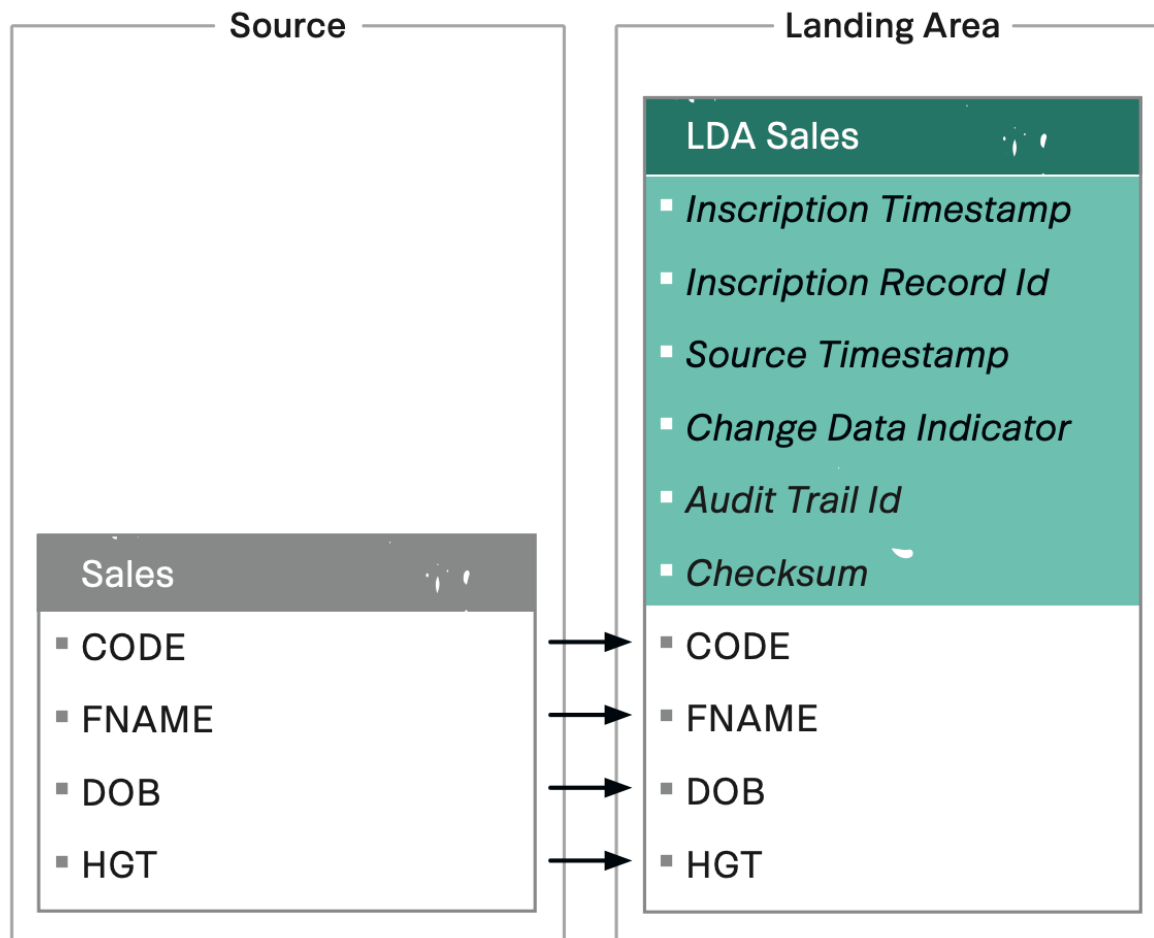


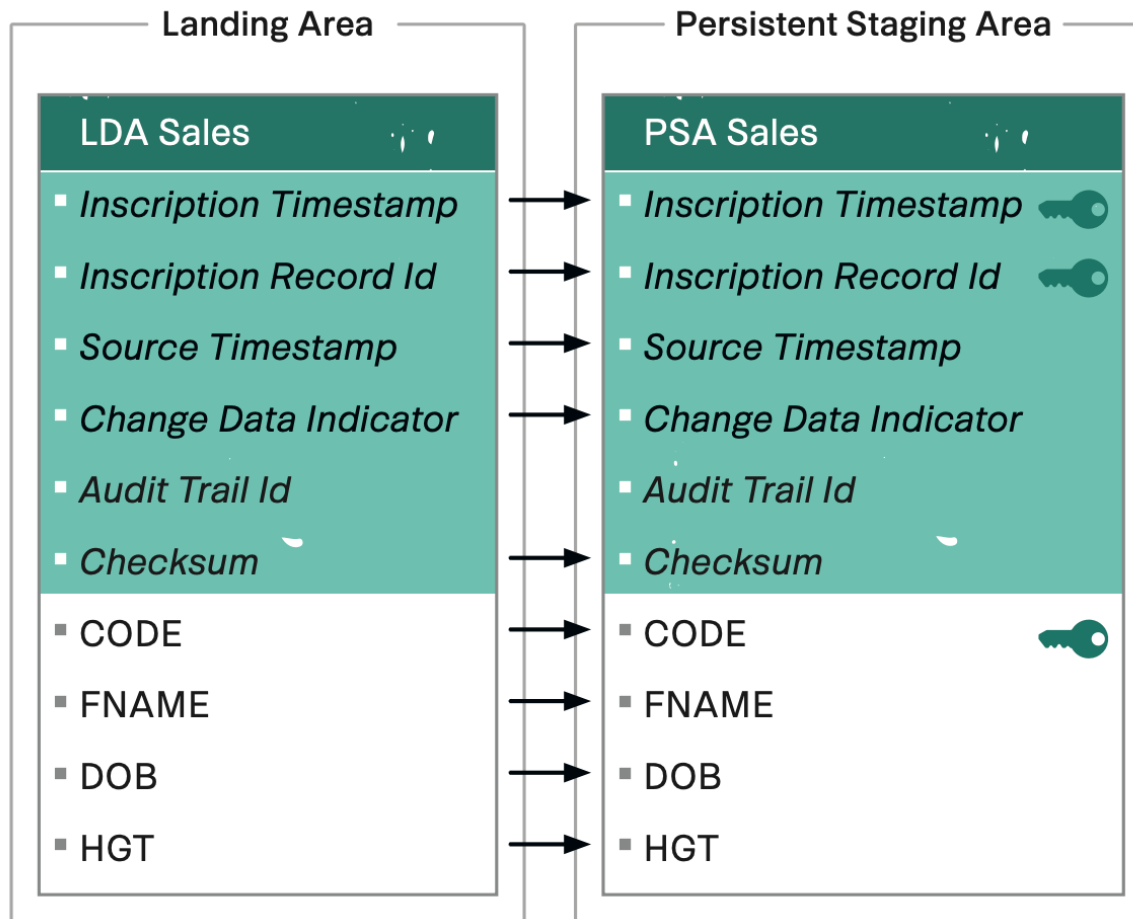
Bitemporalität als Grundprinzip

Data Engine
Thinking



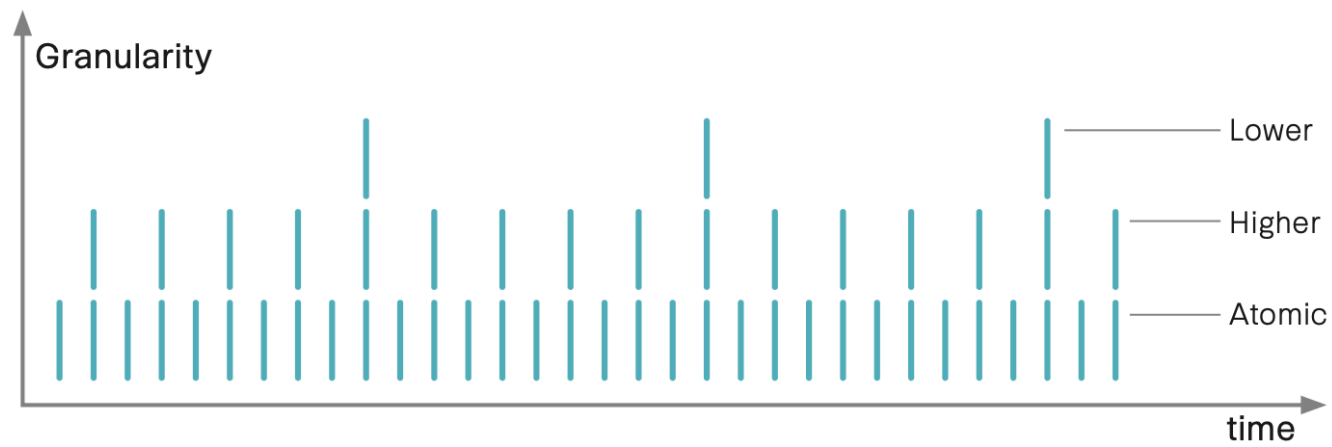


— Data Item Mapping

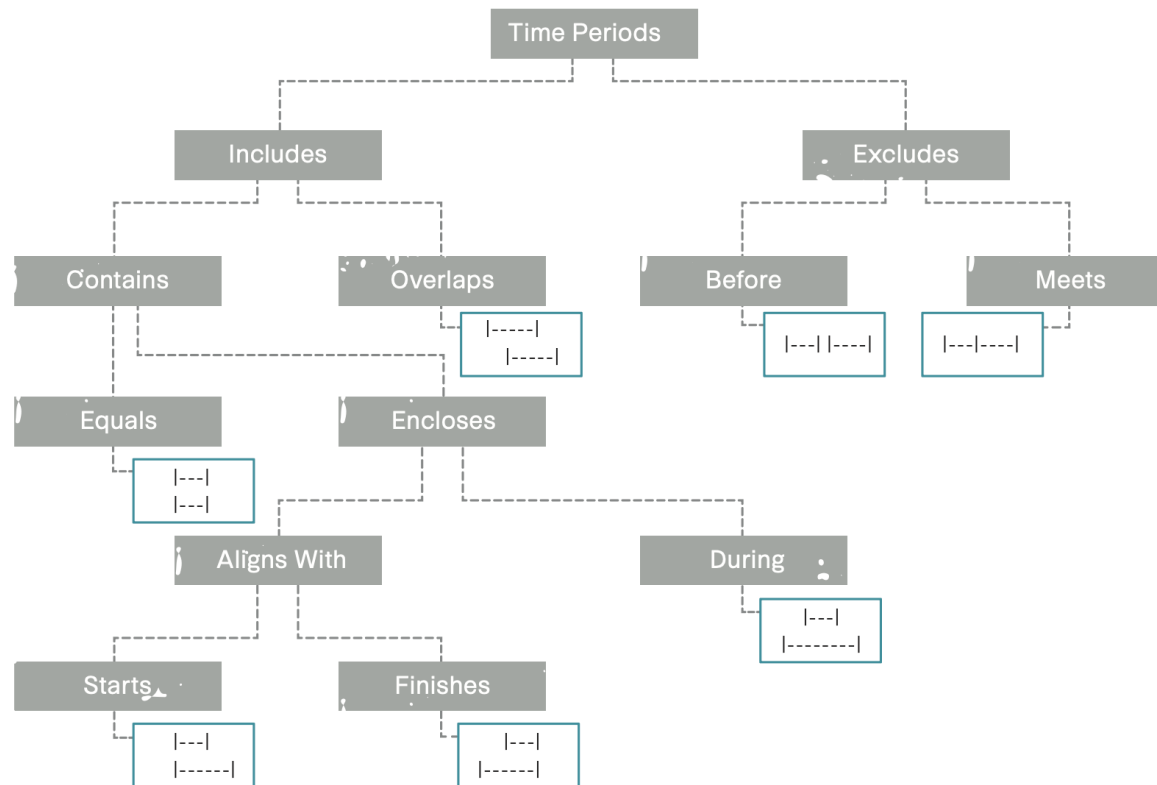


— Data Item Mapping

Clock ticks



The Allen Relationship



The de facto standard

Closed-Closed	T1 [Jan 2023 - Dec 2023] ; T2 [Jan 2024 - Dec 2024]
Closed-Open	T1 [Jan 2023 - Jan 2024[; T2 [Jan 2024 - Jan 2025[
Open-Closed	T1]Dec 2022 - Dec 2023] ; T2]Dec 2023 - Dec 2024]
Open-Open	T1]Dec 2022 - Jan 2024[; T2]Dec 2023 - Jan 2025[

Interpreting Closed-Closed time periods

PSA data object - clock tick granularity: **minute** - type: Closed-Closed

