



University of St.Gallen

Event-Driven Senty Halftime Presentation

St. Gallen, April 20, 2023

Group 1 – Johannes, Luka, Philipp

From insight to impact.

Agenda

1. Senty Overview
2. Development Steps
 - Ex 2: Kafka with Spring
 - Ex 3: Process Orchestration with Camunda
 - Ex 4: Orchestration vs Choreography in Flowing Retail
 - Ex 5: Sagas and Stateful Resilience Patterns
3. Architectural Decisions
4. Final Workflows
 - Registration
 - Project Manager
 - Payment
5. Live Demo
6. Learnings so far + Q&A

Senty Overview

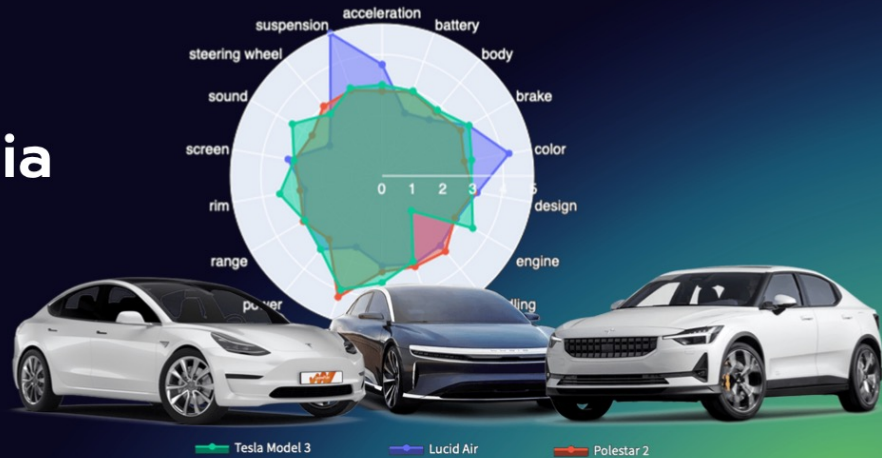
Senty

Use case: Sentiment Analysis tool

Senty


Real-Time Social Media Market Intelligence


feat. Kafka




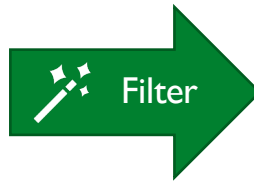
We tackle **3 problems** that help companies track online feedback to boost customer-centricity product development









 **Raj Dev Singh** vor 9 Tagen
I like this channel for every single time 🤔🤔🤔🤔🤔

 **TP Z** 1 day ago
Don't screw up the Panamera please


 **rei koleci** vor 3 Tagen
We want Alex back - its not just about the cars rather the carisma and all...





Choose your own adventure with the new Porsche Cayenne



 **Porsche** 1.18M...   1.5K   

44K views 1 day ago
20 years after we created the world's first sportscar for five, we've redefined the road trip yet again. Meet the new Cayenne and Cayenne Coupé models with enhanced on- and off-road performance. All aboard? Now just choose your own adventure. Show more

128 Comments  Sort by

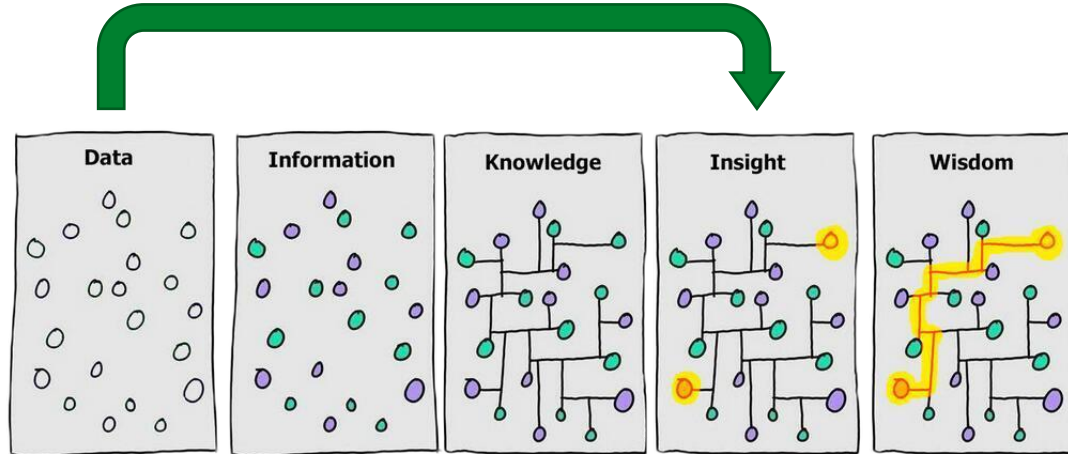
 Add a comment...

 **ThunderTiger0801** 1 day ago
It's a shame the analog rev counter and the starter key knob got lost... These little things made Porsches so special...

