

# Data Cartography

## **XT26**

Maps for orienting organisations driven by data

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# Computing, Economics, Data Science

## Technology and Data Services

## Financial Services

... 90's

2000's

2010's

2020's...



UBS



NatWest  
Group



HARVARD  
UNIVERSITY



LONDON  
STOCK  
EXCHANGE



# The Data Illusion

## AI hype

Driving investment and budget decisions without a shared picture of the data landscape

## Data "House of Cards"

Demand, volume, risks, and regulation are growing faster than our ability to describe the system

## The Reification Fallacy

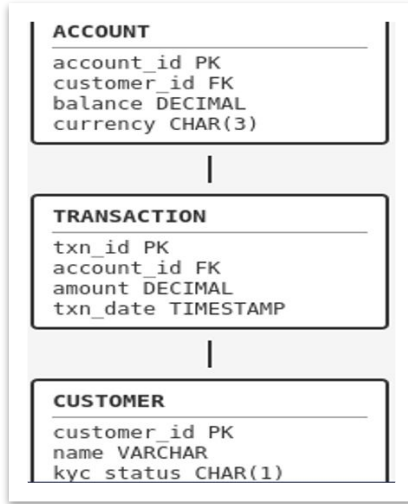
Inventories and catalogues try to replicate systems — they are not digital twins, they are snapshots of intent

# The Audience Problem

The same data domain, three representations. Only one is readable by everyone in the room.