Surrogate Key 	First Name	Last Name	Department	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2015-06-05 10:31	2024-01-05 16:59
A01	Terence	Tindle	DMCE	2024-01-05 17:00	2024-12-21 17:18



Target data object - clock tick granularity: **month** - type: Closed-Closed

Surrogate Key 	First Name	Last Name	Department	Inscription From Timestamp	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2024-01-05 16:45	June 2015	January 2024
A01	Terence	Tindle	DMCE	2024-01-05 16:45	January 2024	December 2024

Interpreting Closed-Closed time periods

PSA data object – clock tick granularity: **day** – type: Closed-Closed

Surrogate Key 	First Name	Last Name	Department	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2015-06-05	2024-01-05
A01	Terence	Tindle	DMCE	2024-01-06	2024-12-21



Target data object – clock tick granularity: **minute** – type: Closed-Closed

Surrogate Key 	First Name	Last Name	Department	Inscription From Timestamp	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2024-01-05 16:45	2015-06-05 00:00	2024-01-05 00:00
A01	Terence	Tindle	DMCE	2024-01-05 16:45	2024-01-06 00:00	2024-12-21 00:00

Switching from Closed-Closed to Closed-Open

PSA data object – clock tick granularity: **day** – type: Closed-**Closed**

Surrogate Key 	First Name	Last Name	Department	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2015-06-05	2024-01-05
A01	Terence	Tindle	DMCE	2024-01-06	2024-12-21



Intermediate data set – Change notation : **day** – type: Closed-**Closed** -> Closed-**Open**