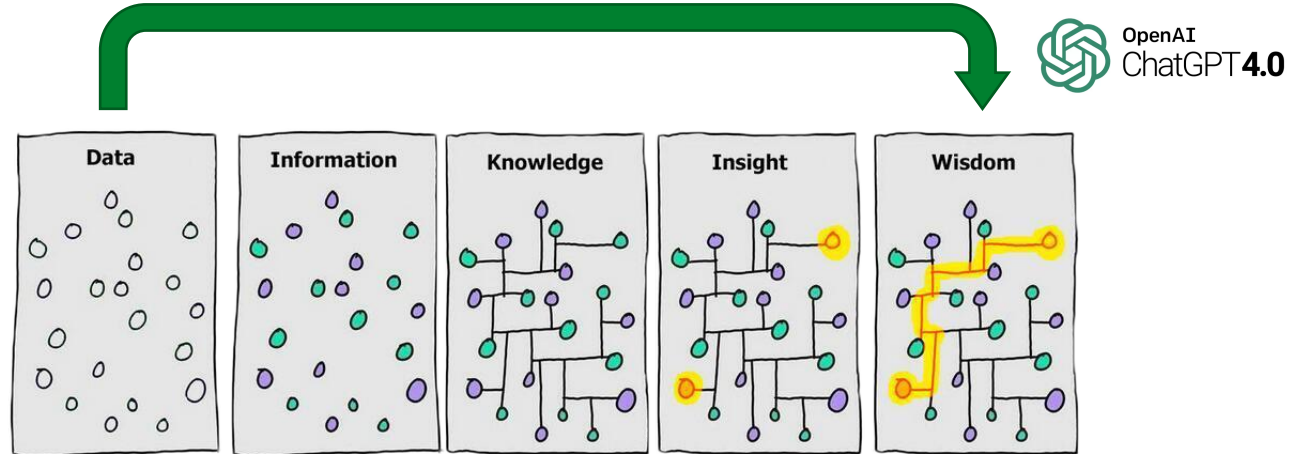
 41  Reply

3 replies

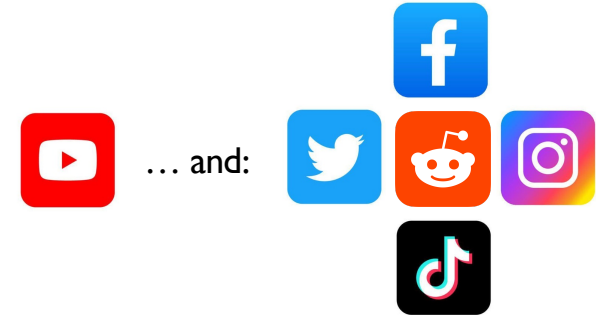
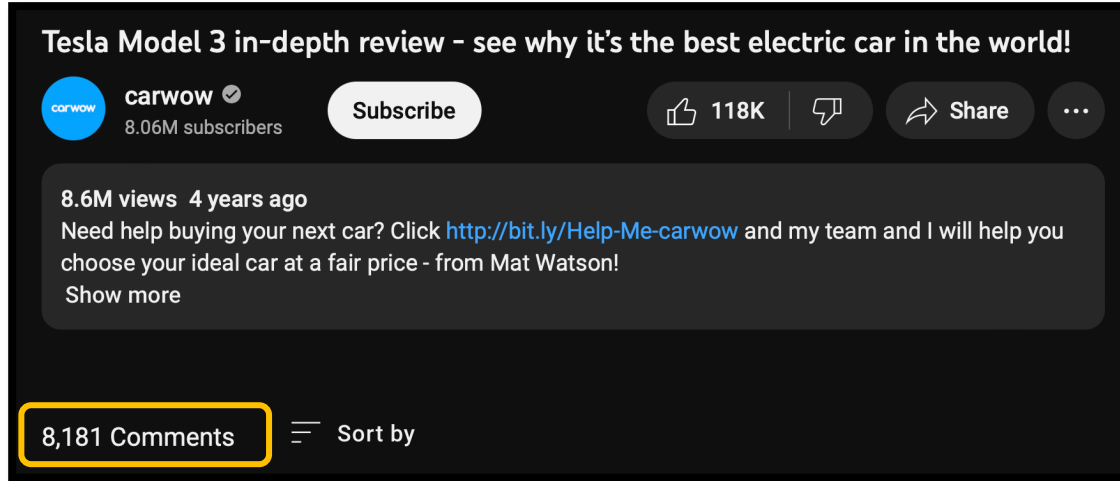
We tackle **3 problems** that help companies track online feedback to boost customer-centricity product development



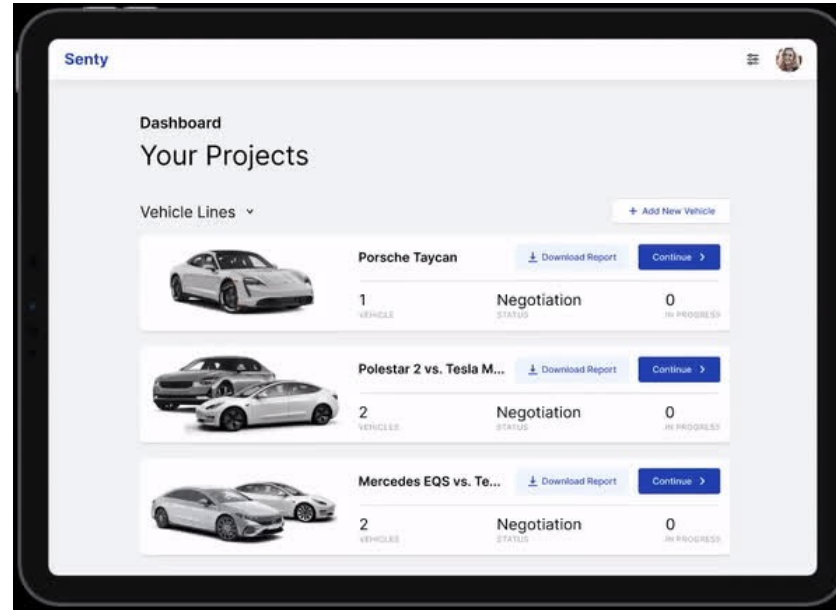
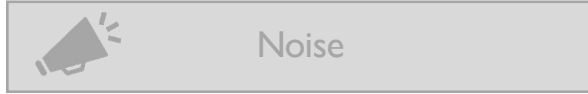
We tackle **3 problems** that help companies track online feedback to boost customer-centricity product development



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Development Steps


Ex 2: Kafka with Spring

Basic Service structure

Initial Senty implementaion:

- Scraper-Service: Scrapes all comments from Youtube videos 
Next implementation period ->
Add additional data source Platforms and find posts/videos over [link](#)



- Comment-Analysis: Counts number of Comments 
Next implementation period ->
sentiment analysis of comments



