

# Architecture Katas On-line

## Autumn 2022



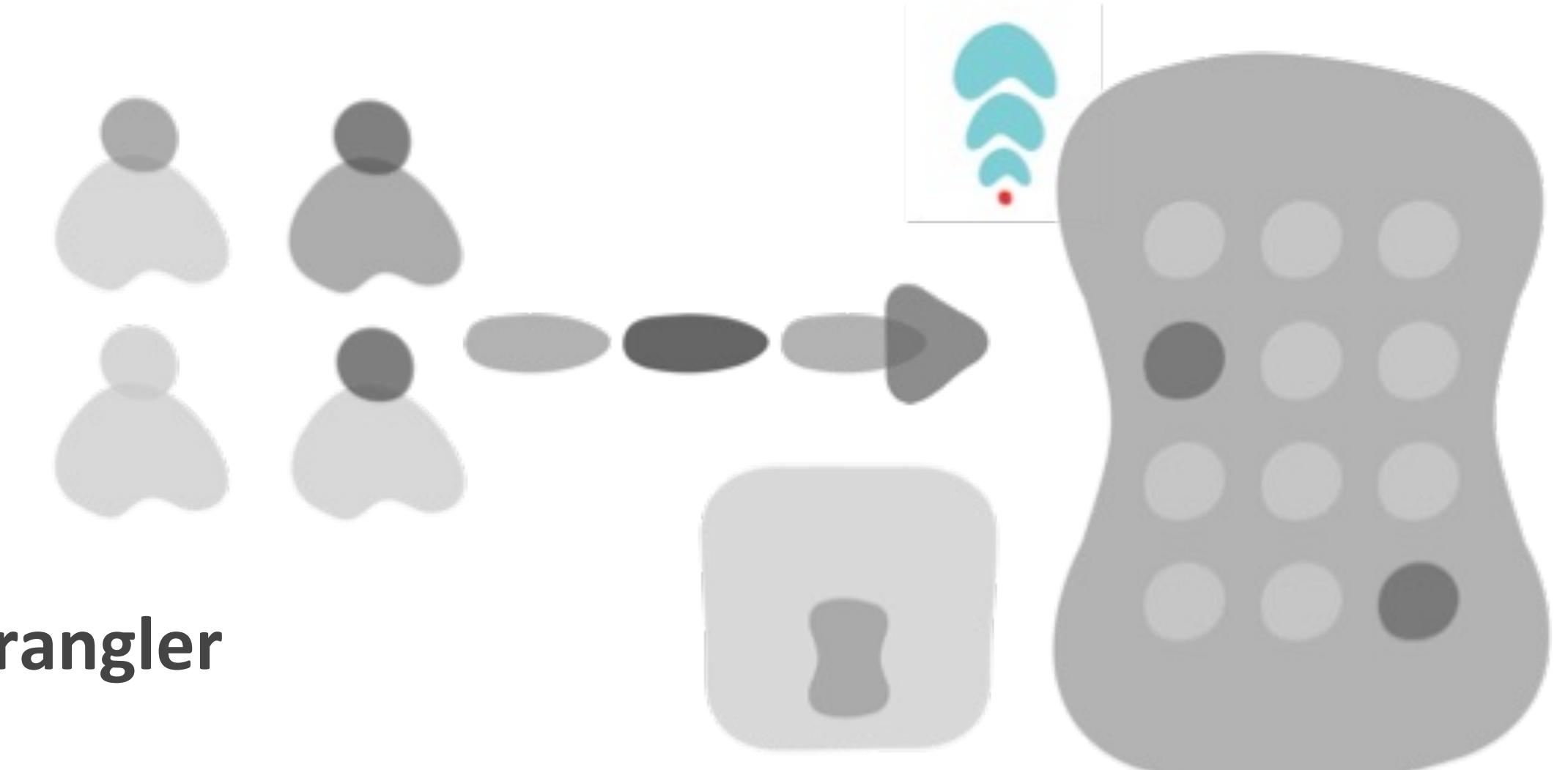
**Neal Ford**

Thoughtworks

Director / Software Architect / Meme Wrangler

<http://www.nealford.com>

@neal4d



**Mark Richards**

Independent Consultant

Hands-on Software Architect, Published Author

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

@markrichardssa

# Introduction

Where did this  
idea come from?

The screenshot shows a web browser window with the URL [archkatas.herokuapp.com](http://archkatas.herokuapp.com) in the address bar. The page title is "Architectural Katas". The main heading is "Architectural Katas". Below it is a quote: "How do we get great designers? Great designers design, of course." --Fred Brooks. Another quote follows: "So how are we supposed to get great architects, if they only get the chance to architect fewer than a half-dozen times in their career?" --Ted Neward. A blue button labeled "Do one! »" is visible. The page is divided into several sections: "About", "Rules", "Contribute", "Invite", "Lead", and "Join". Each section has a brief description and a call-to-action button.

**Architectural Katas**

"How do we get great designers? Great designers design, of course." --Fred Brooks

"So how are we supposed to get great architects, if they only get the chance to architect fewer than a half-dozen times in their career?"  
--Ted Neward

[Do one! »](#)

**About**

The Architectural Katas started as a presentation workshop by Ted Neward. They've taken on a life of their own.

[Learn more »](#)

**Invite**

Want an experienced Architectural Kata moderator to run the workshop at your place of business?

[Contact »](#)

**Rules**

Doing an Architectural Kata requires you to obey a few rules in order to get the maximum out of the activity.

[Read rules »](#)

**Lead**

Want to run the Architectural Katas yourself? There's only a few things you need to know before you do.

[Learn how »](#)

**Contribute**

New Kata problems/proposals are always welcome.

[Send ideas »](#)

**Join**

Want to find a group near you that's running the Architectural Katas?

[Find groups »](#)

© Neward & Associates 2012



Architectural Katas

Home About Rules Contribute Invite Lead Join Contact

# Architectural Katas

"How do we get great designers? Great designers design, of course." --Fred Brooks

"So how are we supposed to get great architects, if they only get the chance to architect fewer than a half-dozen times in their career?"  
--Ted Neward

[Do one! »](#)

## About

The Architectural Katas started as a presentation workshop by Ted Neward. They've taken on a life of their own.

[Learn more »](#)

## Invite

Want an experienced Architectural Kata moderator to run the workshop at your place of business?

## Rules

Doing an Architectural Kata requires you to obey a few rules in order to get the maximum out of the activity.

[Read rules »](#)

## Lead

Want to run the Architectural Katas yourself? There's only a few things you need to know before you do.

## Contribute

New Kata problems/proposals are always welcome.

[Send ideas »](#)

## Join

Want to find a group near you that's running the Architectural Katas?

...and then...

<http://fundamentalsofsoftwarearchitecture.com/katas/>

The screenshot shows a web browser window with the URL <http://fundamentalsofsoftwarearchitecture.com/katas/> in the address bar. The page content includes a header with navigation links like "Architectural Katas", "Fundamentals of Software Architecture", and "List of Architecture Katas". Below the header, there is a section titled "Architectural Katas" with a quote from Fred Brooks: "How do we get great designers? Great designers design, of course." attributed to "Fred Brooks". Another quote follows: "So how are we supposed to get great architects, if they only get the chance to architect fewer than a half-dozen times in their career?" attributed to "Ted Neward". At the bottom, there is an "About" section describing the purpose of architectural katas and a note about the project team's process.

fundamentalsofsoftwarearchitecture.com

Architectural Katas Updated Fundamentals of Software Architecture Images Architectural  
Katas Fundamentals of Software Architecture List of Architecture Katas

---

## Architectural Katas

*inspired by Ted Neward's original [Architectural Katas](#)*

"How do we get great designers?  
Great designers design,  
of course."  
Fred Brooks

"So how are we supposed to get great architects, if  
they only get the chance to architect fewer than  
a half-dozen times in their career?"  
Ted Neward

---

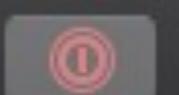
## About

Architectural Katas are intended as a small-group (3-5 people) exercise, usually as part of a larger group (4-10 groups are ideal), each of whom is doing a different kata. A Moderator keeps track of time, assigns Katas (or allows this website to choose one randomly), and acts as the facilitator for the exercise.

Each group is given a project (in many ways, an RFP–Request For Proposal) that needs development. The project team meets for a while, discovers requirements that aren't in the original proposal by

...and then...  
.



Search

LIVE ONLINE TRAINING

# Architectural Katas

Topic: Software Development



NEAL FORD



# Late 2020...

October 20, November 17 & December  
3, 2020

10:00am – 12:00pm EST

This course has ended.

[What you'll learn](#)   [Instructor](#)   [Schedule](#)

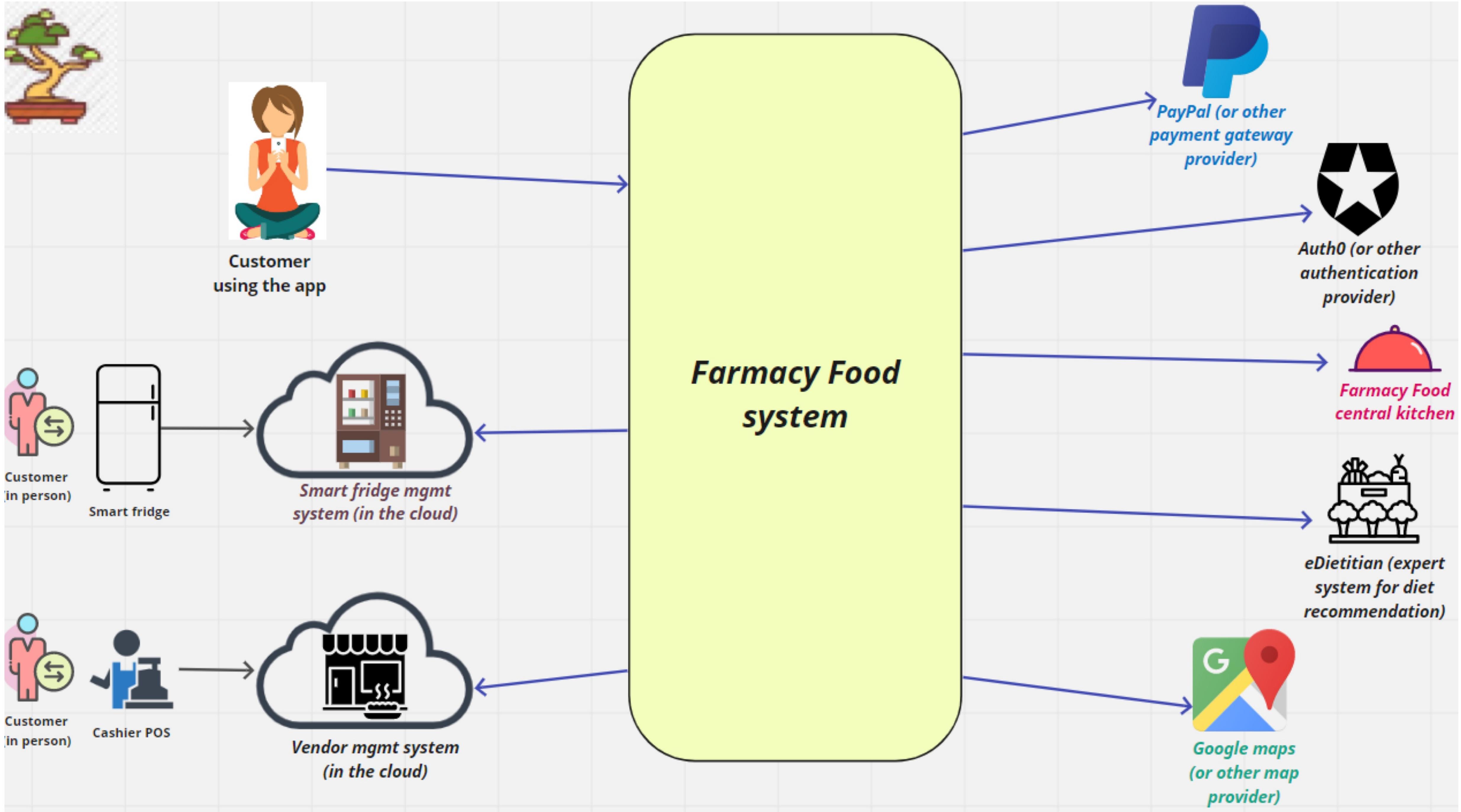
New information after 10/20 kickoff:

The image shows a screenshot of the FarmacyFood website. At the top, there's a navigation bar with icons for back, forward, search, and refresh, followed by the URL "farmacyfood.com". The main header features the "FarmacyFood" logo with a green stylized 'F'. To the right are links for "ABOUT US", "INTERESTED?", "Sign Up", and a shopping cart icon showing "0".

The main visual is a large photograph of a bowl of soup with rice, vegetables, and herbs, overlaid with the text "Let Food be Thy Medicine" in white. Below this text is a green button with the text "LEARN MORE >".

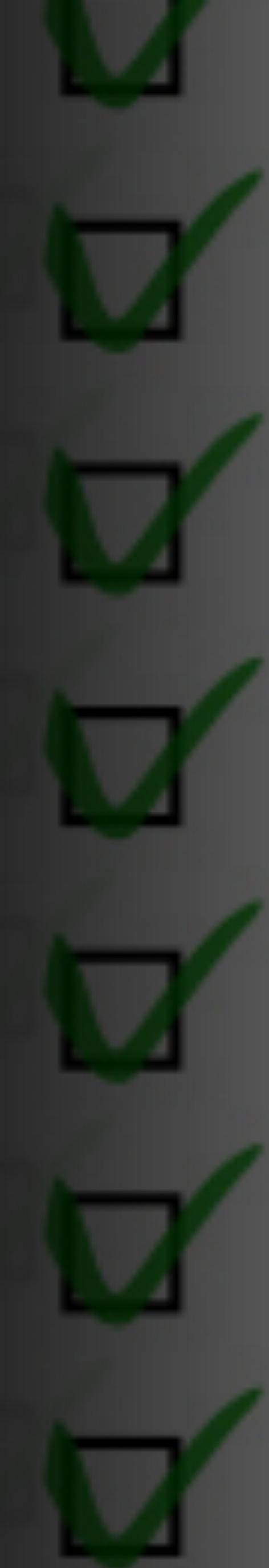
Below the main image, there's a green banner with a repeating leaf pattern. On the left side of the banner, there are two black meal prep containers filled with pasta and vegetables. In the center, the FarmacyFood logo is displayed again, followed by the text "Healthy, locally sourced meals for delivery or pick-up." Below this is a "GET STARTED" button.

On the right side of the banner, there's a smartphone displaying the FarmacyFood mobile app interface, which includes sections for "OUR FOOD", "OUR MISSION", and "YOUR IMPACT".



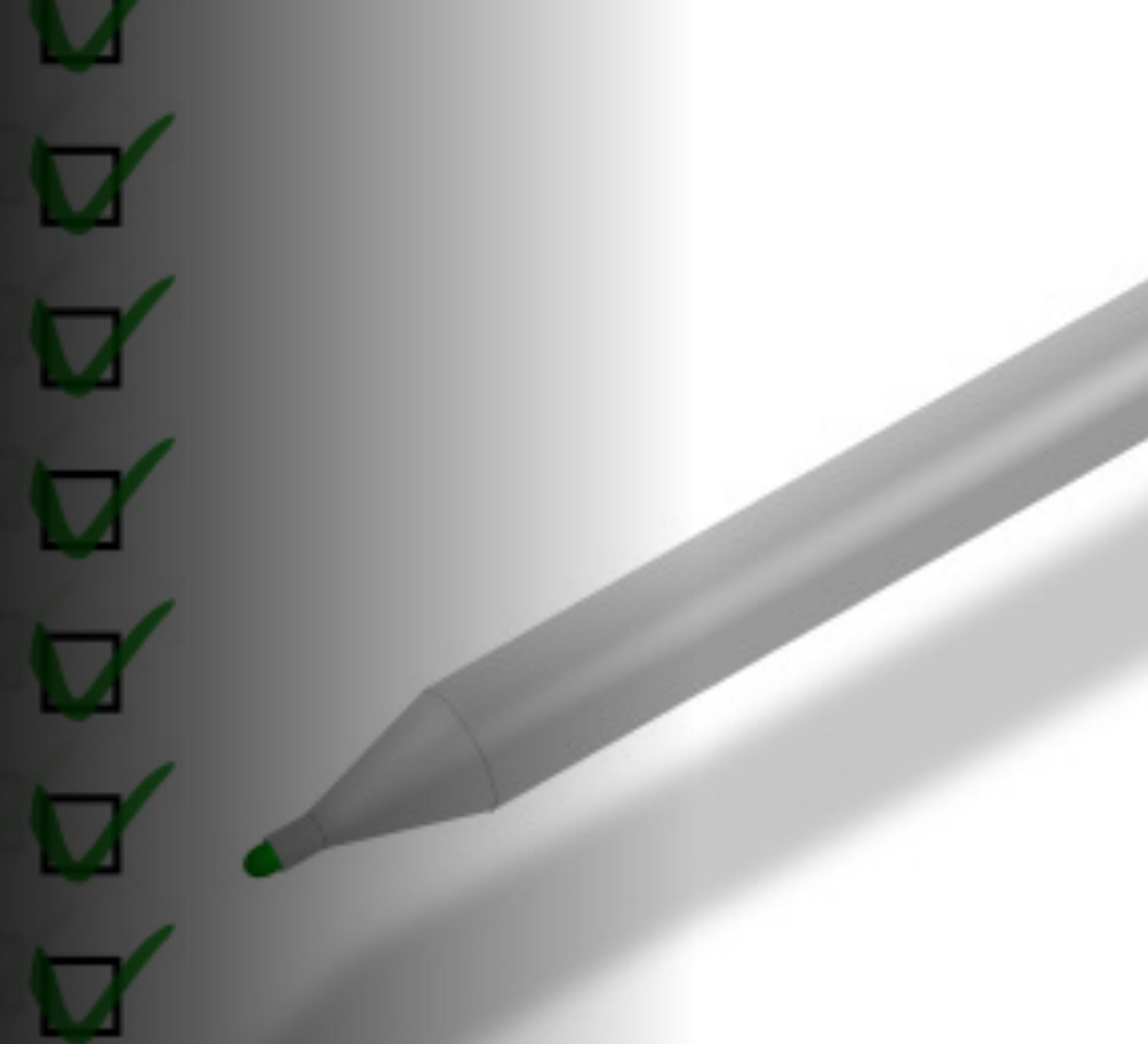
# Judges Criteria

---



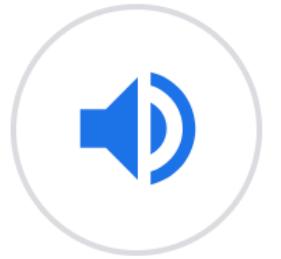
# Clarity of narrative, organization, and supporting documentation

---



# Narrative and Organization

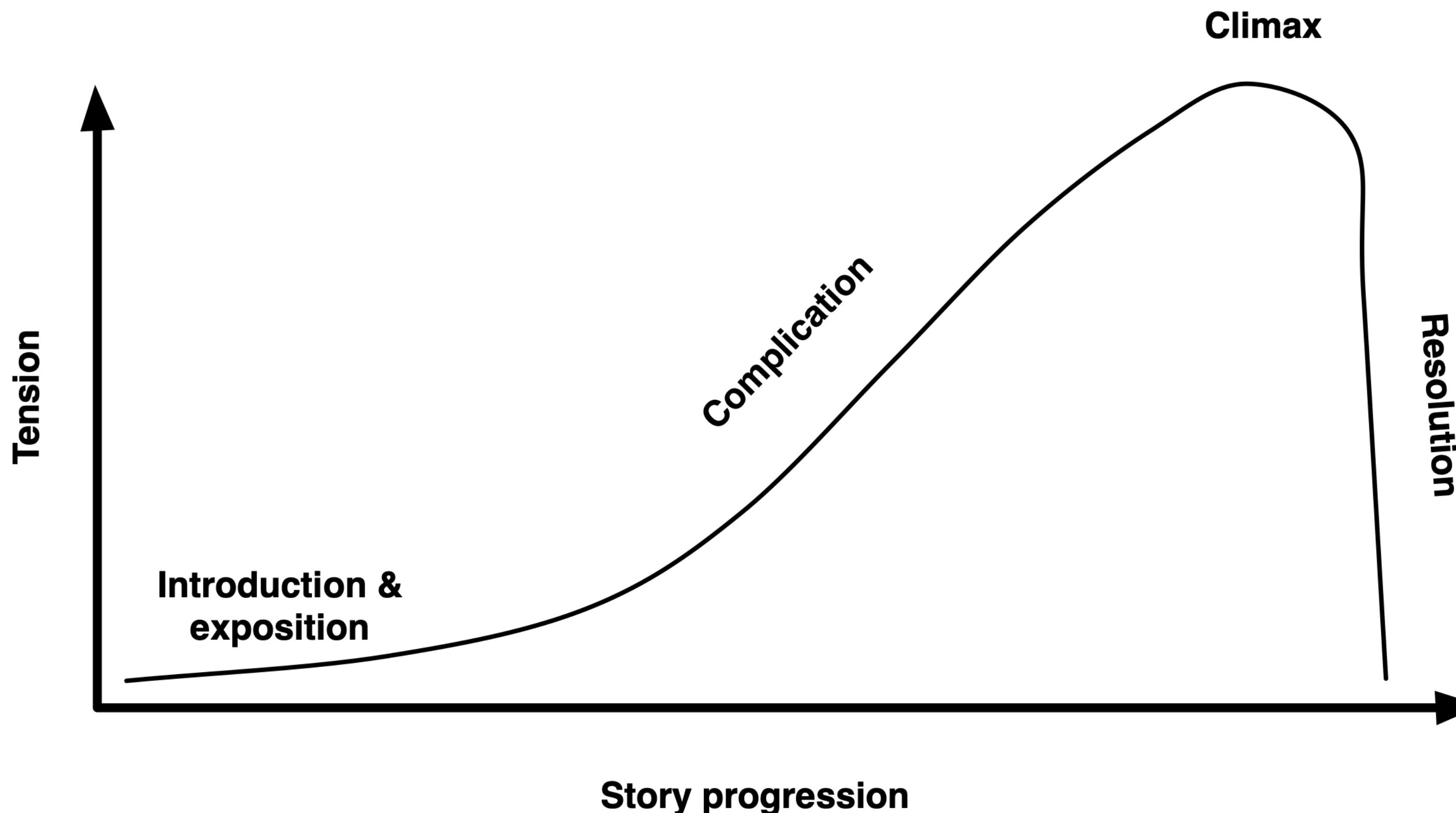
A narrative tells the story of the architectural solution



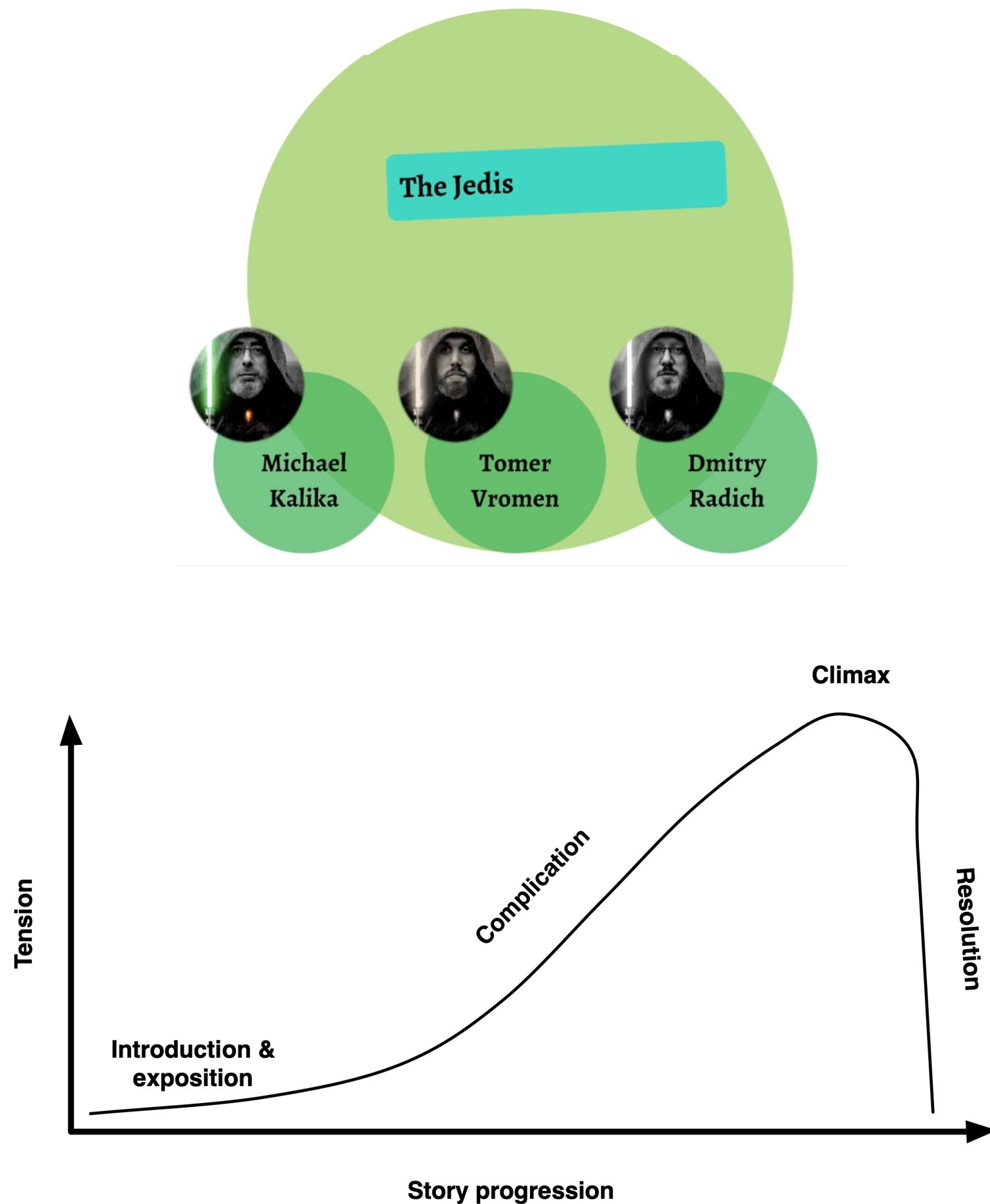
**narrative**  
/'nerətiv/  
*noun*  
a spoken or written account of connected events; a story.