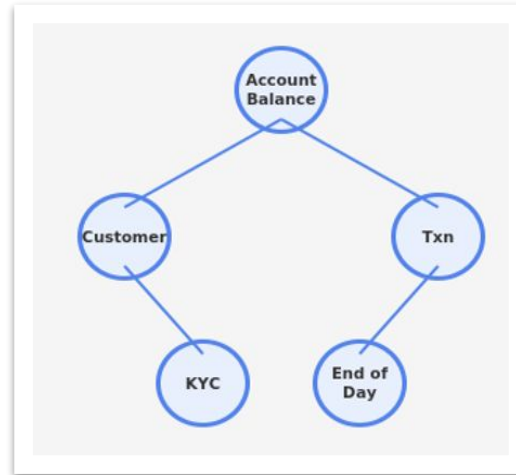
## Entity-relationship

Understood and used by a few



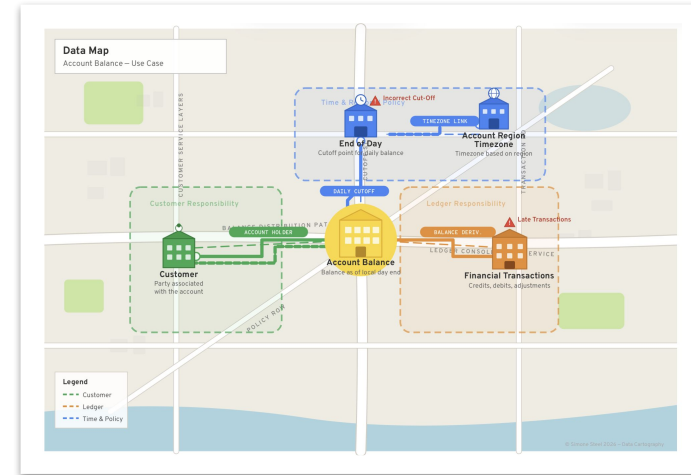
## Graphs

Understood and used by a few



## Maps

Understood and used by all

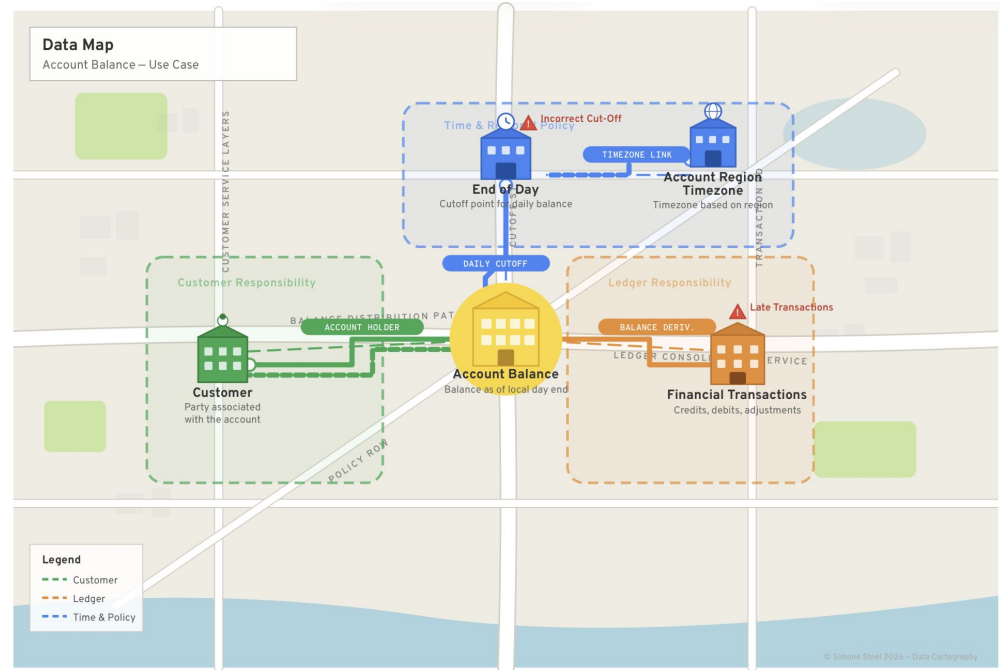


# A Lesson from Cartography

Maps are not terrain.  
But they let us navigate terrain we  
have never visited.

We are natural map readers. Since Google Maps entered the public domain in 2005, these digital conventions have become ubiquitous:

- Spatial awareness (relative position)
- Landmarks (components)
- Scale (level and scope of concern)
- Transport systems (connections)
- Heat map (service status)



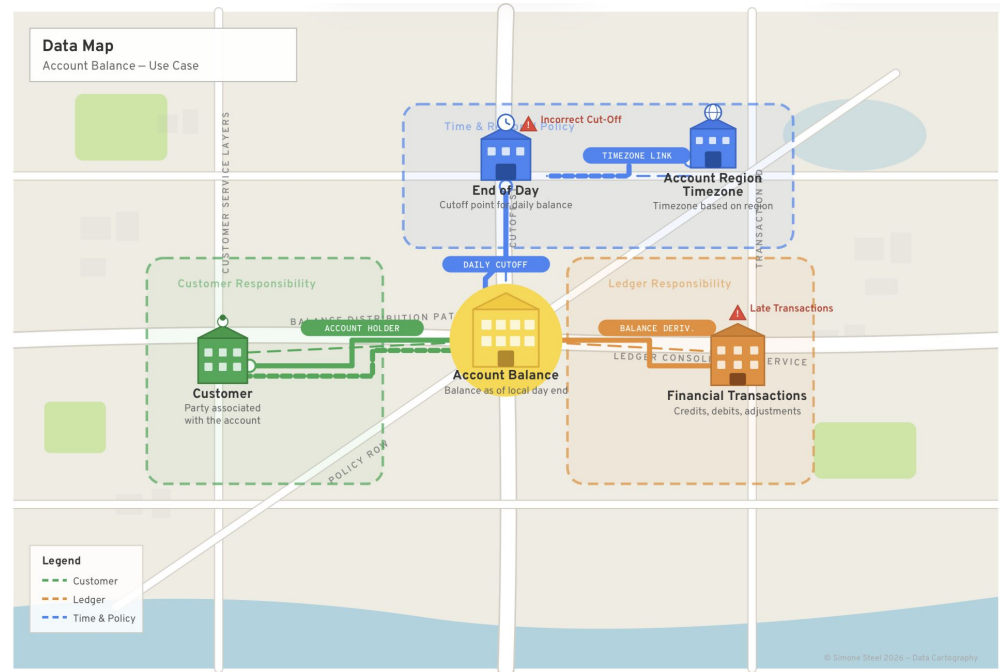
Data Cartography does not replace data modelling. It projects modelling knowledge into a language the organisation can navigate.