- Email-Notifier: Sends out Notifications per mail based on events 

ADR 0001: Initial Project
Setup and Kafka
Configuration 

Ex 2: Kafka with Spring

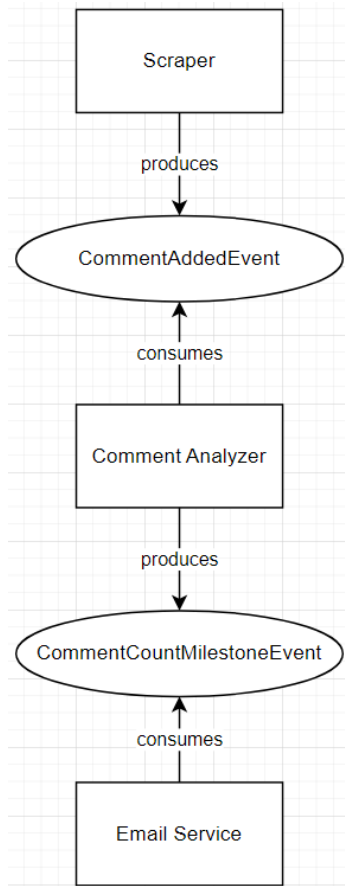
Event Notification

added a notification service which sends emails
to inform customers about relevant progress in the process

```
@KafkaListener(id = "email-notifier", topics = MessageSender.TOPIC_NAME)
public void goodsFetchedEventReceived(String messageJson, @Header("type") String messageType) throws
Exception {
    if ("CommentCountMilestoneEvent".equals(messageType)) {

        System.out.println(messageJson);
        Message<JsonNode> message = objectMapper.readValue(messageJson, new
        TypeReference<Message<JsonNode>>() {
        });
        IntNode payload = (IntNode) message.getData();
        int count = payload.intValue();

        emailService.sendEmail("Comment Milestone reached! You now have " + count + " comments on your
        video!");
    }
}
```



Ex 3: Process Orchestration with Camunda

Project-Manager workflow + HTML User Interface

Senty
Get actionable insights from your social media data.

Order Form

Company Name
Volvo

Customer ID
0001

Video ID
vwXcu78d

Tokens
1000

Social Media Platform
YouTube

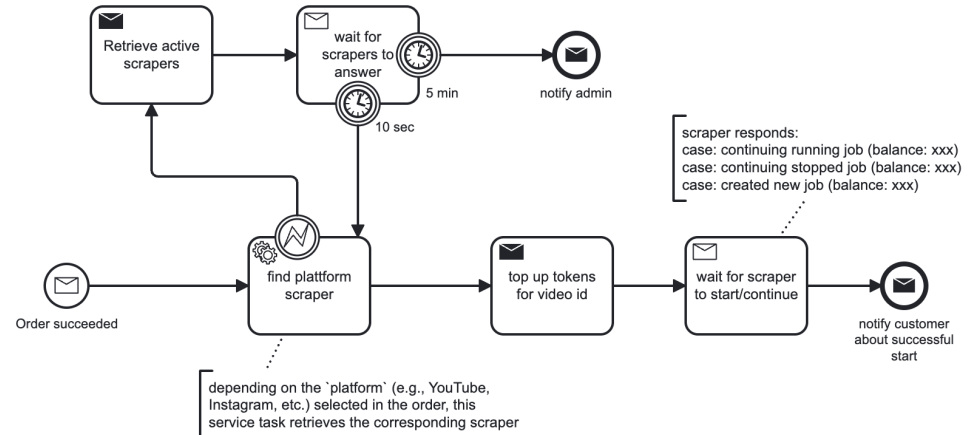
Order

Thank you for order #1
Trace id: 5dc58f93-196e-481d-a993-2f938a38478a

Workflow includes:

- different types of gateways
- external tasks
- user tasks
- timers
- message events
- exceptions


ADR 0002: Process Orchestration and Messaging with Camunda and Kafka



Ex 3: Process Orchestration with Camunda

Project-Manager workflow + HTML User Interface

ADR 0002: Process Orchestration and Messaging with Camunda and Kafka



Things kept in mind:

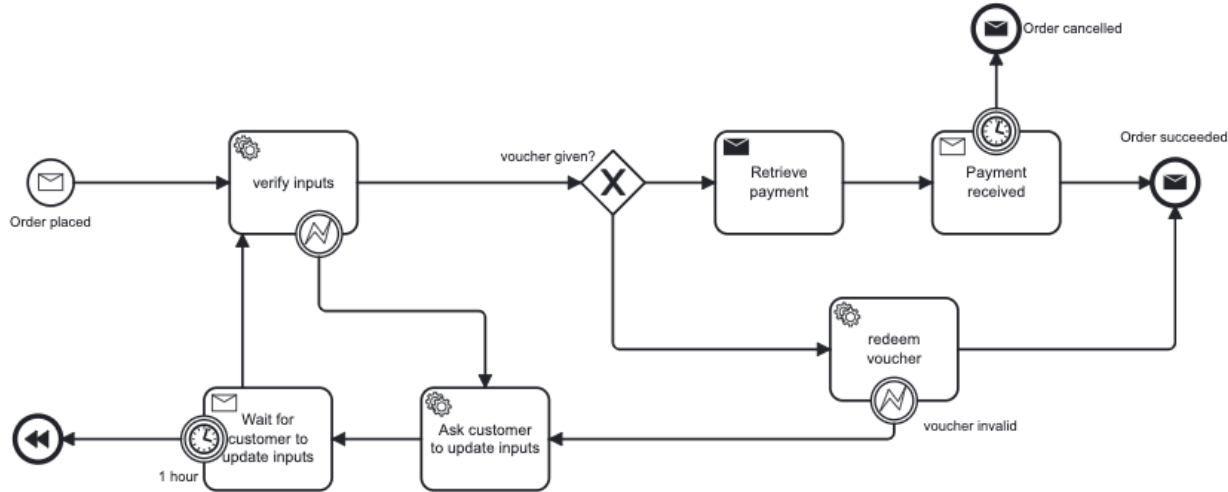
- ✓ Boundaries and Business Processes
 - Workflow lives within service boundaries
- ✓ Avoiding Process Monoliths
 - distributed responsibilities
 - achieved a level of isolation
 - allows to scale development
- ✓ Modelling the happy path first
 - started with happy path
 - added complexity and errors

Our Reasons for Workflow Engines:

