Pattern: Saga

A very long story; A long series of events

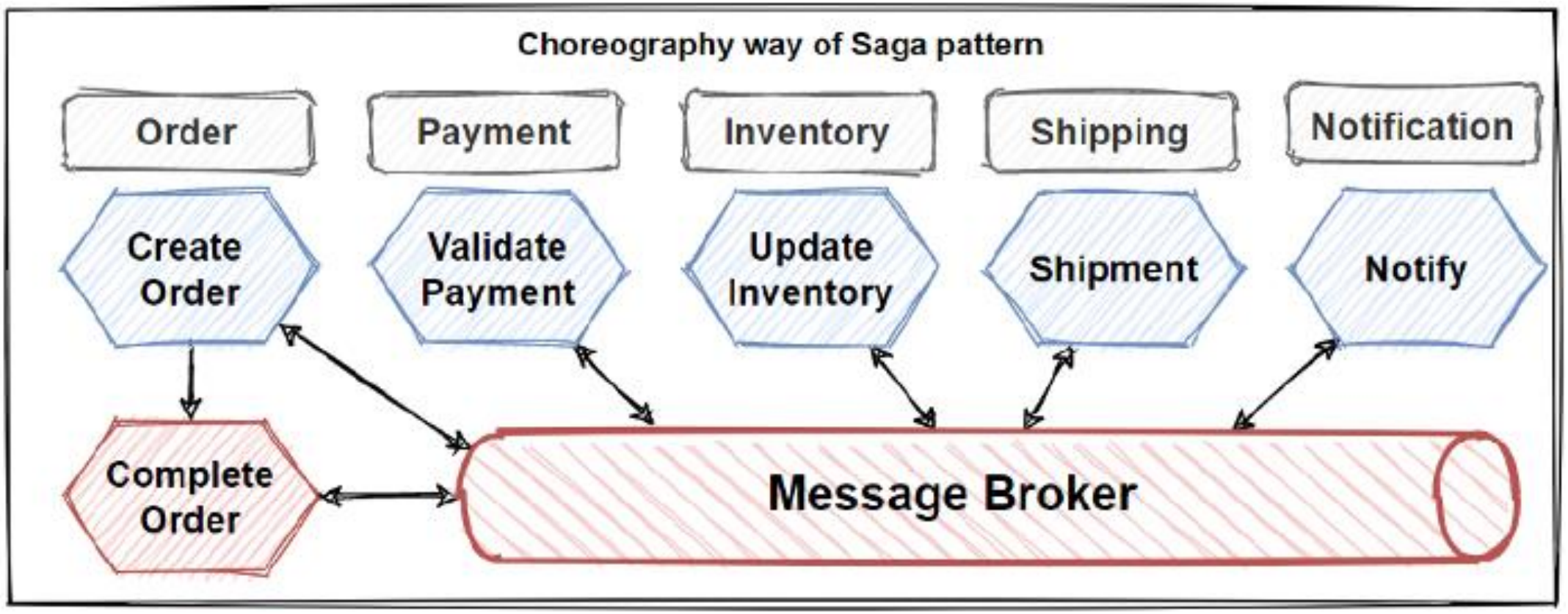
Problem

How to implement transactions that span services?

Solution

1. A saga is a sequence of local transactions.
2. Each local transaction updates the database and returns a message to trigger the next local transaction in the saga.
3. If a local transaction fails because it violates a business rule then the saga executes a series of compensating transactions that undo the changes that were made by the preceding local transactions.