# 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

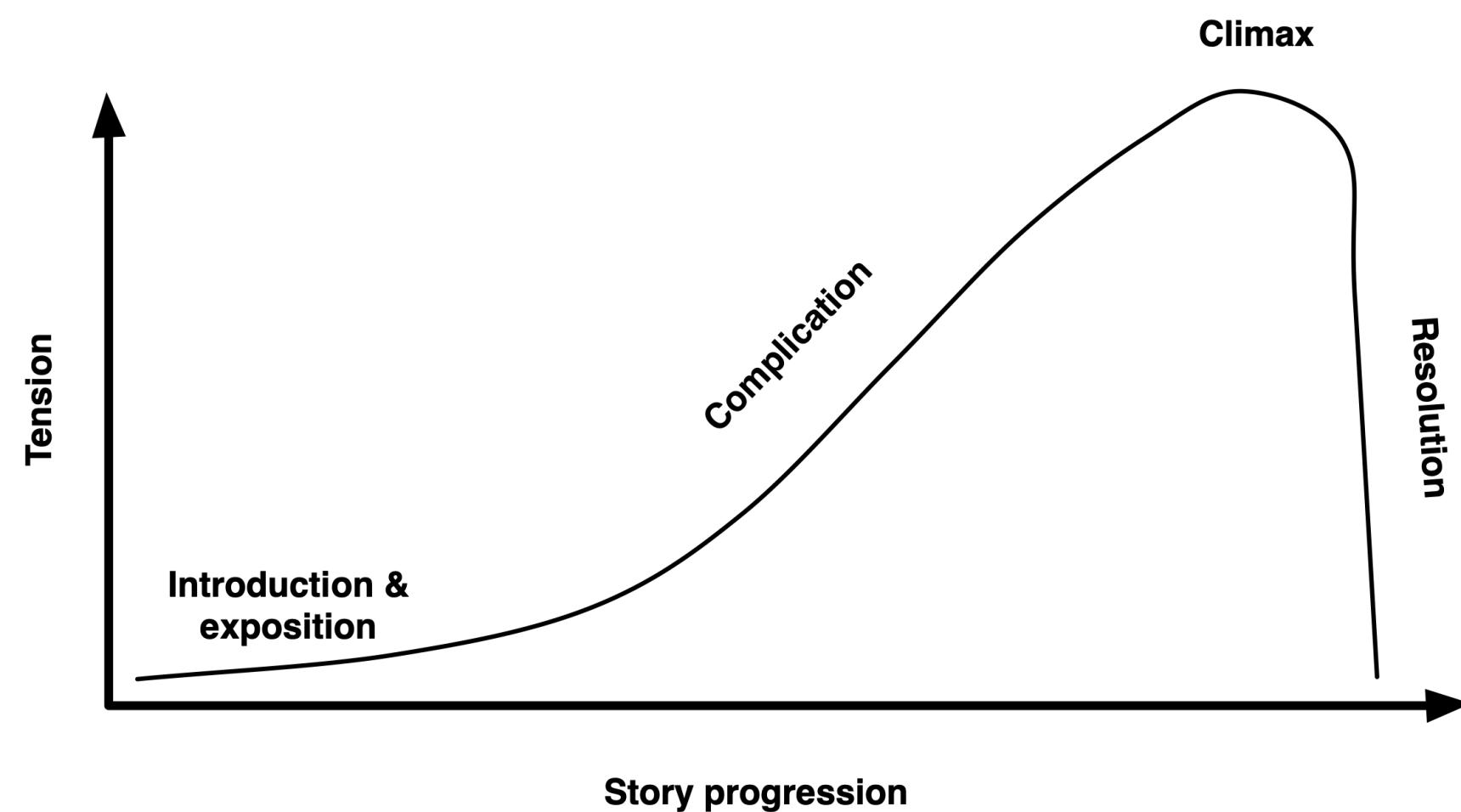
## The Strategy

## 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 use cases](#), the interview with the PO, Kwaku Osei, but also with some assumptions. These requirements 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 fulfills the requirements.

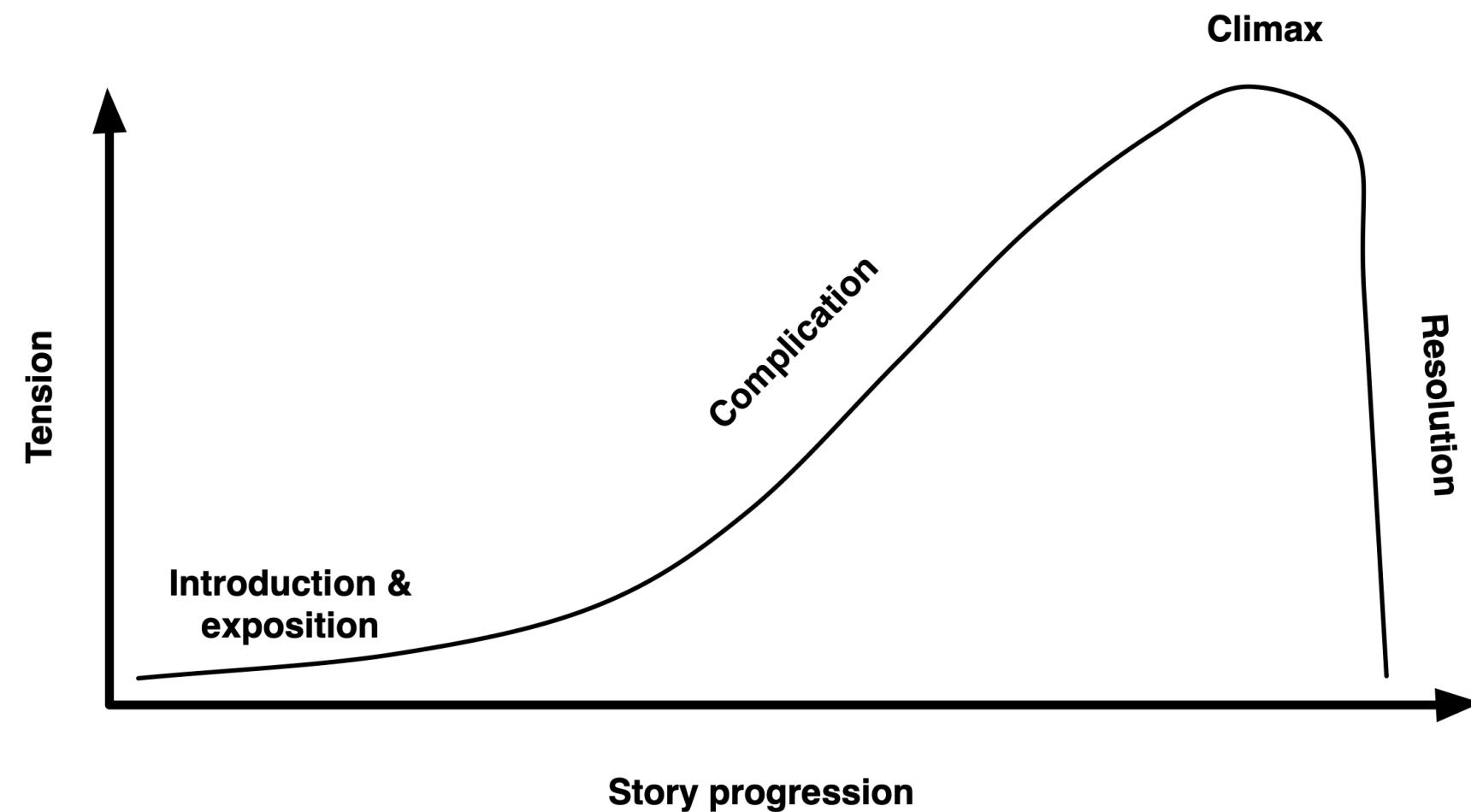
As a starting point, there's a context diagram that gives an overview of the system boundaries. The central part of the diagram is what we called the *Farmacy Food System*, which is the scope of this proposal.

## ADRs

The linked ADRs below record the main architecture decisions related to the Farmacy Food System, its 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

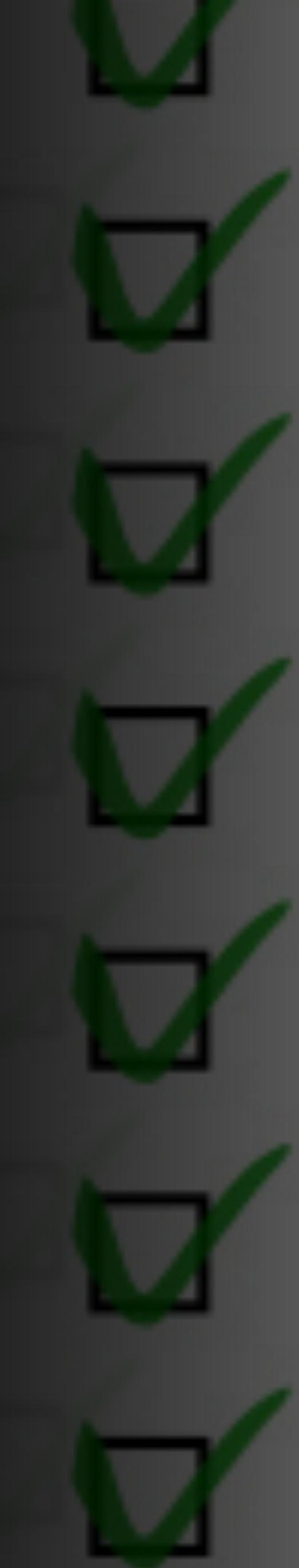
Mid-Level Architecture

Milestones

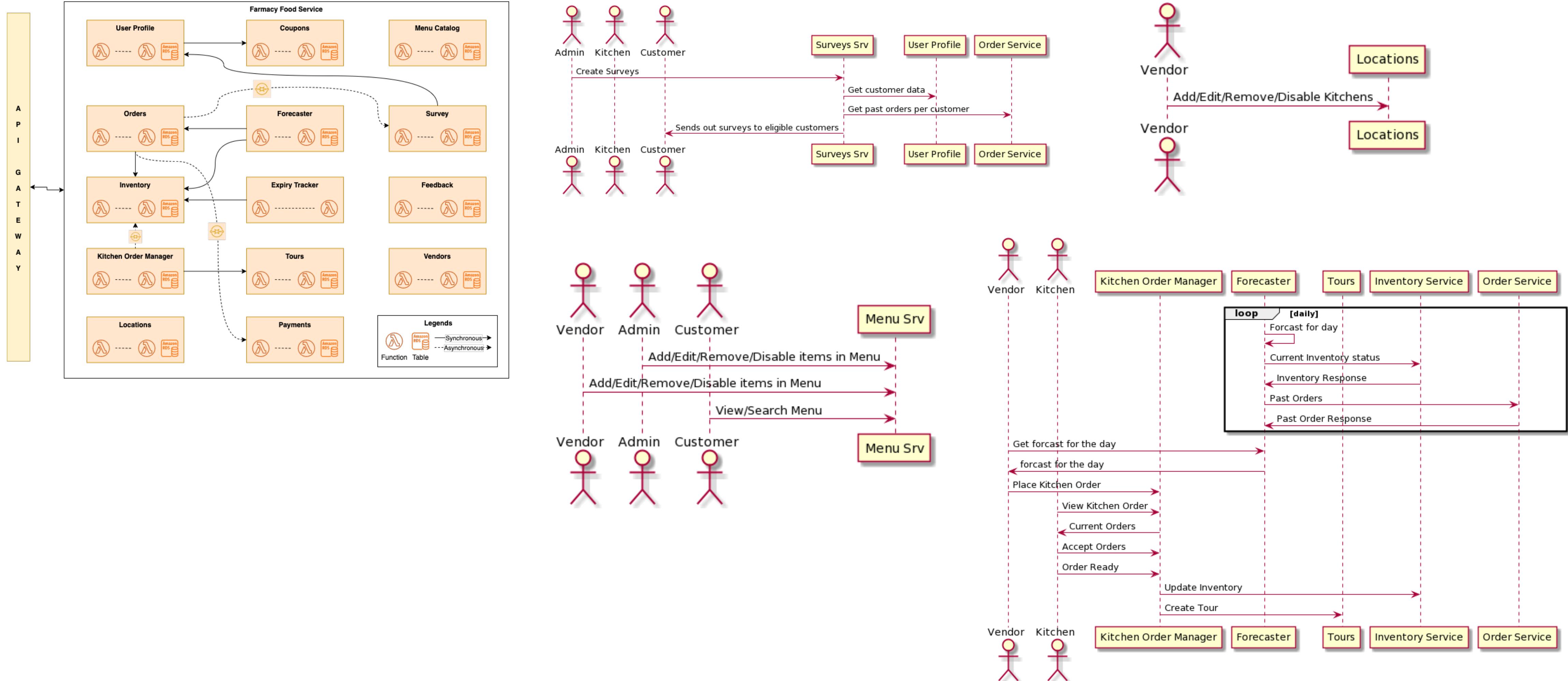
ADRs

# Completeness of solution

---

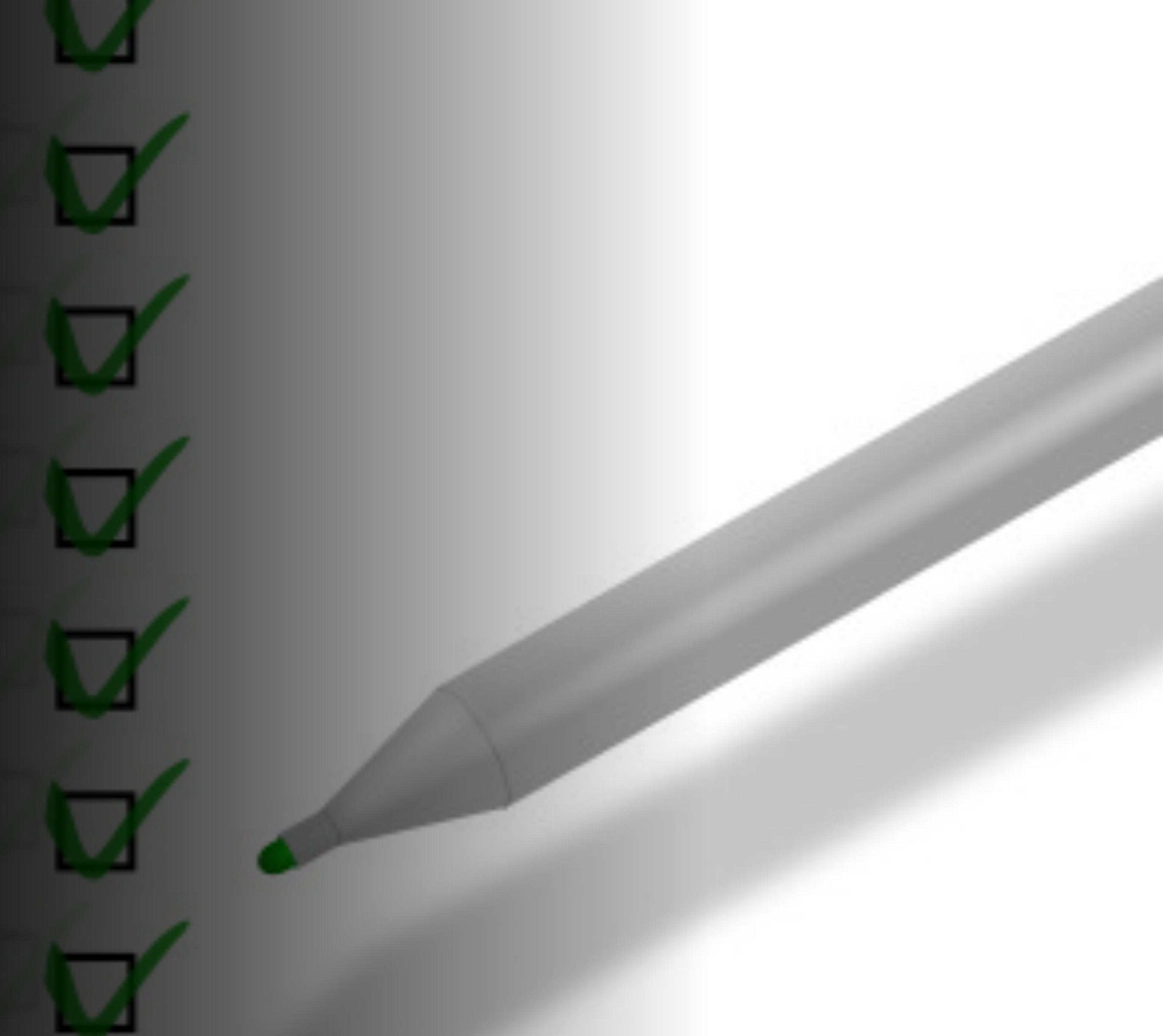


# Completeness of Solution



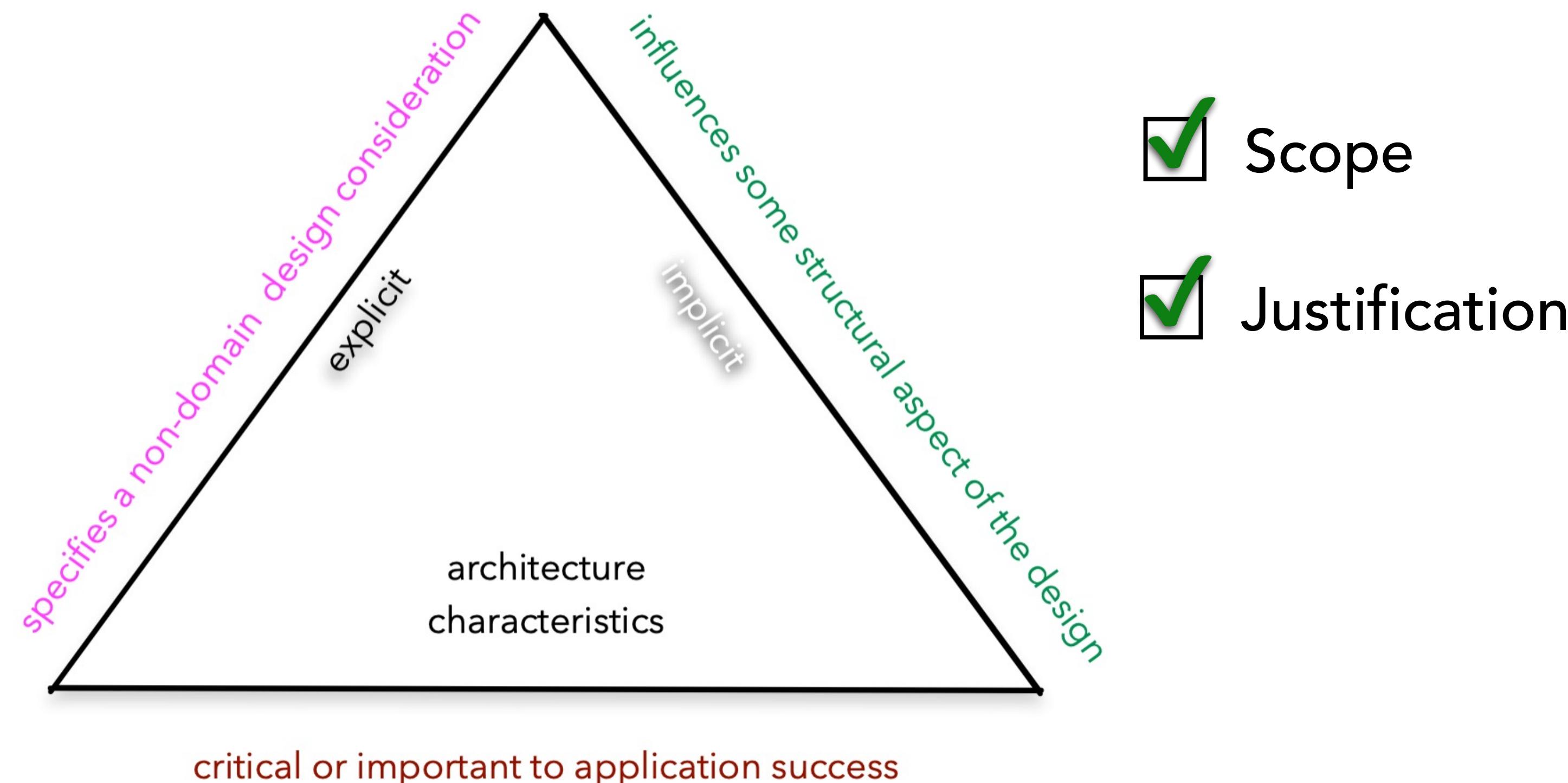
# Identification of supporting architecture characteristics

