



# Architecture Katas On-line

## Autumn 2021



**Neal Ford**

ThoughtWorks

Director / Software Architect / Meme Wrangler

<http://www.nealford.com>

@neal4d



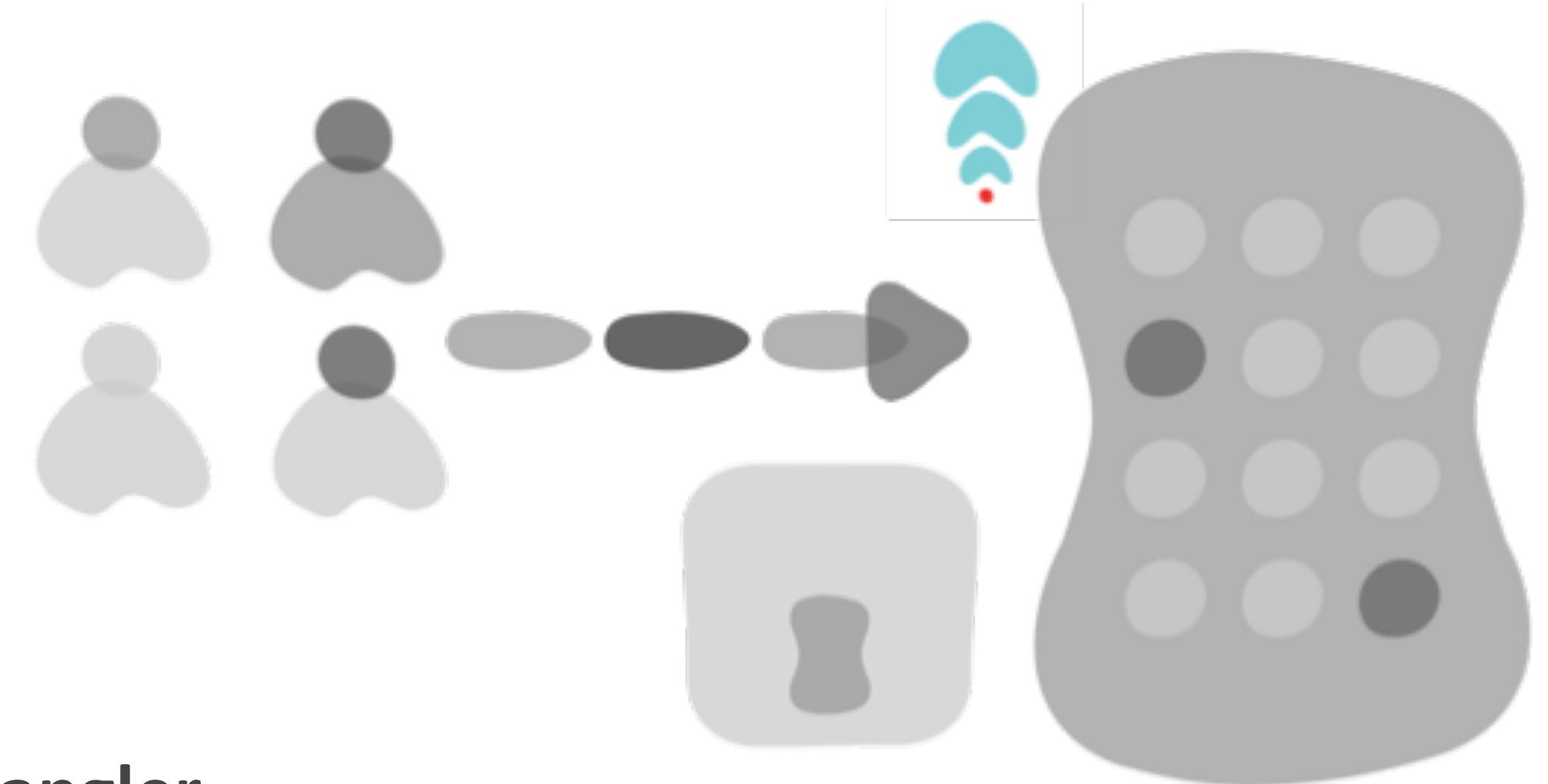
**Mark Richards**

Independent Consultant

Hands-on Software Architect, Published Author

Founder, [DeveloperToArchitect.com](https://DeveloperToArchitect.com)

@markrichardssa



# Judges Criteria

---

- Clarity of narrative
  - Organization
  - Supporting documentation
-

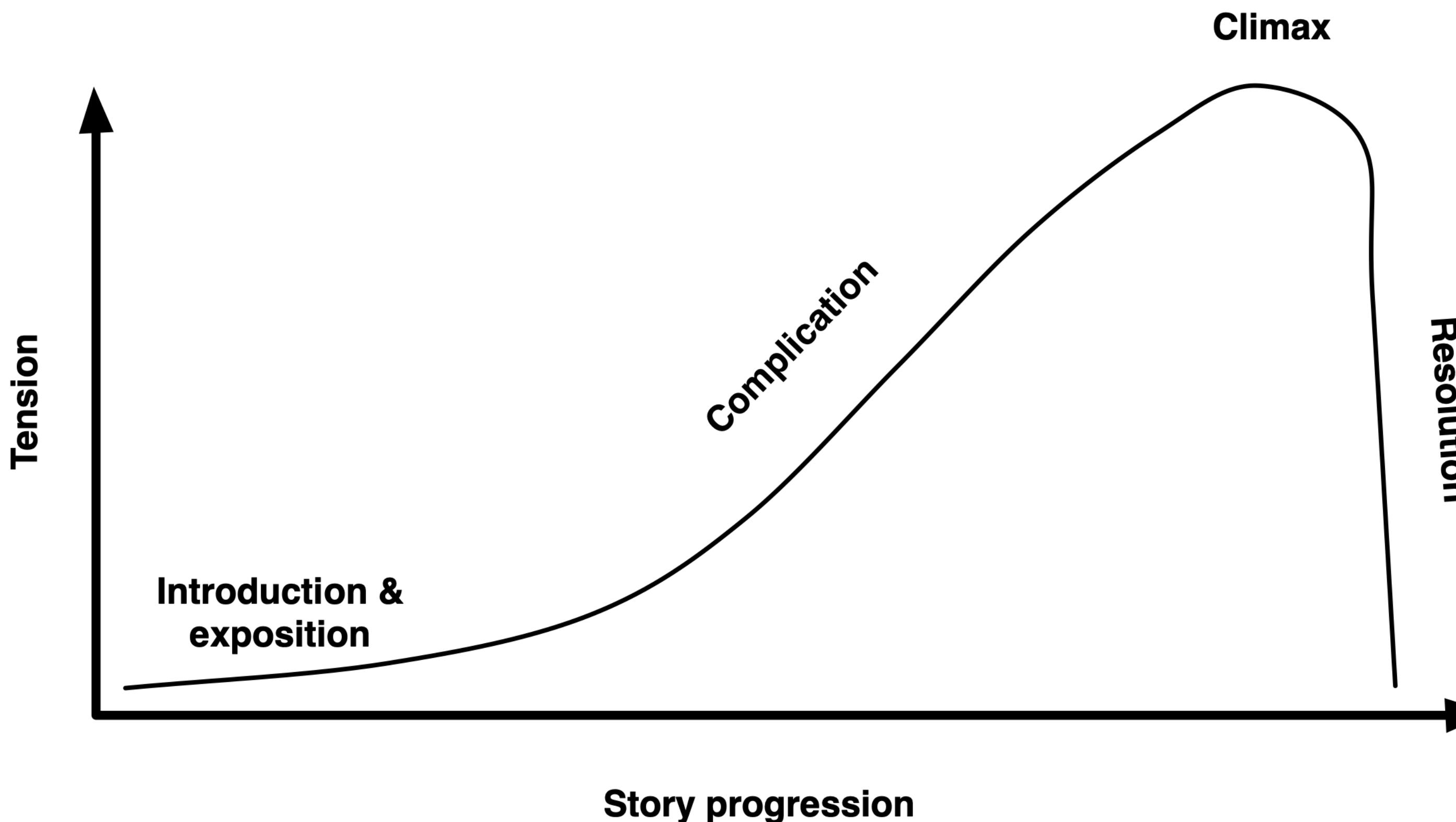
# Narrative and Organization

A narrative tells the story of the architectural solution

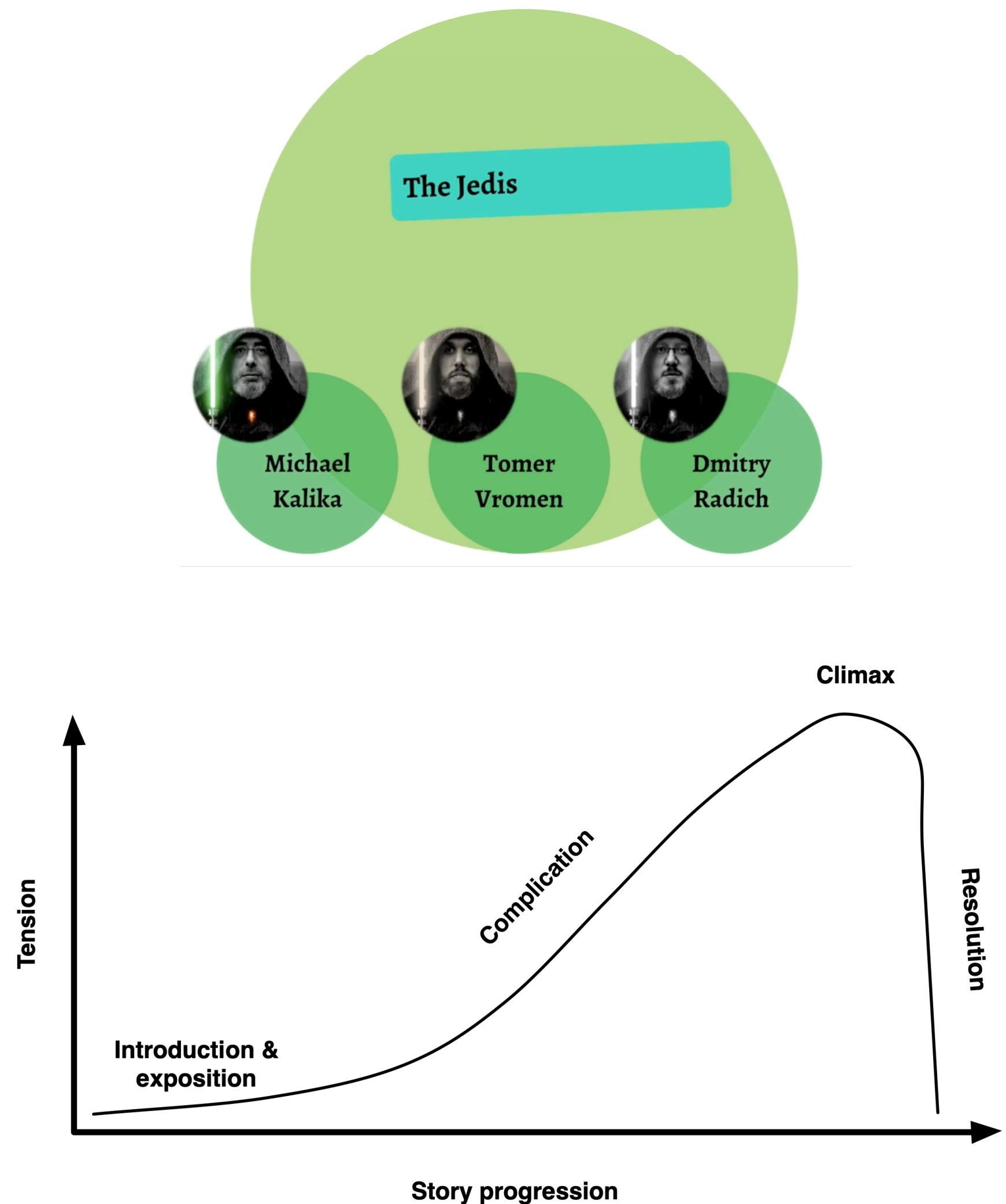
 **narrative**  
/'nerətiv/  
*noun*  
a spoken or written account of connected events; a story.

# Narrative and Organization

A *narrative arc* a literary term for the path a story follows. It provides a backbone by providing a clear beginning, middle, and end of the story



[https://github.com/TheJedis2020/arch\\_katas\\_2020](https://github.com/TheJedis2020/arch_katas_2020)



## Prelude

## The Vision

## The Final Video Presentation

## Business Requirements

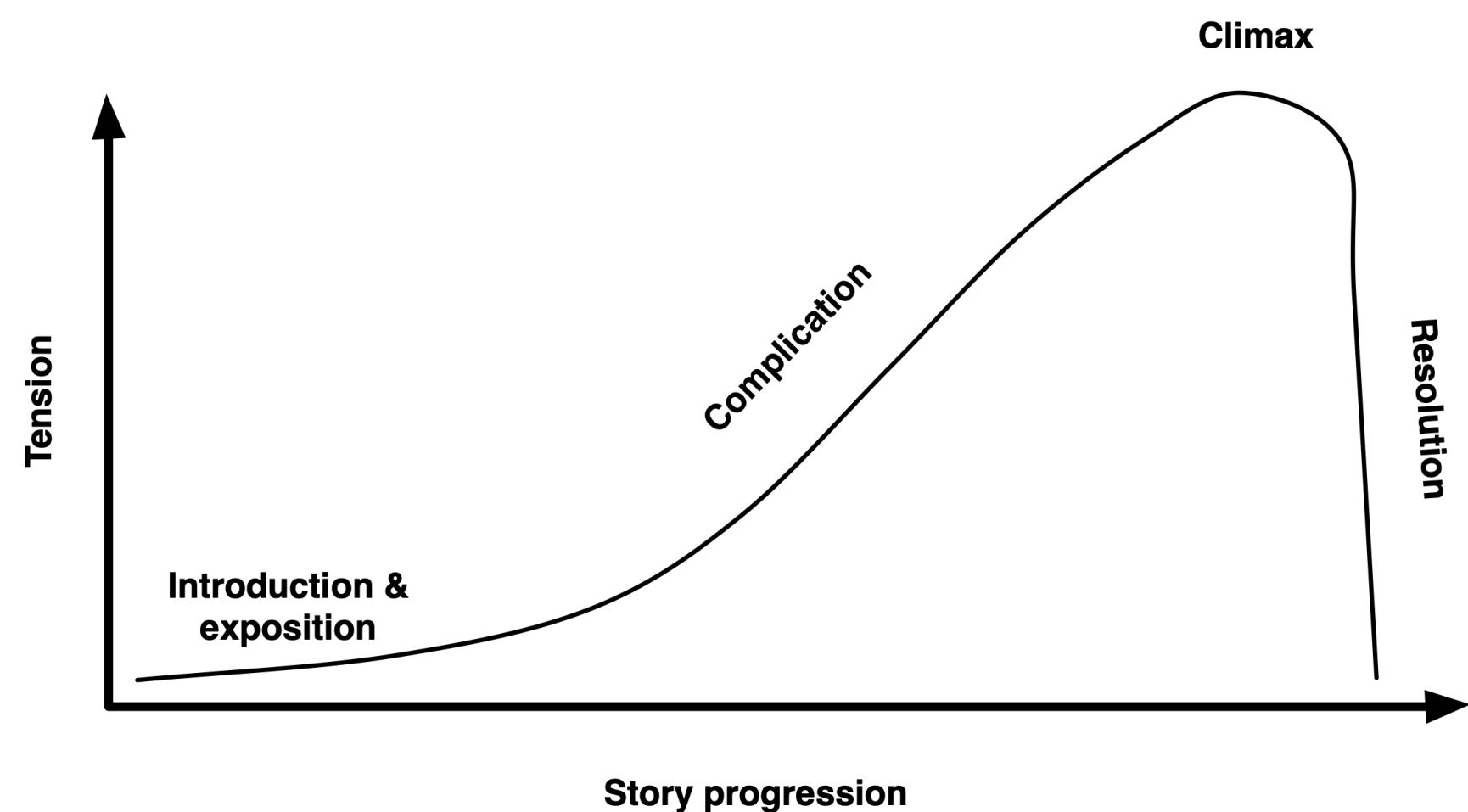
## The Strategy

## The Architecture

## Sequence Diagrams

## Architectural Desision Records (ADRs)

<https://github.com/miyagis-forests/farmacy-food-kata>



## Requirements

This section contains the requirements, distilled from the [provided user stories](#), the interview with the PO, Kwaku Osei, but also with some assumptions and educated guesses. These are the main drivers for the design decisions in this proposal.