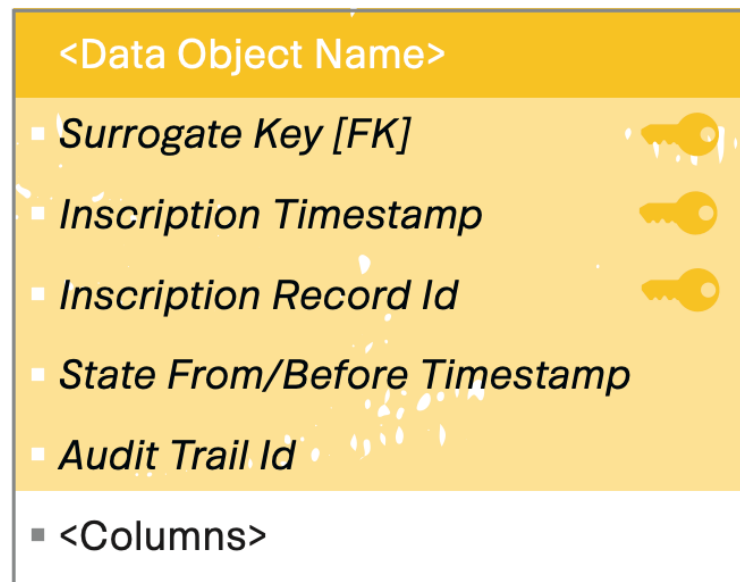
Surrogate Key 	First Name	Last Name	Department	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2015-06-05	2024-01-05 2024-01-06
A01	Terence	Tindle	DMCE	2024-01-06	2024-12-21



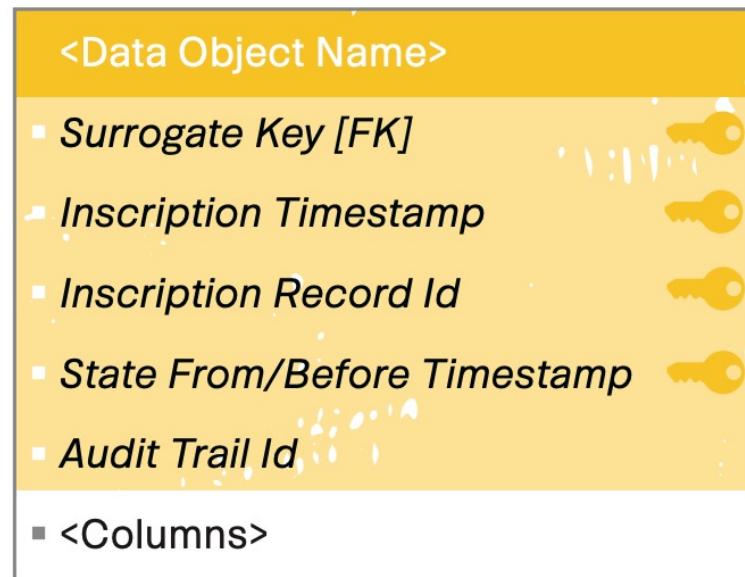
Target data object – clock tick granularity: **minute** – type: Closed-**Open**

Surrogate Key 	First Name	Last Name	Department	Inscription From Timestamp	State From Timestamp	State To Timestamp
A01	Terence	Tindle	Controlling	2024-01-05 16:45	2015-06-05 00:00	2024-01-06 00:00
A01	Terence	Tindle	DMCE	2024-01-05 16:45	2024-01-06 00:00	2024-12-21 00:00

