Atlas Platform

Design Principles

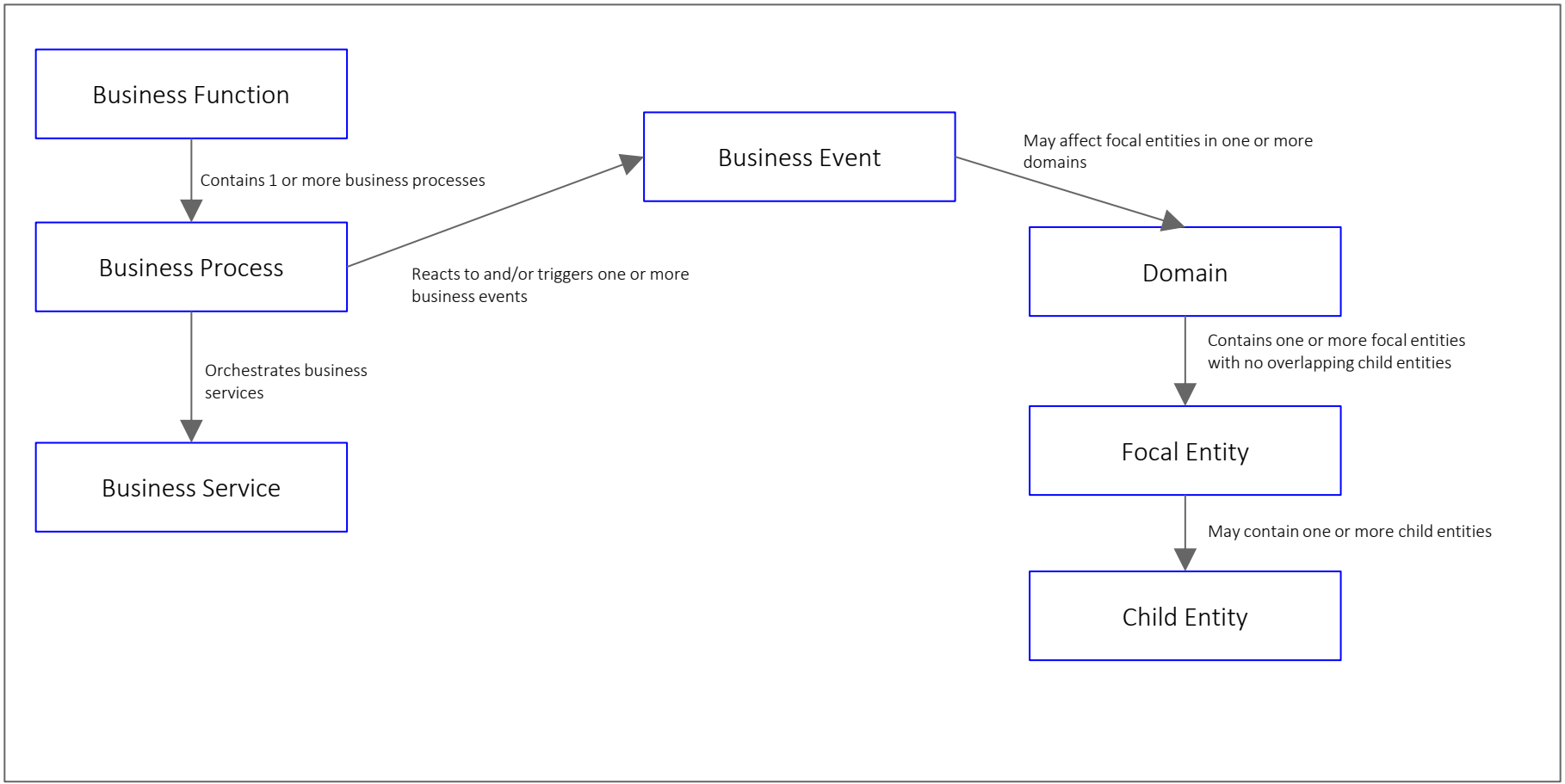
What is Atlas Model?

The model maps directly onto the six questions that are relevant in any ***data processing pipeline***:

1. **What results are calculated?** Answered via state machines, triggered by business events
2. **Where in event time are results calculated?** Answered via event-time windowing.
3. **When in processing time are results materialized?** Answered via business process, states and current Impact.
4. **How do refinements of results relate?** Answered via accumulation modes (live mode, bucketing mode etc)
5. **What causes changes in state of a business entity?** Answered by business event impact
6. **How did a business object look like before and after an event impact?** Answered by temporal snapshots.