- [Functional requirements](#)
- [Quality attribute requirements](#), aka architecture characteristics

## Architecture

Here you find the documentation of the software architecture that's derived from the requirements.

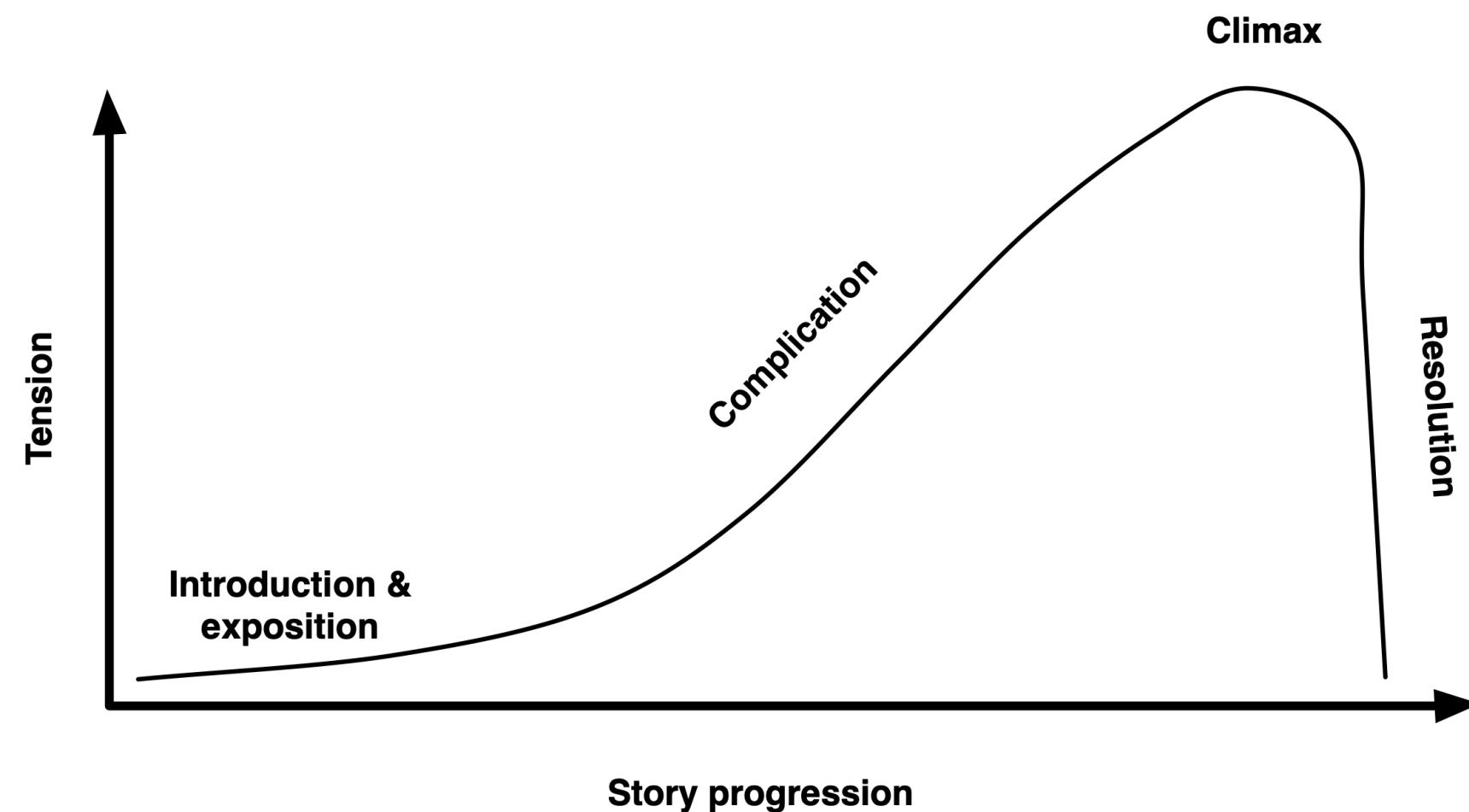
As a starting point, there's a context diagram that gives an overview of the system boundaries. The central system is what we called the *Farmacy Food System*, which is the scope of this proposal.

## ADRs

The linked ADRs below record the main architecture decisions recorded in this proposal, along with their context and rationale.

- ADR 001 - [Microservice style](#)
- ADR 002 - [Payment gateway](#)

<https://github.com/lookfwd/archkata>



Overview

Vision

Goals and Opportunities

Use Cases

Architecture Characteristics

Design Constraints

High-Level Architecture

Mid-Level Architecture

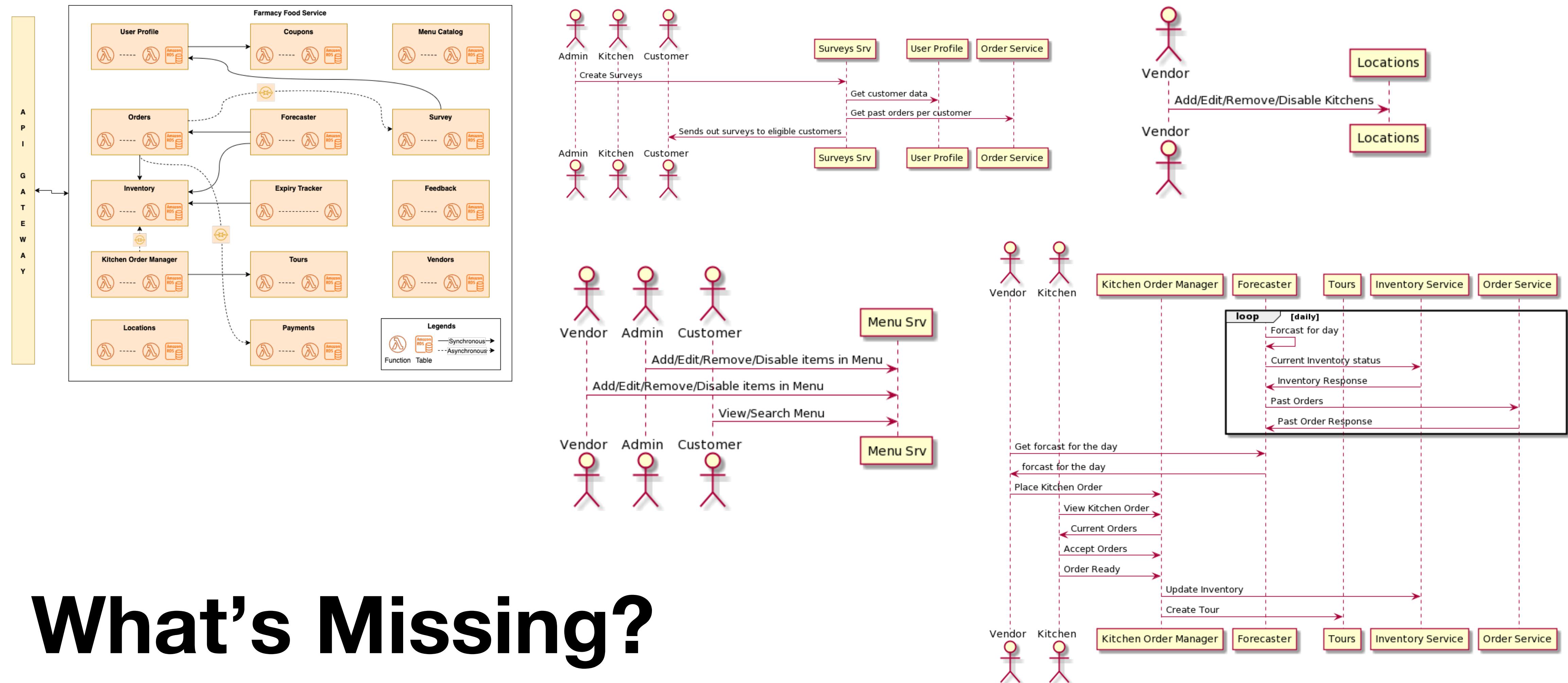
Milestones

ADRs

# Completeness of Solution

---

# Completeness of Solution

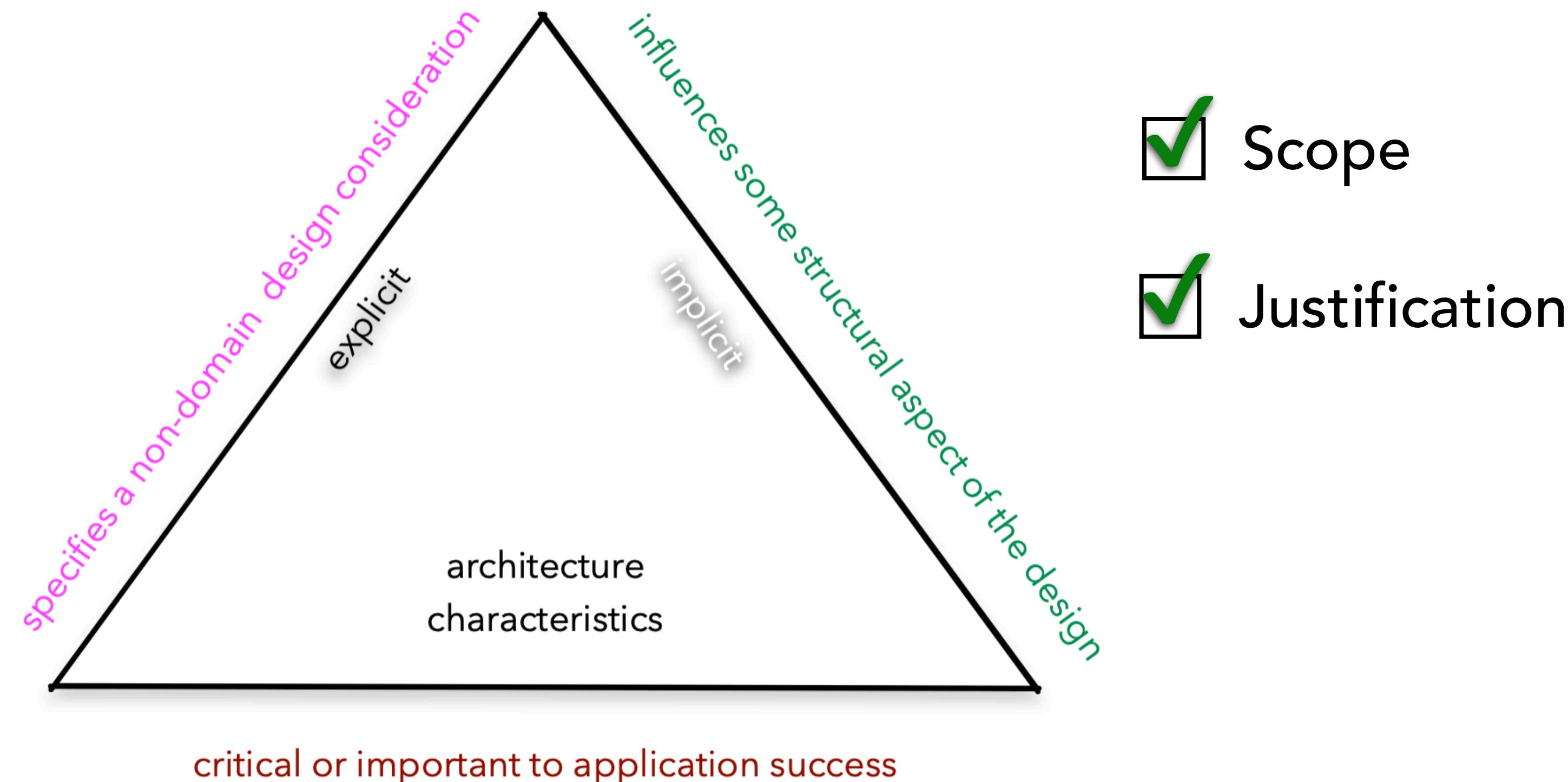


# Identification of Supporting Architecture Characteristics

---

# Architecture Characteristics

Architecture characteristics form the foundational aspects of the architecture and are required for proper trade-off analysis and decision making



<https://www.developertoarchitect.com/downloads/worksheets.html>

<https://www.developertoarchitect.com/lessons/lesson112.html>

## Architecture Characteristics Worksheet

System/Project: \_\_\_\_\_

Architect/Team: \_\_\_\_\_ Date: \_\_\_\_\_

Candidate Architecture Characteristics		
performance	data integrity	deployability
responsiveness	data consistency	testability
availability	adaptability	abstraction
fault tolerance	extensibility	workflow
scalability	interoperability	configurability
elasticity	concurrency	recoverability
others: _____ _____		

**Top 3 Driving Characteristics**

<input type="checkbox"/>	1. _____	Implicit Characteristics feasibility (cost/time)
<input type="checkbox"/>	2. _____	security
<input type="checkbox"/>	3. _____	maintainability
<input type="checkbox"/>	4. _____	simplicity
<input type="checkbox"/>	5. _____	
<input type="checkbox"/>	6. _____	Others Considered
<input type="checkbox"/>	7. _____	