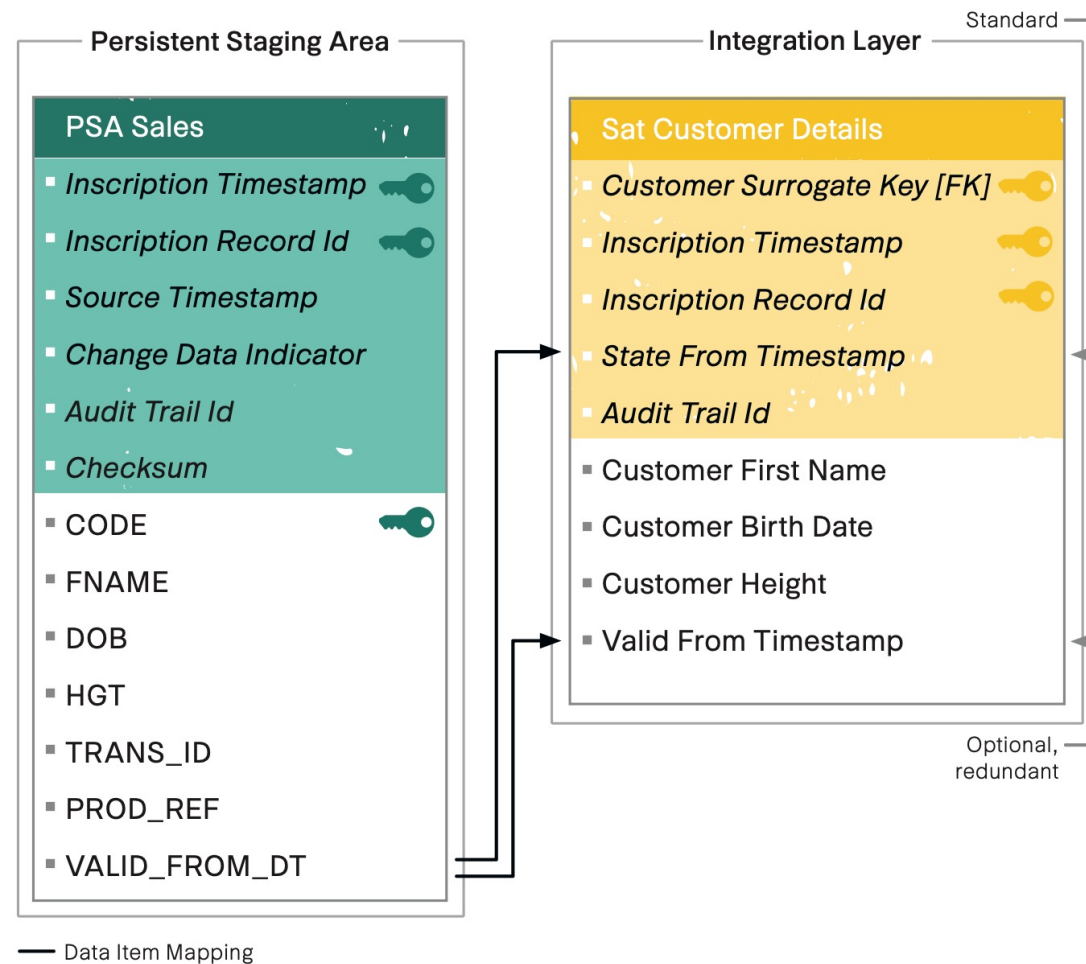
Data object structure - unitemporal



Data object structure - bitemporal



Mapping



Incomplete time periods

PSA data object - Exchange Rate

Base Currency	Target Currency	Inscription Timestamp	Valid From	Exchange Rate
AUD	EUR	2024-07-25	2024-07-23	1.35
AUD	EUR	2024-07-25	2024-07-24	1.278
AUD	EUR	2024-07-25	2024-07-25	1.3



Intermediate data set - Add missing timestamp

Base Currency	Target Currency	Inscription Timestamp	Exchange Rate	State From Timestamp	State Before Timestamp
AUD	EUR	2024-07-25	1.35	2024-07-23	2024-07-24
AUD	EUR	2024-07-25	1.278	2024-07-24	2024-07-25
AUD	EUR	2024-07-25	1.3	2024-07-25	9999-12-31

Interpretation

PSA data object - Exchange Rate

Base Currency	Target Currency	Inscription Timestamp	Valid From	Exchange Rate
AUD	EUR	2024-07-25	2024-07-23	1.35
AUD	EUR	2024-07-25	2024-07-24	1.278
AUD	EUR	2024-07-25	2024-07-25	1.3
AUD	EUR	2024-07-26	2024-07-22	1.3

Interpretation 2

Interpretation 1

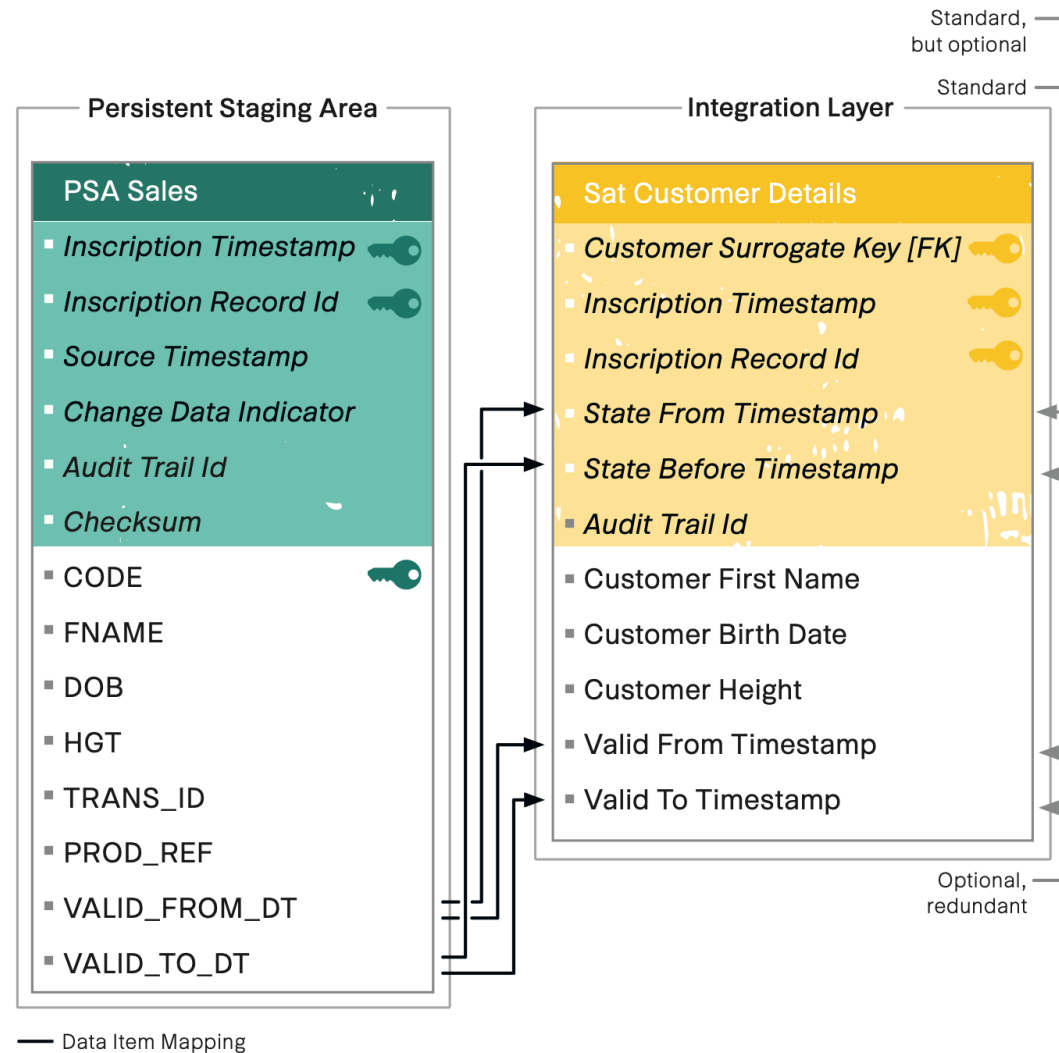
Intermediate data set 1 - Backdated missing record 'overwrites'