---



# 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. _____	

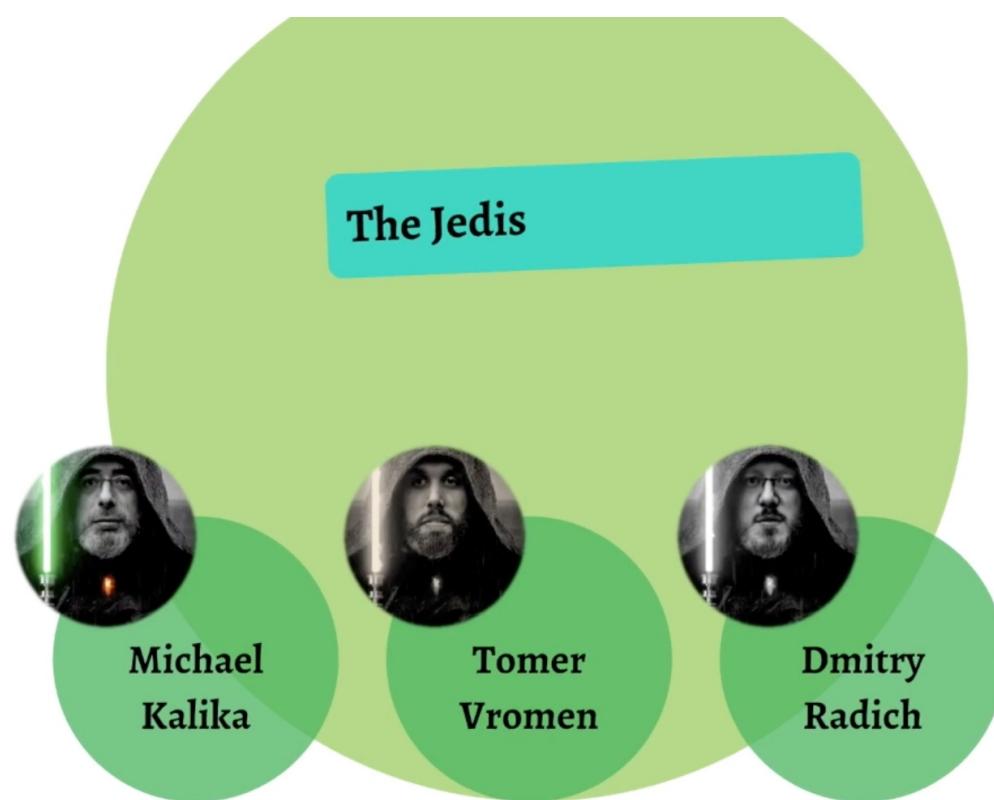
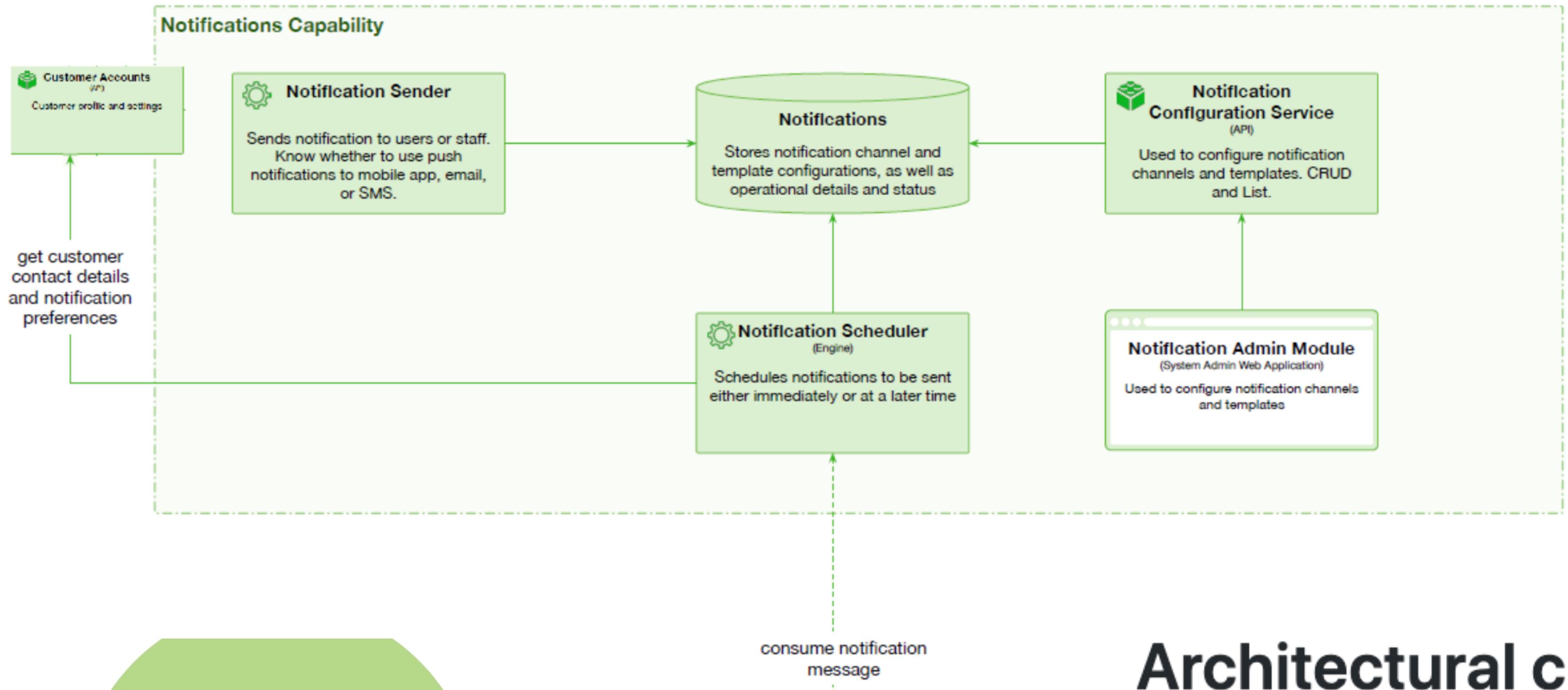
**Instructions**

- 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



# Notifications Capability



## Architectural characteristics

- Elasticity.
- Fault tolerance.
- Plugin support.



## 1. Enable Discovery - Agility

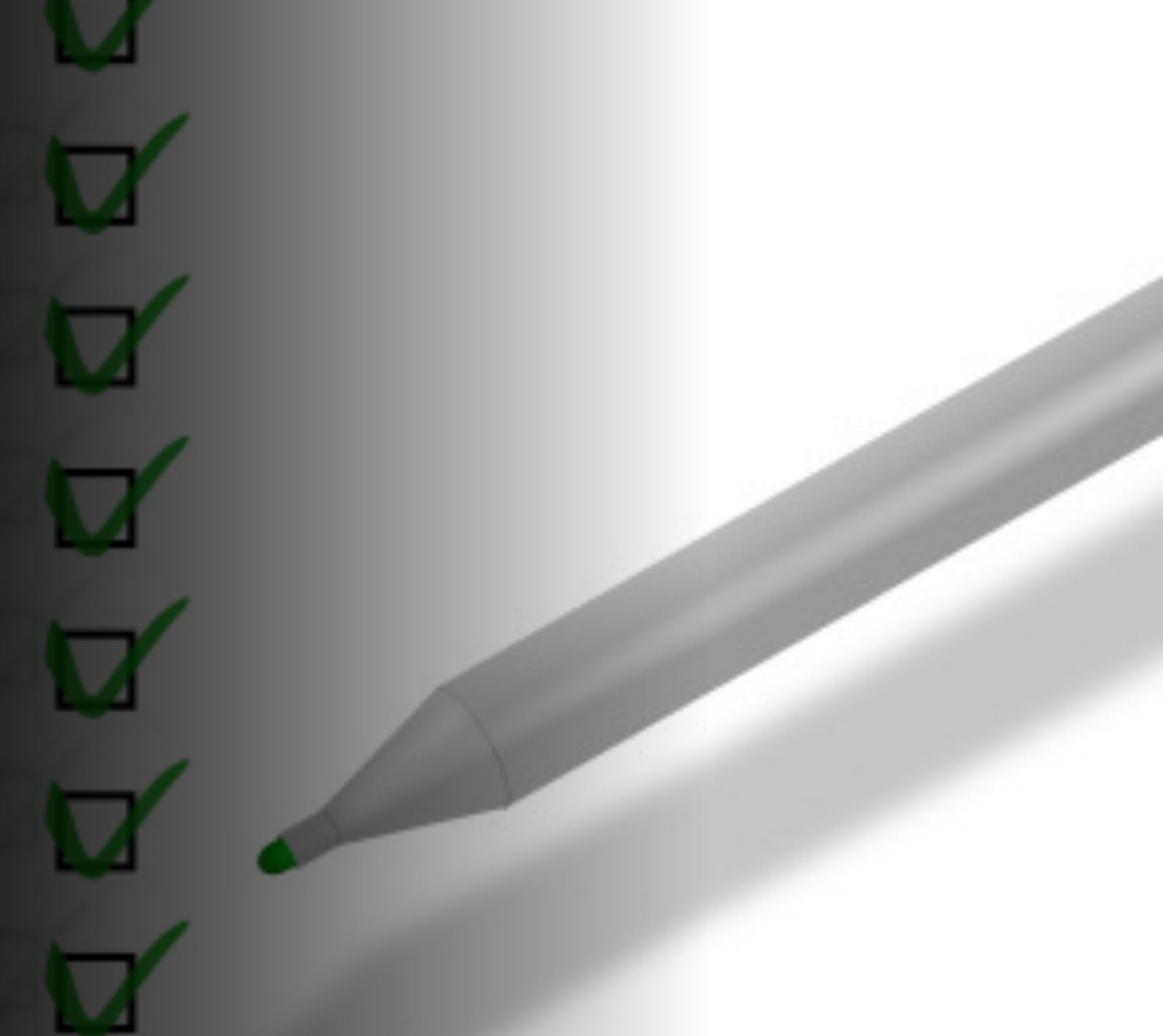
The customer experience in acquisition channels (mobile, web and even SMS) must be seamless. This requires custom experimentation and optimization. The architecture must provide ways to capture customer behaviour with comprehensive analytics and support A/B testing. It's a plus if it can also provide 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.

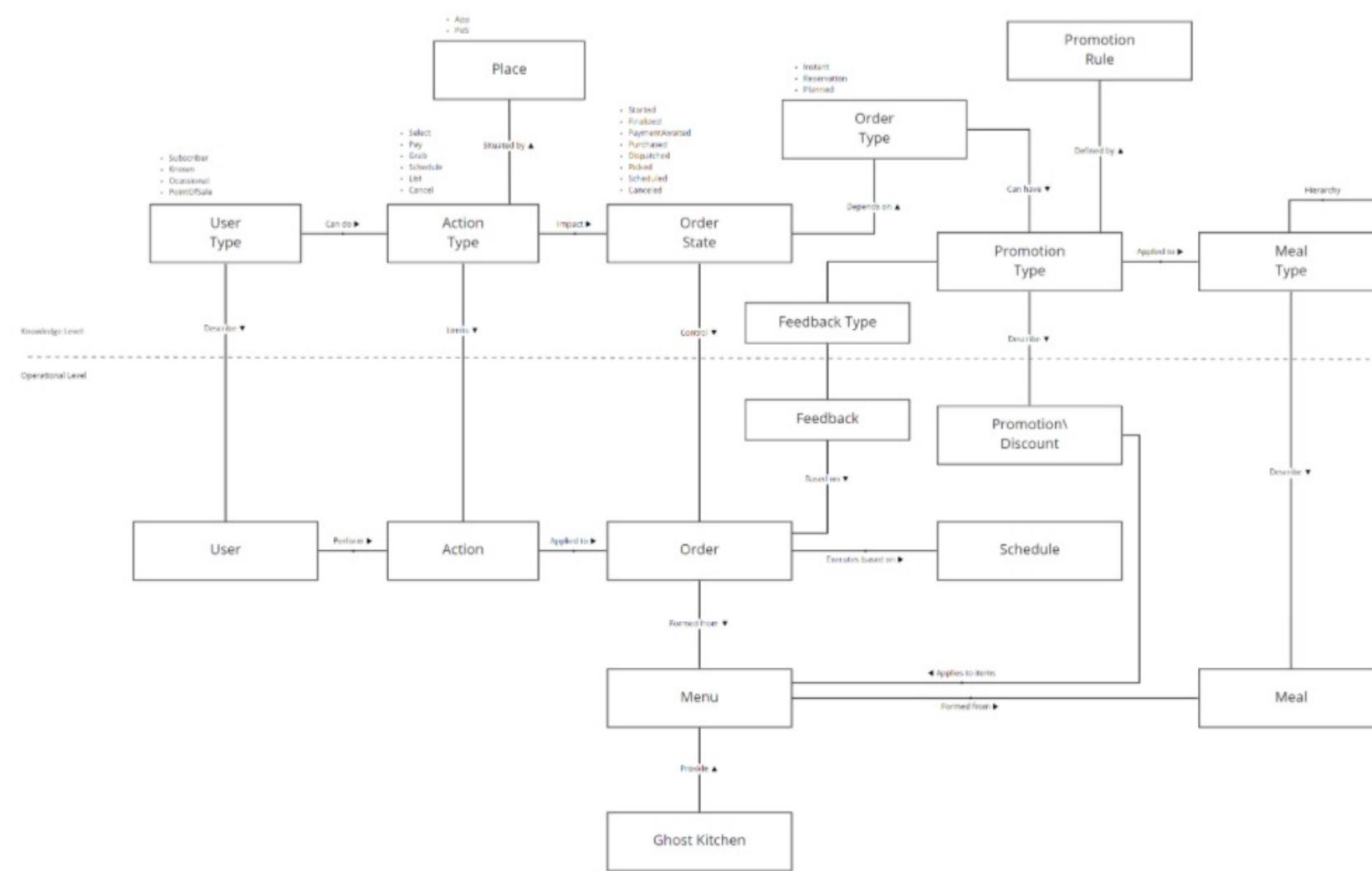


“The goal of a diagram is to convey a clear and shared understanding of the architecture”