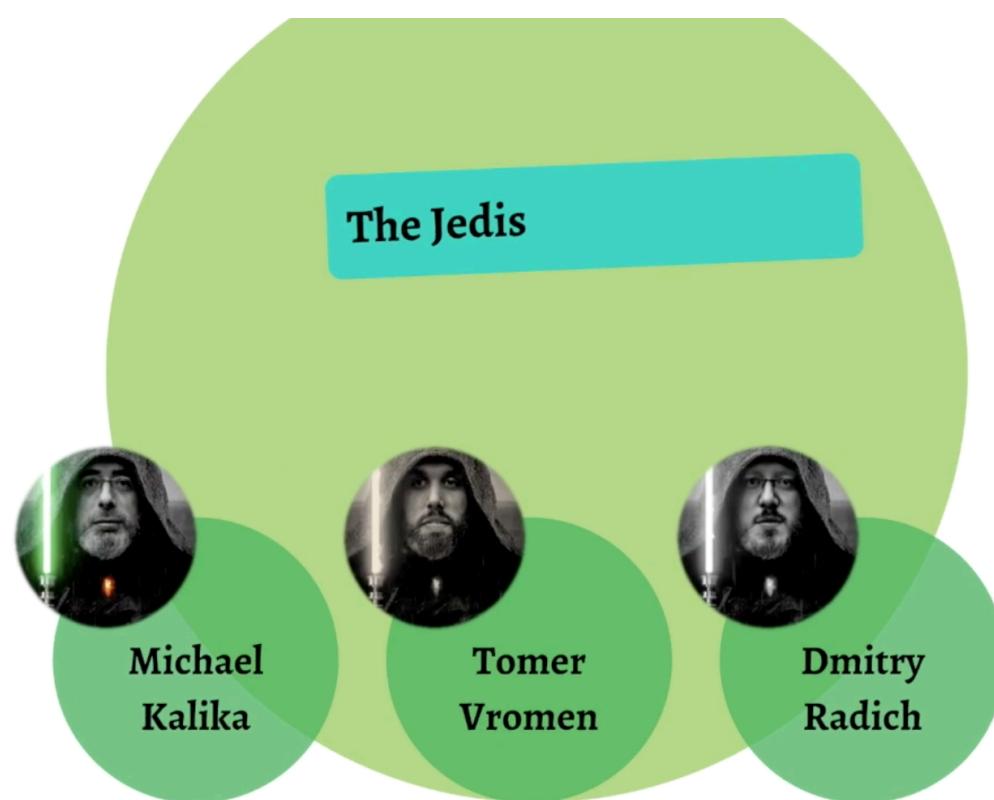
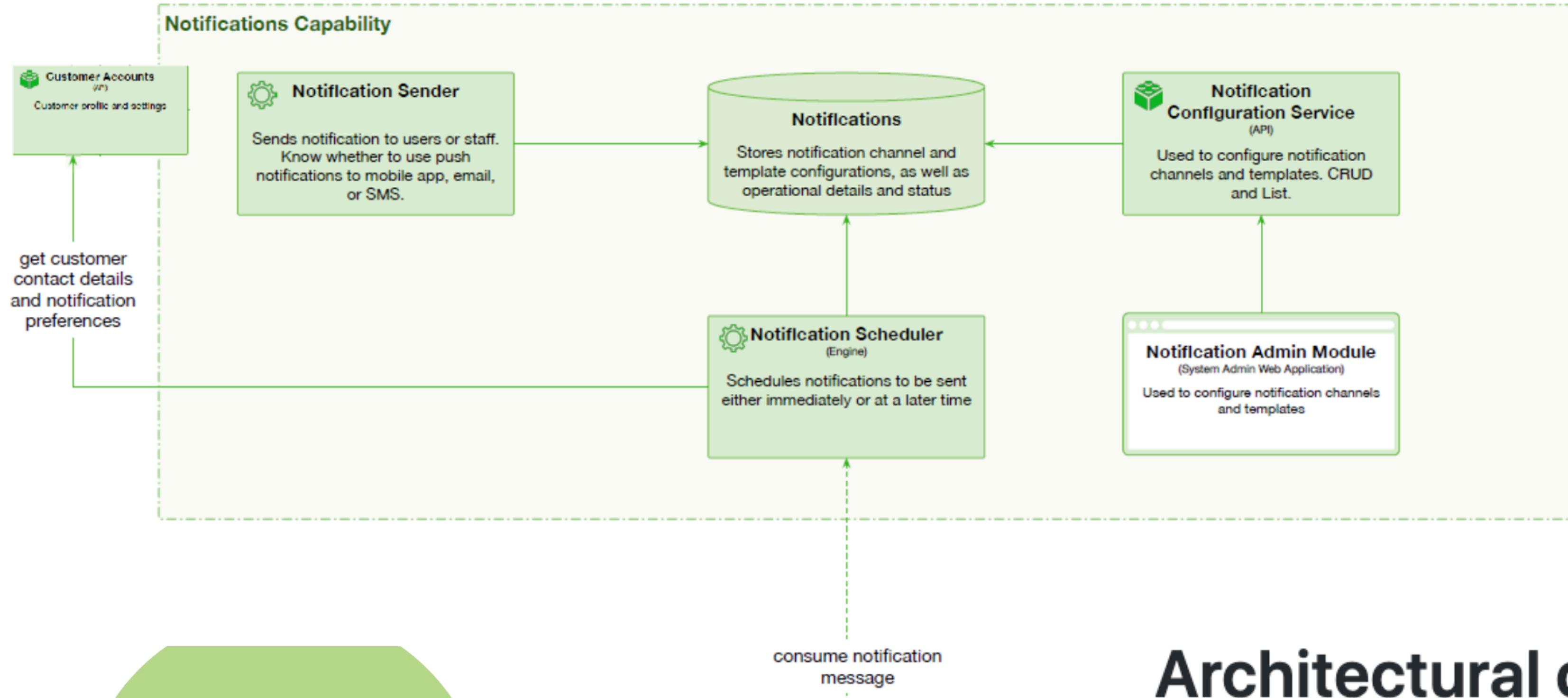
**Instructions**

- Identify no more than 7 driving characteristics.
- Pick the top 3 characteristics (in any order).
- Implicit characteristics can become driving characteristics if they are deemed *structural* concerns.
- Add additional characteristics identified that weren't deemed as important as the list of 7 to the *Others Considered* list.

<sup>a</sup> denotes characteristics that are related; some systems only need one of these, other systems may need both  
<sup>b</sup>



# Notifications Capability



## Architectural characteristics

- Elasticity.
- Fault tolerance.
- Plugin support.



## 1. Enable Discovery - Agility

The customer experience in acquisition channels (mobile, web and even SMS) must be seamless. This requires custom experimentation and optimization. The architecture must provide ways to capture customer behaviour with comprehensive analytics and support A/B testing. It's a plus if it can also provide rich experiences like smart recommendations powered by AI/Machine Learning. Those features must be immediately available on pay-as-you go basis, instead of requiring significant upfront investments in development or technology.

## 2. Affordable DevSecOps - Viability

The startup must be able to implement the architecture given budget and time constraints. More specifically this is framed as an integration project where solutions from Software as a Service (SaaS) vendors are integrated using minimal software development. The architecture must be able to be built by delivering features that address the most immediate growth pain points of the business. Complex features that require custom software development must be postponed to as late as possible.

# Diagrams: Types, level of detail, and completeness

---

# Diagrams

An effective architecture picture is worth more than a 1,000 words.  
Architecture represents topology, which benefits from visual representations.

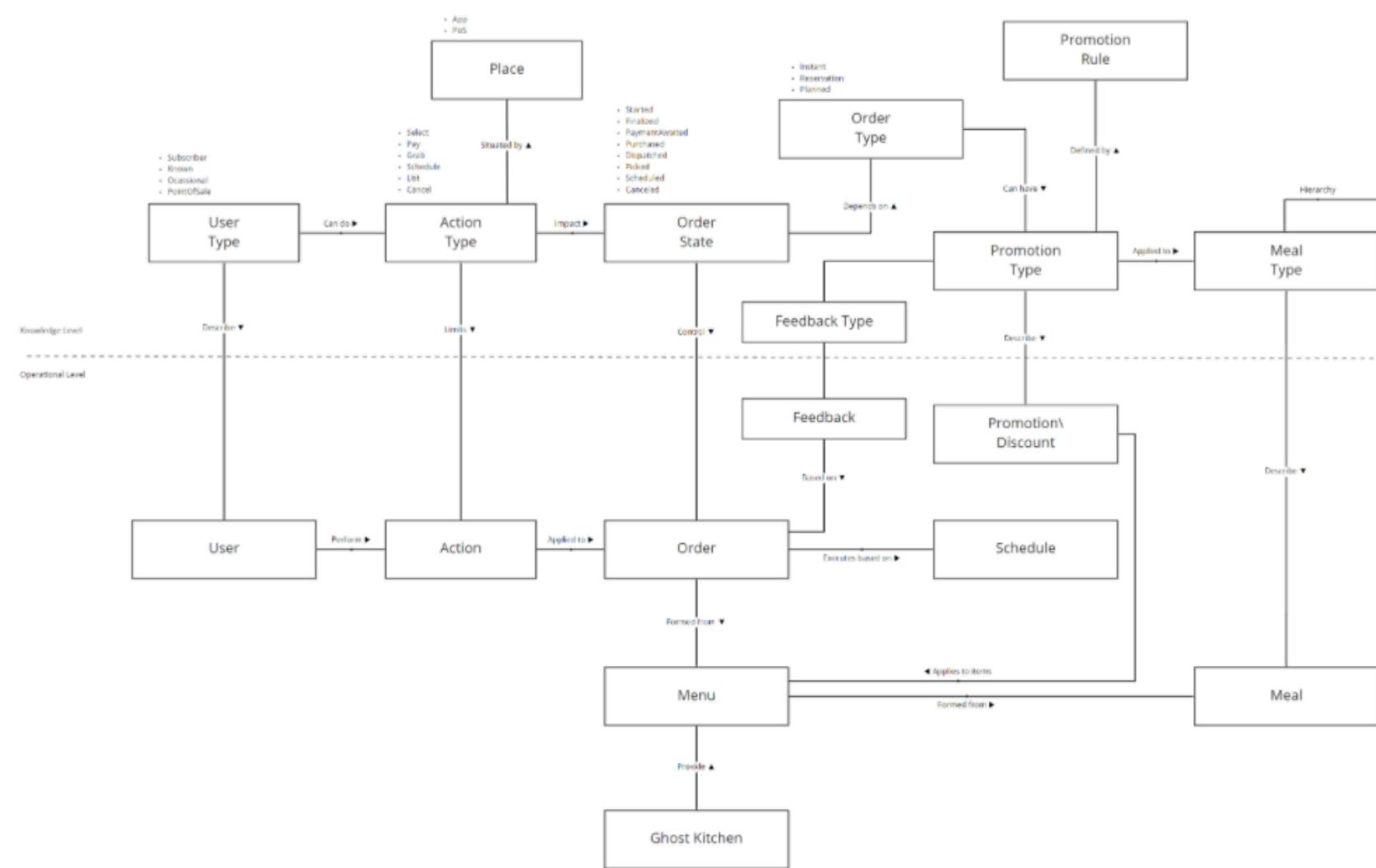


“The goal of a diagram is to convey a clear and shared understanding of the architecture”

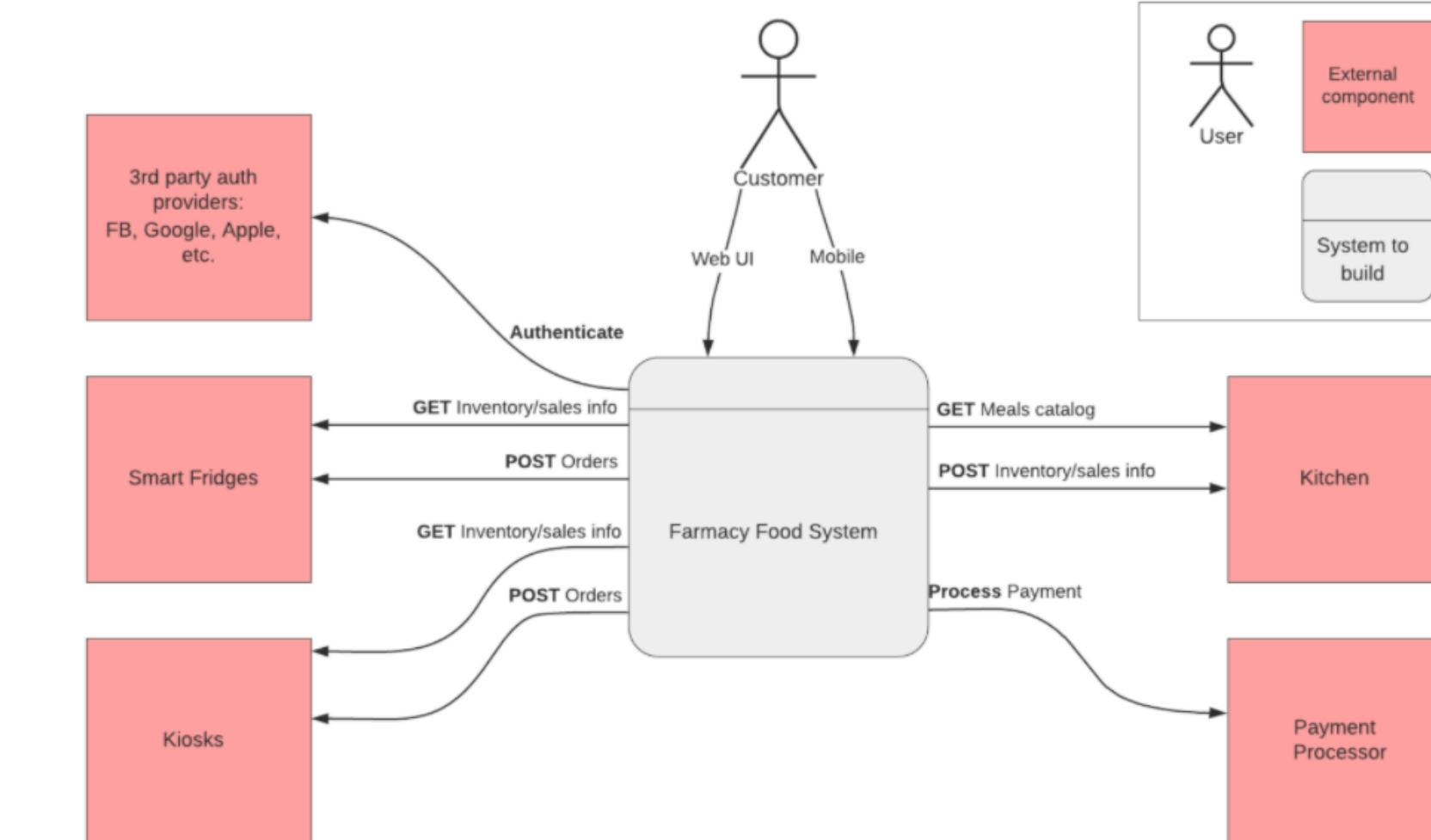
- Neal Ford

# Diagrams

An effective architecture picture is worth more than a 1,000 words.  
Architecture represents topology, which benefits from visual representations.