- Durable State
- Scheduling
- Versioning
- Visibility
- Audit data
- Tooling
- Support for Human / Machine Collaboration

Ex 4: Orchestration vs Choreography in Flowing Retail

Order Workflow and Events/Commands



ADR 0003: Updated Project Setup
and Orchestration vs. Choreography

ADR 0004: Finding Active Scrapers
using Event-based Approach



Commands:

- Payment retrieval
- topUp messages
- retrieve active scrapers

Events:

- order succeeded/placed

Ex 4: Orchestration vs Choreography in Flowing Retail

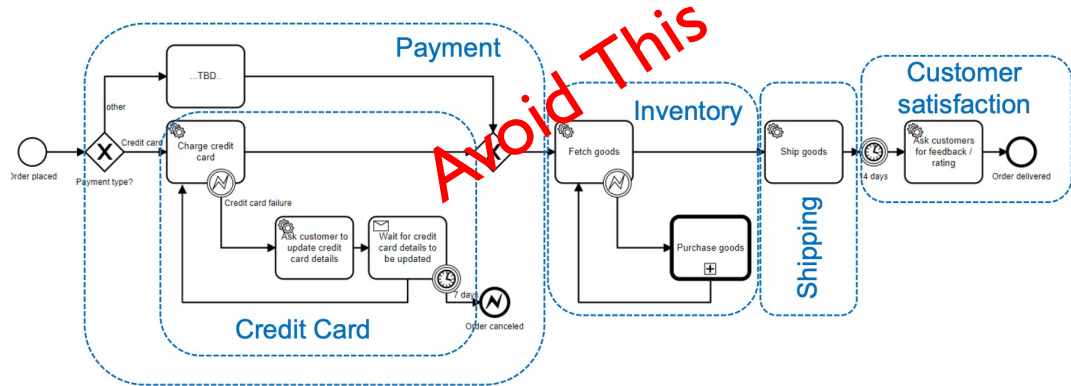
Order Workflow and Events/Commands

Things kept in mind:

- ✓ Breaking Event Chains
 - implemented Commands
 - improved decoupling
 - improved scalability
- ✓ Clear Responsibilities
- ✓ Finding the Right Balance

ADR 0003: Updated Project Setup
and Orchestration vs. Choreography

ADR 0004: Finding Active Scrapers
using Event-based Approach



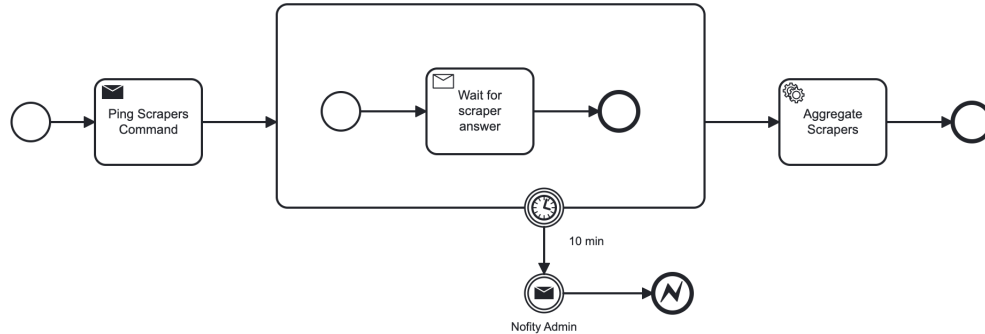
Ex 5: Sagas and Stateful Resilience Patterns

Stateful retry + Human Intervention

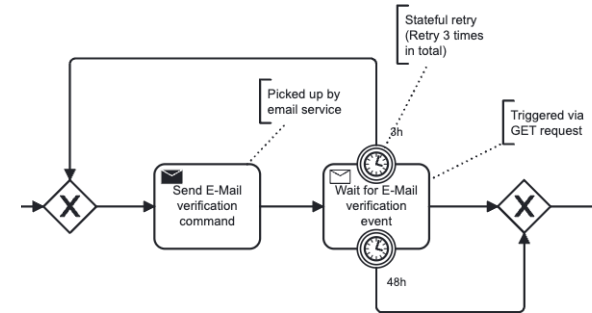
ADR 0005: Superseed Orchestration
vs Choreography



Human Intervention:



Stateful retry:



Ex 5: Sagas and Stateful Resilience Patterns

Stateful retry + Human Intervention

Things kept in mind:

- ✓ Fail fast is not enough!
 - implemented Commands
 - improved decoupling
 - improved scalability
- ✓ Consistency problems
 - Each Service with its own ACID Transactions
 - Activities become long-running (Large sentiment-analysis request)
 - Need for Business Transactions at some point

ADR 0006: Registration and authentication merged



Architectural Decisions

Architectural Decisions

Initial Project Setup and Kafka Configuration

ADR #0001

Decision:

We decided to split our system into three services:

- Project Manager
- Scraper Service
- Email-Notifier

Consequences:

+++ Scalability, Flexibility, Integration

- service-oriented architecture
- use of Kafka for Service-communication (Topics/Events)

Process Orchestration and Messaging with Camunda and Kafka

ADR #0002

Decision:

Camunda for process orchestration and Kafka for messaging.

Consequences:

+++ Scalability, Efficiency, Integration

- The services will need to be integrated correctly to ensure functionality across Camunda and Kafka. This also increases the system's complexity

Updated Project Setup and Orchestration vs. Choreography

ADR #0003

Decision:

decided to use an orchestration-based approach to manage the workflow between the services. the project-manager will be responsible for orchestration. There is a new service **Checkout**

Consequences:

- Separation of concerns
- Fault tolerance

Architectural Decisions

Finding Active Scrapers using Event-based Approach

ADR #0004

Decision:

An event-based approach is chosen to find active scrapers. The Projectmanager will emit an event using Kafka, and the scrapers will respond with their status

Consequences:

+++ Scalability, Efficiency

--- Latency

- number of scrapers can be increased or decreased without effects on other services
- may introduce some latency since the PM needs to wait for the scrapers to respond

Superseed Orchestration vs Choreography

ADR #0005

Decision:

Adapted the mix of orchestration and choreography for services

Consequences:

Orchestration (with Camunda):

- project-manager
- Registration
- payment

Choreography:

- scraper
- email-notifier
- comment-analysis
- checkout

Architectural Decisions

Registration and Authentication merged ADR #0006

Decision:

We decided to implement the tasks registration and login in a single service.