(Note no destructive updates or deletes)

Business Functions, Process, Domains and Events



Stores and Types of Stores

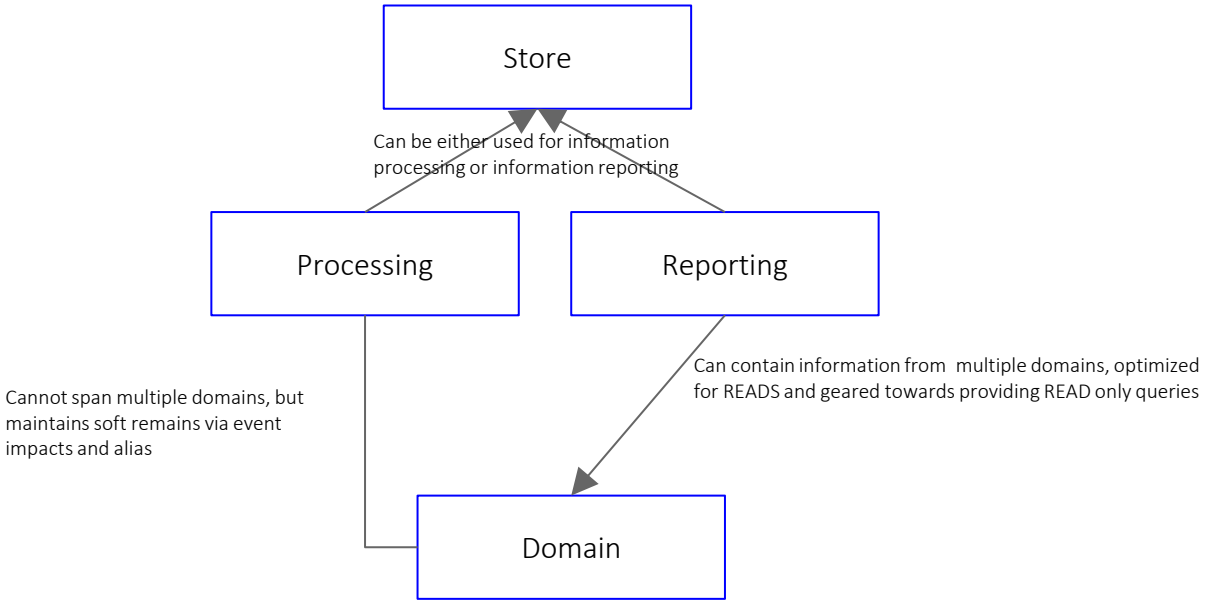
Store - a logical container of information. (Could be in-memory or physical)

Can only be accessed via a DAL (Data Access Layer)

Processing Store - contains domain information that is needed by business processing services.
Highly optimized for WRITES and point queries as needed by business services

Reporting Store - contains information from one or more domains as needed.

Highly optimized for serving READ only queries. Can be as simple providing customized views to underlying transactional data or as complex as a data warehouse.



Business Function

A business function represents high level business tasks associated with a specific goal. A business function may encapsulate other business functions.

E.g. 1) Deal Structure/Instrument Setup

2) Order Entry, Trade Capture

3) Trade lifecycle management - example of business functions that encapsulates other business functions such as (Trade Booking, Confirmations, Allocation Processing, Settlement Processing etc)

A business process represents formal definitions of tasks executed via business services in a deterministic manner.

I. A business process orchestrates business services using a state machine whose transitions are triggered via events and conditions.

II. A business process may contain one or more sub-processes.

Business Service

A business service provides a set of available operations from the perspective of interfacing client layers. It encapsulates the business logic, controlling transactions and coordinating responses in the implementation of its operations.

I. A business service may use other business services (such as Reference data service, Core Integration service.)

II. A business services uses other core/common libraries for caching, logging, metrics, DAL, ID generation, as defined with Atlas infrastructure.

III. All business services in ATLAS will be managed for robustness, security etc.

Business Event

A business event represents real world events that business participants can associate with.

I. A business event is immutable and its payload carries the minimal set of information needed to perform the intended action of the user.

I. In ATLAS, business events acts as intersection points between domains.
E.g. The payload of a new Trade event may contain aliases names to a Split as a cross reference.

A business domain contains versioned data, defined relationships and records all business event impacts on its entities.

I. Any business domain in ATLAS contains a focal entity and/or child entities that are impacted by registered events.

I. A business domain is the golden source of its native focal entity.

Focal Entity

A focal entity is the focal point of a particular domain. The management of this entity happens within its parent domain. Other domains can refer to/ or publish events that can affect a focal entity in another domain.