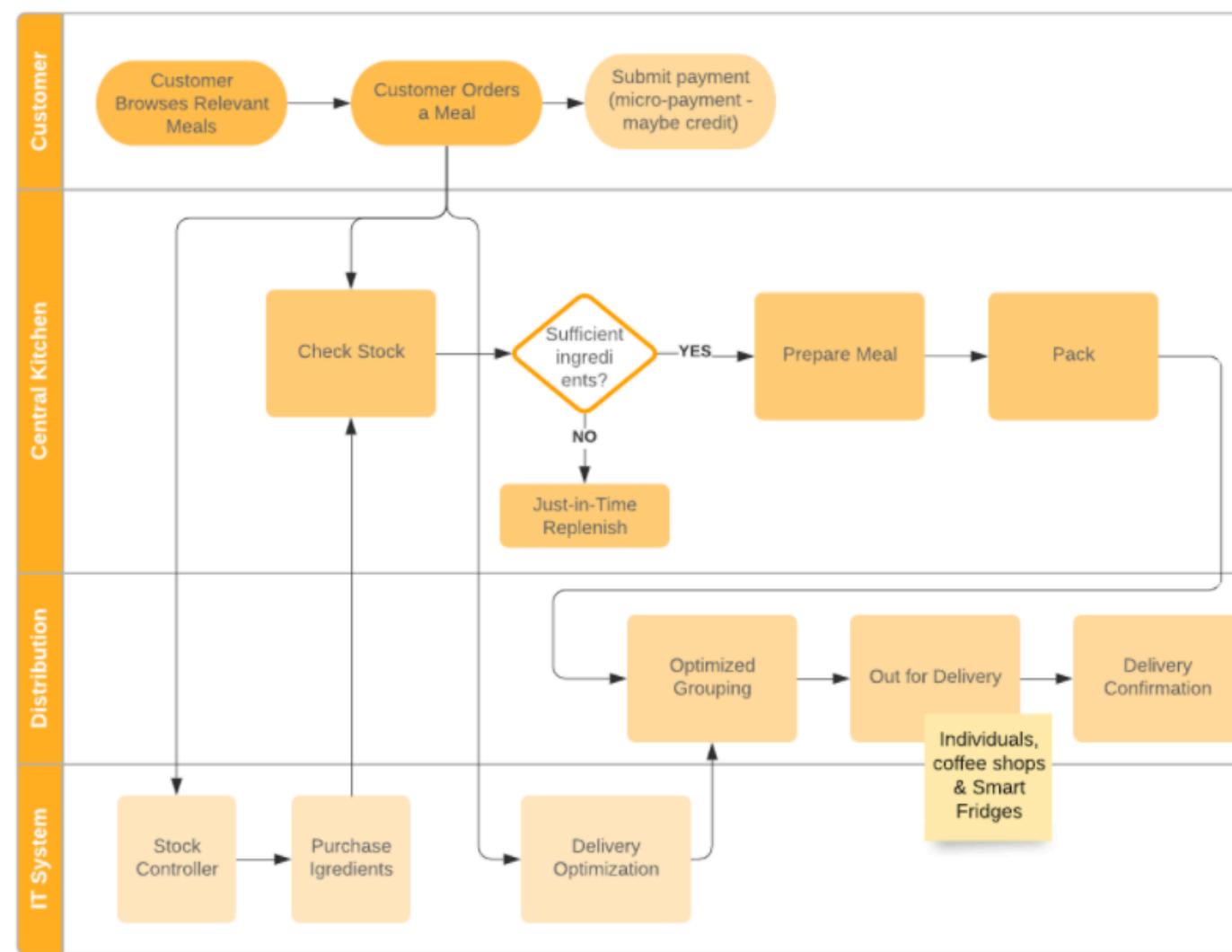
component diagrams



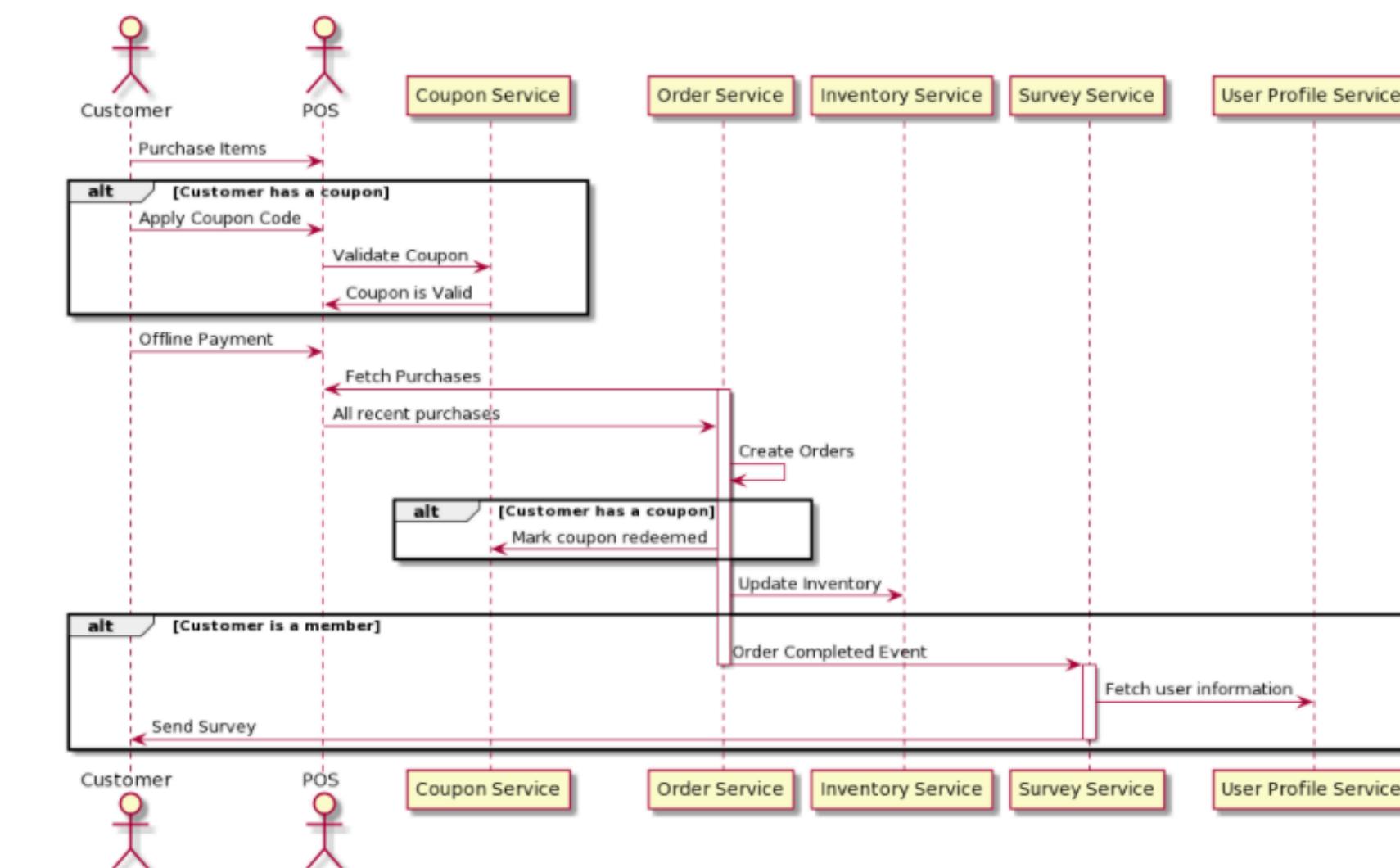
context diagrams

# Diagrams

An effective architecture picture is worth more than a 1,000 words.  
Architecture represents topology, which benefits from visual representations.



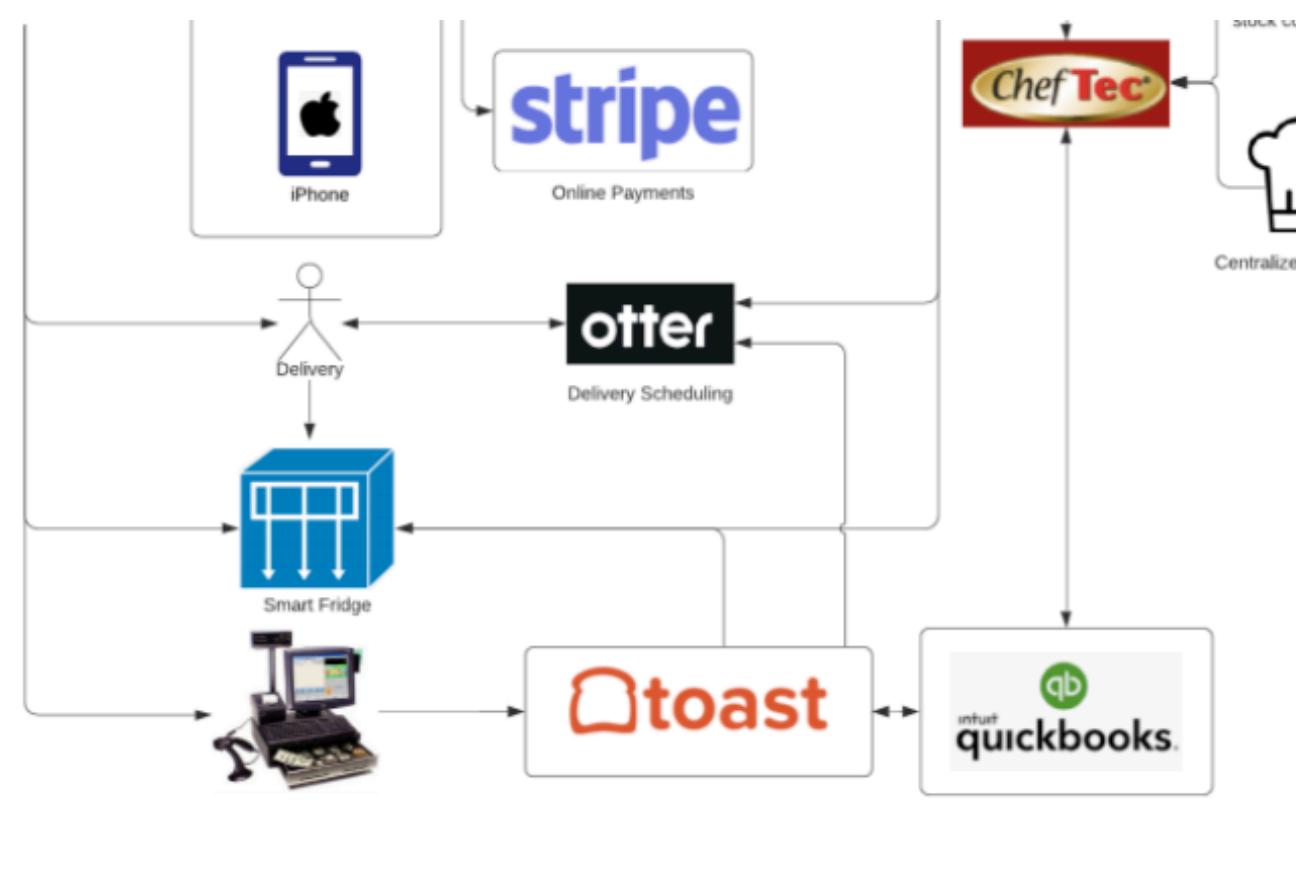
user journey diagrams



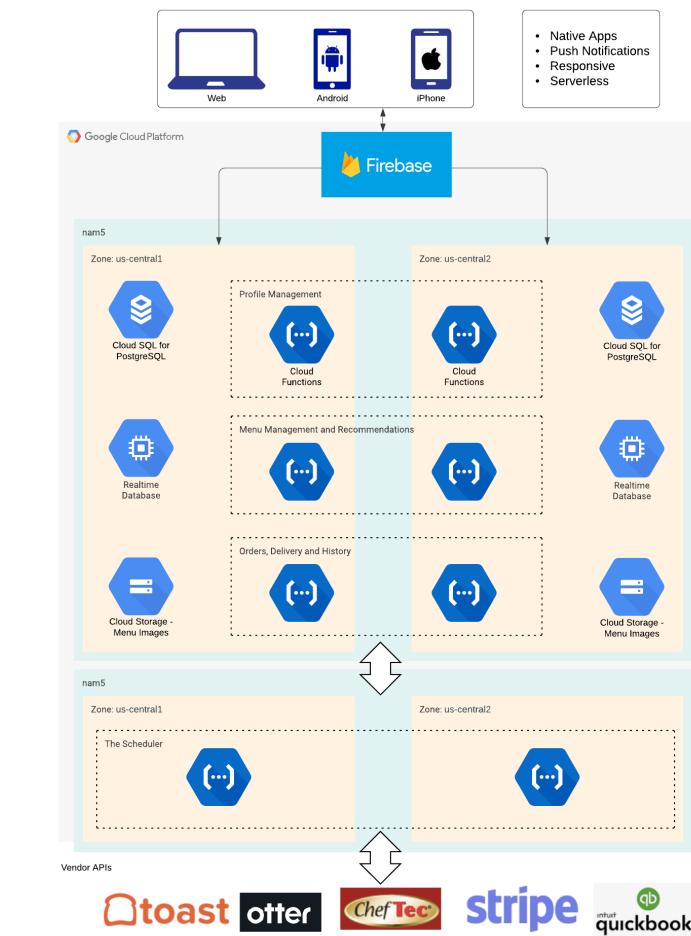
sequence diagrams

# Diagrams

An effective architecture picture is worth more than a 1,000 words.  
Architecture represents topology, which benefits from visual representations.



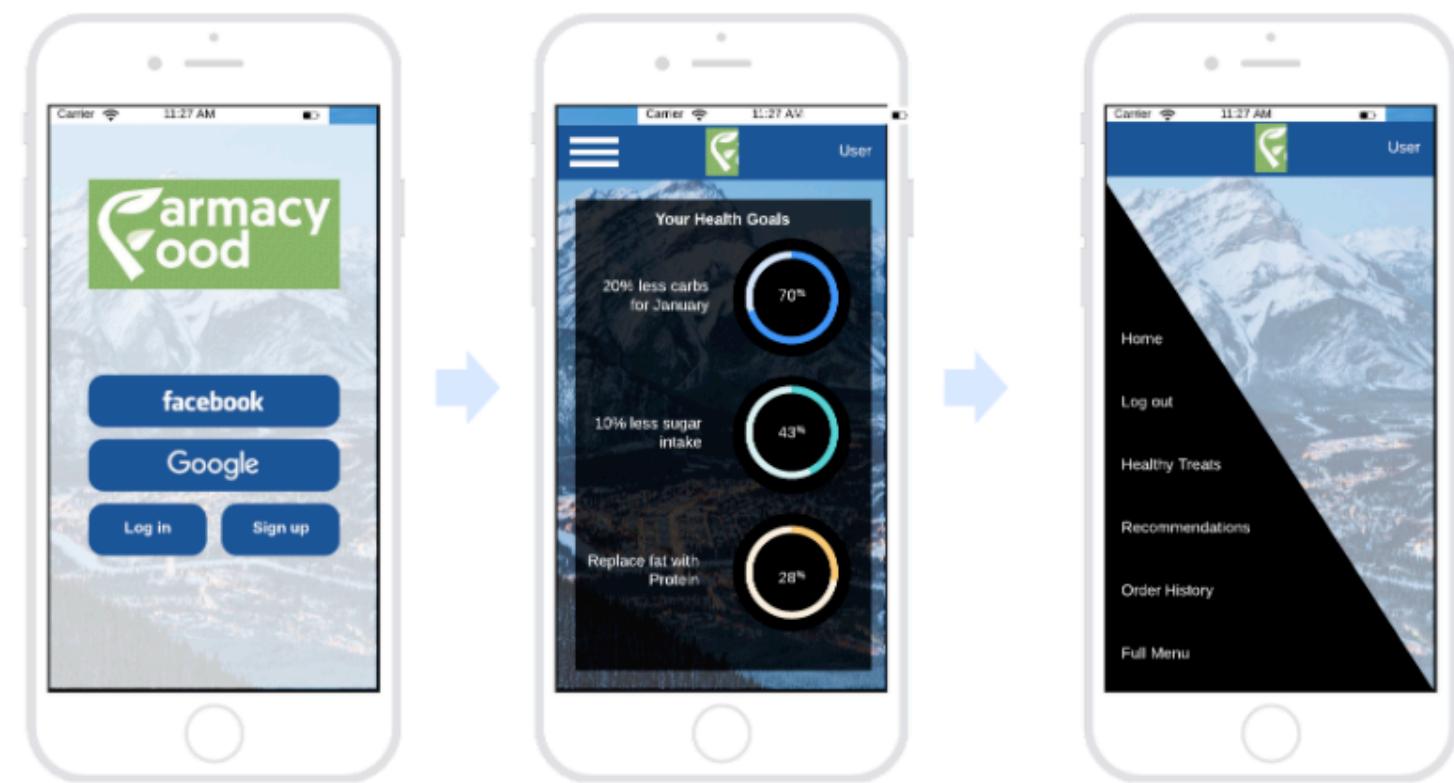
system-level diagrams



deployment diagrams

# Diagrams

An effective architecture picture is worth more than a 1,000 words.  
Architecture represents topology, which benefits from visual representations.