Base Currency	Target Currency	Inscription Timestamp	Exchange Rate	State From Timestamp	State Before Timestamp
AUD	EUR	2024-07-25	1.35	2024-07-23	2024-07-24
AUD	EUR	2024-07-25	1.278	2024-07-24	2024-07-25
AUD	EUR	2024-07-25	1.3	2024-07-25	9999-12-31
AUD	EUR	2024-07-26	1.3	2024-07-22	9999-12-31

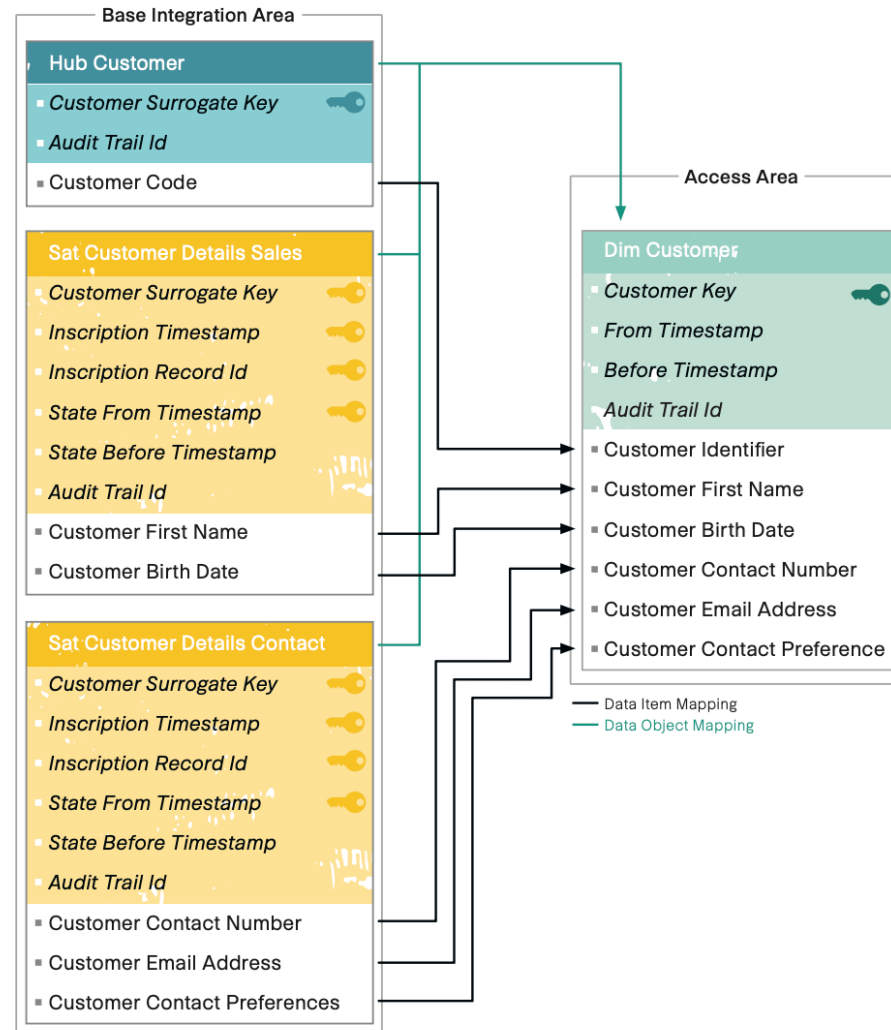
Intermediate data set 2 - Backdated missing record 'inherits'