A focal entity is always inserted or updated (temporal fields only) **but never deleted.**

Questions that can be asked

1) What is the most recent version snapshot of the focal entity?
2) Which events impacted a focal entity and when?
3) What was the focal entity snapshot as at *datetime*?

A System of Record is the authoritative source of a focal entity.

Any changes to a focal entity within a system of record can only be *carried forward* via well defined business events.

I. All changes to a focal entity within a System of record are recorded as immutable changes.

II. There are no as-of corrections to a focal entity within a System of Record.

III. System of records are temporal

A System of Reference refers to focal entities that are created and managed in another system.

A system of reference may get to know about changes to a focal entity some time after it has already occurred.

I. Enables other systems to get access to that transaction some time after it has been created.
II. There can be as-of corrections to a focal entity within a System of Reference
III. Requires bi-temporality

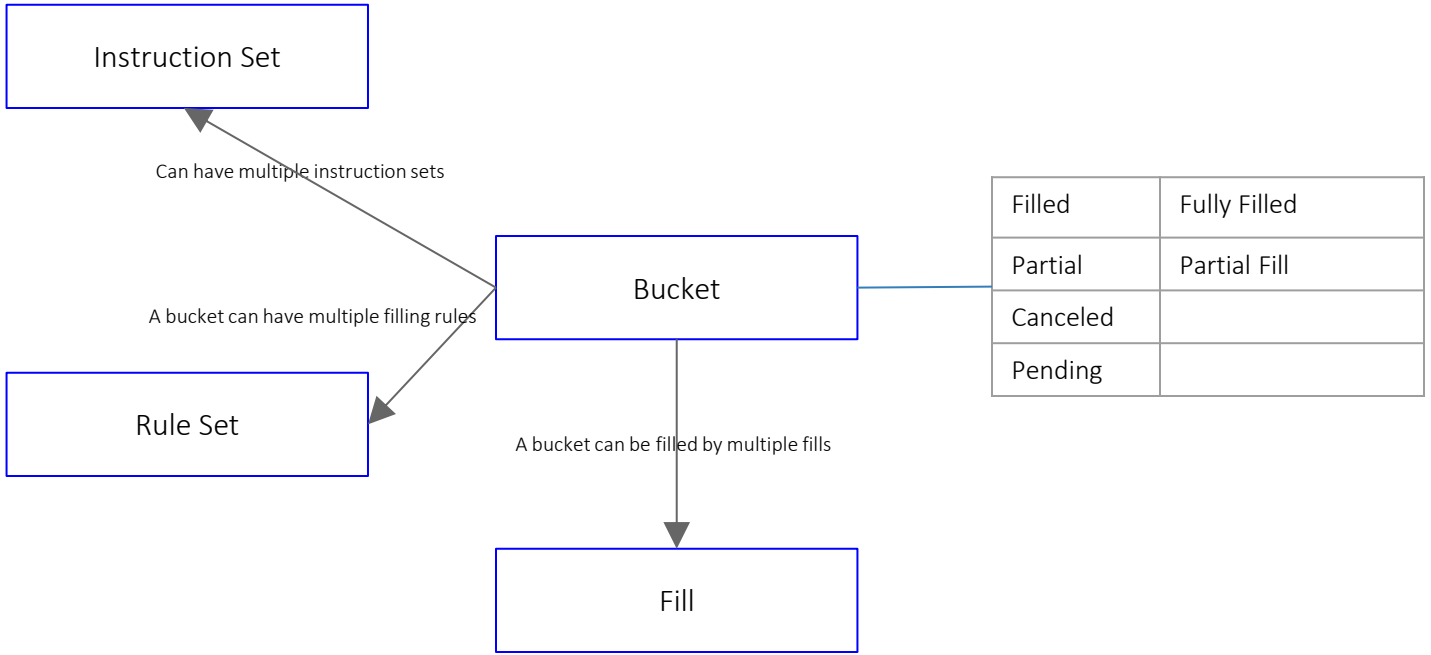
Separation of Concerns

- An Atlas domain is responsible for the lifecycle management of its focal entity.

- All lifecycle state changes to a focal entity can only be triggered by a business event that the domain has registered for.

- Any relevant data/attributes of entities can only be populated via event payloads.