Data Ownership: Joint Ownership – Service Consolidation Technique

Consequences:

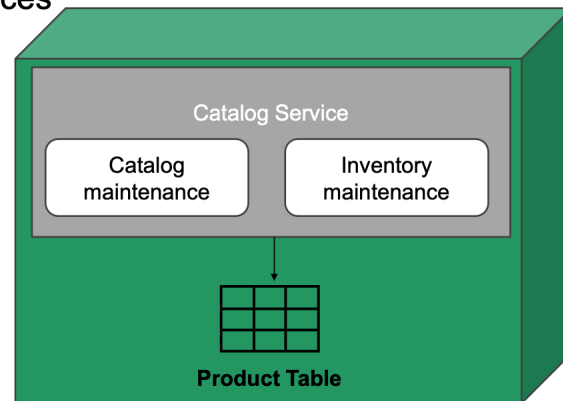
+++ Preserves atomic Transactions, good overall performance, reduced complexity

--- More coarse-grained scalability, Less fault tolerance, increased deployment risk



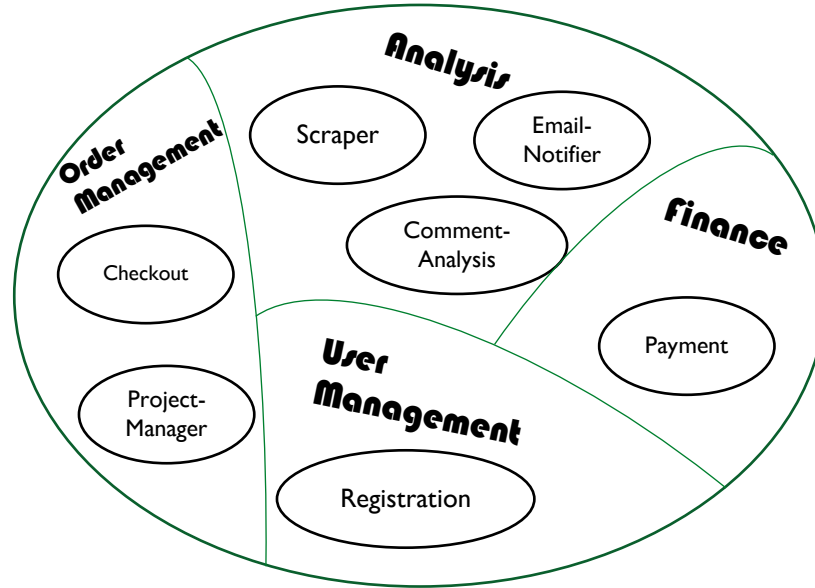
- with the Service Consolidation technique ownership issues are resolved combining services