# Data Cartography is a visual grammar

*The practice of projecting complex, evolving data systems into navigable maps that reveal structure, stability, and change across domains.*

## Why? **Utility** of data with a shared map

- Quick **context** setting — "you are here"
- **Visualisation** of bottlenecks and business cases
- **Common mental model** — we all know famous landmarks
- **Scale** — from board meetings to daily process controls
- **Heat map** — weak links, legacy infrastructure, risk





# What Each Artefact Reveals

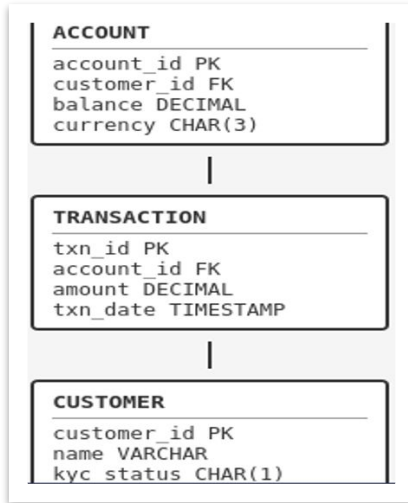
ER diagrams and graph models answer structural questions. Data Maps answer organisational ones.

Capability	ER Diagram	Graph Structure	Data Map
Data structure & schema	●	●	●
Relationships & cardinality	●	●	●
Data flow & dependencies	●	●	●
Ownership & responsibility zones	●	●	●
Cross-domain risk visibility	●	●	●
Business context & landmarks	●	●	●
Readable by non-technical executives	●	●	●
Supports regulatory demonstration	●	●	●
Machine-readable (RDF / JSON-LD)	●	●	●

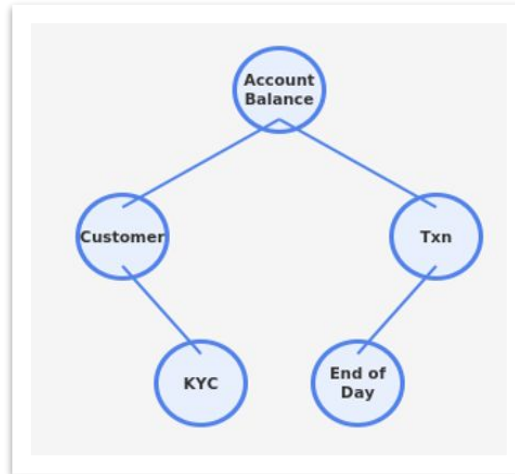
# The Same Question, Three Answers

“Who is responsible for maintaining account balance?”

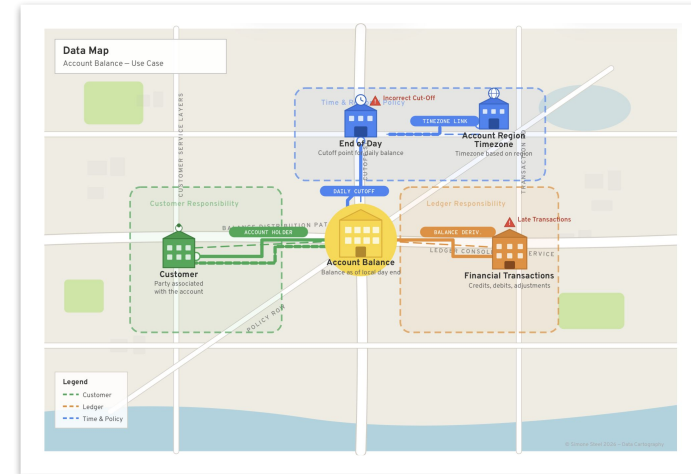
**Schema** can show you the tables



**A graph** can help with connections



**Maps** can show accountability



# The Budget Meeting

## COO — Customer onboarding

Customer zone (green boundary)