Design Pattern



Filled	Fully Filled
Partial	Partial Fill
Canceled	
Pending	

Types of Stores

There are two types of stores

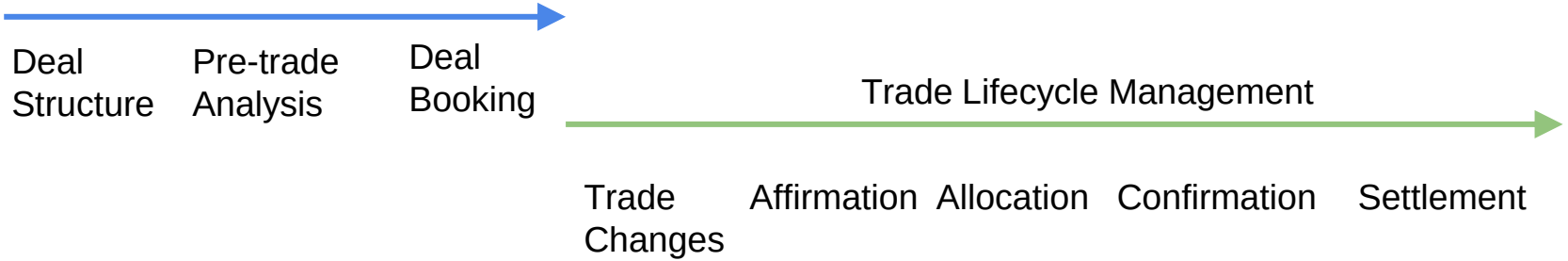
I. Operational Stores - deals with day-to-day management of focal entities
II. Reporting stores - deals with reporting on focal entities across domains

Types of Stores

System of Record	System of Reference	Both
Mainly deals with transaction processing.	Deals with reporting on transactions (operational) or providing views across multiple domains.	Contains data managed by Atlas intermingled with data imported from other external sources
Needs system time only		Needs Bi-temporality
Order, Trade, Allocation etc		Positions, PnL, Subedger

Business Functions

Shows business functions encapsulating other sub-functions



Deal Structure

- OTC Determine and agree upon contractual terms
- ISDA Master Agreement
- Setup all reference data such as Index curves that is needed for the deal

Deal Booking/ Capture

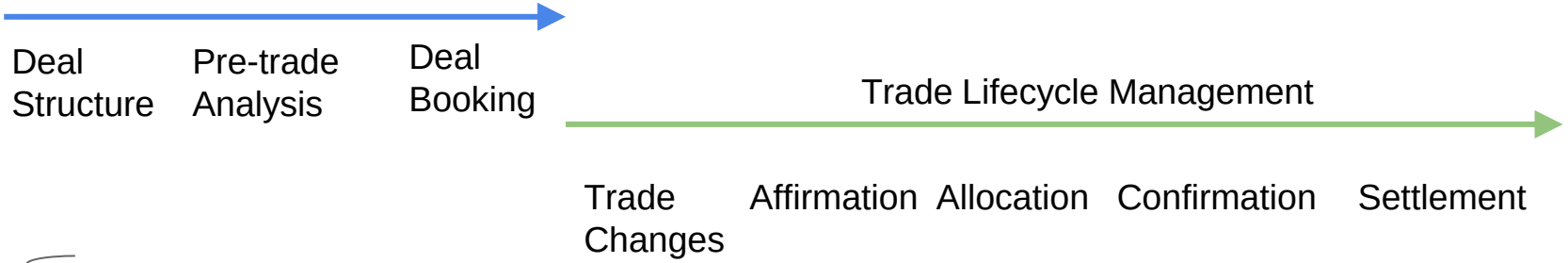
- Validate - Capture all parameter values of a deal
- Enrichment
- Approvals / Compliance Checks

Trade Lifecycle

- Manage changes to the deal throughout its full term. (Amend, Upsize, Assign, Novate etc
- Adjust obligations due to economic impacts
- Maintain and report all versioned changes as and when impacted by business events

Business Functions

Shows business functions encapsulating other sub-functions



Affirmation

Same-day **affirmation** (SDA) also known as T0 refers to completing the entire **trade** verification process on the same day that the actual **trade** took place.

Trade verification is carried out on the institutional side of the market between the investment manager and the broker/dealer.

Allocation Processing

The life cycle event where the settlement account breakdown (allocations) of a block trade is communicated electronically to the counterparty.

Confirmation

The life cycle event where two trade counterparties communicate and agree upon the economic details of a trade in order to achieve settlement.

Atlas Domains

1. Order Entry 2. Order Management	1. Deal Setup (Mainly for OTC) 2. Trade Entry 3. Trade 4. Confirmation 5. Settlements
Asset Servicing Allocation Position Keeping Reference Data	

APPENDIX A - Business Functions