Data Ownership Joint Ownership – Service Consolidation Technique

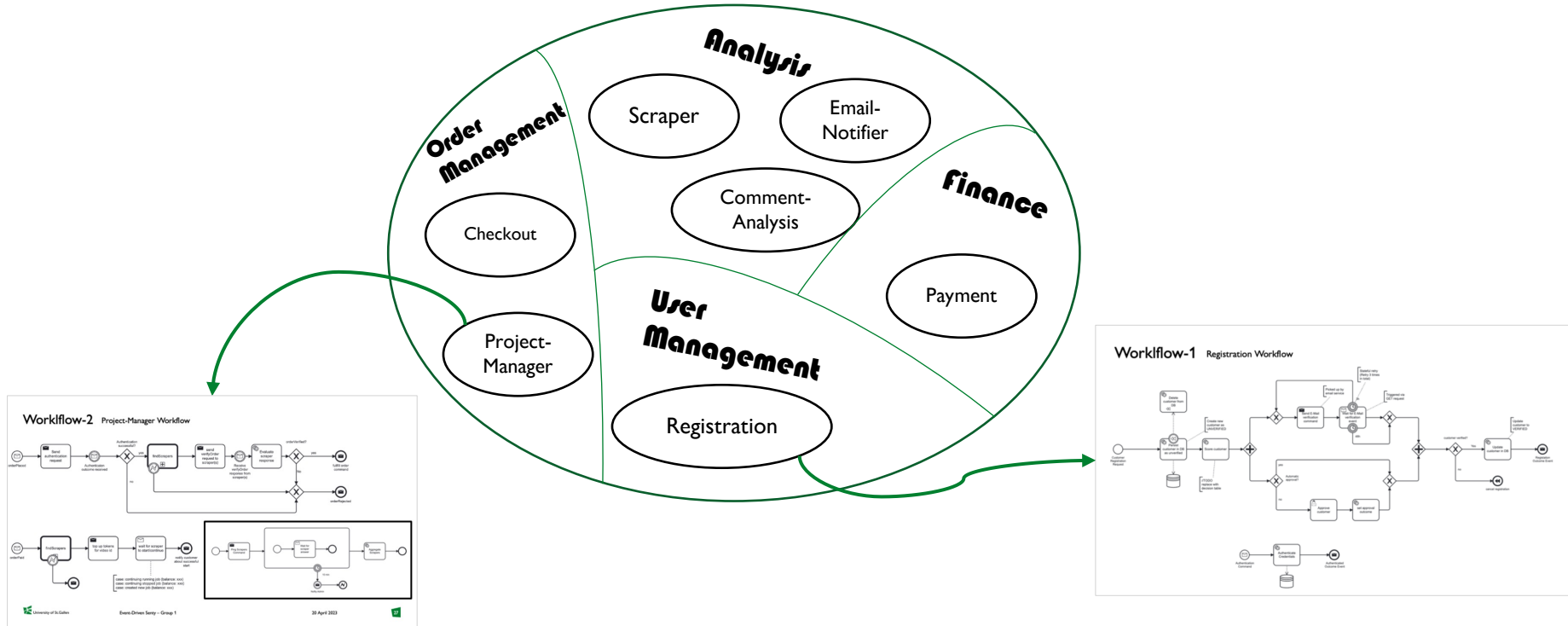


Workflows

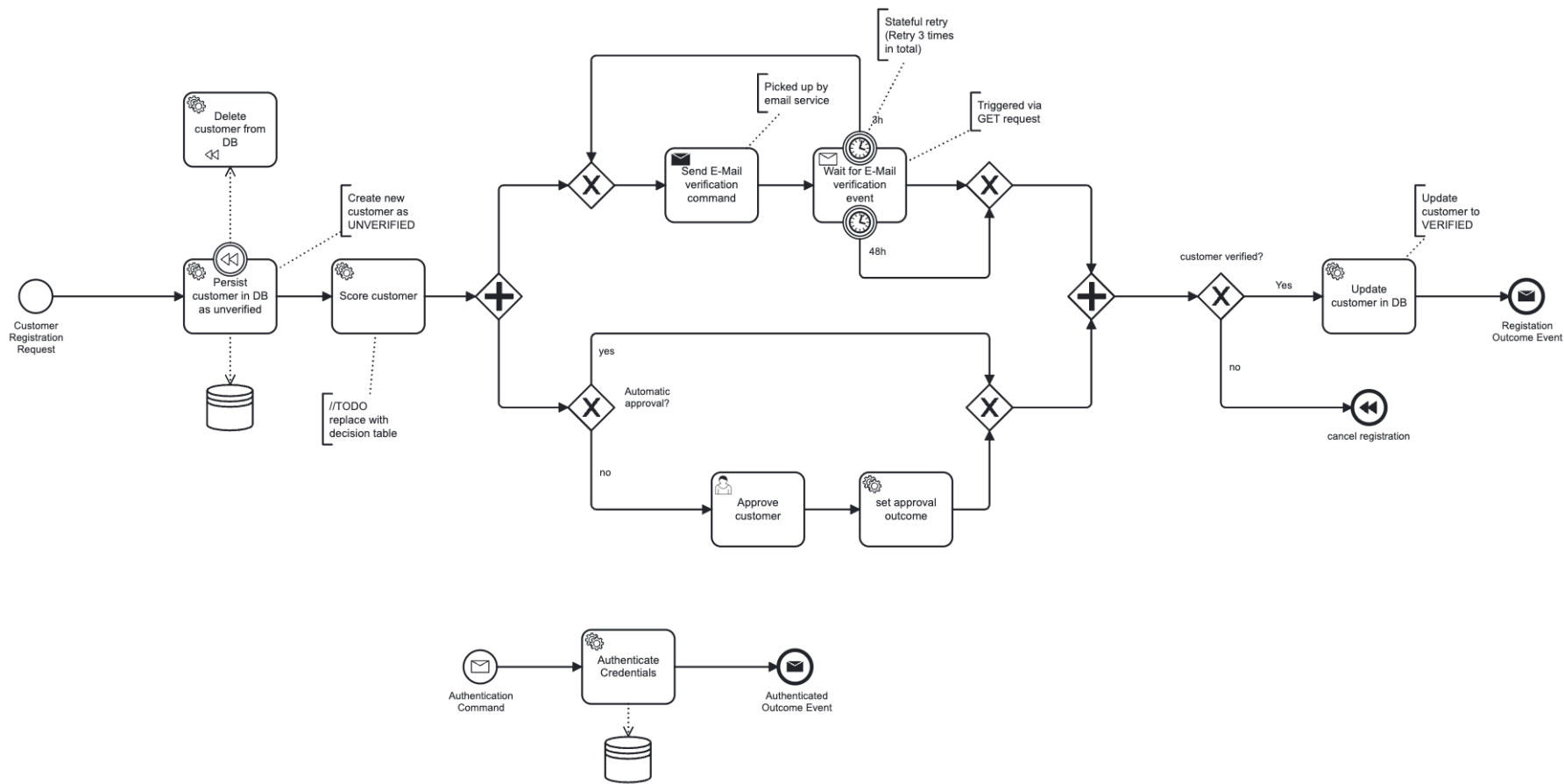
Microservices



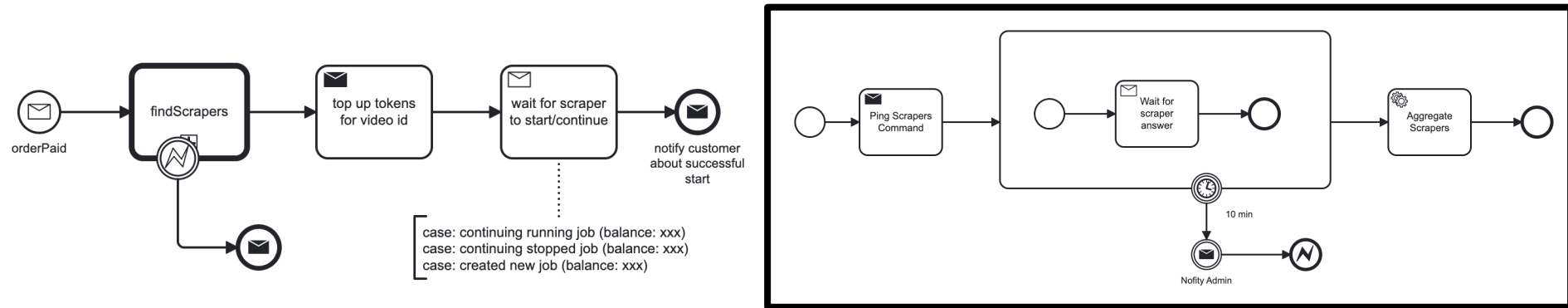
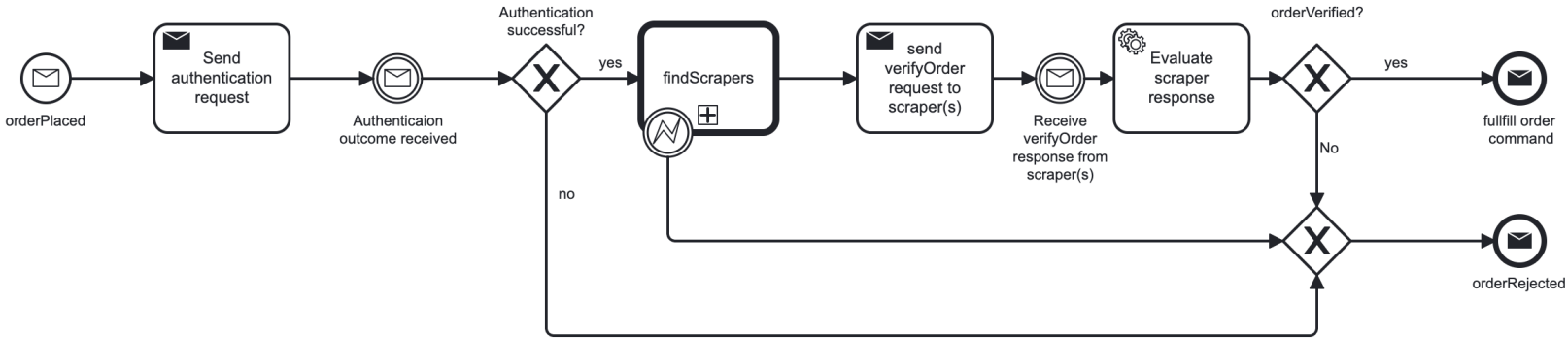
Microservices