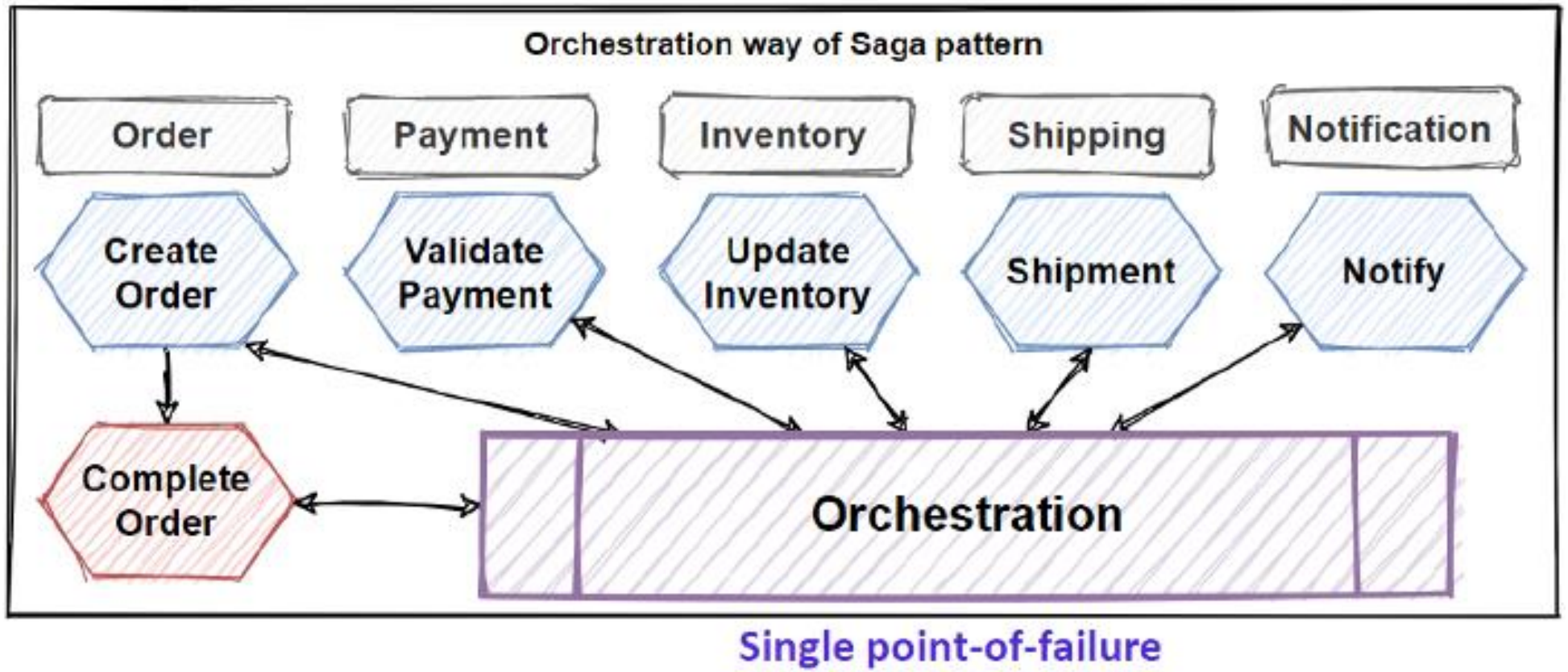
Choreography Saga Pattern



Choreography Saga Pattern

- Choreography provides to coordinate sagas with applying publish-subscribe principles. With choreography, each microservices run its own local transaction and publishes events to **message broker system** and that trigger **local transactions** in other microservices.
- This way is good for simple workflows if they don’t require too much microservices transaction steps.
- But if **Saga Workflow** steps increase, then it can become confusing and hard to manage transaction between saga microservices.

Orchestration Saga



Orchestration Saga Pattern

- **Orchestration** provides to coordinate sagas with a **centralized** controller microservice. This centralized controller microservice, orchestrate the **saga workflow** and invoke to execute local microservices transactions in sequentially.
- The orchestrator microservices execute **saga transaction** and manage them in centralized way and if one of the step is failed, then executes rollback steps with compensating transactions.

References:

- https://medium.com/design-microservices-architecture-with-patterns/saga-pattern-for-microservices-distributed-transactions-7e95d0613345
- https://microservices.io/patterns/data/saga.html