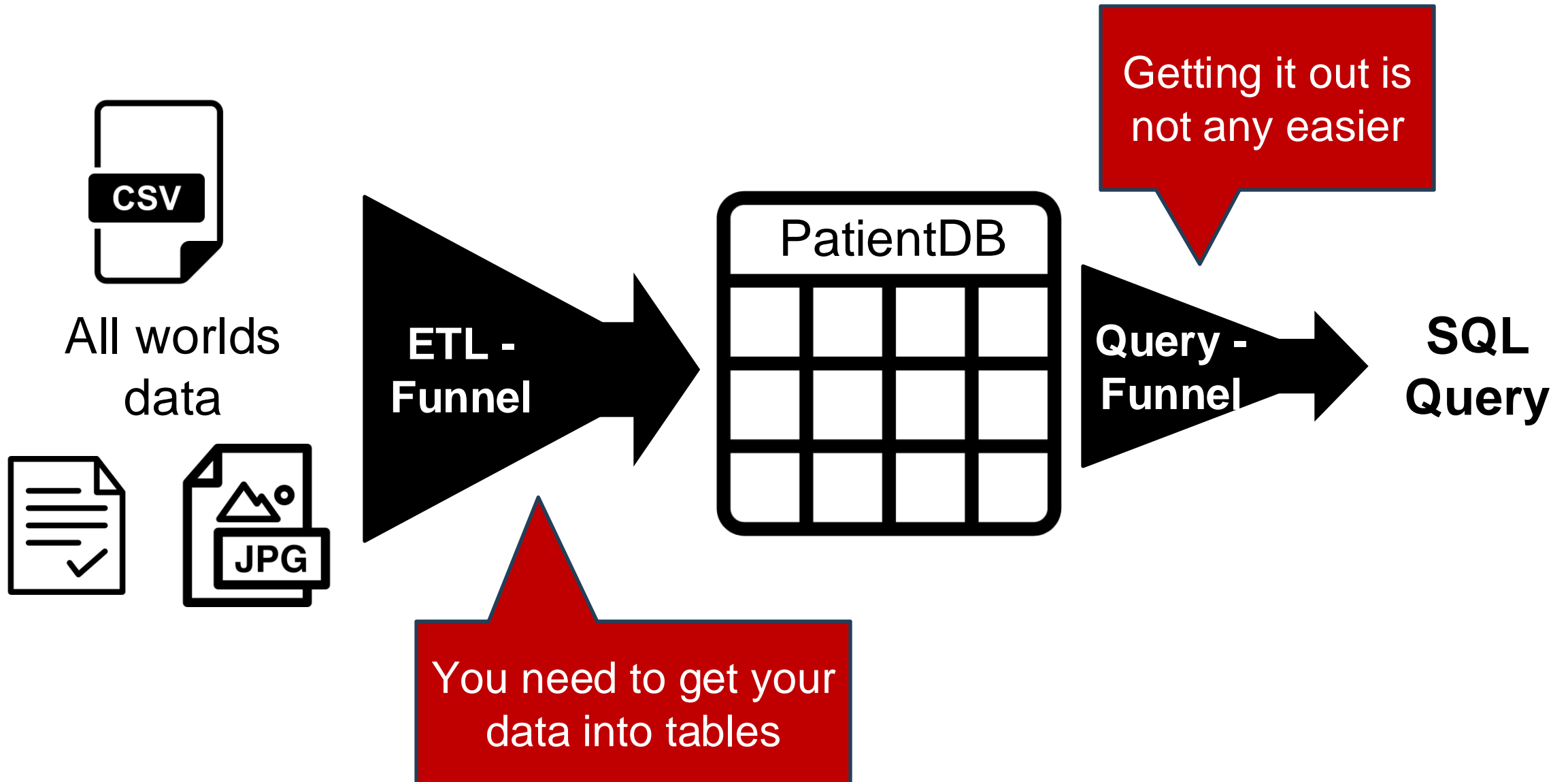


The Relational Model is dead.
Long live the Relational Model!?

THE
REALIATIONAL
MODEL

Carsten Binnig
LLM & DB Panel, HPTS

Rel. DBMSs limit the Use of Data



Let us reimagine Data Management!

Patients (table)		
name	age	
Alice	42	
Bob	23	1 week

LLMs are the “wrong” way:
slow, only (very) simple
queries, black-box,

Sloppy, Naturalistic
Queries

Examinations (text)

Alice was diagnosed with
Covid ...