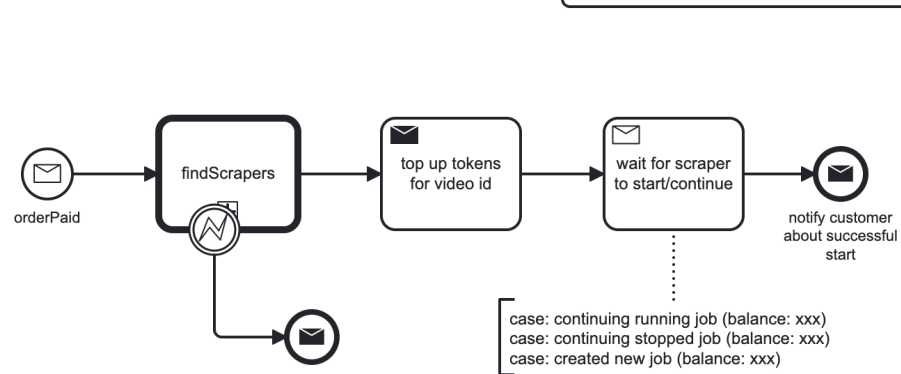
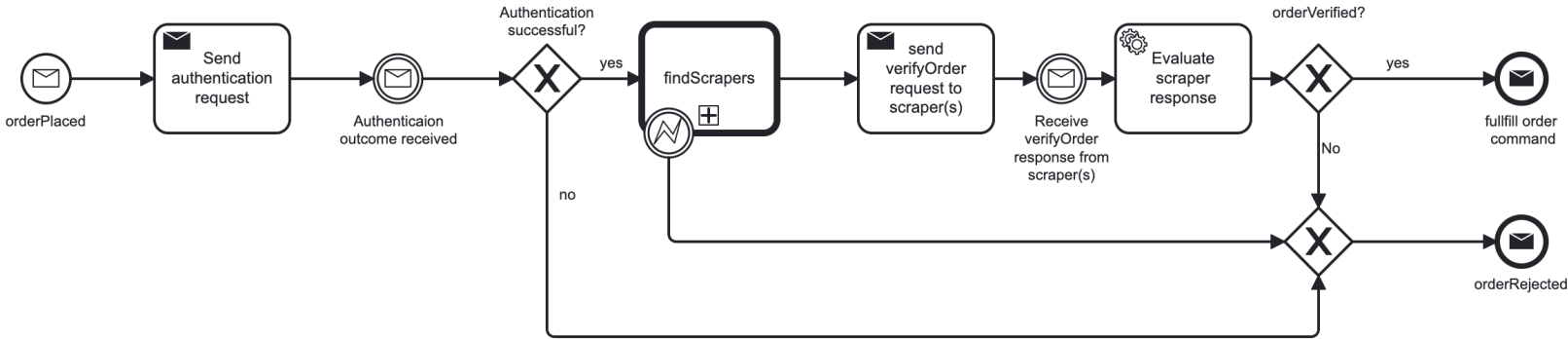
Workflow-1 Registration Workflow