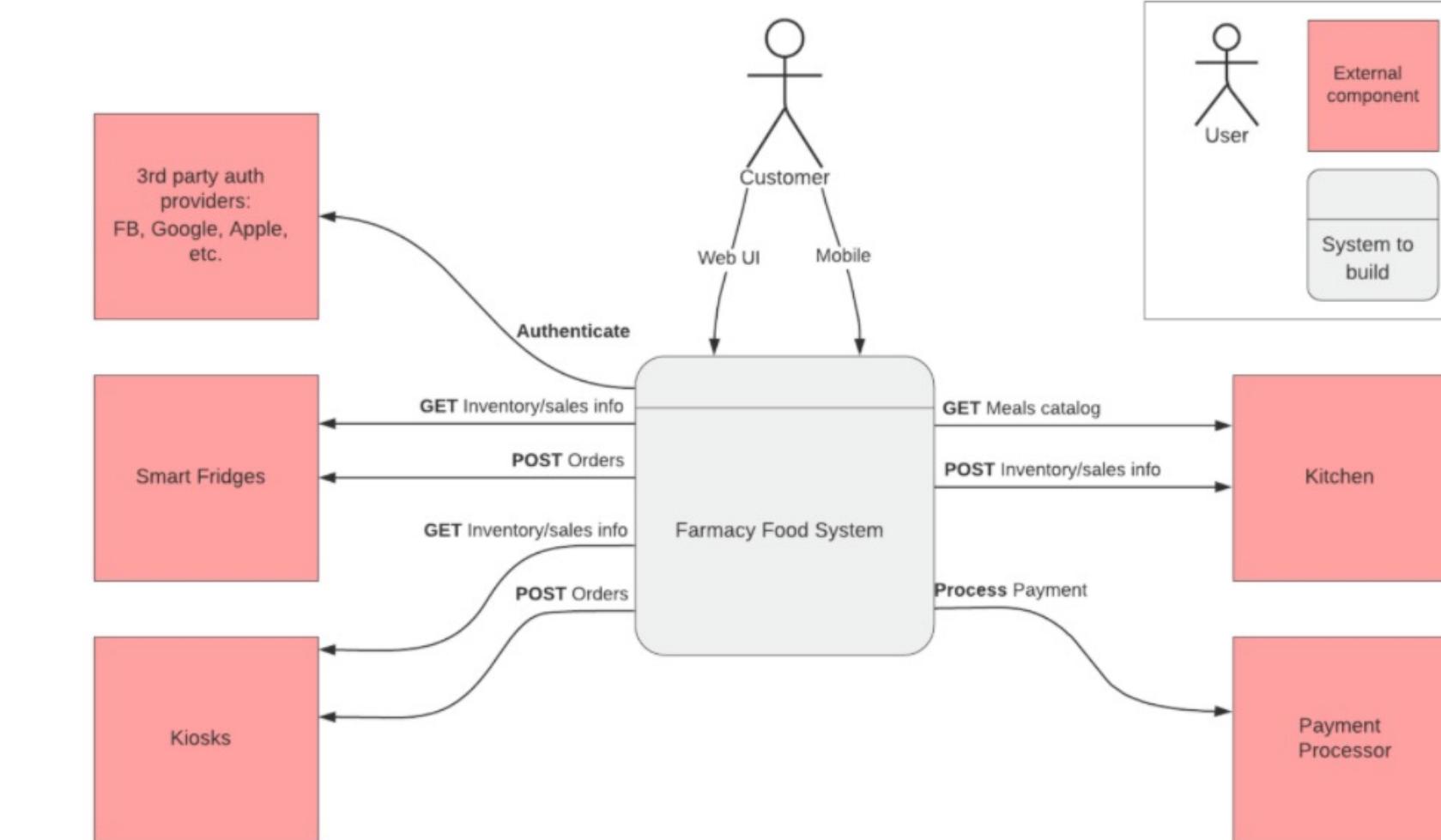
- Neal Ford

# Diagrams

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



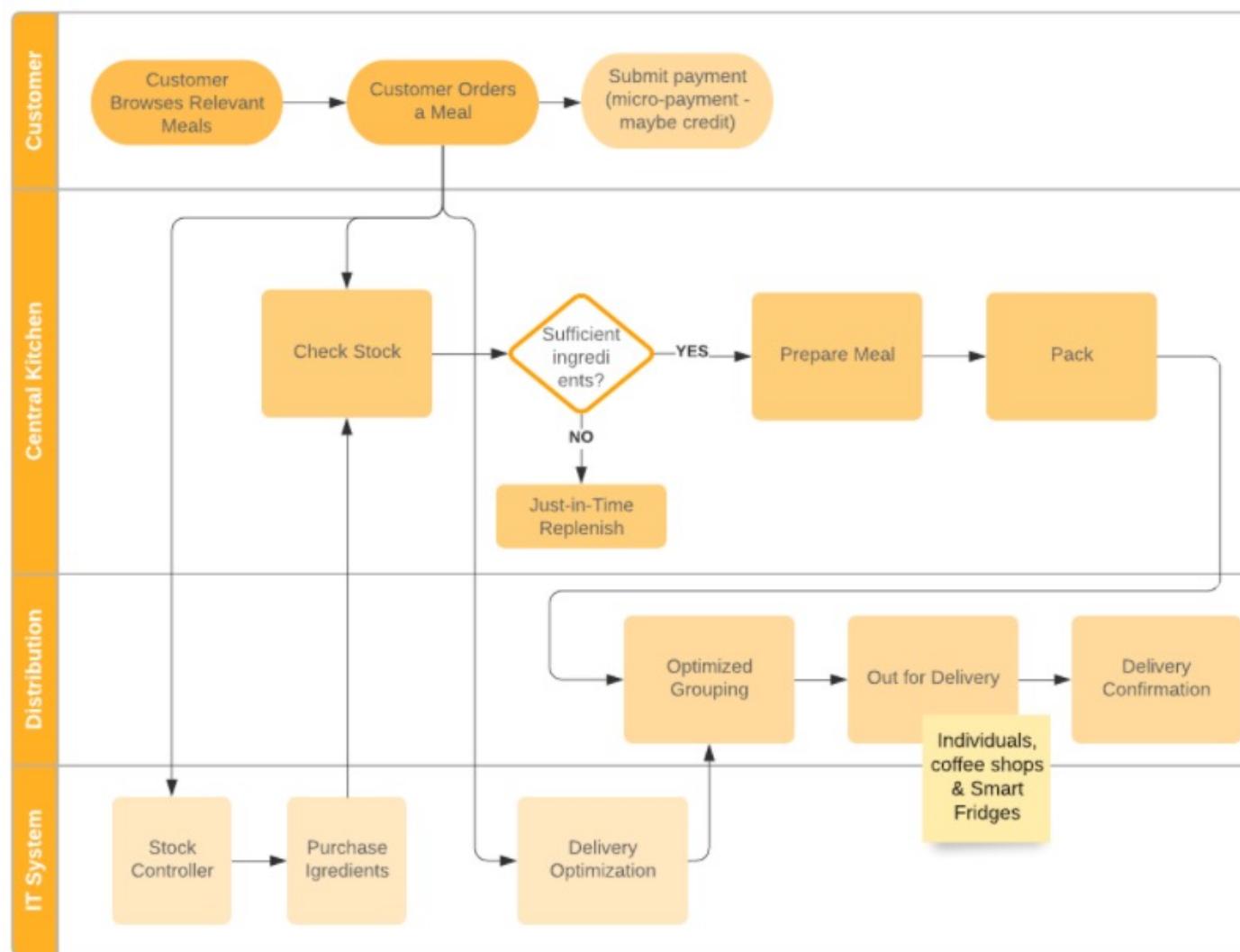
component diagrams



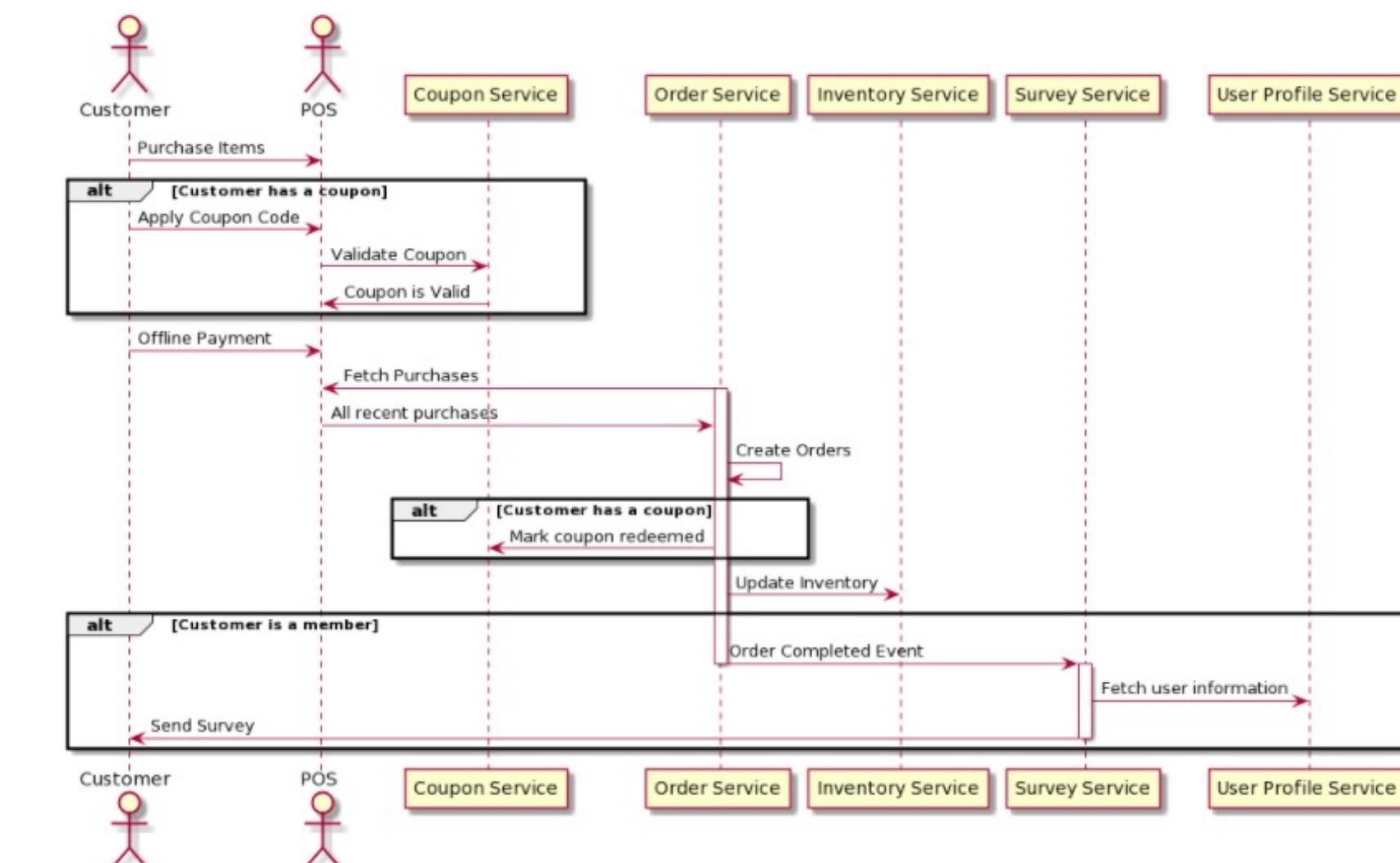
context diagrams

# Diagrams

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



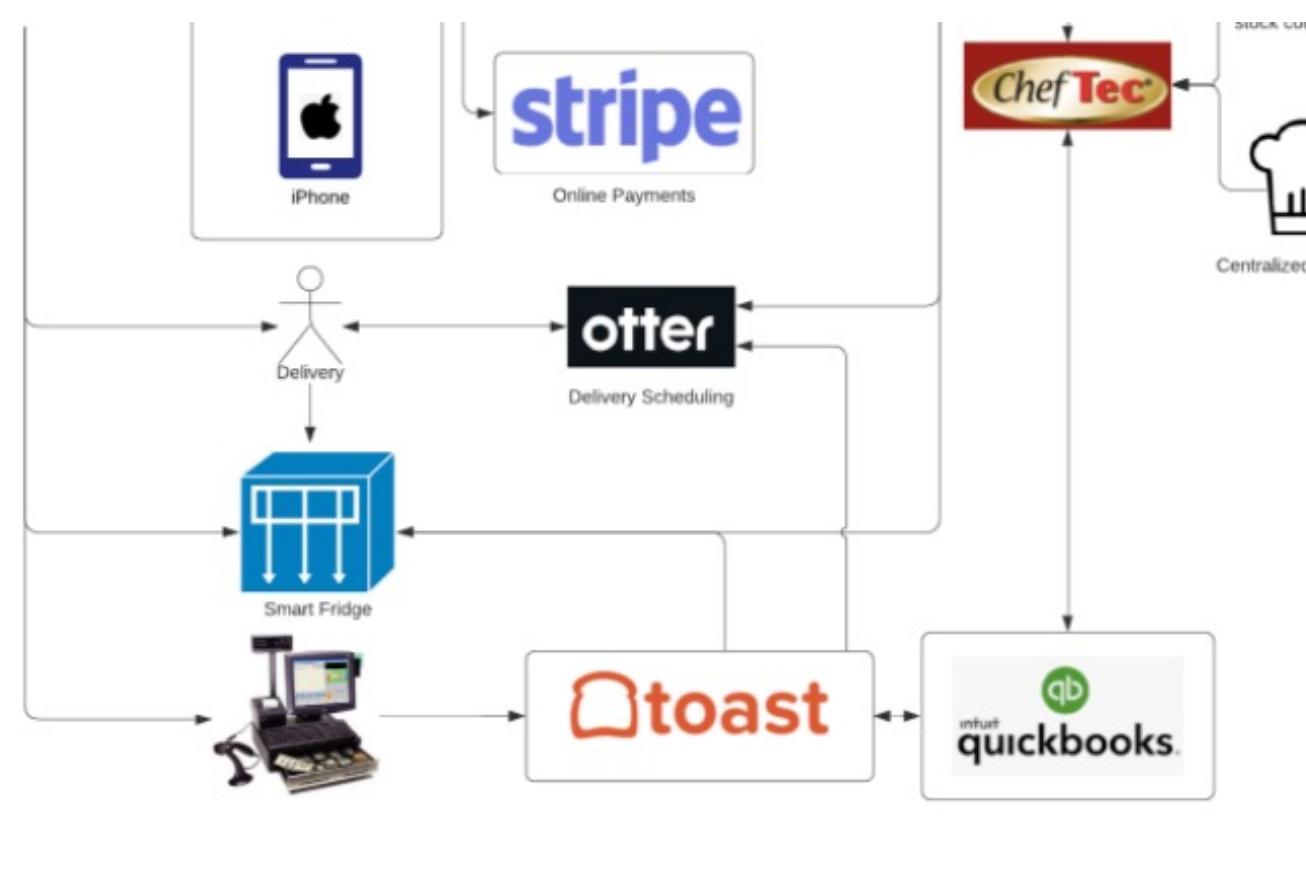
user journey diagrams



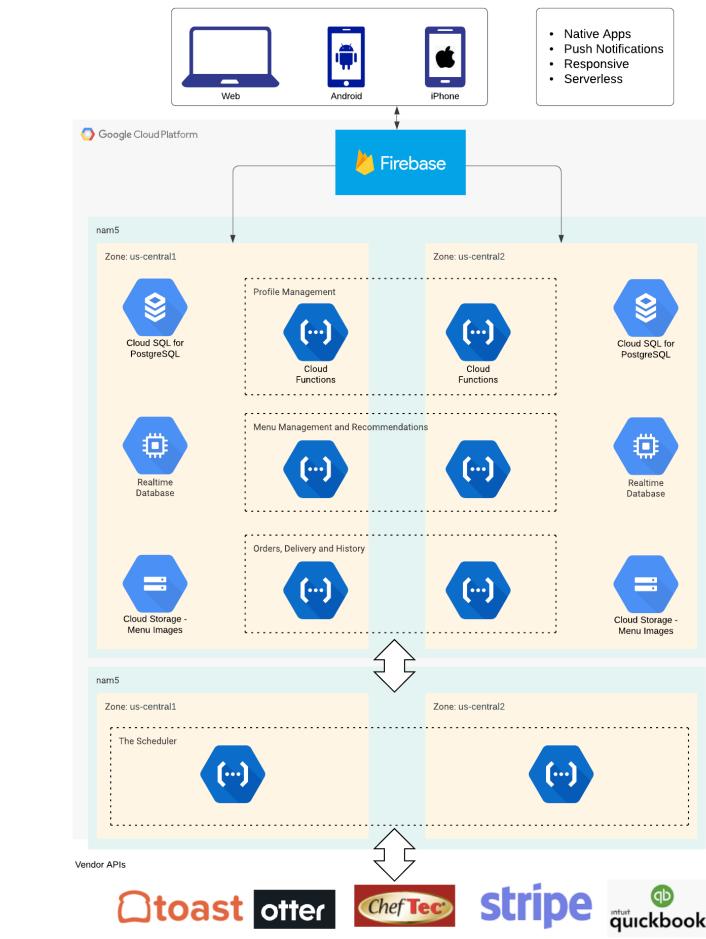
sequence diagrams

# Diagrams

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



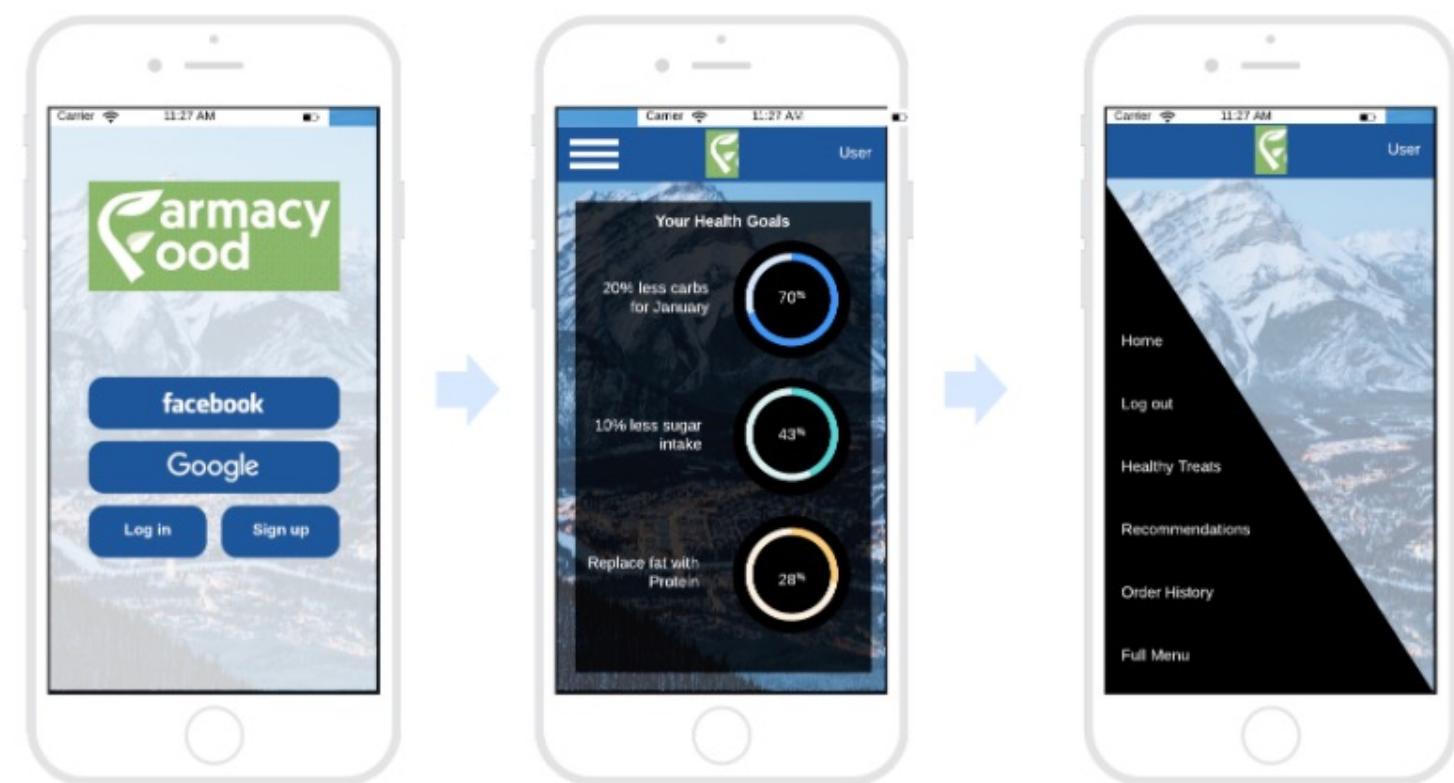
system-level diagrams



deployment diagrams

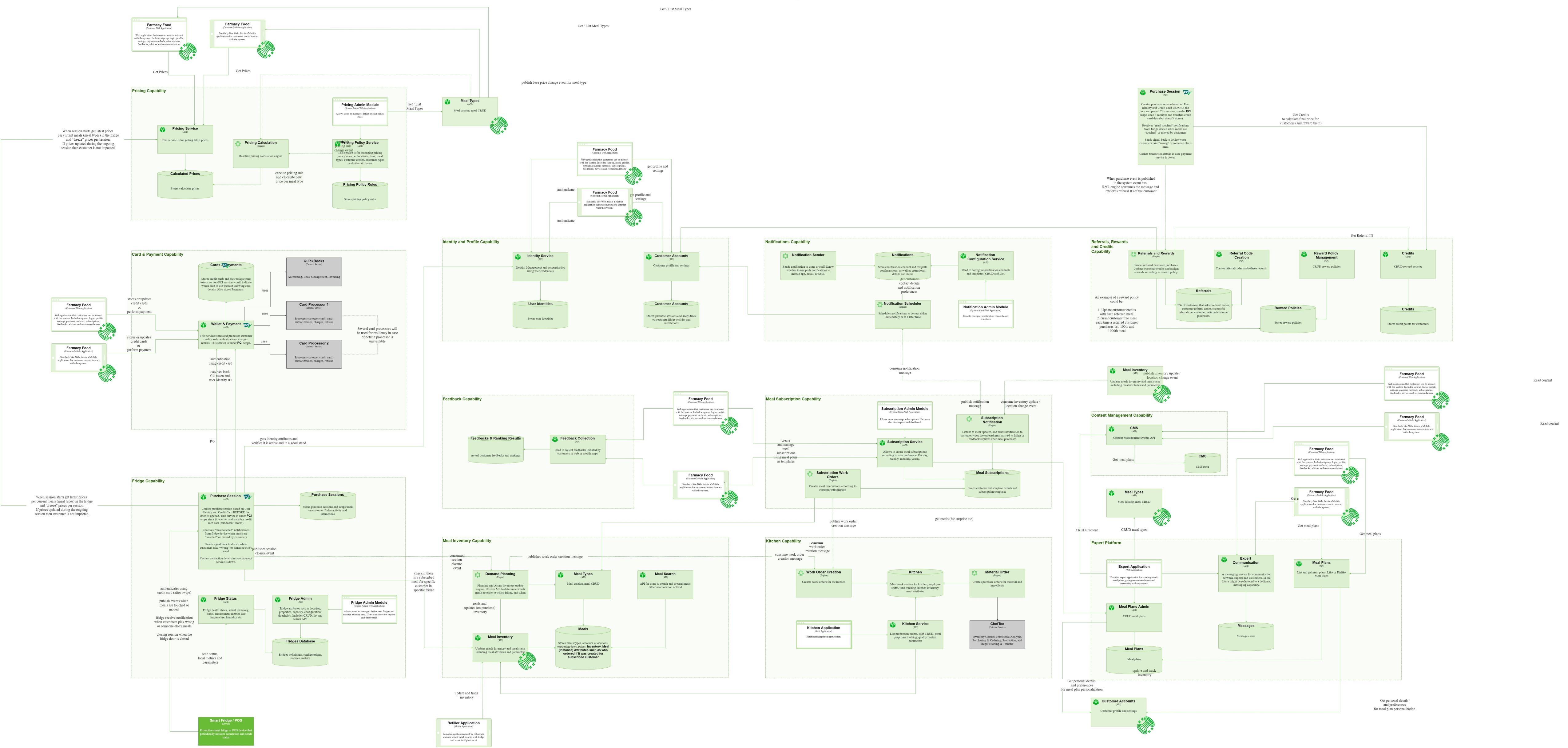
# Diagrams

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

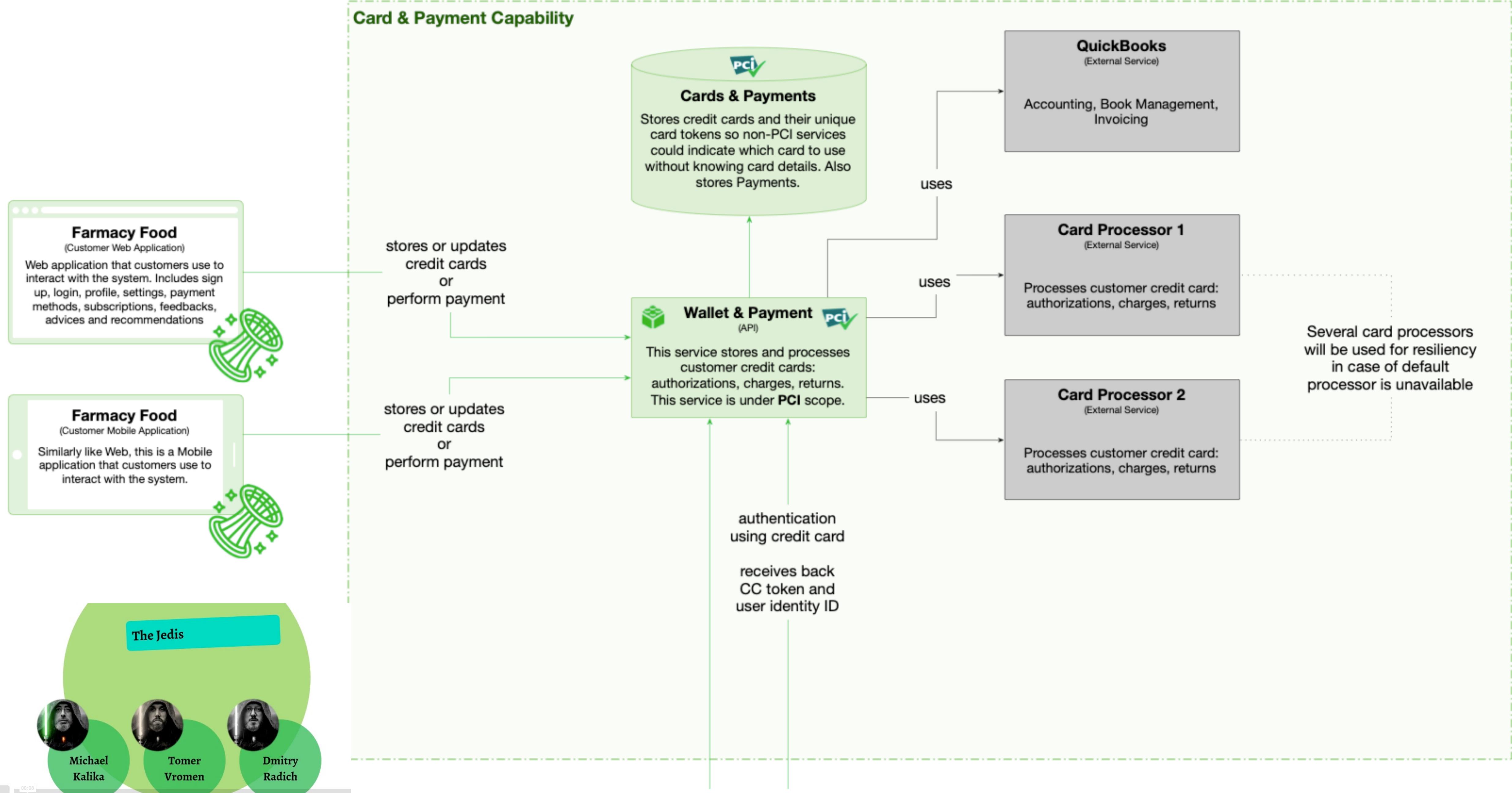


user interface mockups

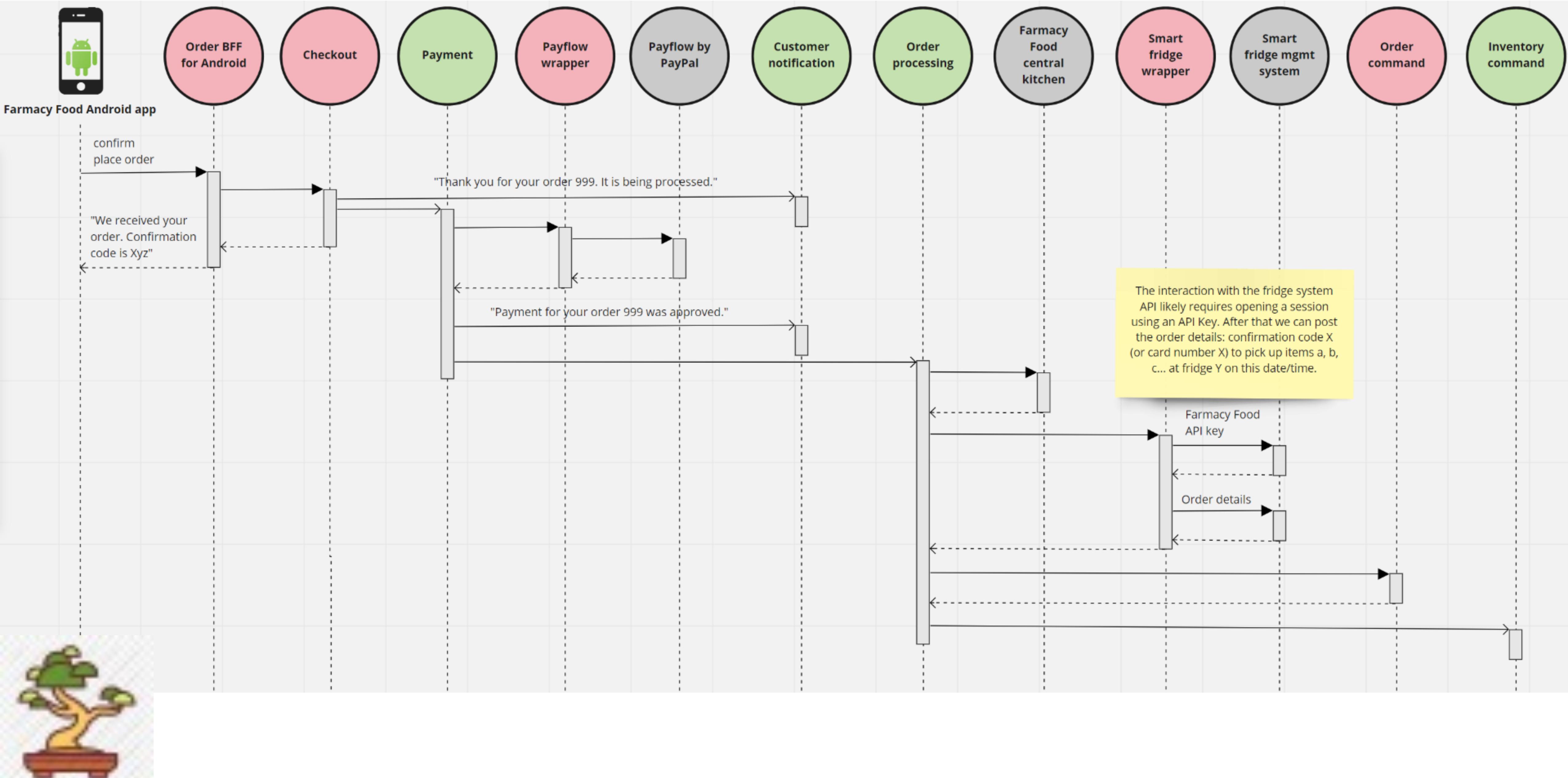
## System Component Diagram

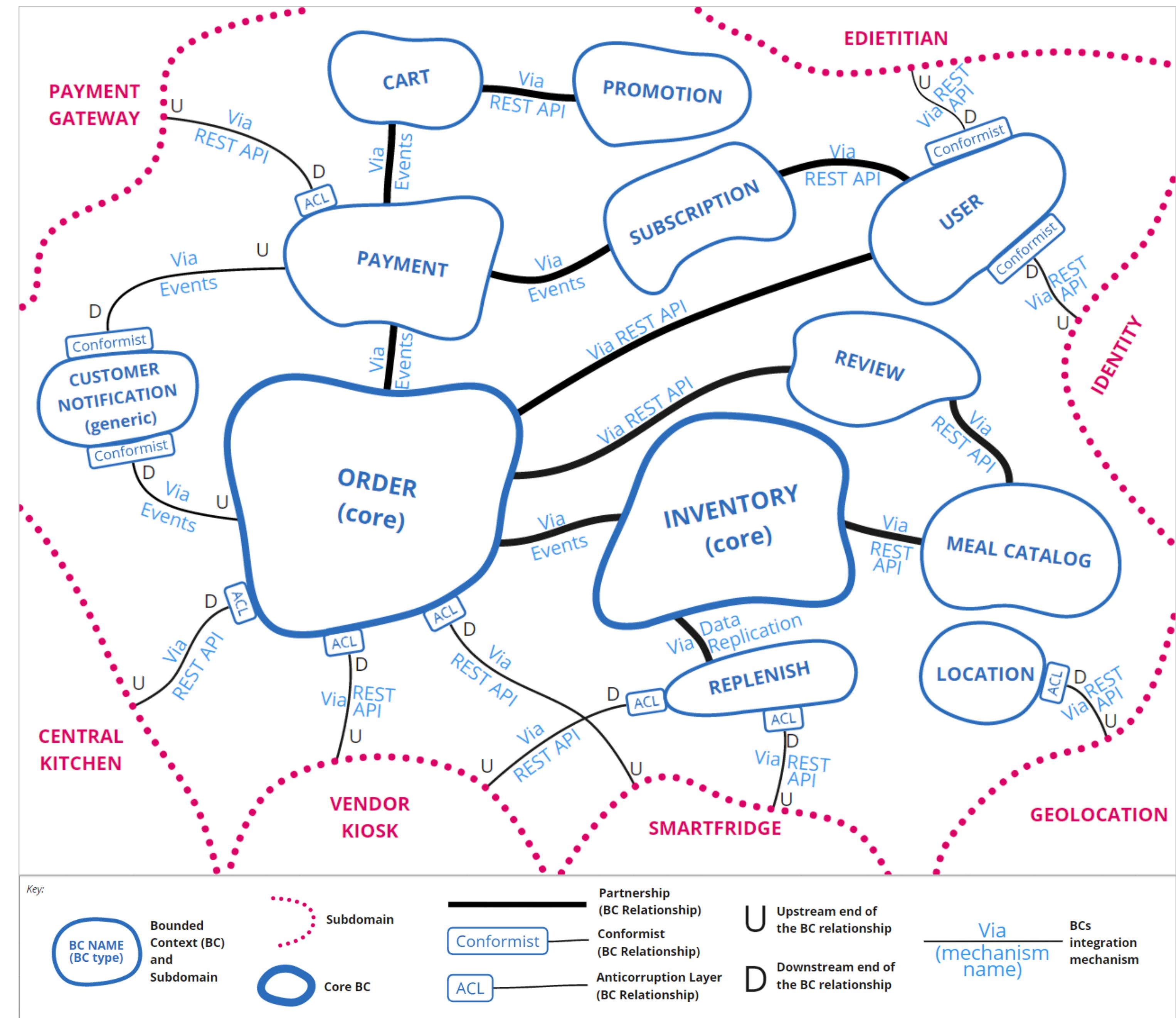


## Card & Payment Capability



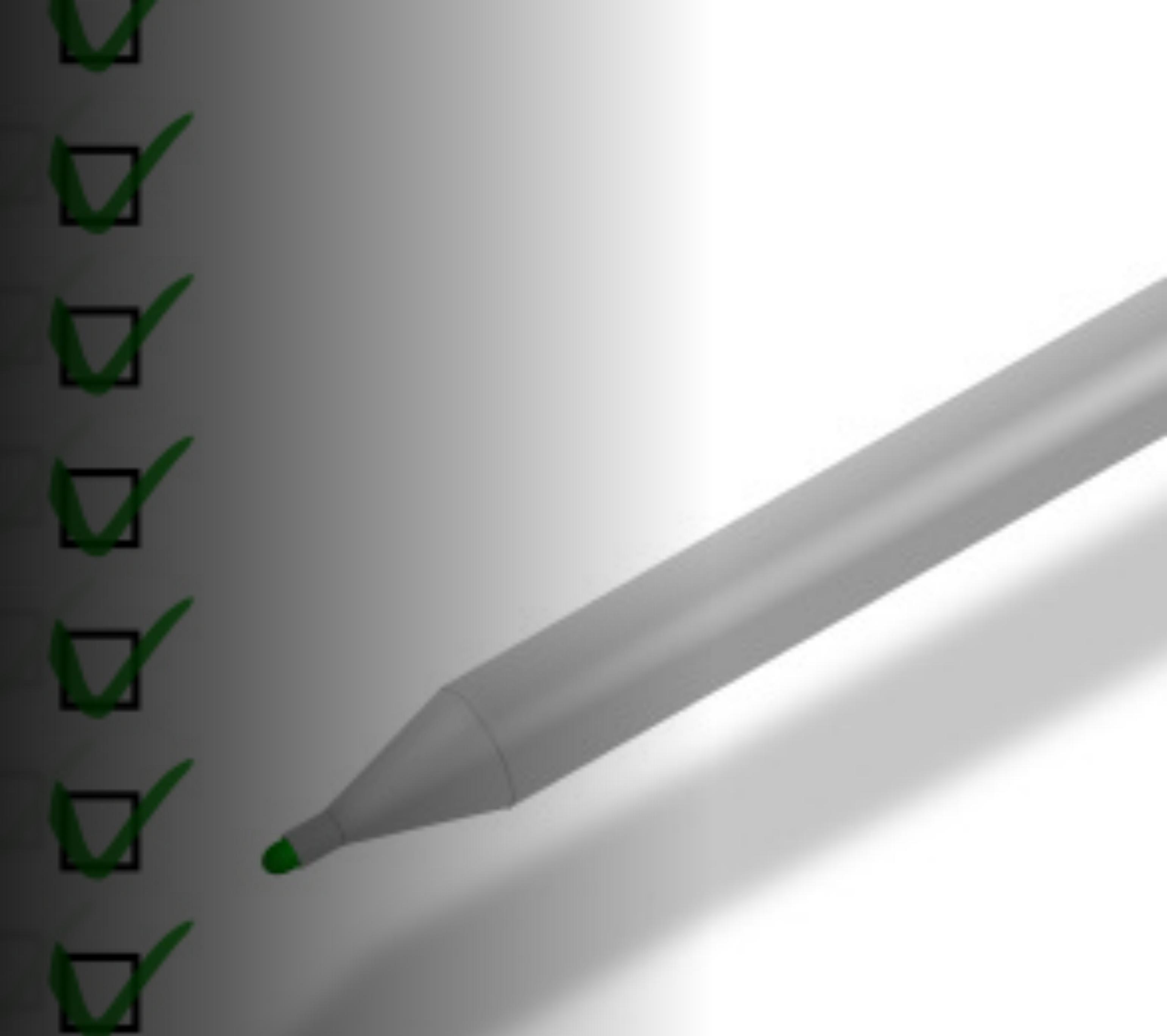