Scans (images)

Alice

Bob



What is the
average duration of
the stay of patients
with **Covid?**

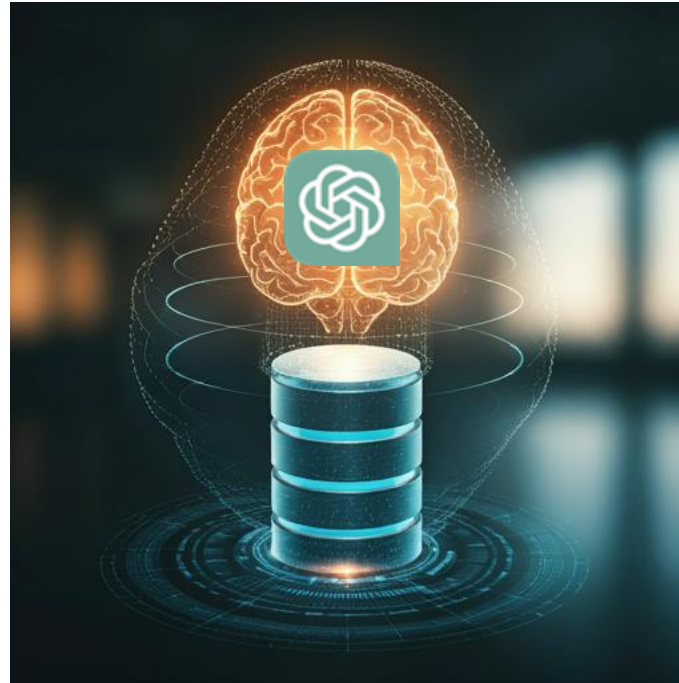


Multimodal Data,
No ETL'ing

Our Vision: LLM-augmented DBMSs

[CIDR'24, SIGMOD'24,
VLDB'25]

Use a relational DBMS at the core
and augment with LLMs for “smartness”



Our Vision: LLM-augmented DBMSs

[CIDR'24, SIGMOD'24, VLDB'25]

- 👍 **Efficient execution** outside LLM
- 👍 **Optimizations** like filter-pushdown
- 👍 Users **can inspect** the query plan

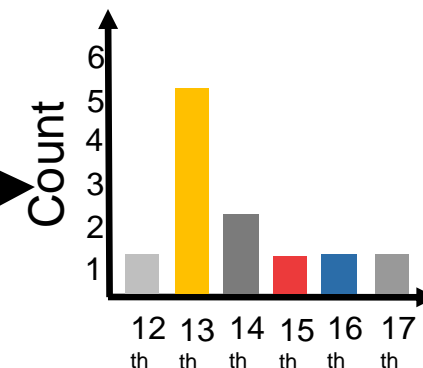
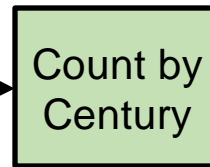
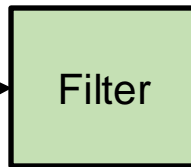
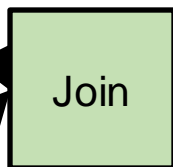
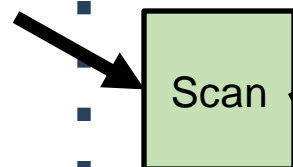
User Query

Plot number of painting depicting Madonna and Child for each Century

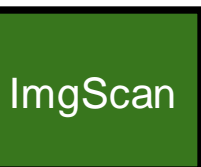
LLM-based Query Planning

Relational Engine
(in the inside)

metadata.csv
name, year, ..., img_path
Madonna, 1889, ..., i1.png
Irises, 1480, ..., i2.png
...
Scream, 1893, ..., in.png



LLM-based Data Selection



LLM-based Operators

img	Madonna And Child?
i1.png	Y
i2.png	N

LLM-based Result Gen

A dark, atmospheric photograph of a gravestone. The stone is grey and has the words "THE RELATIONAL MODEL" engraved on it in a serif font. The stone is surrounded by colorful flowers, including a large pink and yellow one in the foreground. A golden sunburst is visible at the top of the image. The overall scene is dimly lit, suggesting a night or dusk setting.

To be remembered ...

1. The Relational Model is dead:

Rethink data management beyond tables & SQL!

2. Long live the Relational Model:

LLM-augmented DBMS - Relational from the inside,
but not (necessarily) from the outside