user interface mockups

# Architecture Decision Records: Documentation and justification

---



O'REILLY®



# Fundamentals of **Software** **Architecture**

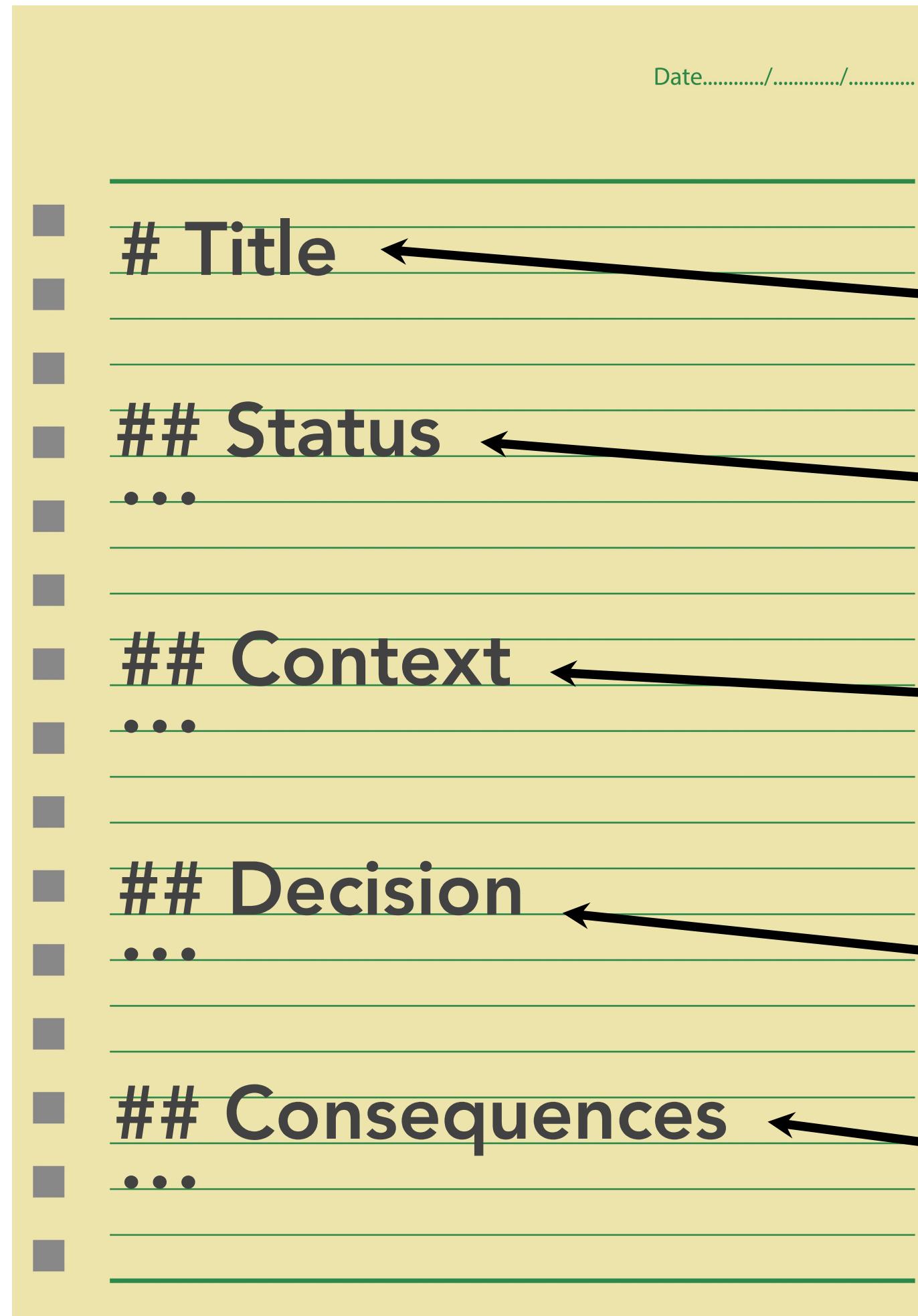
An Engineering Approach

Mark Richards & Neal Ford

## Second Law of Software Architecture

*"Why is more  
important than how"*

# architecture decision records



short text file; 1-2 pages long, one file per decision  
markdown, textile, asciidoc, plaintext, etc.

short noun phrase

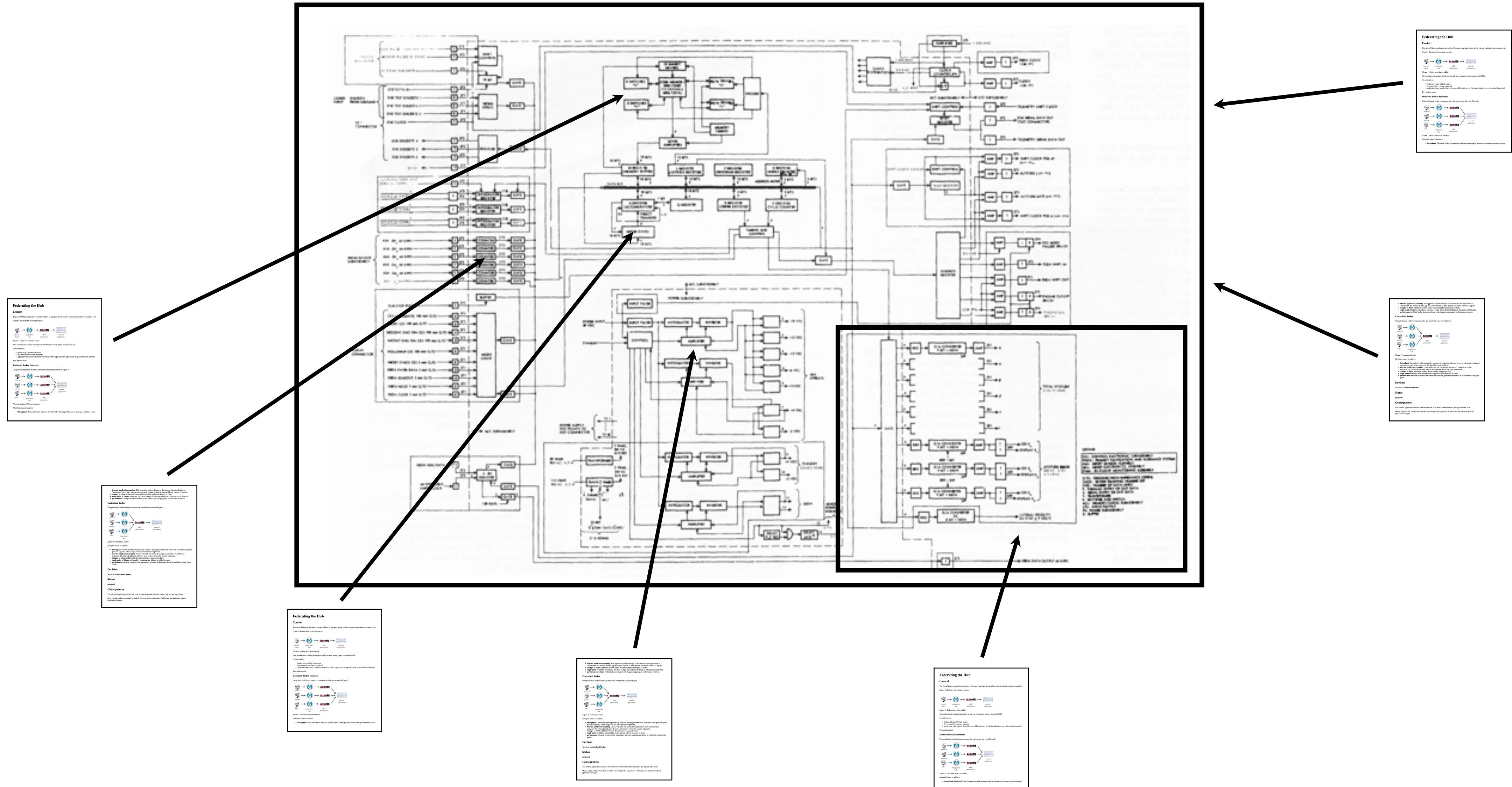
proposed, accepted, superseded

description of the problem and alternative  
solutions available (documentation)

**decision and justification (the “why”)**

trade-offs and impact of decision

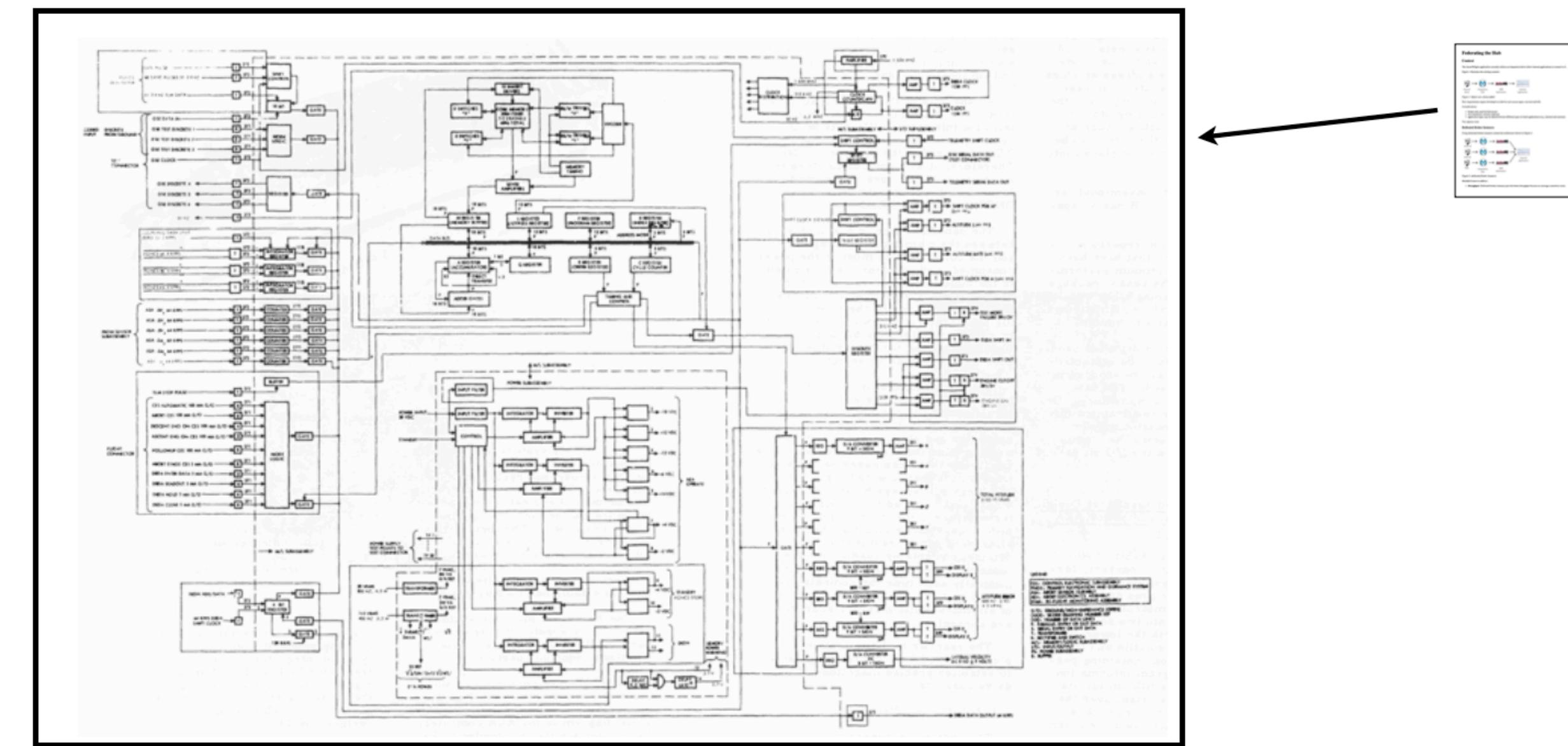
# architecture decision records



# architecture decision records

## ADR 001: Use the microservice architecture style with containerization

Farmacy Food is a start up company and does not have a sizeable team of experienced developers available. The overarching architecture style for the Farmacy Food system should be simple, easy to create, maintain and **evolve**. Finding developers that can create and evolve the system, as well as tools and frameworks that support the system should not require heaps of money. In other words, Farmacy Food is not in a position to be an *early adopter*, and should hence adopt an established architecture style that supports evolution.



# architecture decision records

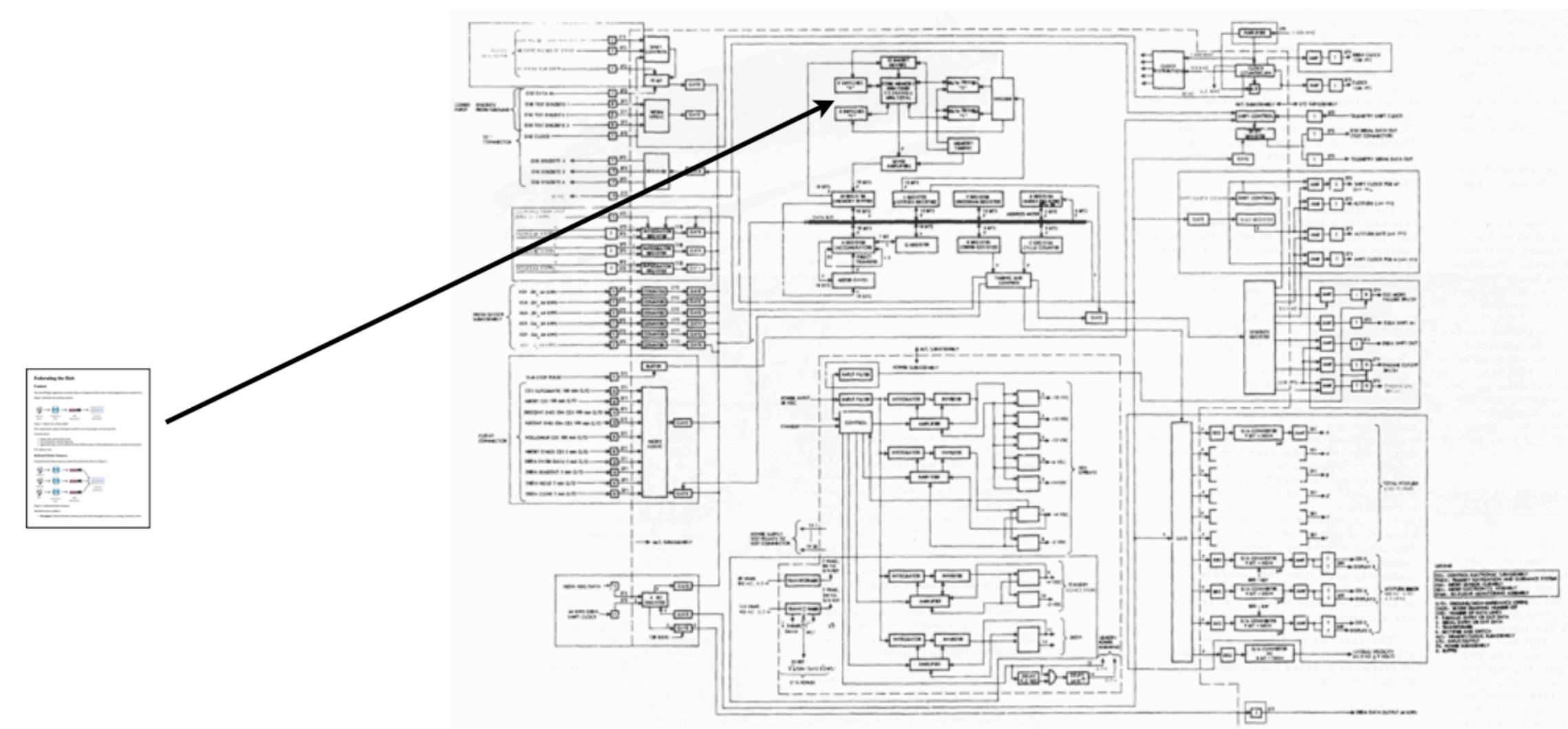
## ADR\_004 Use a centralized notification for external communication

### Context

There was some confusion around the purpose of the notification component. Specifically, is this component an event bus for **all** communication or is it a shared component for communicating externally.