# Behavior





# Architecture decision records - documentation and justification

---



O'REILLY®



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

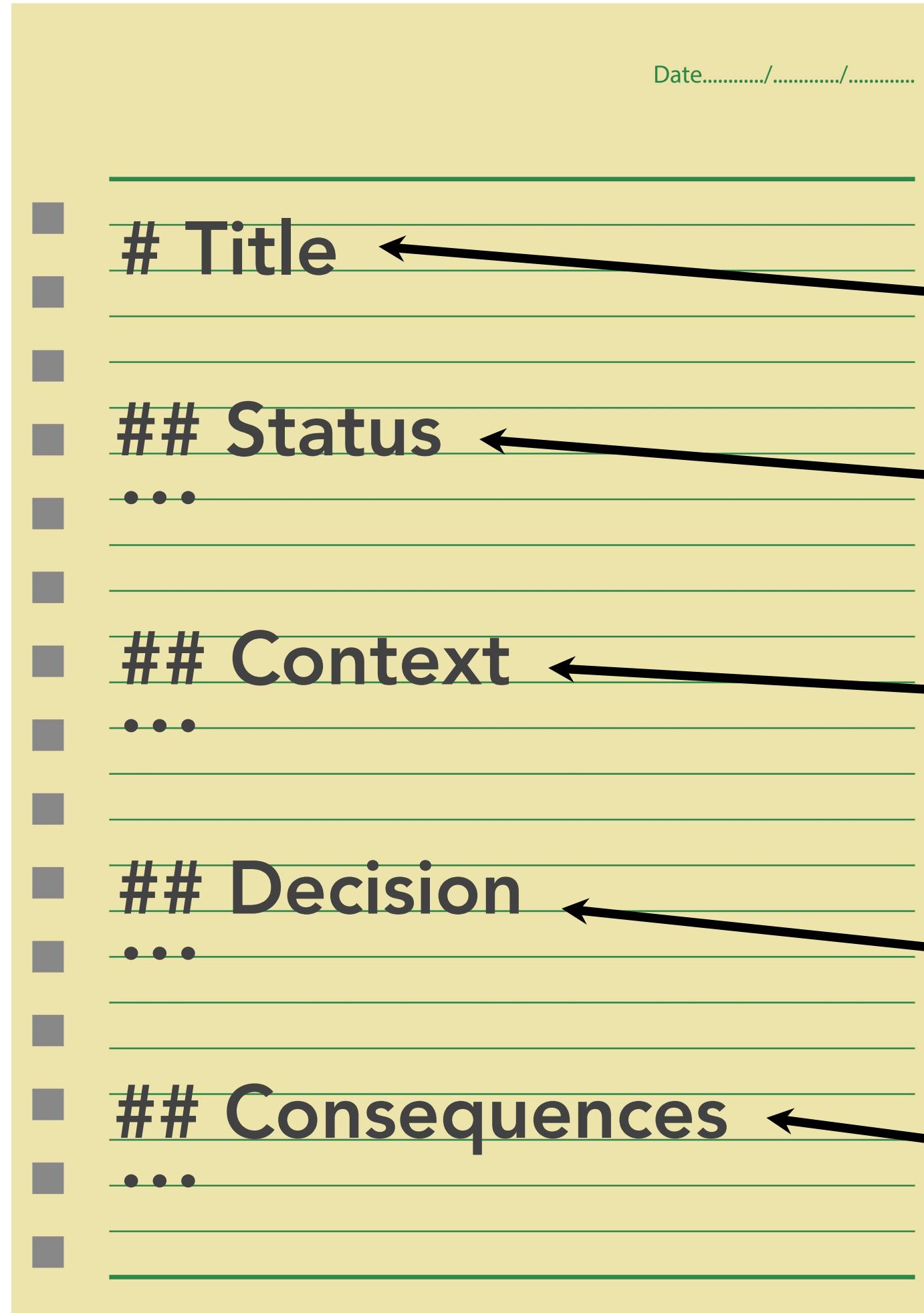
An Engineering Approach

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

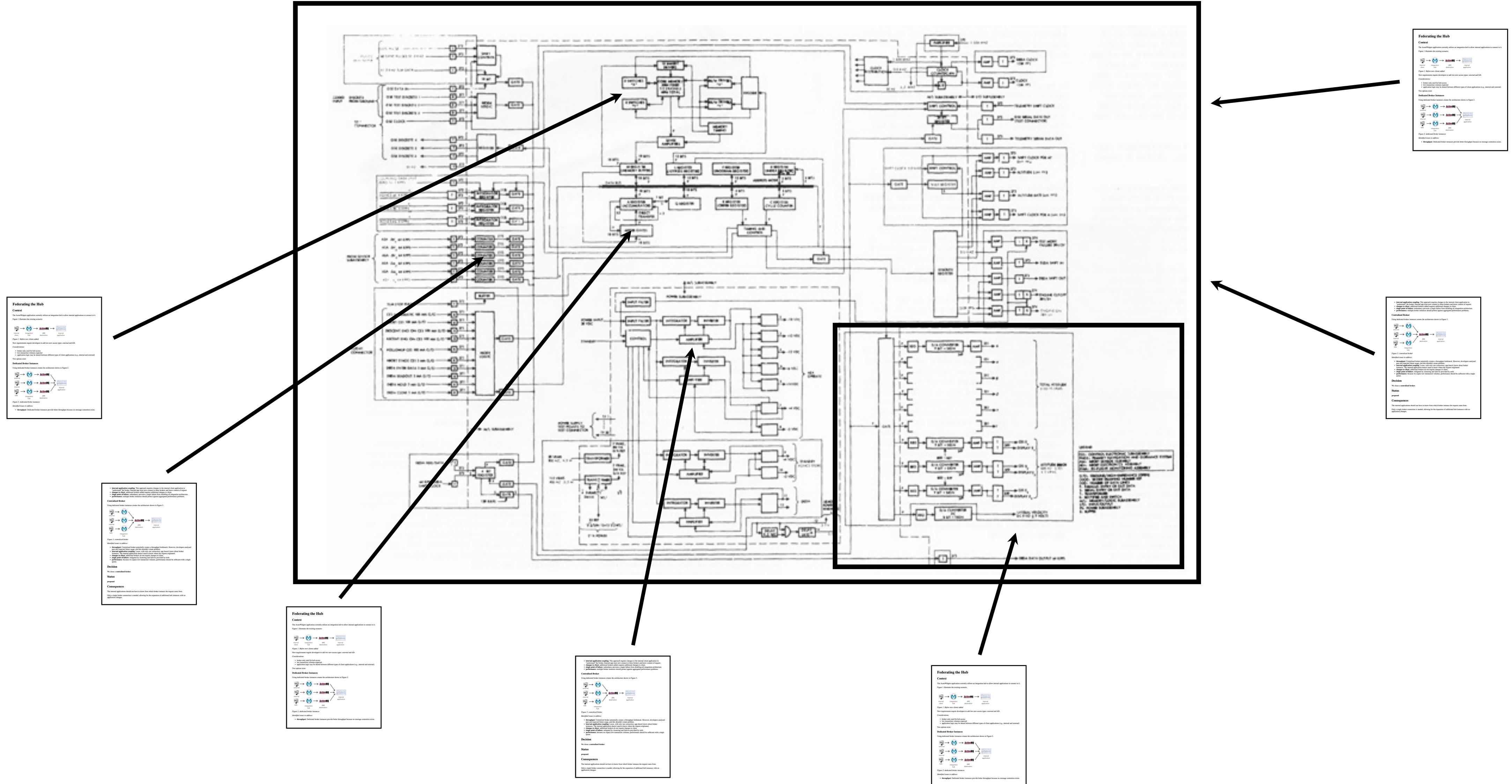
proposed, accepted, superseded

description of the problem and alternative  
solutions available (documentation)

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

trade-offs and impact of decision

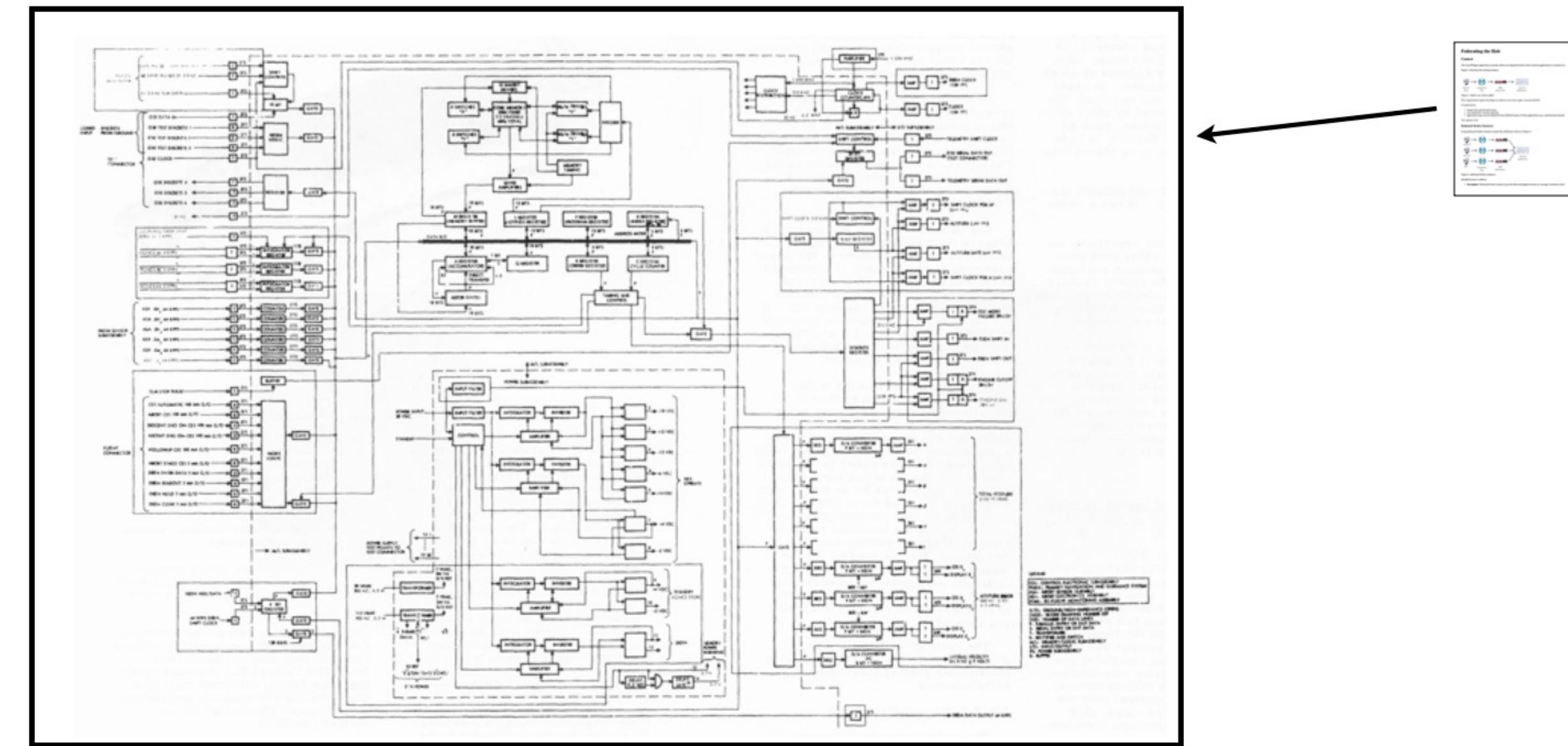
# architecture decision records



# 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

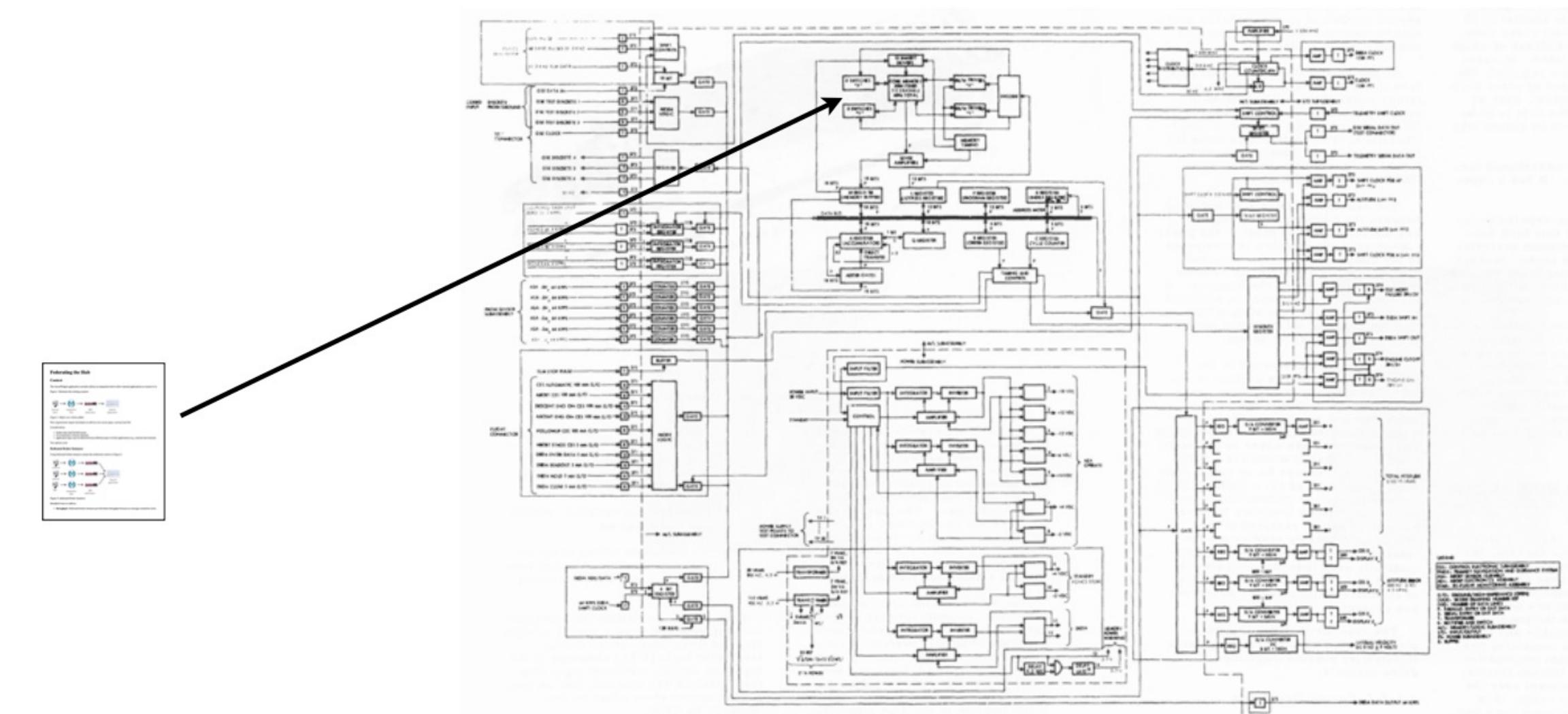
There was some confusion around the purpose of the notification component. Specifically, is this component an event bus for **all** communication or is it a shared component for communicating externally.