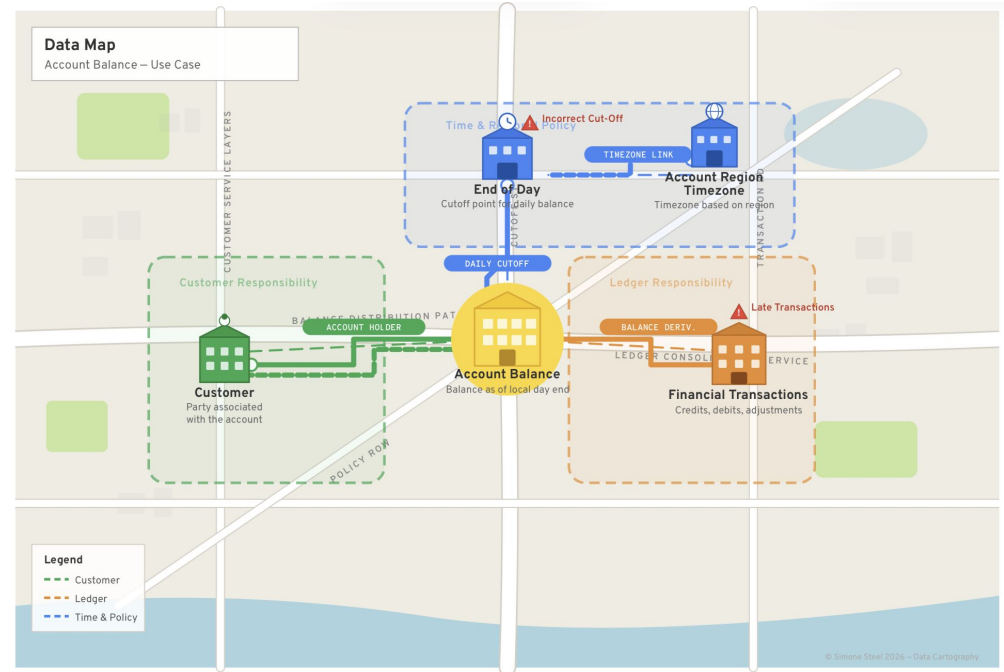
## CTO — End-of-life replacement

Daily snapshot cutoff (blue boundary)

## Head of Risk — Remediation

Late transactions & timezone misalignment

On separate slide decks, these look independent. On the Map, they converge: all three are changing systems that feed into Account Balance at the centre. The map reveals investment sequencing, over-investment in one zone, and cross-domain dependencies that no slide deck has ever shown.



# The Semantics Challenge

Data Cartography provides a shared visual language for navigating complexity. But it does not, by itself, resolve the deeper problem of semantics and meaning.

## Onboarding team

"**Customer**" = applicant progressing through KYC

## Ledger team

"**Customer**" = account holder with transaction history

## Regulator

"**Customer**" = legal entity with reporting obligations

The map shows that these teams share a data zone and that their responsibilities overlap — but reconciling what each means by the same word requires data governance, shared ontologies, and sustained cross-functional dialogue. Data Cartography makes the need for that dialogue visible. It does not replace it.

# First Steps

A Data Map does not require new technology. It requires courage to try a more humane approach to systems architecture: *The act of mapping reveals questions that years of inventories never surfaced.*

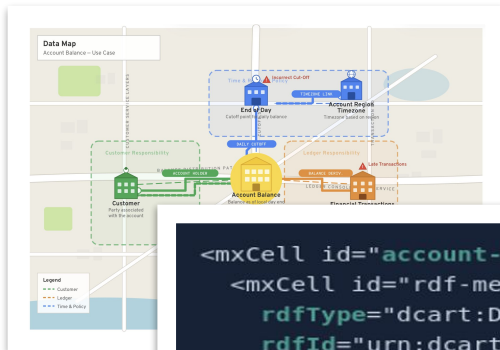
- 1 Choose a single, well-understood data domain
- 2 Identify the data zones — stable foundational entities
- 3 Place the landmarks — applications, processes, data stores
- 4 Draw the paths — connections and dependencies; this will reveal the next domain
- 5 Apply a single layer of organisational responsibility

# The Draw.io Bridge

One concept, three representations: visual for executives, editable for architects, machine-readable for systems. All linked.

## Data Map

Human-readable



## Draw.io XML

Editable by architects

```
<mxCell id="account-balance" value="Account Balance" style="shape=building;...">
<mxCell id="rdf-meta" value="" style="hidden">
  rdfType="dcard:DataLandmark"
  rdfId="urn:dcard:account-balance"
  rdfLabel="Account Balance"
</mxCell>
</mxCell>
```

## RDF Turtle

Machine-readable

```
@prefix dcard: <http://datacartography.org/ontology#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .

dcard:account-balance
  a dcard:DataLandmark ;
  rdfs:label "Account Balance" ;
  dcard:zone dcard:ledger-responsibility ;
  dcard:risk dcard:incorrect-cutoff ;
  dcard:dependsOn dcard:customer, dcard:financial-transactions .
```

# Data Cartography

The maps you already carry in your head — the informal, unwritten understanding of how your systems fit together — are the foundation.

Data Cartography gives them a grammar, a structure, and a shared surface where everyone in the room can finally point to the same place and say:

**"Here. This is where we need to invest first — and here is what needs to wait."**

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