### Decision

We decided to have a dedicated notification system responsible of sending external notification. The reasons include:

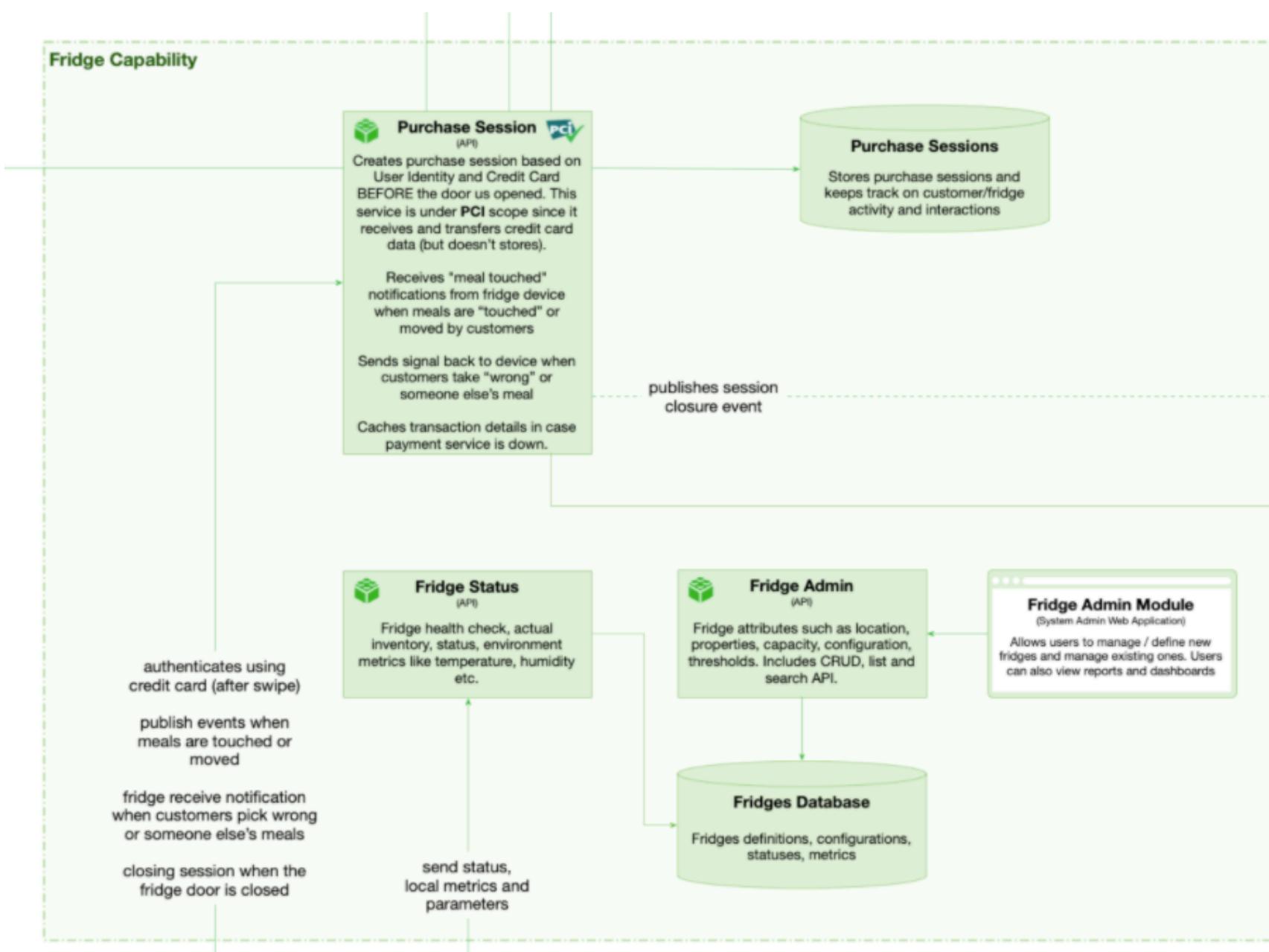


# Overall Solution

---

# Overall Solution

The architecture solution describes the overall structure of the system and how it will be constructed



- Are the architecture characteristics demonstrated in the solution?
- Is the solution appropriate and feasible given the project constraints?
- Are the architecture styles selected represented in the solution?

**Integration**

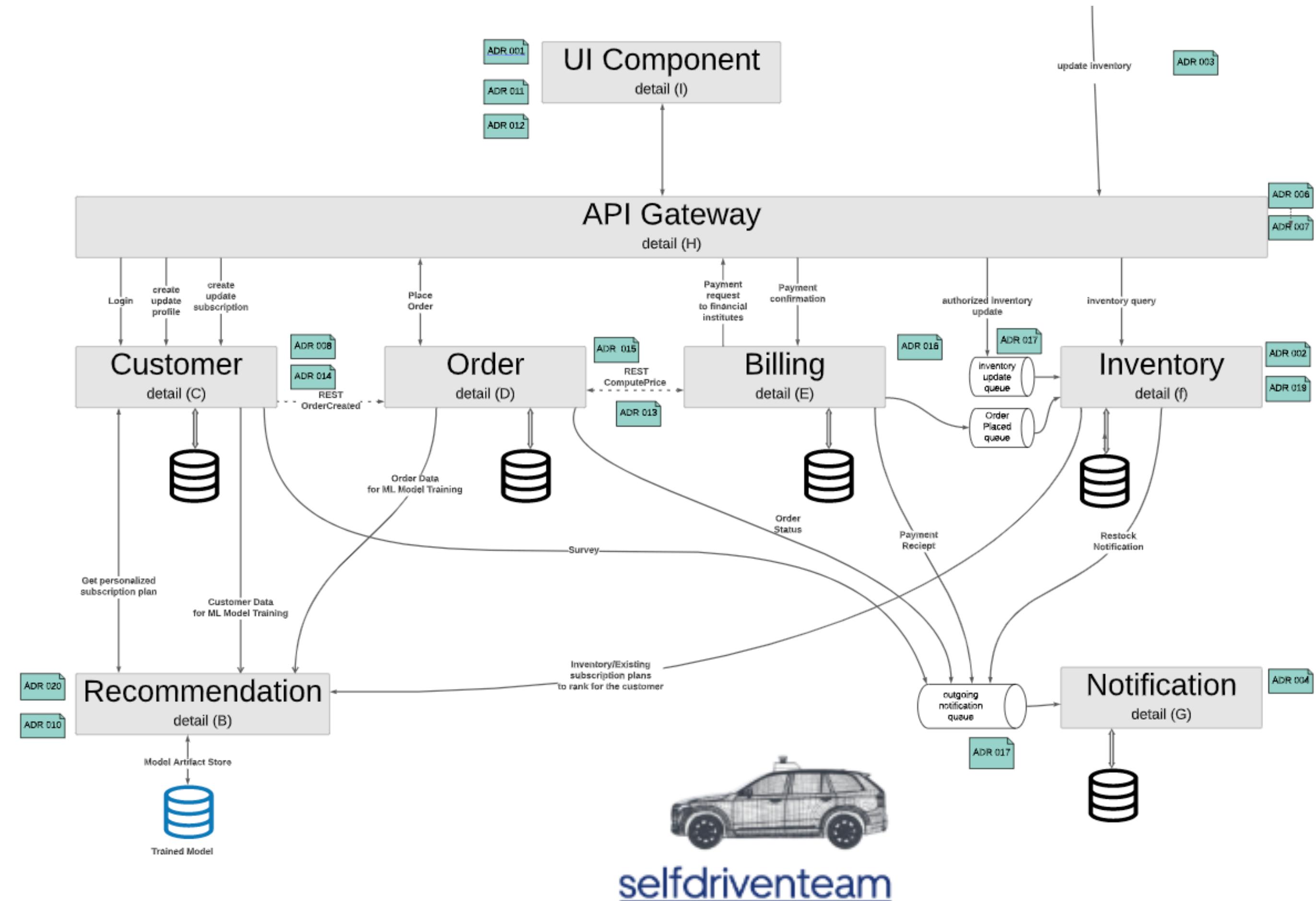
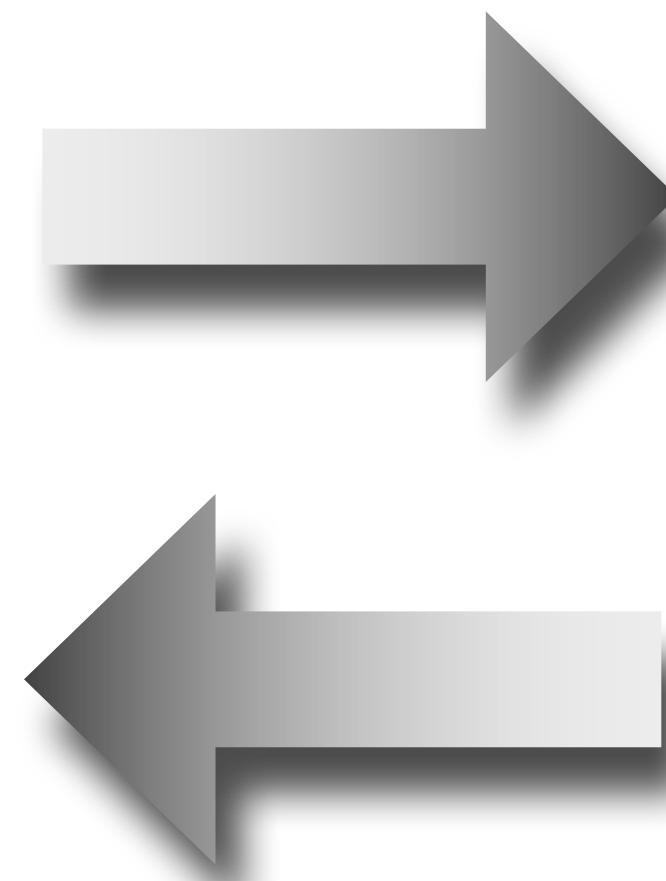
**Feasibility**

**Agility**

**Availability**

**Security**

**Scalability**



# Final Architecture Presentation (Semi-Finalists)

---



# The Kata

---

# Definitions

- Transactional Customer - Farmacy Foods
- Engaged Customer - in Farmacy Family and Farmacy Foods
- Support Community - engaged members within a community
- Client - low-income families, elderly, first responders
- Community - small group of engaged customers within a neighborhood area

# Overview

Farmacy Family is an enhancement of the existing Farmacy Foods system (designed by Arch Colider from the first Kata exercise) that adds tighter engagement with their customers.

When a transactional customer purchases a meal, Farmacy Family will generate an email elucidating additional benefits available for becoming an engaged customer.

# Primary Goals

- Develop relationships between engaged customers and nurture those relationships.
- Convert transactional customers to engaged customers.
- Generate analytical data from medical information to demonstrate the benefits of Farmacy Foods.

# Goal

Thus, the overall goal of Farmacy Family is to connect, gather, analyze, and communicate.

# Users

Hundreds, separated by distinct geographic zones. Additionally, different clusters of customers frequently consolidate around similar dietary requirements. Mostly targeting low income, elderly, and first responders.

# Requirements

- Add a new system to manage customer profiles, allowing community engagement, personalization around preferences and dietary needs
- Support geographical trend analysis to hone Farmacy Family's ability to optimize the foods delivered to fridges (an additional integration point TO Farmacy Foods)
- Support both push and pull models for community engagement. In other words, Farmacy Family will manage forums, emails, and create connections between similar demographics. Farmacy Family needs transactional member information for outreach purposes. The engagement model includes subscriptions, forums, reference material, class information, and other media that supports Food-as-medicine

# Technical Details

## Domain areas

### Onboarding

- profile for customer
- analytics

### Community

- forum (localized, temporal)
- in person / virtual events (localized, temporal)
- classes (localized, temporal)
- interactive media library (global, reference)
- general wellness education (global, reference)

### Integration (extranet)

- dietician
- clinics
- Farmacy Foods

# Engagement Models

## Clients

- Covered above - building a community, education, increased awareness

## Clinics - Work with clinics to establish baseline tests for clients

- Gather results
- Test every 3 months
- Analyze results
- Demonstrate any change in their overall health
- use this info to gain investors and additional support and help

## Dieticians

- Farmacy Foods supported generic advice from dieticians. Farmacy Family will support one-on-one advice for engaged customers
- Regular contact via messages
- Selective access to medical information about the customer from a partner clinic

## Family Foods

- Farmacy Family needs to know which Transactional Customers (and their information) are not part of Farmacy Family (Engaged Customer) to start the onboarding process for those customers
- Farmacy Foods needs to know which transactional customers are Engaged Customers