### Decision

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



[selfdriveteam](#)



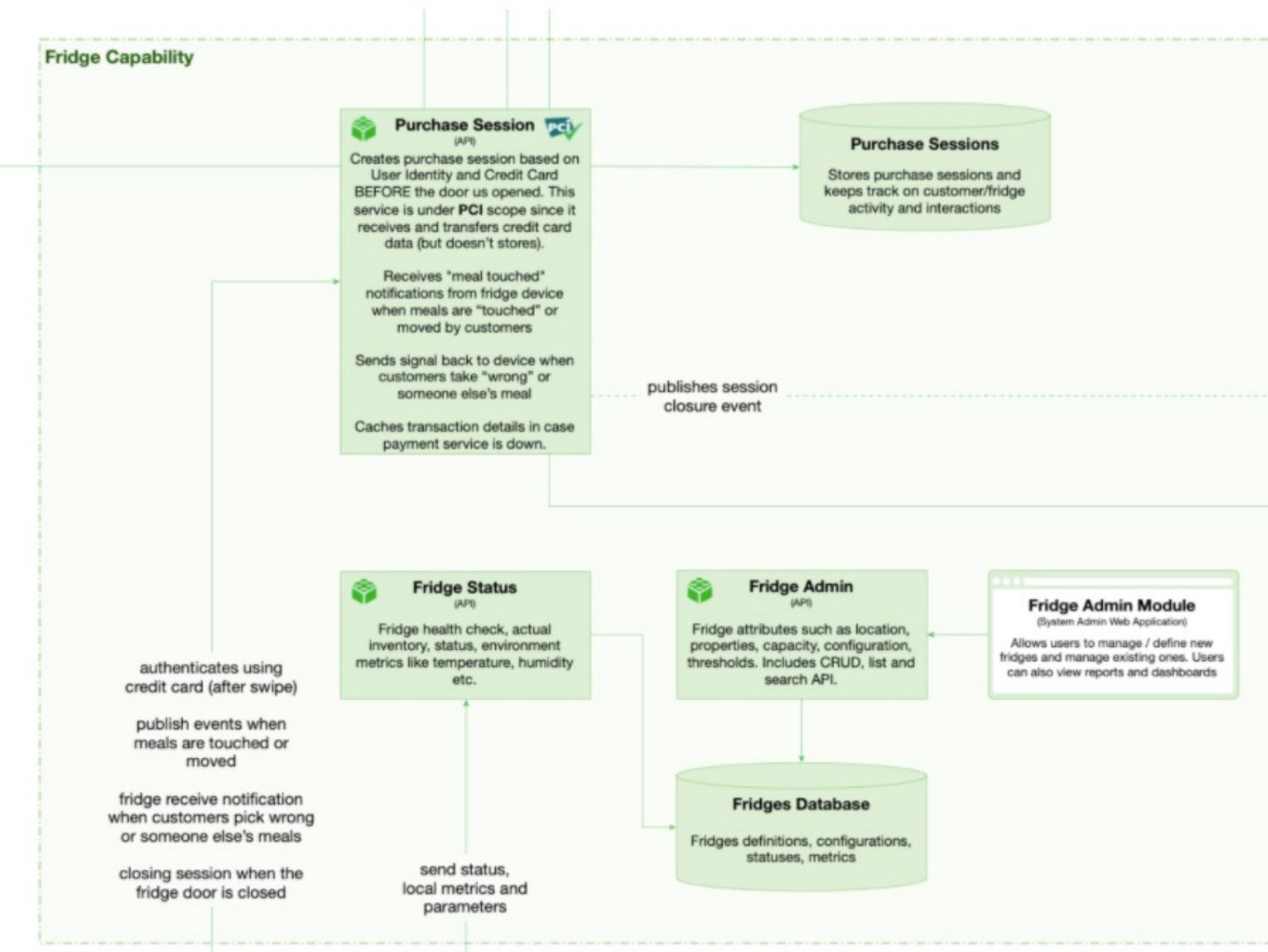
# Overall solution

---



# 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**

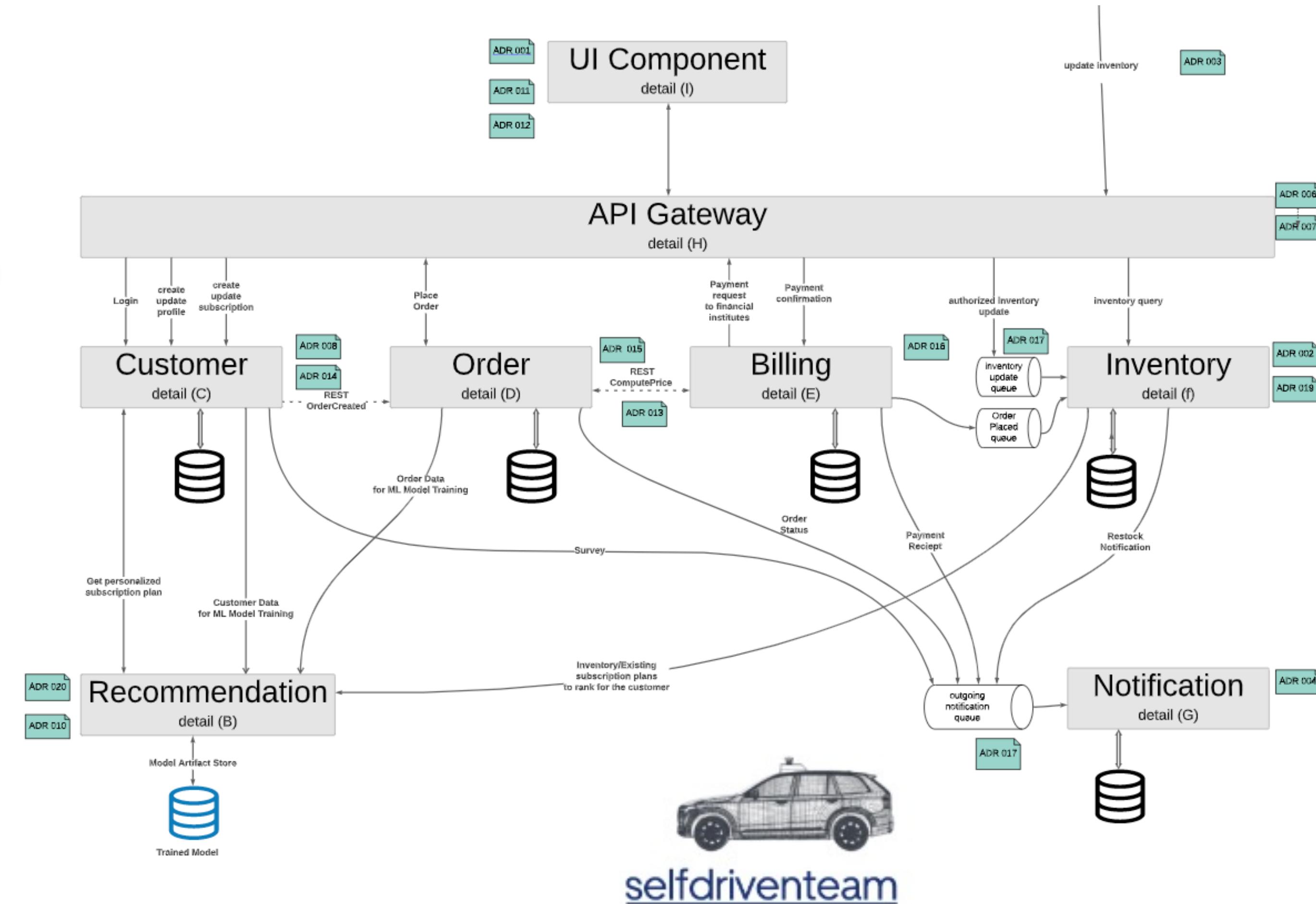
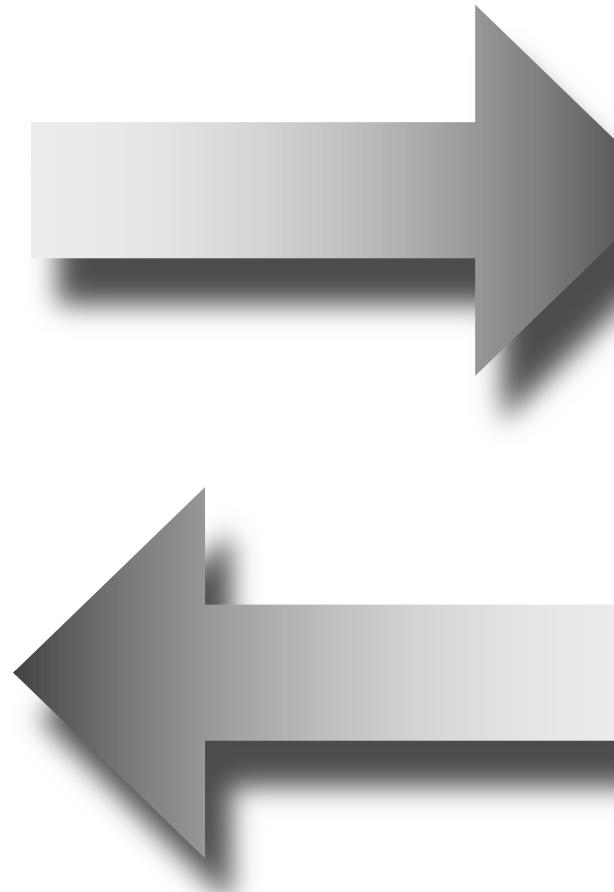
**Feasibility**

**Agility**

**Availability**

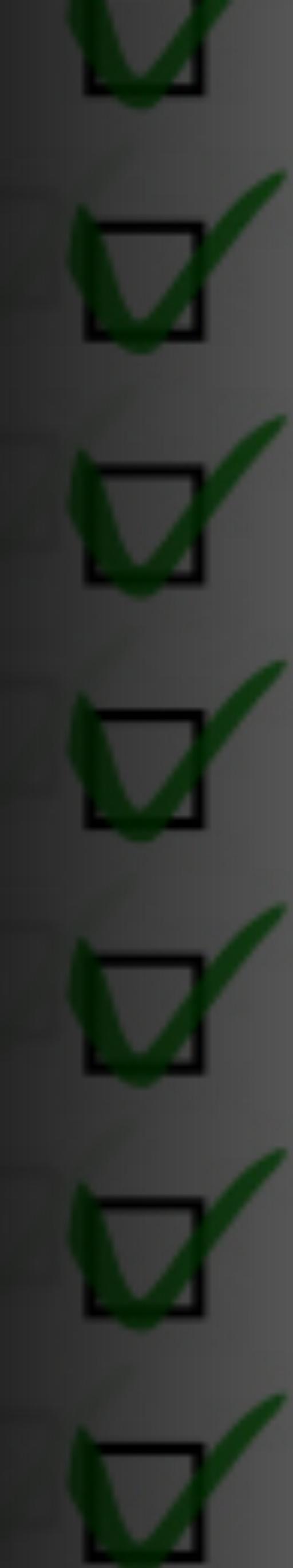
**Security**

**Scalability**



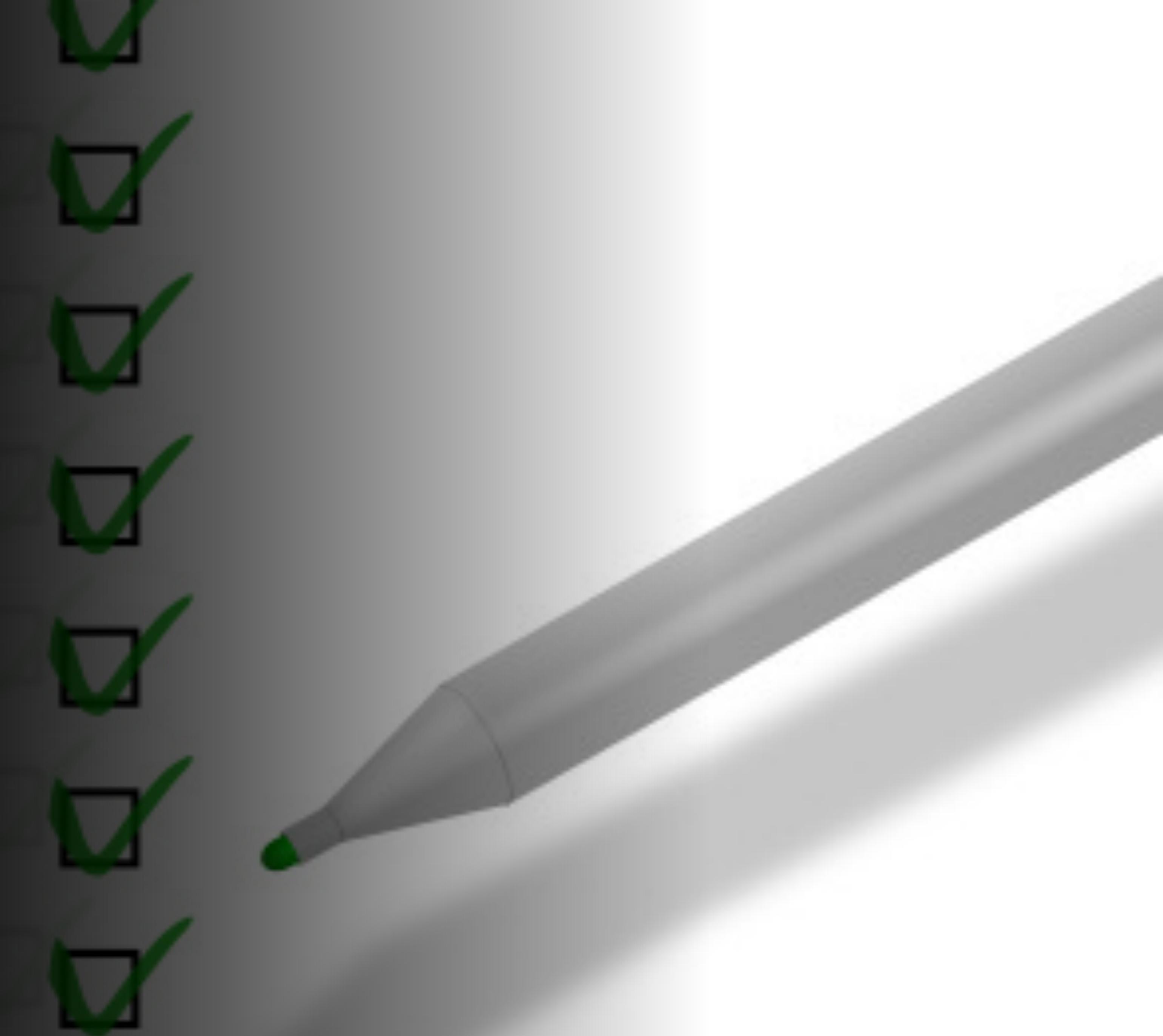
# Final architecture presentation (semi-finalist)

---



# Meet the SME

---



# John Verdi

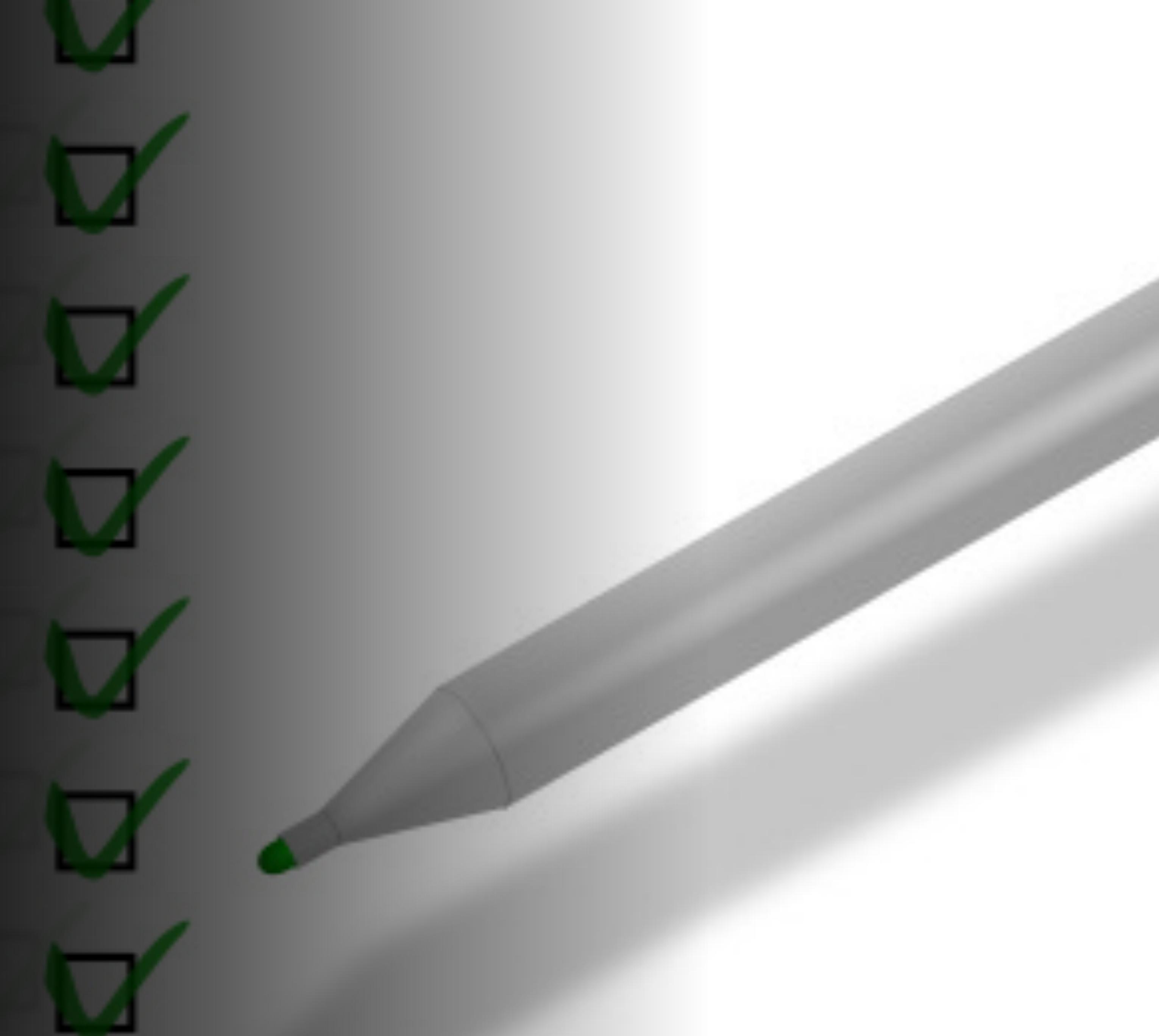
## Founder of the Hey, Blue! Initiative



John Verdi is a retired law enforcement officer from NYC and a 9/11 First Responder. John received a degree in Criminal Justice from St. John's University and is the Founder of the Hey, Blue! Initiative: an interactive approach to creating meaningful connections between police officers and the communities they serve. John is also the co-founder of the Verdi EcoSchool, the only place and project based urban farm school in the southeastern US. John is a proud husband to his wife Ayana, father to his 2 children Giovanni and Annabella and enjoys making connections with people in his community.

# Meet the Judges

---



# David Bock



David Bock is the vice president of strategic development at Core4ce, where he helps turn new ideas into successfully executed business plans. Previously, David was the VP of tech and engineering mission support at Decisiv, where he was responsible for internal IT operations, site reliability engineering, quality assurance, security, customer service, and the company's 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 and team processes at software conferences.

# Jacqui Read



Jacqui Read is a thought leader in the documentation and communication of design, outlining technical solutions to a broad variety of audiences, from technical leads to the C-suite and from developers to prospective clients. She's an experienced software architect and has worked in domains including fintech and big data, in roles such as software developer, technical architect, and solution architect. From her origins publishing blog posts and gists, she's become involved in user groups, workshops, and conferences. In 2021, she led the winning team at the autumn O'Reilly Architectural Katas challenge. Her interests include living documentation, NoSQL, and Agile practices, with a focus on learning and improvement through iteration.

# Emily Bache



Emily Bache is a Samman Technical Coach with ProAgile AB. She helps teams to improve their coding and testing skills, including Test-Driven Development. Emily lives in Göteborg, Sweden, but is originally from the UK. She is the author of "The Coding Dojo Handbook" and often speaks at international conferences.

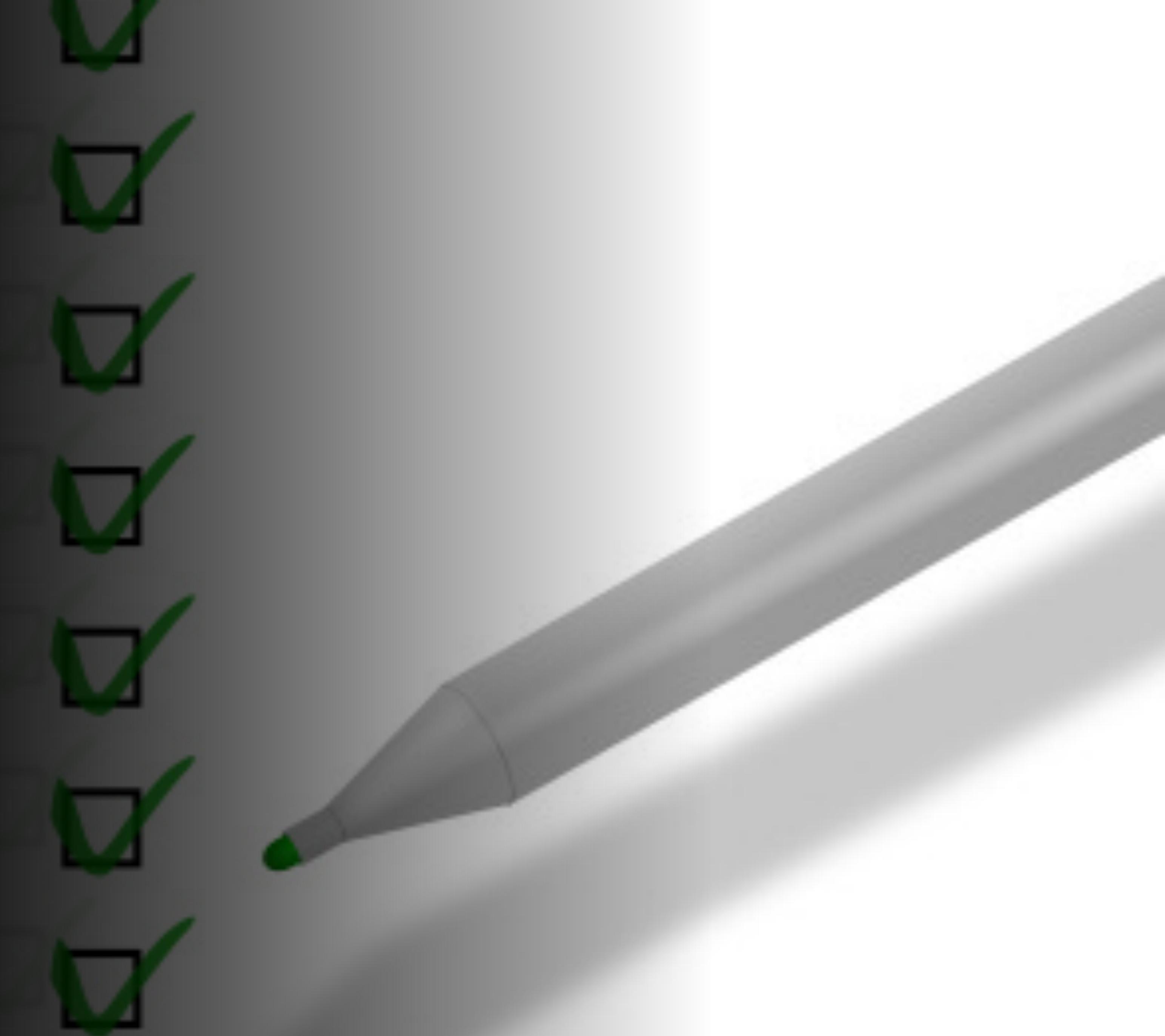
# Clare Sudbery



Clare Sudbery is an independent technical coach with 22 years of software engineering experience. She specializes in TDD, refactoring, and other XP practices. Before recently becoming a freelance technical coach, Clare worked at Made Tech and Thoughtworks. She abandoned IT 12 years ago to retrain as a high school math teacher...but quickly returned to software, gaining new energy via extreme programming. Up until very recently she led Made Tech's academy program, coaching inexperienced engineers to learn on the job. Clare has a passion for helping underrepresented groups to flourish in tech. She hosts the acclaimed [Making Tech Better](#) podcast and publishes notes and scribbles at [A Woman in Technology](#), [Everything Clare Knows](#), and [In Simple Terms](#).