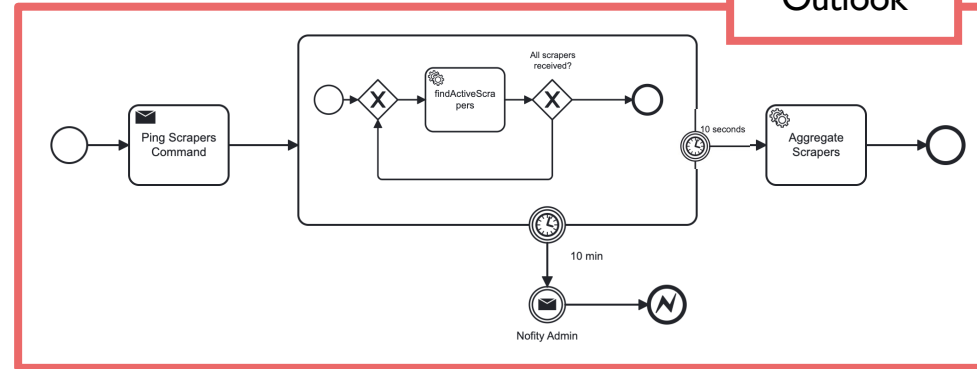
Workflow-2 Project-Manager Workflow



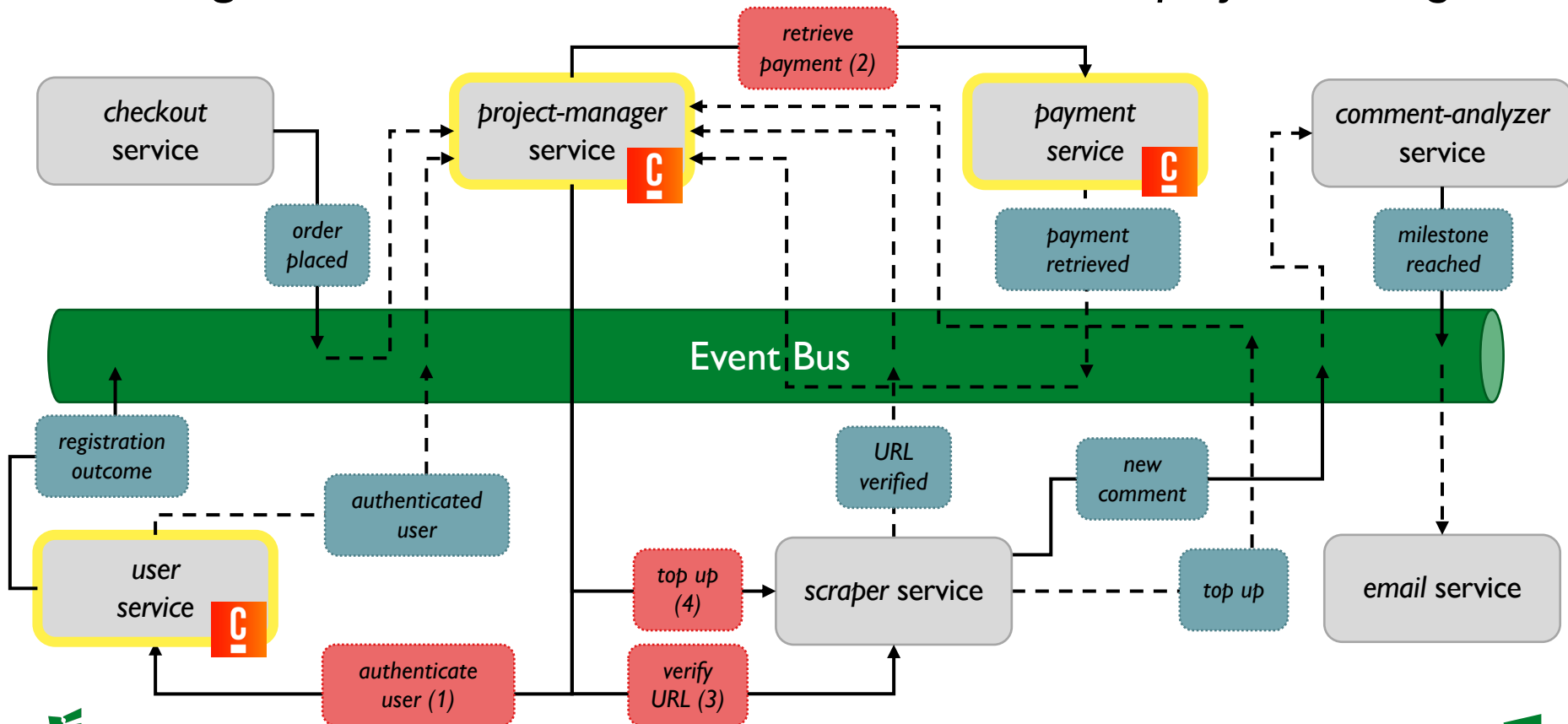
Workflow-2 Project-Manager Workflow



Outlook



Breaking our Event Chain with Commands via *project-manager*



Live Demo

Contributions

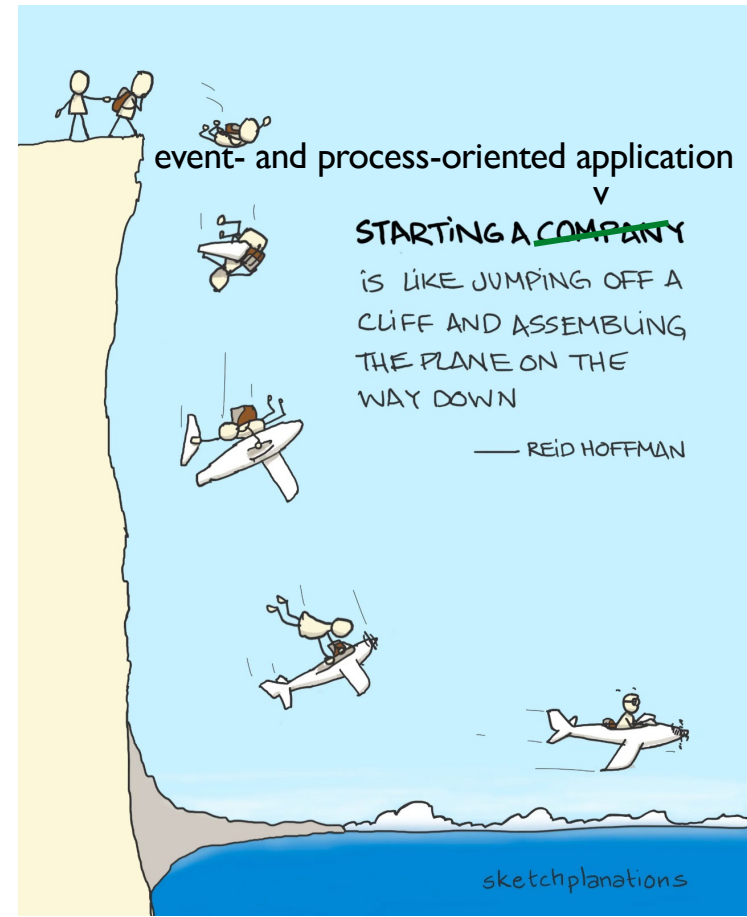
Contribution



Learnings

Learnings

- Modelling & debugging is hard (smaller iterations?)
- Refactoring more error prone
- Distributed system = Work distribution
- Orchestration vs Choreography
- Don't get lost in the bounded + business contexts
- Model or code it?



Thank You



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