Base Currency	Target Currency	Inscription Timestamp	Exchange Rate	State From Timestamp	State Before Timestamp
AUD	EUR	2024-07-26	1.3	2024-07-22	2024-07-23
AUD	EUR	2024-07-25	1.35	2024-07-23	2024-07-24
AUD	EUR	2024-07-25	1.278	2024-07-24	2024-07-25
AUD	EUR	2024-07-25	1.3	2024-07-25	9999-12-31

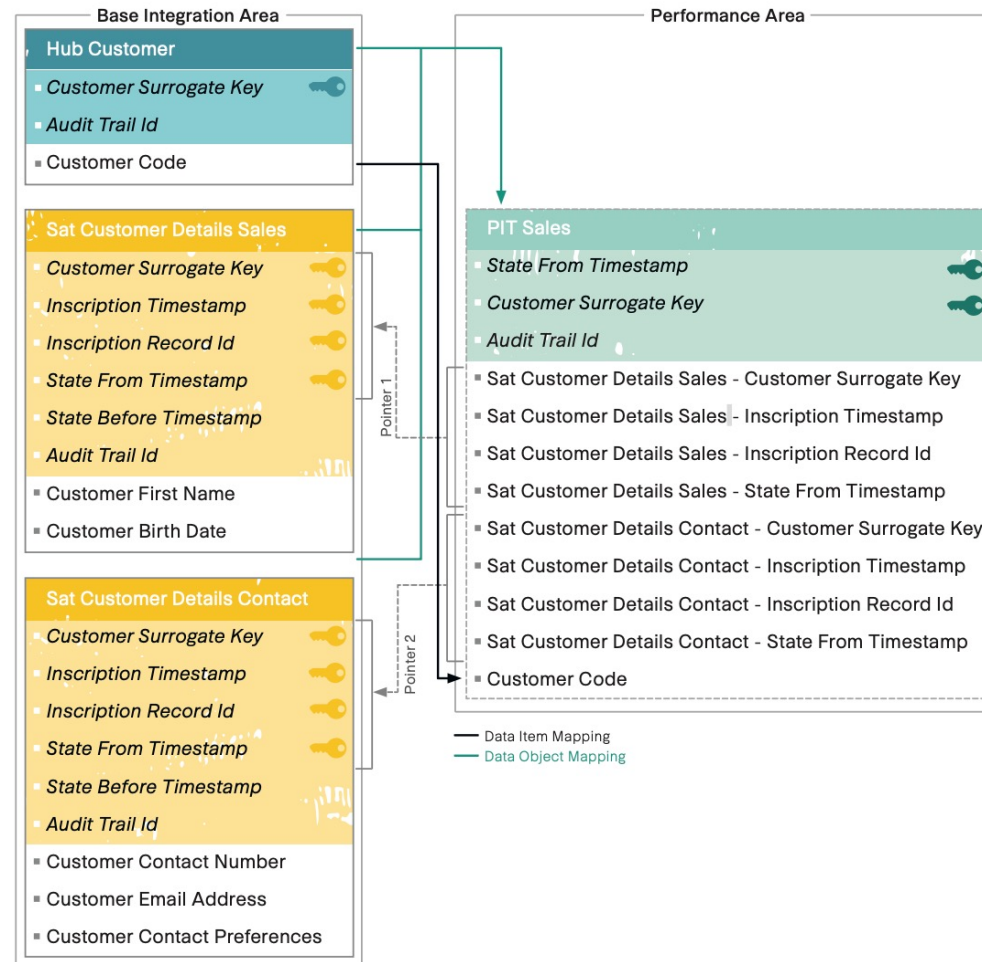
Mapping

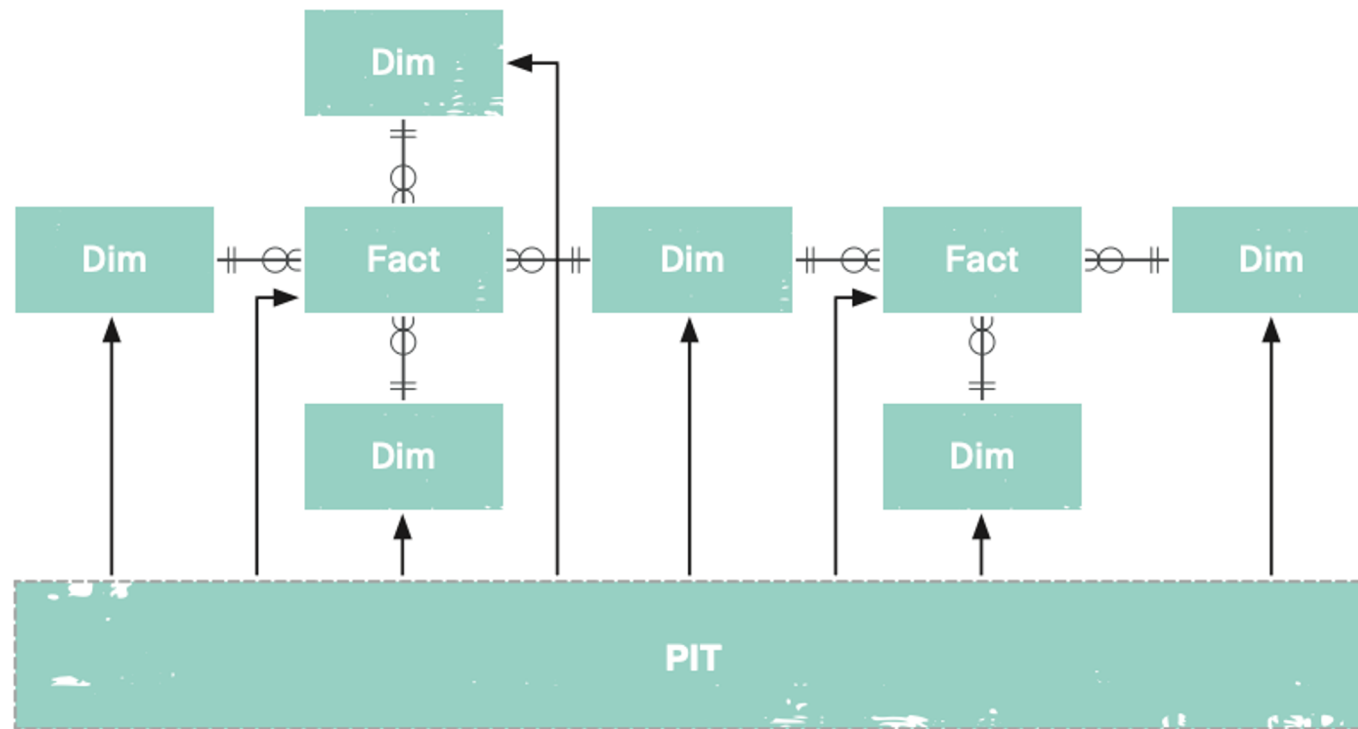


Dimension



PIT



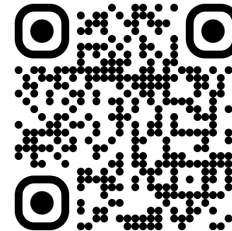


The Book

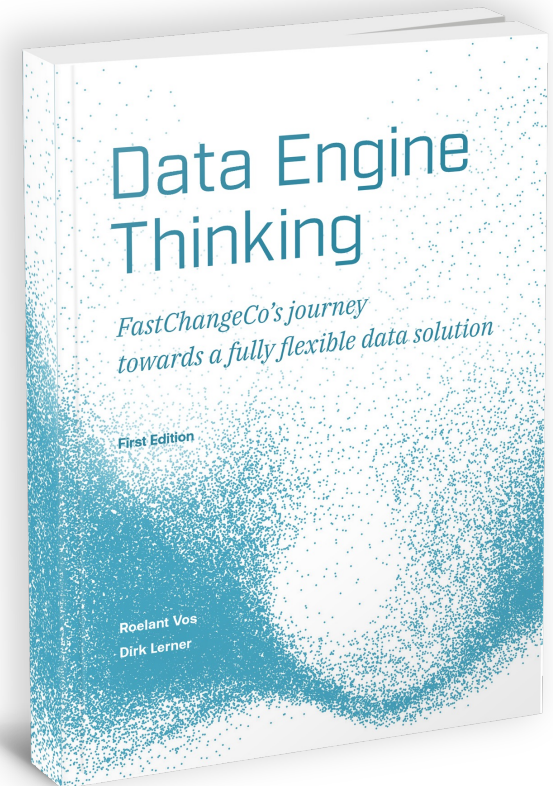