# The Problem

---







# Our Mission

The Hey, Blue! initiative facilitates moments of meaningful connection between police officers and members of their community by offering intentional opportunities for individuals to meet and share positive experiences. #HeyBlue



# Vision

Inspired by the extraordinary acts of heroism displayed by both individual community members and first responders during 9/11, EcoSchool co-founder, John Verdi, wanted to build a platform that could bring police officers and communities together with a shared purpose.



# Vision

Connection-driven projects like Preschool Storytime and Hello, a virtual handshake, are just the start of a larger movement designed to create an awareness of our shared humanity.

Website: <https://heyblue.app/>  
Verdie School Nonprofit:  
<https://www.verdiecoschool.org/heyblue>



# Vision

If police officers across the United States simply connected with 5 community members per day, the result would be **1.2 BILLION** connections in a year.



# HeyBlue App/Platform

The HeyBlue App Project is a sustained effort that facilitates moments of meaningful connection between police officers and members of their community by offering intentional opportunities for individuals to meet and share positive experiences.

These positive interactions turn into points that the individual can use to purchase items and the police officer can donate to a non-profit or family in need.



# HeyBlue App/Platform

Problem Statement #1: Connecting civilians and police officers for positive interactions

Problem Statement #2: Turning interactions into points and exchanging those points for goods (civilians) or donating them to nonprofits (police officers)

Technology Solution Description: Application for connecting police officers and community through interactions and adding value to the interactions.



# HeyBlue App/Platform

## Users:

- Individuals
- Police Officers
- Charities
- Retail Organization



# Requirements

The Platform must establish a way to incentivize and create connections between police and members of the community through virtual handshakes and community events.



# Requirements

Web and Mobile-Based with back-end processing and reporting and analytics that tracks site activity and connections.

Analytics can take app data and aggregate it with other available public data to build comprehensive reports to show impact of app in community



# Must Have...

- End-Use Ease of Use
- Location Tracking
- Connecting with other users
- Uploading to social media
- Connectivity to Users Social Media is an option
- Tracking engagement
- The ability to opt in to and out of push notifications



# Must Have...

The Platform must provide a way to allow Civilians to find retail establishments where they can redeem their points.

The Platform must provide a way to allow Officers to find Charities where they can gift their points.

The App must protect user data and consider what data is stored and what data is transient.



# Must Have...

Allow Businesses/Charities to create a storefront on the app to encourage users to redeem or donate their points.

Businesses should have a catalog of items that they are offering and the point value assigned to each item available.



# Must Have...

Reminder to think critically about the civilian and officer experience, anticipate these users needs while developing the use case and user stories.

Consider what can offer these users maximum value to fulfill the intent of logging on the app and turning on their location finder.



# Civilian Workflow

- Step 1 Create User Profile
- Step 2 Allow notifications for when an opportunity for an interaction with a police office is nearby
- Step 3 Connect with the police officer and say hello virtually or in person
- Step 4 Post connection on HeyBlue! Social media
- Step 5 Receive points for interactions
- Step 6 Redeem points at participating businesses for goods



# Police Officer Workflow

- Step 1 Create User Profile
- Step 2 Allow notifications for when an interaction is nearby
- Step 3 Connect with the civilian and say hello virtually or in person
- Step 4 Post connection on HeyBlue! Social media
- Step 5 Receive points for interactions
- Step 6 Transfer points to participating non-profits for them to redeem for goods at participating businesses



# Charity Workflow

- Step 1 Create Profile
- Step 2 Allow Police Officers to Connect
- Step 3 Allow Officer Points to be Donated
- Step 4 Redeem Points at Participating Retail Establishments (Identify Participating Retail Establishments?)



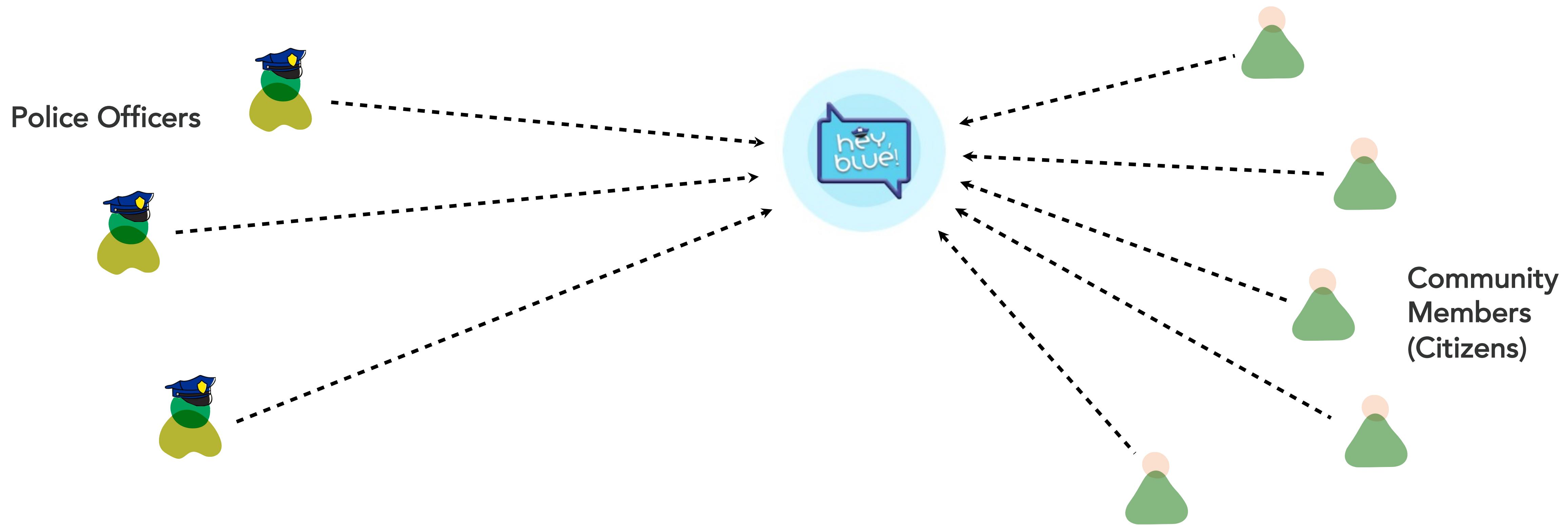
# Business Workflow

- Step 1 Create Profile
- Step 2 Allow Civilians to opt in to push notifications to alert them that a participating establishment is nearby
- Step 3 Allow Civilian points to be redeemed for goods

# Interactions

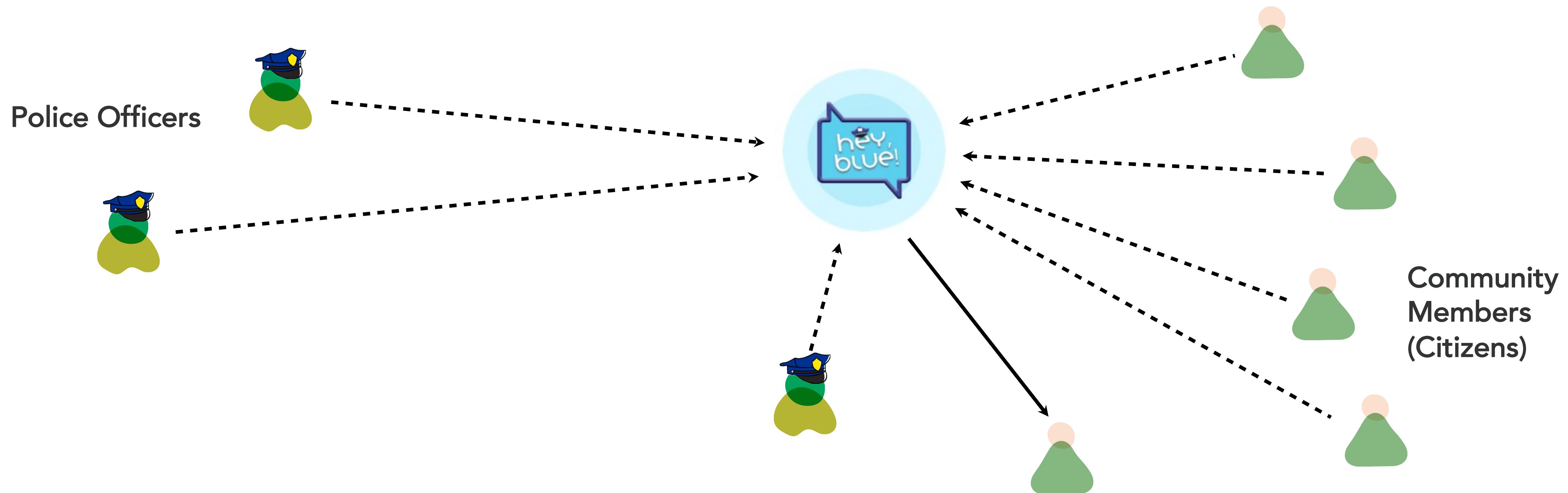
# Hey Blue! - Creating an Interaction

1. Citizens and police officers around the community register with the HeyBlue! application



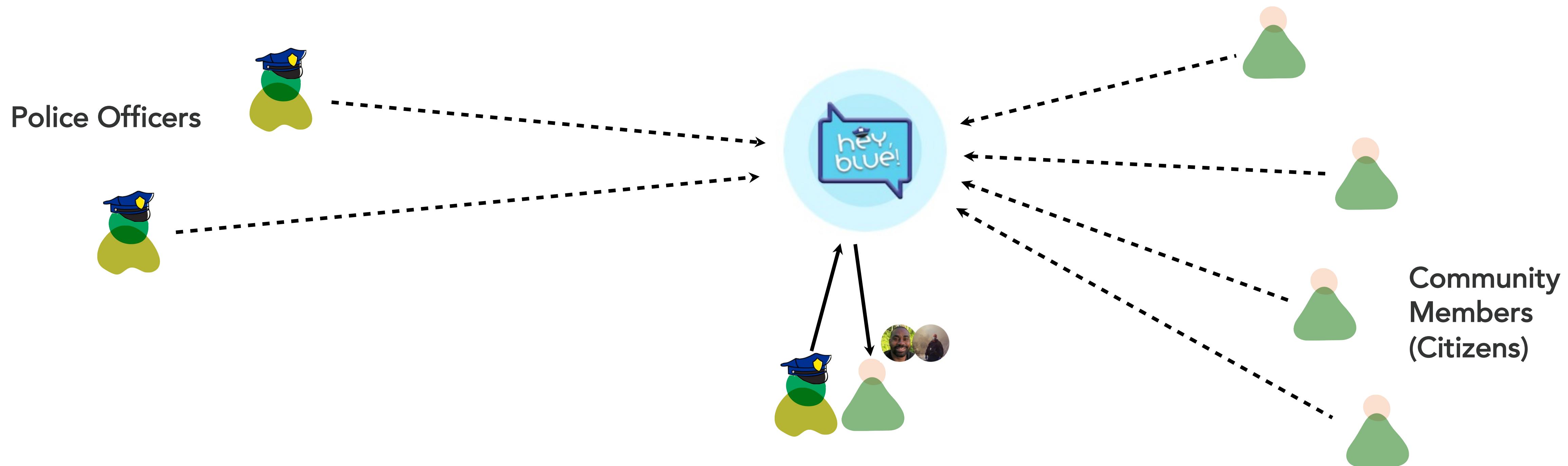
# Hey Blue! - Creating an Interaction

1. Citizens and police officers around the community register with the HeyBlue! application
2. HeyBlue! notifies the citizen when a police officer is near (or citizen can check via the app)



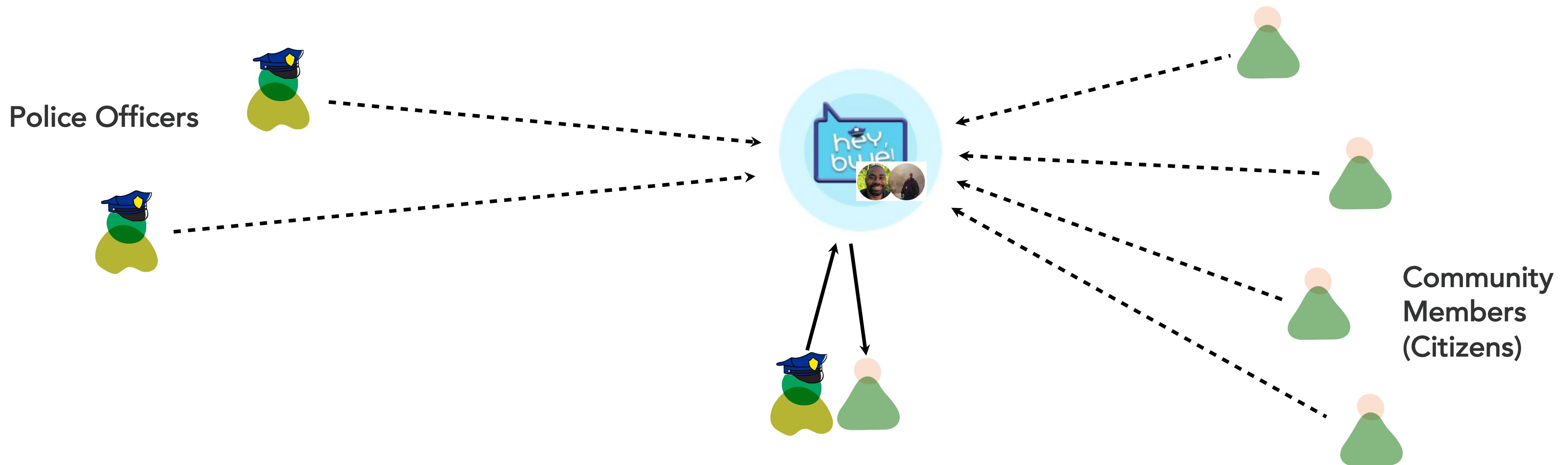
# Hey Blue! - Creating an Interaction

1. Citizens and police officers around the community register with the HeyBlue! application
2. HeyBlue! notifies the citizen when a police officer is near (or citizen can check via the app)
3. The citizen contacts the police officer through the HeyBlue! app and they connect via a virtual handshake and hello



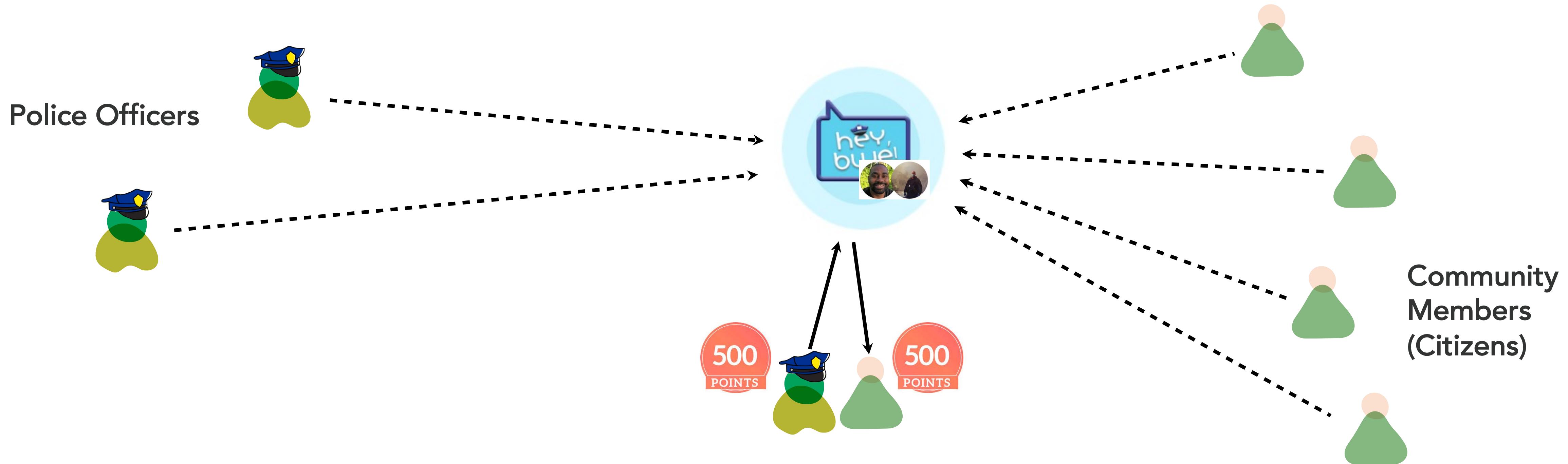
# Hey Blue! - Creating an Interaction

1. Citizens and police officers around the community register with the HeyBlue! application
2. HeyBlue! notifies the citizen when a police officer is near (or citizen can check via the app)
3. The citizen contacts the police officer through the HeyBlue! app and they connect via a virtual handshake and hello
4. The citizen uploads the connection to HeyBlue! to create an interaction (they can also upload to additional social media sites)



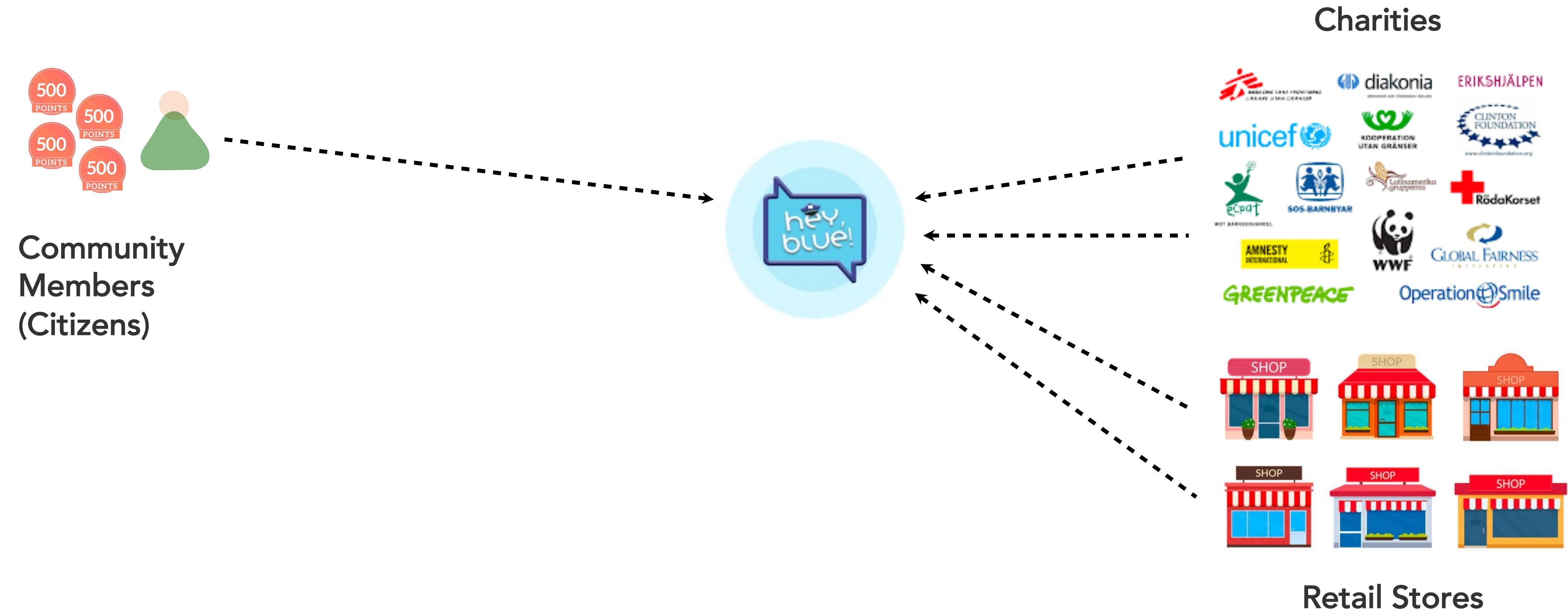
# Hey Blue! - Creating an Interaction

1. Citizens and police officers around the community register with the HeyBlue! application
2. HeyBlue! notifies the citizen when a police officer is near (or citizen can check via the app)
3. The citizen contacts the police officer through the HeyBlue! app and they connect via a virtual handshake and hello
4. The citizen uploads the connection to HeyBlue! to create an interaction (they can also upload to additional social media sites)
5. Both the citizen and the police officer receive points for the interaction