# Requirements

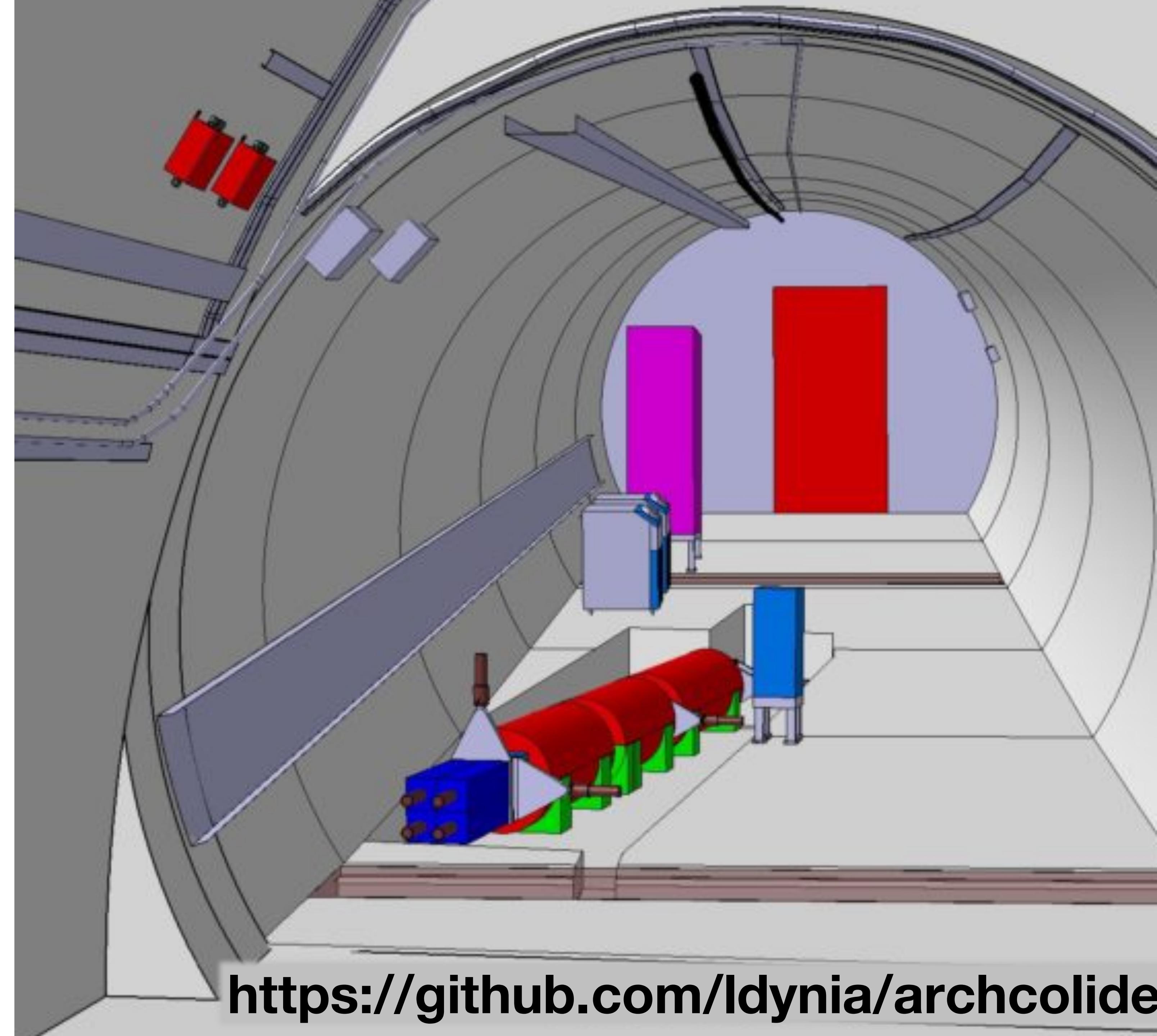
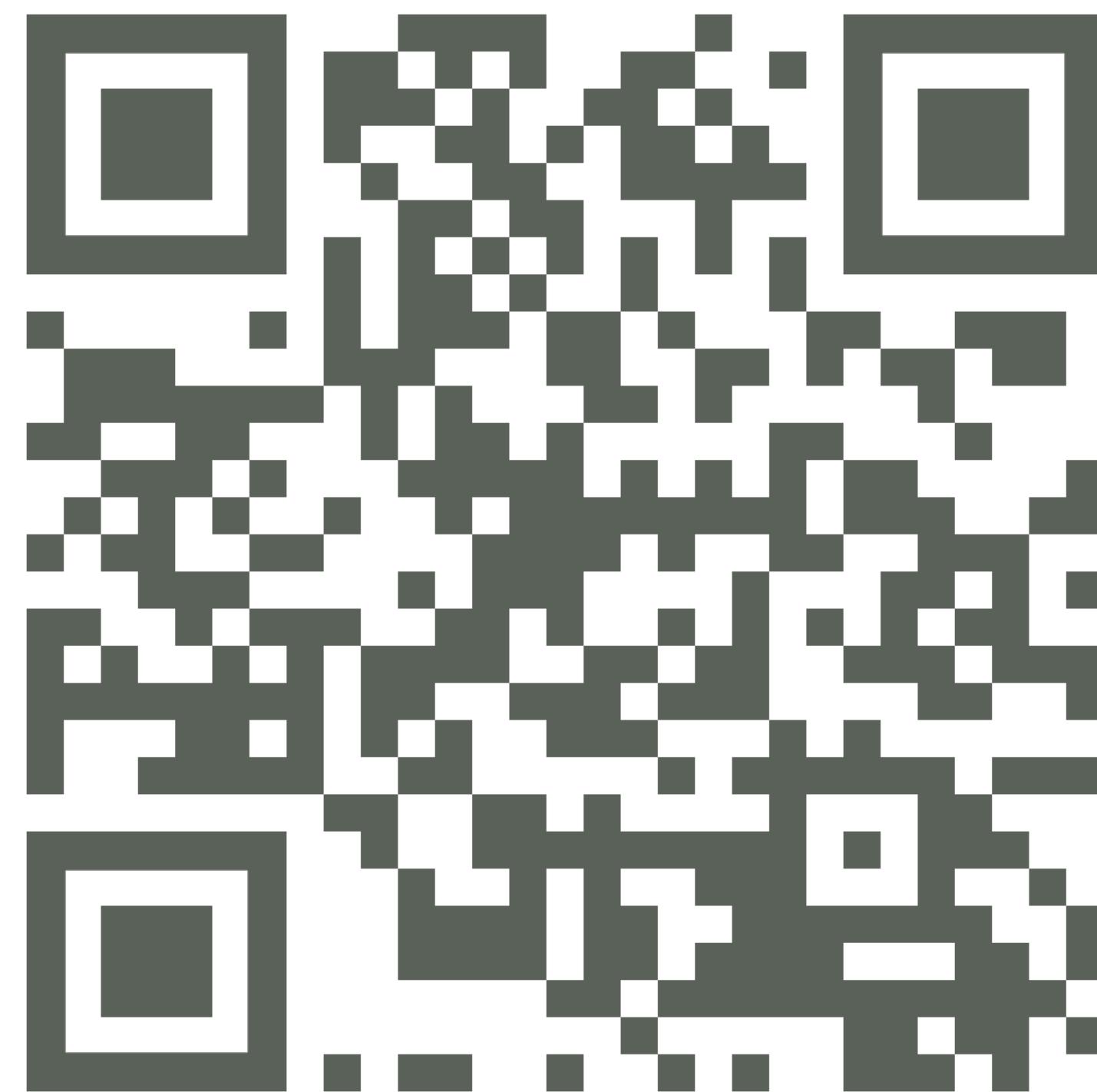
- eDietian has access customer profile to improve advice and monitoring of customers. Additionally, the customer and dietitian can interact via messages.
- Farmacy Family wants to improve the distribution and potential food waste from having the wrong mix of foods in a particular fridge.
- Farmacy Family will include medical profile information and the ability to share information with medical service providers.
- Farmacy Family customers can customize how much profile information they want to allow the community to see, at a fine-grained level.

# Requirements

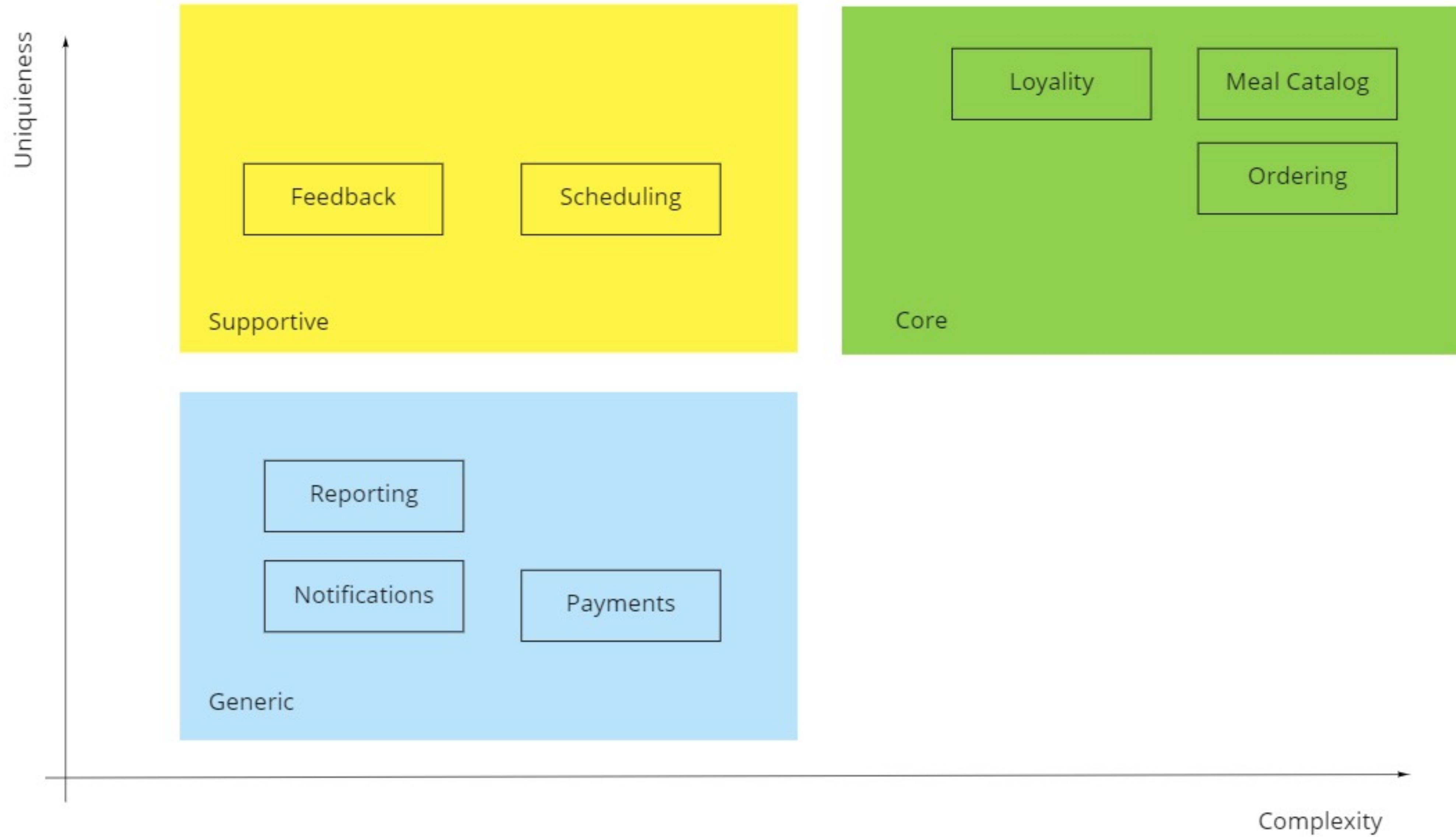
- Farmacy Family has relationships with third party providers (clinics, doctors, etc) that have access to more analytical data to improve engagement (for example, regional dietary observations).
- Add Farmacy Family user interface to existing Foods interface, which is currently a Reactive monolith. Create a holistic UX for both food and Farmacy Family to support engagement model.

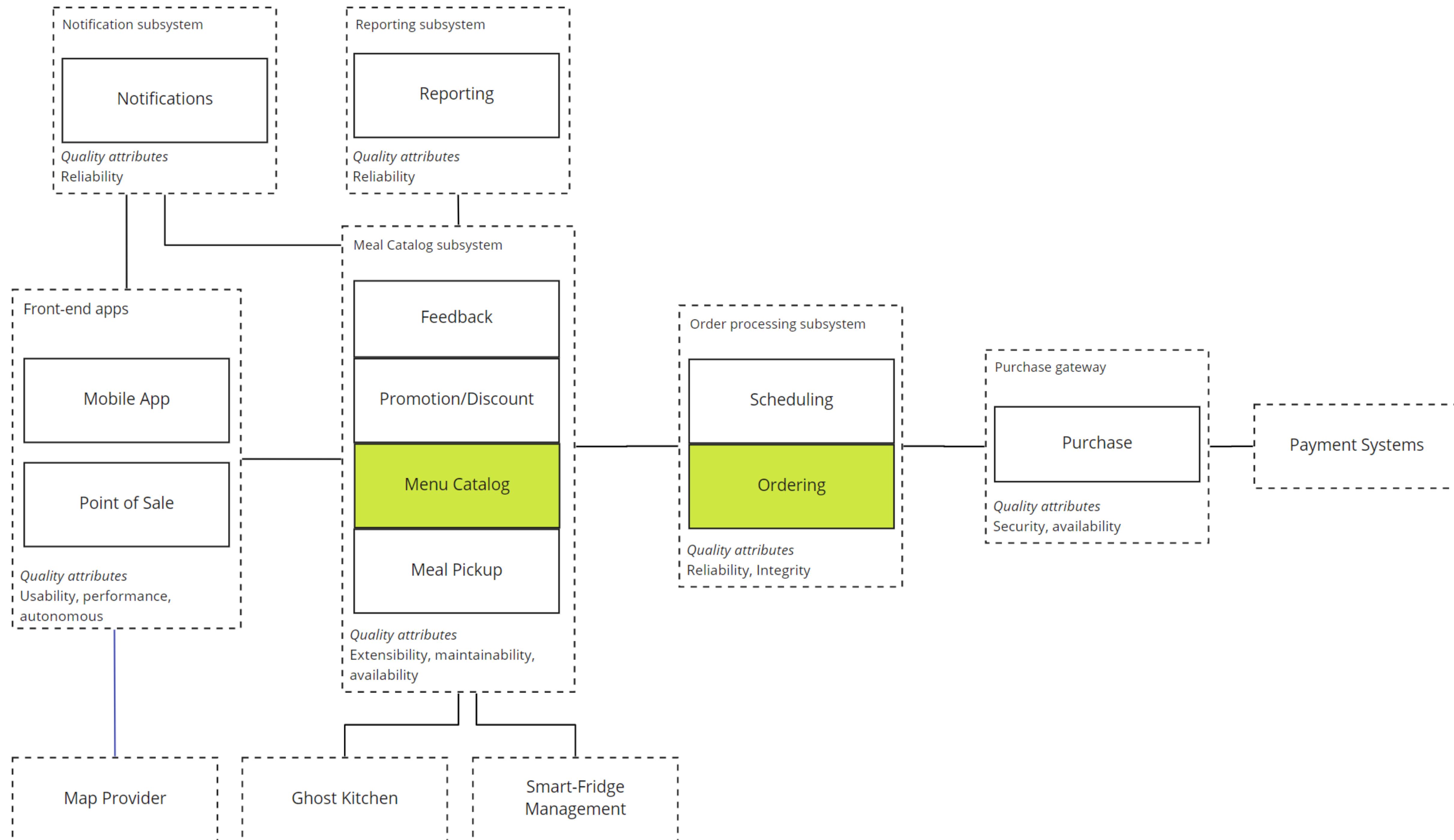
# Additional Context

- The new system must seamlessly incorporate into Farmacy Foods.
- Improved use of analytics driven through the new integration of Farmacy Family will help gather new investors and prove better dietary outcomes in member communities.