Data is evidence on past activity, events that are frozen in time for us to uncover and analyze. Without understanding the context of how it is created, data is simply 'stuff'.

Data Engine Thinking covers the end-to-end methodology to deliver a data solution that is truly designed to adapt to progressive understanding - and ultimately meet the business' needs.

- Design and implement a solution that is designed for change
- Solve real-world problems encountered when working with data
- Fully automate your delivery



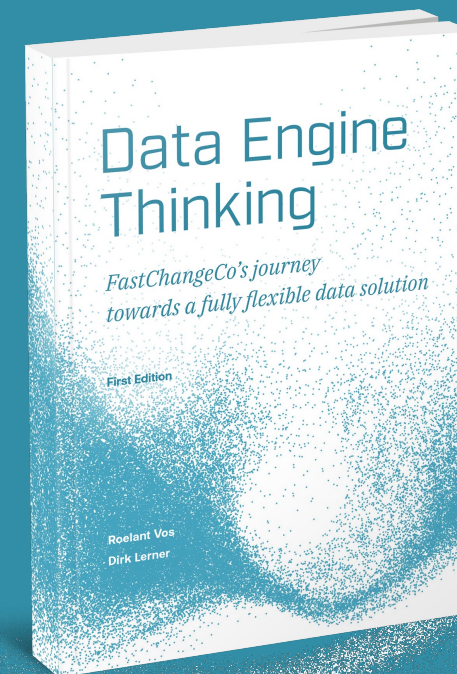
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