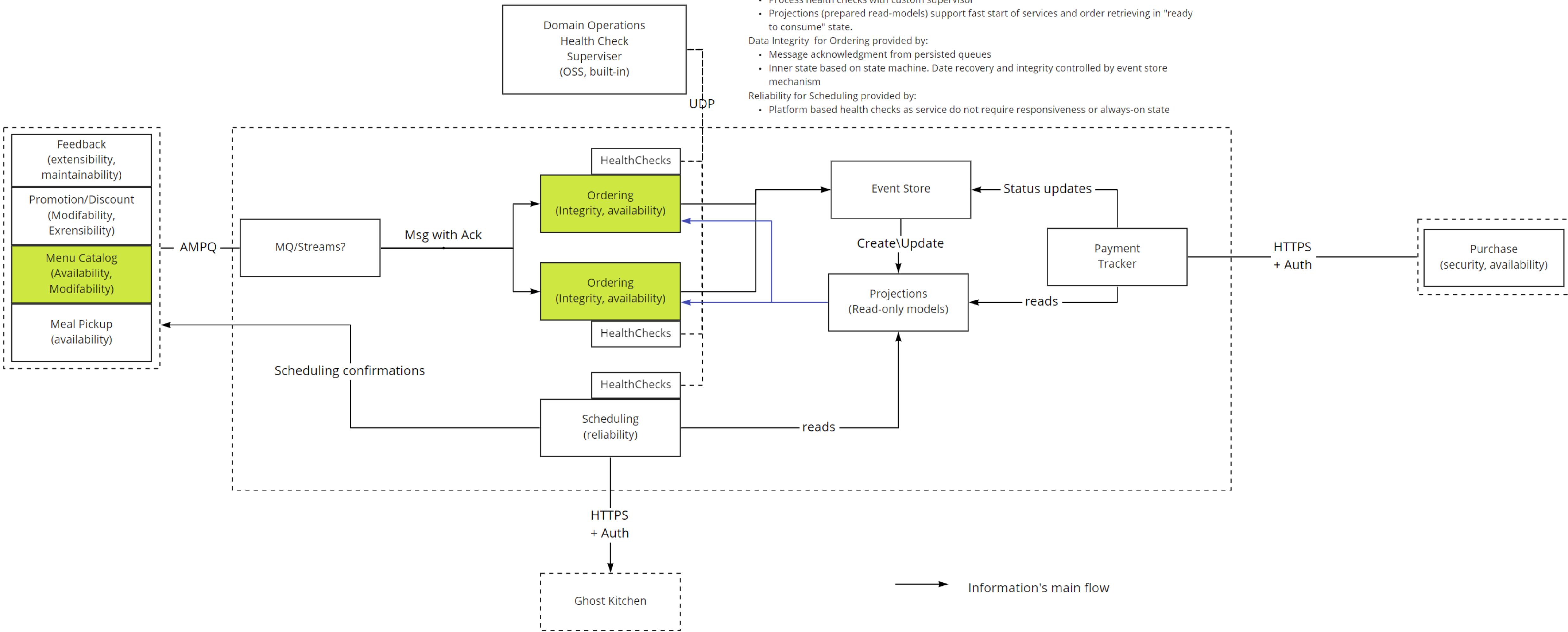


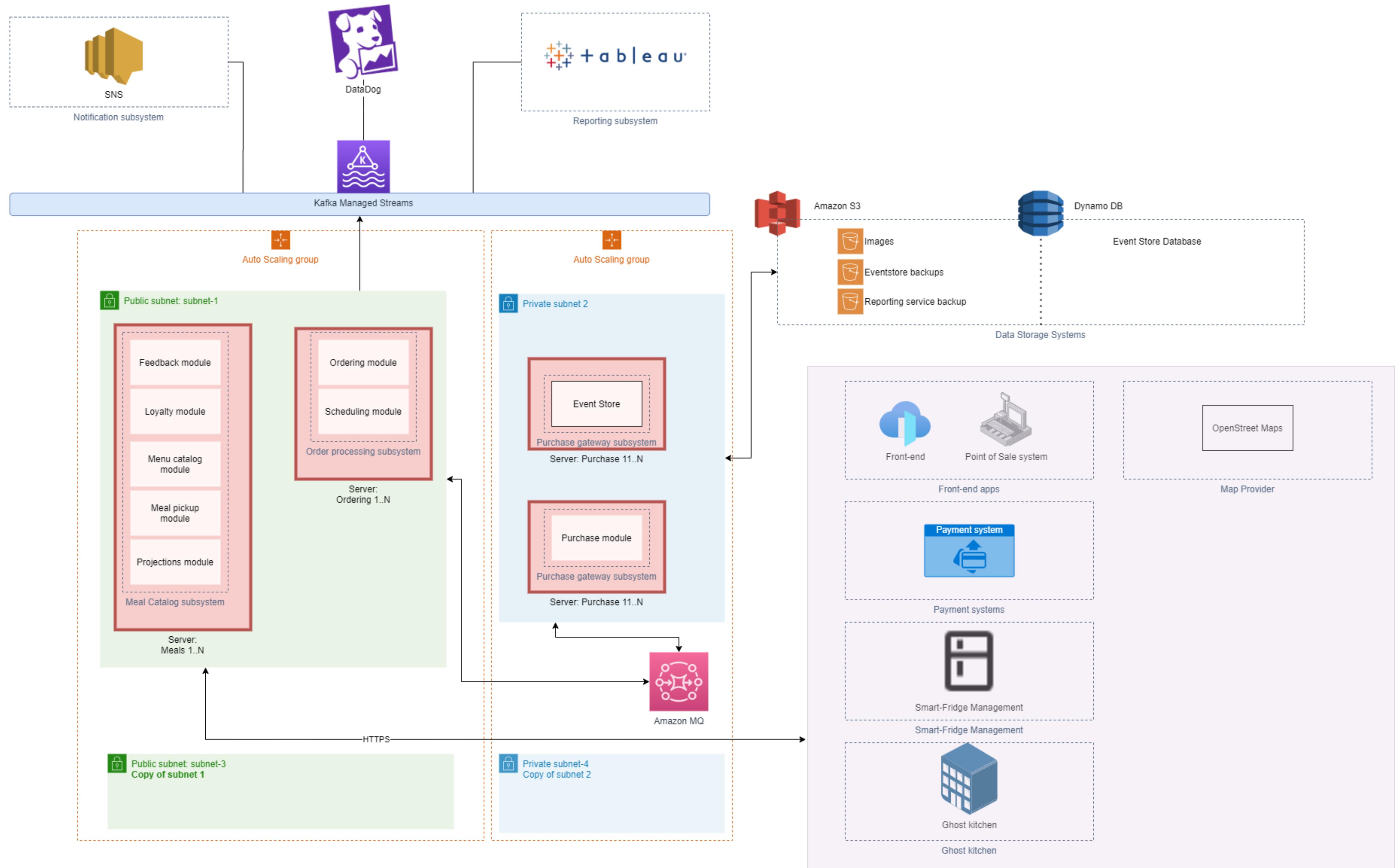
<https://github.com/ldynia/archcolide>

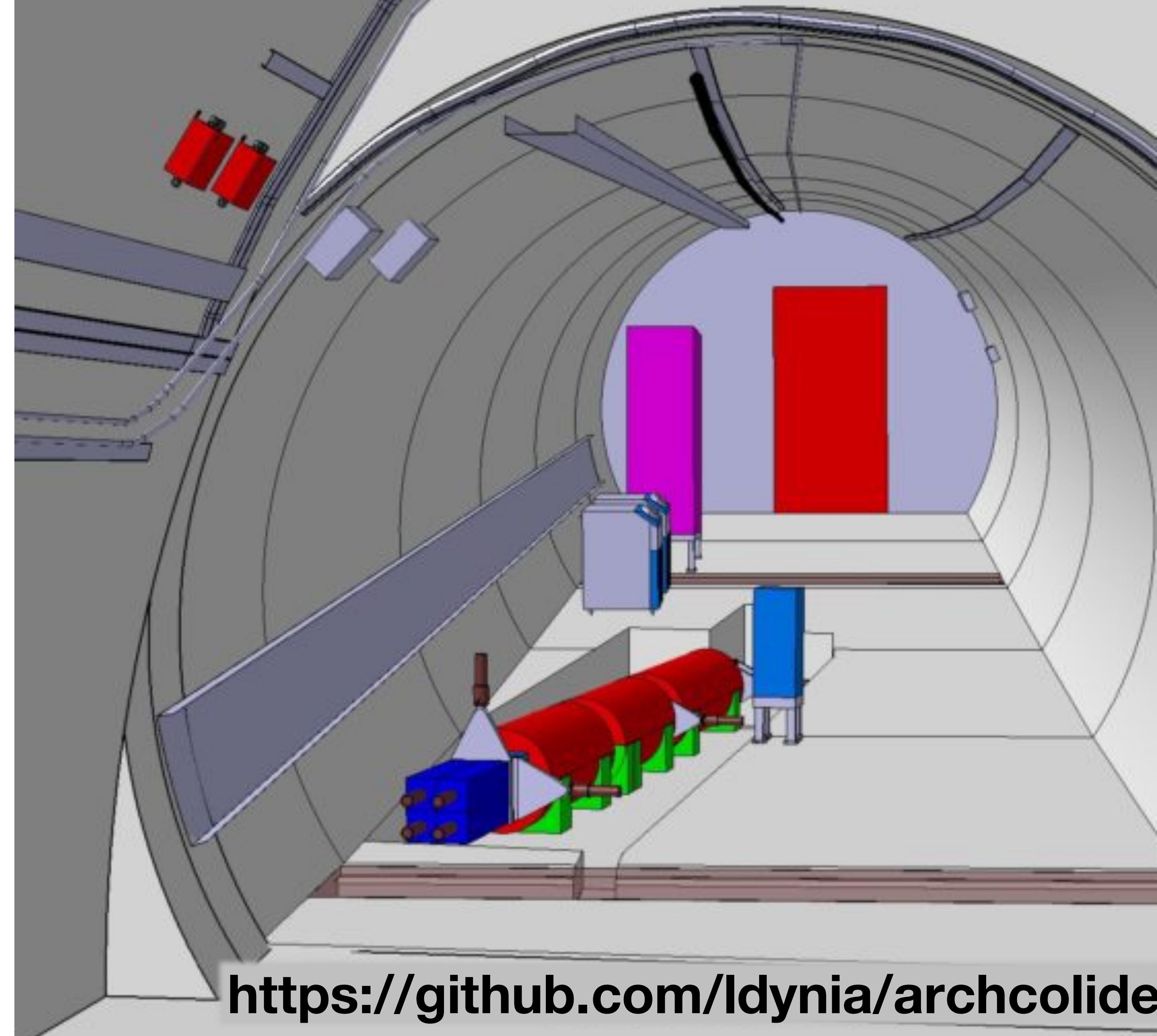
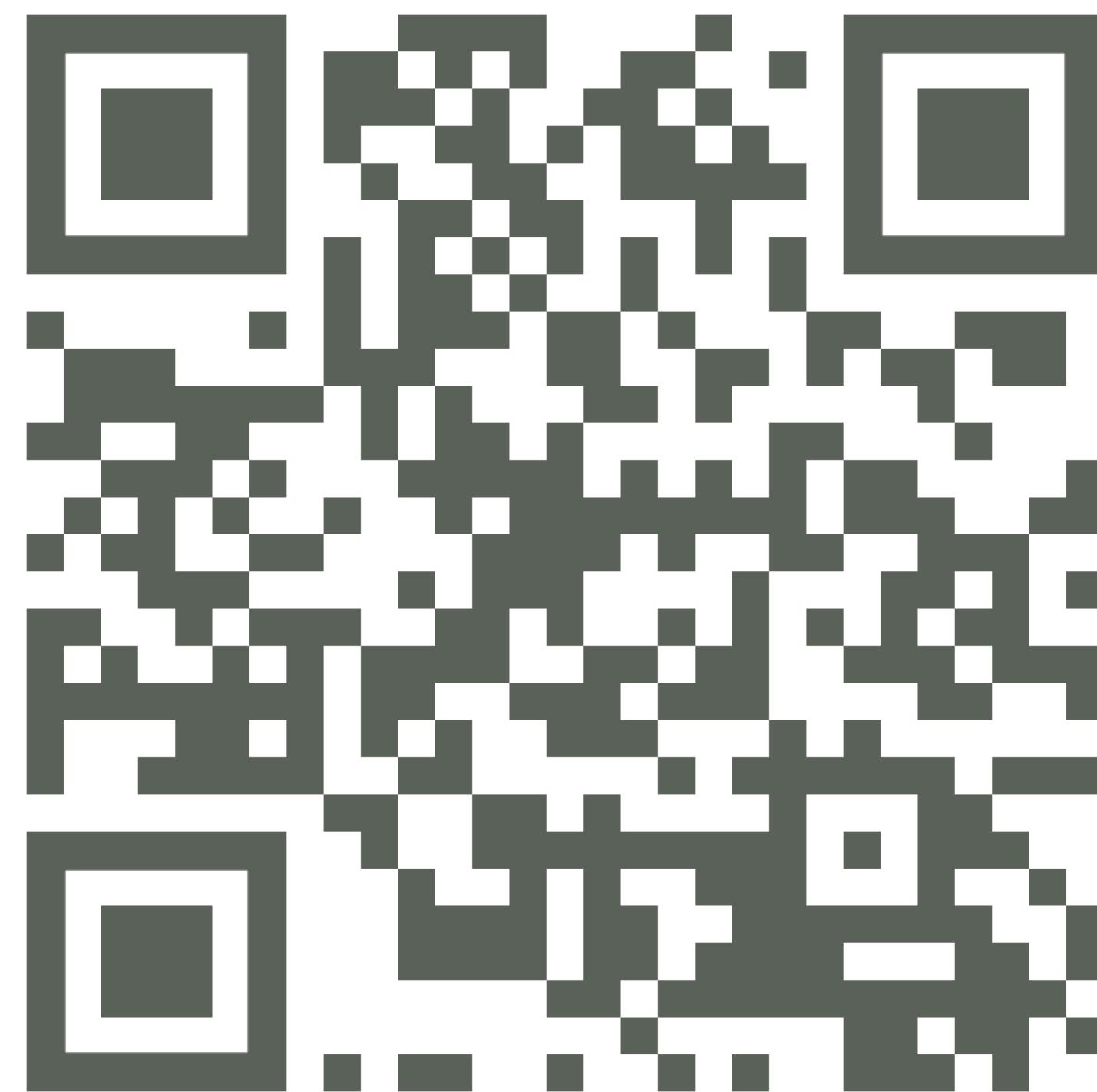




# Event Sourcing







<https://github.com/ldynia/archcolide>

# Meet the SME

---

# Kwaku Osei

## Founder, Farmacy Food



Kwaku Osei is the founder of Farmacy Food, a tech-enabled healthy food startup that seeks to make health and wellness radically affordable and accessible, and Cooperative Capital, a community-based private equity fund that enables residents to pool their money together to make promising investments within their community.

He was previously an Executive Associate at Rock Ventures, served as CEO to Project X LLC, and worked at Deloitte Consulting in DC. He currently serves on the boards of The Economic Development Corporation of the City of Detroit, Community Development Advocates for Detroit (CDAD), Detroit Community Wealth Fund, and Bridging Communities, Inc.

# Meet the Judges

---

# Pramod Sadalage

## Director, Thoughtworks



Pramod Sadalage is Director at Thoughtworks where he enjoys the rare role of bridging the divide between database professionals and application developers. He is usually sent in to clients with particularly challenging data needs, which require new technologies and techniques. In the early 00's he developed techniques to allow relational databases to be designed in an evolutionary manner based on version-controlled schema migrations.

He is contributing author for Building Evolutionary Architectures - Support Constant Change, co-author of Refactoring Databases, co-author of NoSQL Distilled, author of Recipes for Continuous Database Integration and continues to speak and write about the insights he and his clients learn.

# Emily Bache

## Technical Agile Coach, ProAgile



Emily Bache is a Technical coach at ProAgile and also a well known author and speaker. Emily works with software development teams and organizations who want to get better at the technical practices needed to be agile, including Test-Driven Development, Refactoring, Incremental Design and Architecture. Emily's most recent book "Technical Agile Coaching with the Samman Method" (<https://leanpub.com/techagilecoach>) details her coaching methods. Originally from the UK, Emily lives in Gothenburg, Sweden.

# David Bock

## Vice President of Strategic Development, Core4ce



- At Core4ce, Mr. Bock is the Vice President of Strategic Development. Mr. Bock is responsible for turning new ideas at Core4ce into successfully executed business plans.
- Prior to joining Core4ce, Mr. Bock was the VP of Tech & Engineering Mission Support at Decisiv, where he was responsible for internal IT operations, Site Reliability Engineering, Quality Assurance, Security, Customer Service, and Release and Triage teams.
- David served as the Editor of O'Reilly's OnJava.com website, has been published in several books and magazines, and frequently speaks on technology & team processes at software conferences.

# Cassandra (Cassie) Shum

Thoughtworks, Technical Director, Enterprise Modernization, Platform and Cloud NA



- Cassie is the Technical Director, Enterprise Modernization, Platform and Cloud, for North America. As a software engineer and architect, she has spent the last 10+ years at Thoughtworks focusing on building highly scalable and resilient architectures including event-driven systems and microservices on cloud-based technologies.
- Cassie has also been involved in growing not only organizations in the delivery practices and technical strategy but also the next generation of technologists. Some of her passions include advocating for women in technology and public speaking.

# Contest Details

---

# Important Dates & Reminders

- All teams must submit a google form (<https://forms.gle/RfGAQS9Bso5CjKfD7>) by October 22<sup>nd</sup>, 5PM Eastern to participate
- Solutions are due in your GitHub repo by October 31<sup>st</sup>, midnight Eastern
- Finalists will be announced at the second event on November 10<sup>th</sup>
- Questions? Email us at [katas@oreilly.com](mailto:katas@oreilly.com)