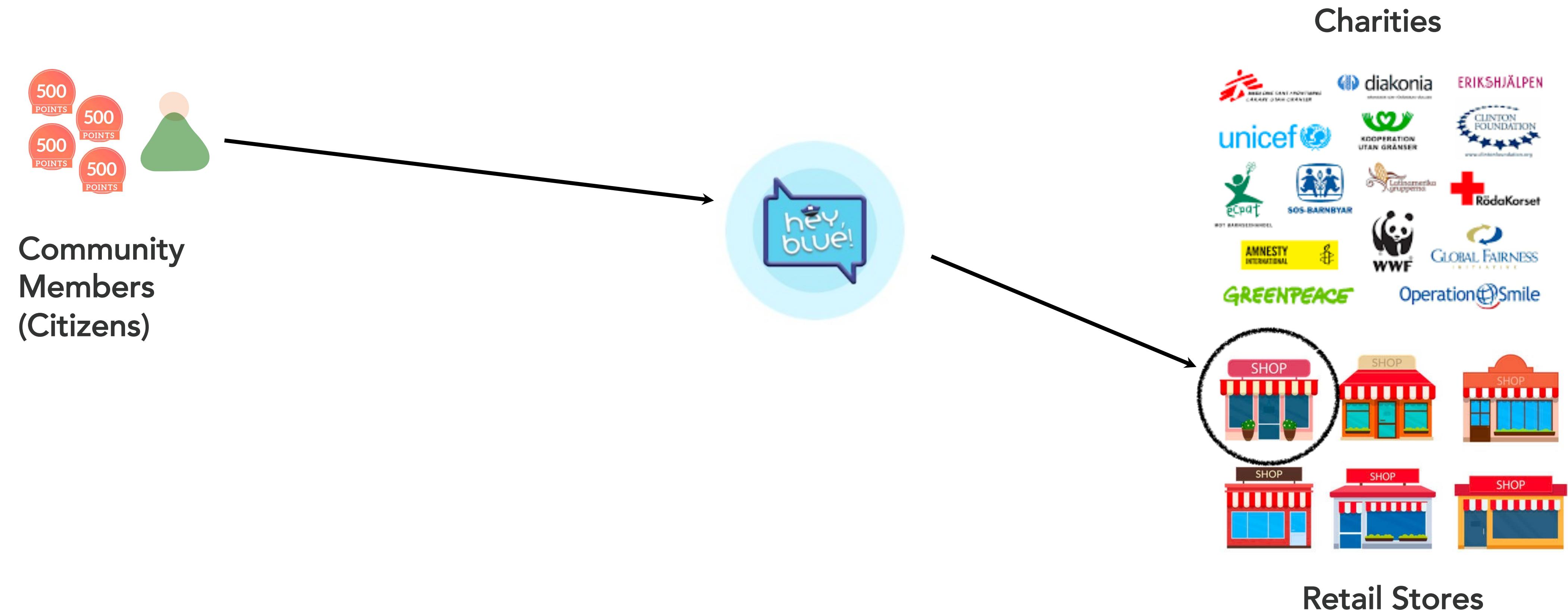
# Hey Blue! - Citizen Redeems Points

1. Citizens earn points through interactions, and can use them to purchase items from retailers or donate to a charity



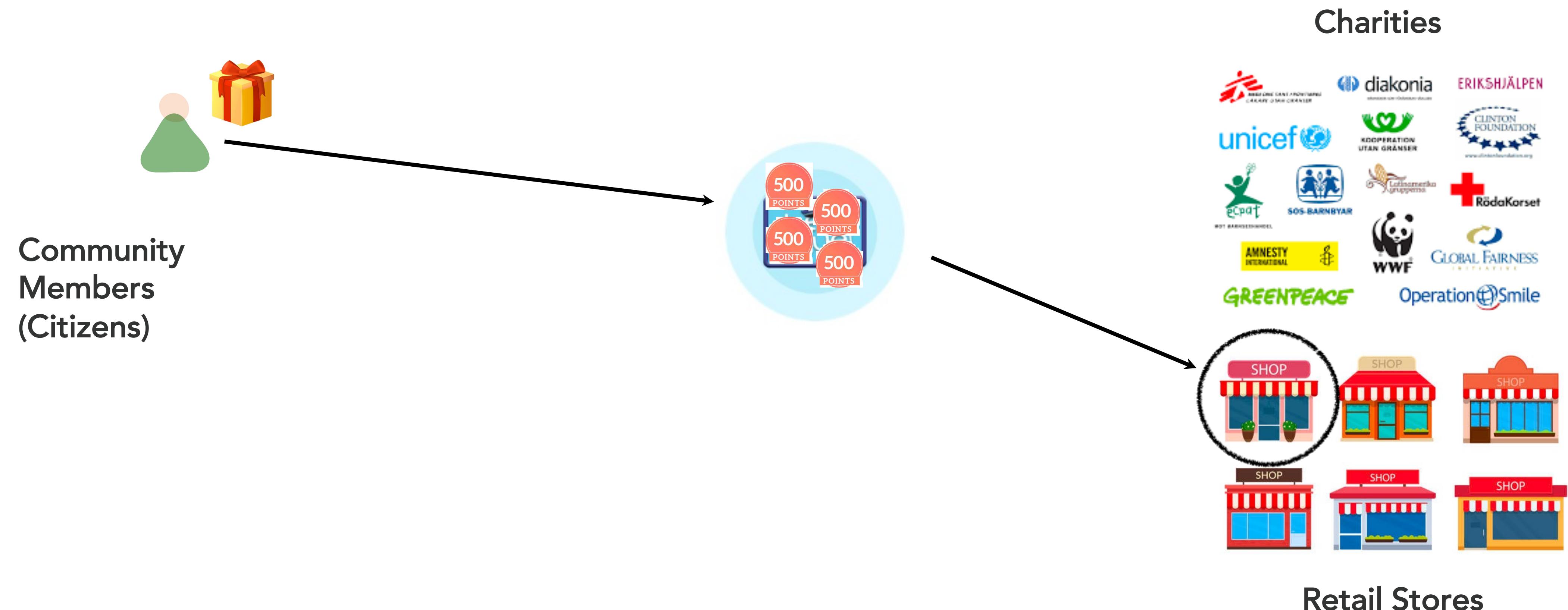
# Hey Blue! - Citizen Redeems Points

1. Citizens earn points through interactions, and can use them to purchase items from retailers or donate to a charity
2. The citizen browses the retail stores through the HeyBlue! app, looking for something to buy with their points



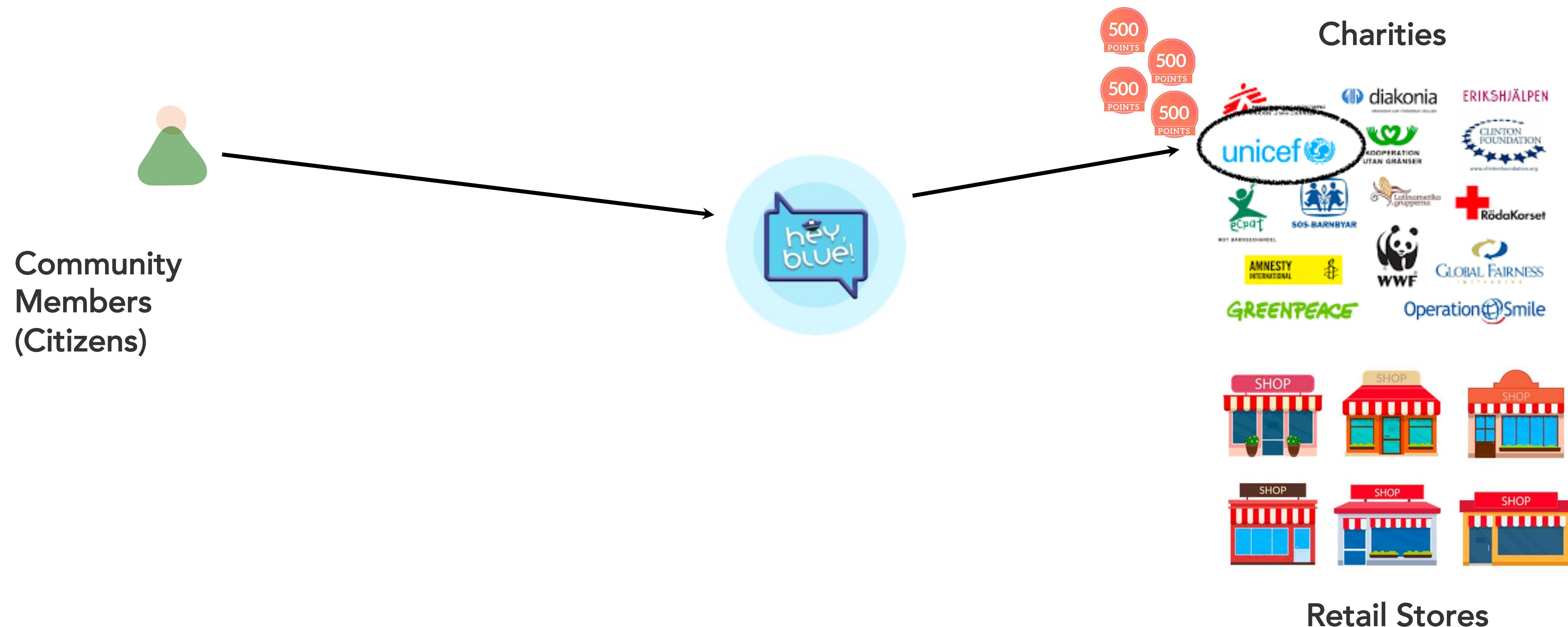
# Hey Blue! - Citizen Redeems Points

1. Citizens earn points through interactions, and can use them to purchase items from retailers or donate to a charity
2. The citizen browses the retail stores through the HeyBlue! app, looking for something to buy with their points
3. The citizen redeems their points for selected items from the retail store



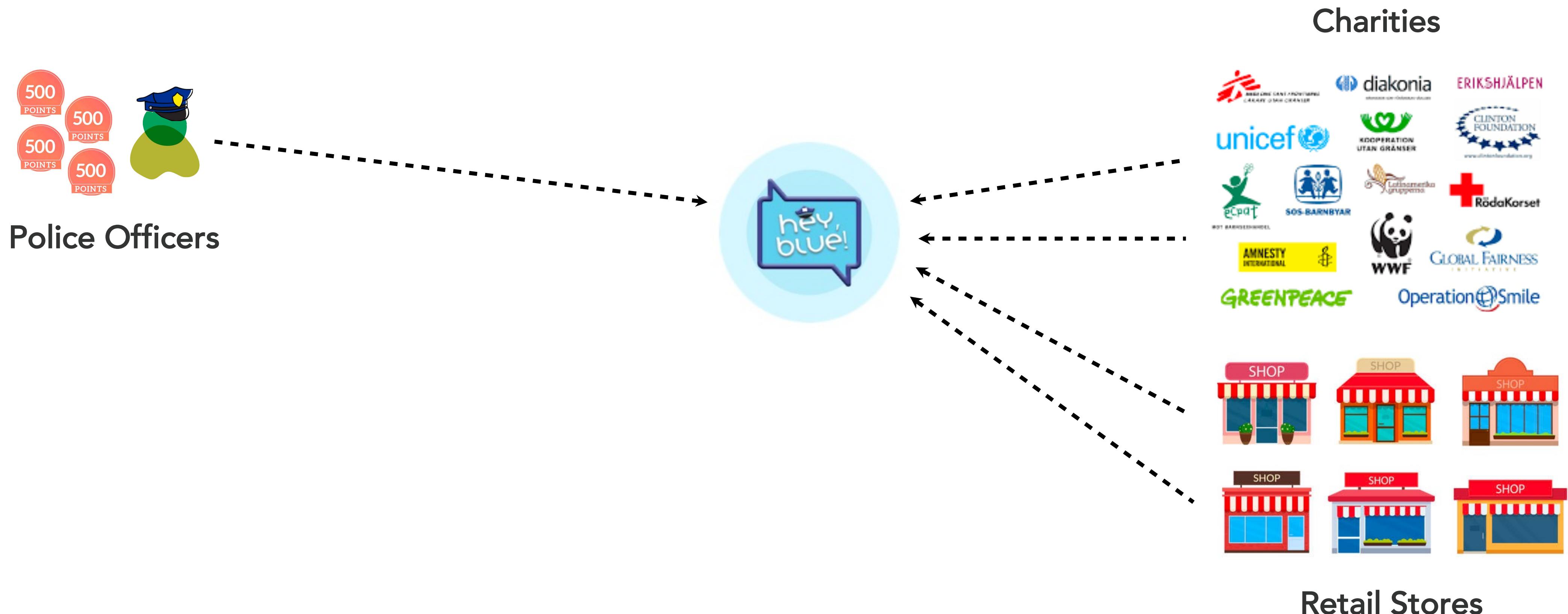
# Hey Blue! - Citizen Redeems Points

1. Citizens earn points through interactions, and can use them to purchase items from retailers or donate to a charity
2. The citizen browses the retail stores through the HeyBlue! app, looking for something to buy with their points
3. The citizen redeems their points for selected items from the retail store
4. Alternatively, the citizen can donate their points to a charity so that the charity can purchase something from a retail store



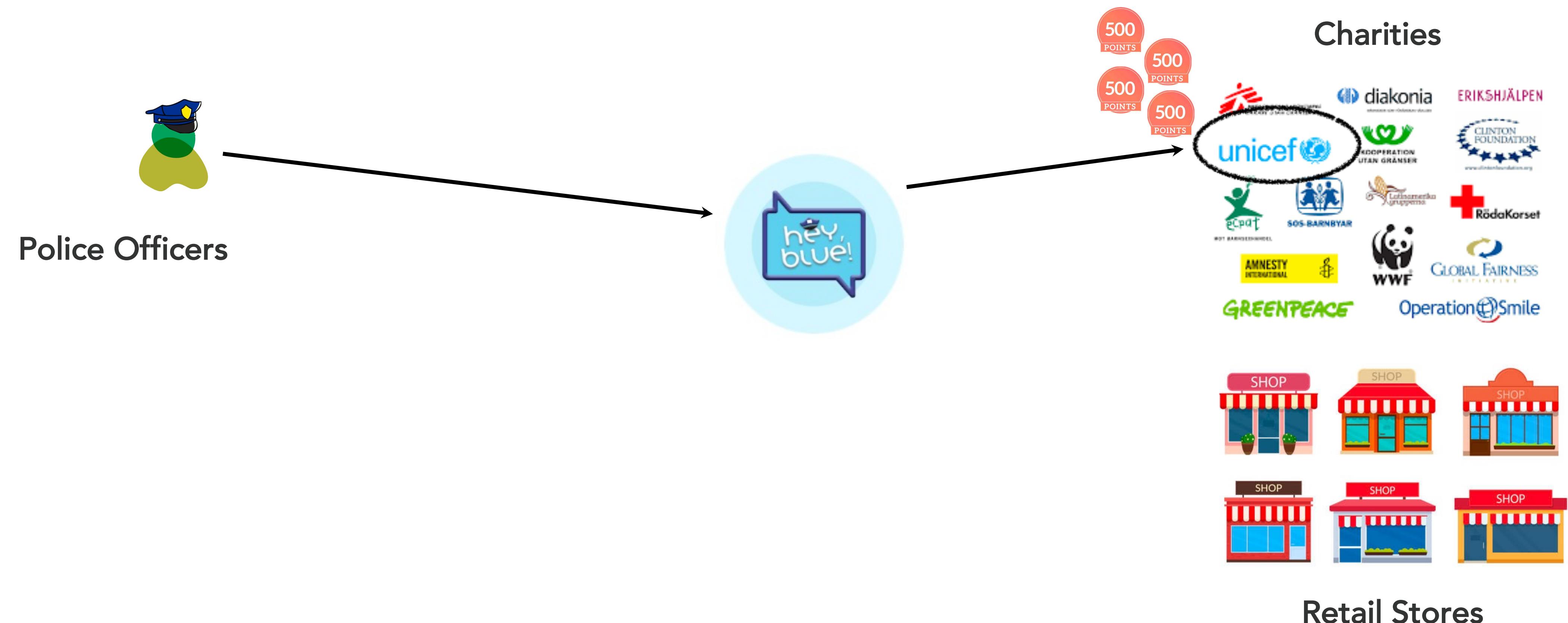
# Hey Blue! - Police Officer Donate Points

1. Police officers earn points through interactions, and can use them to donate to a charity



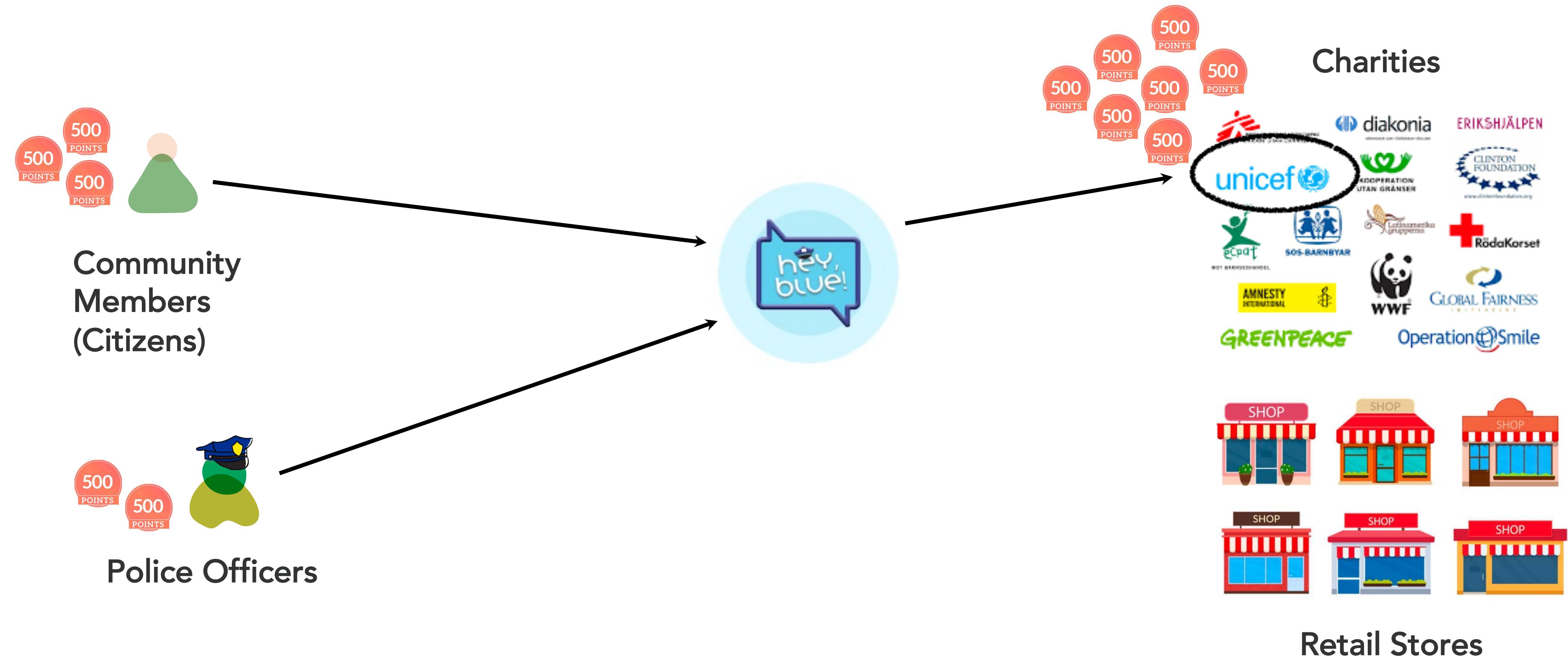
# Hey Blue! - Police Officer Donates Points

1. Police officers earn points through interactions, and can use them to donate to a charity
2. The police officer browses the registered charities through the HeyBlue! app, and donates points to a selected charity



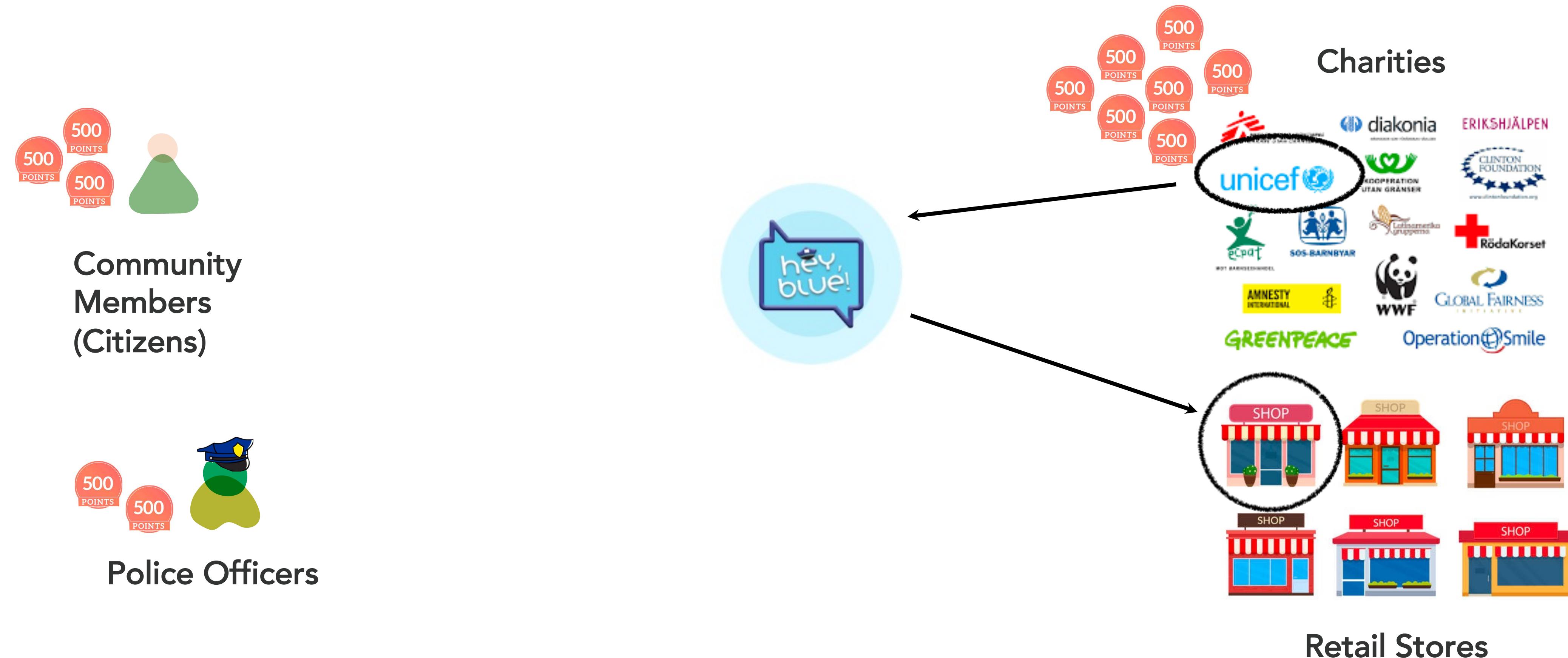
# Hey Blue! - Charity Redeems Points

1. Police officers and citizens can donate points to a registered charity



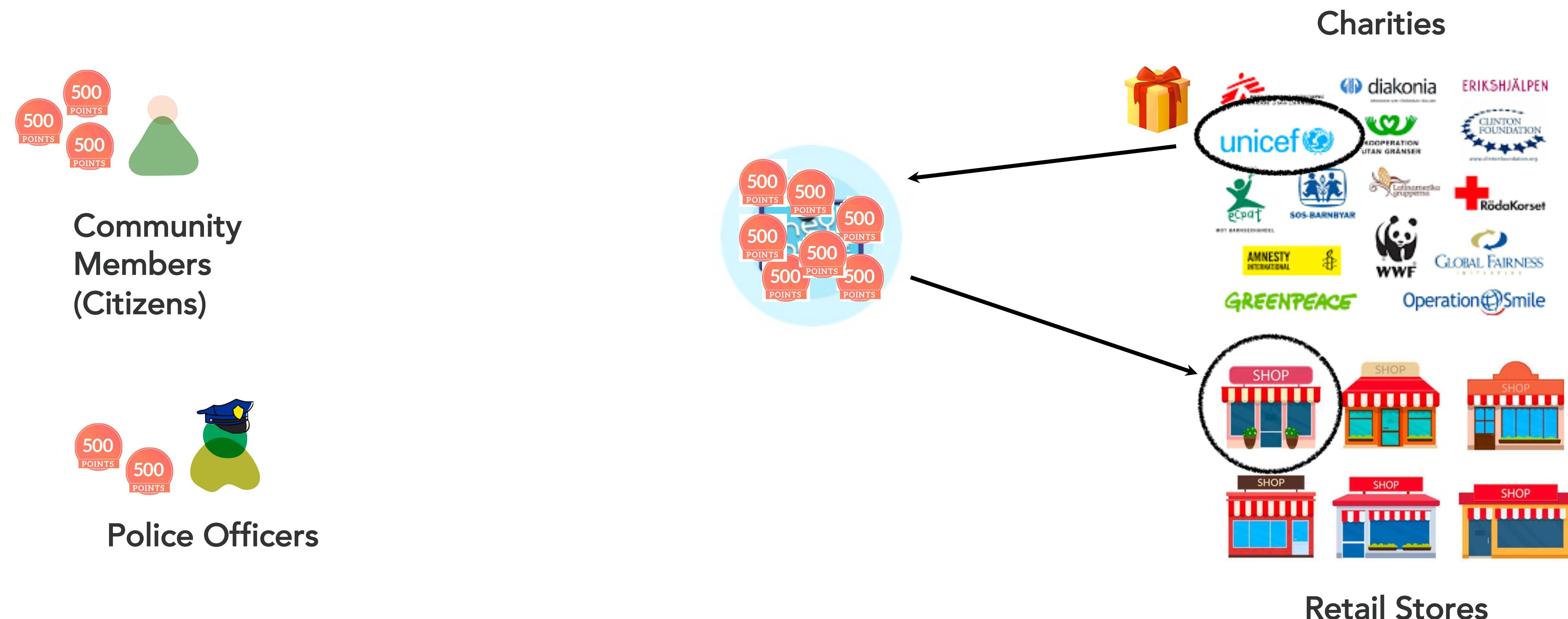
# Hey Blue! - Charity Redeems Points

1. Police officers and citizens can donate points to a registered charity
2. The charity organization browses the retail stores through the HeyBlue! app, looking for something to buy with their points



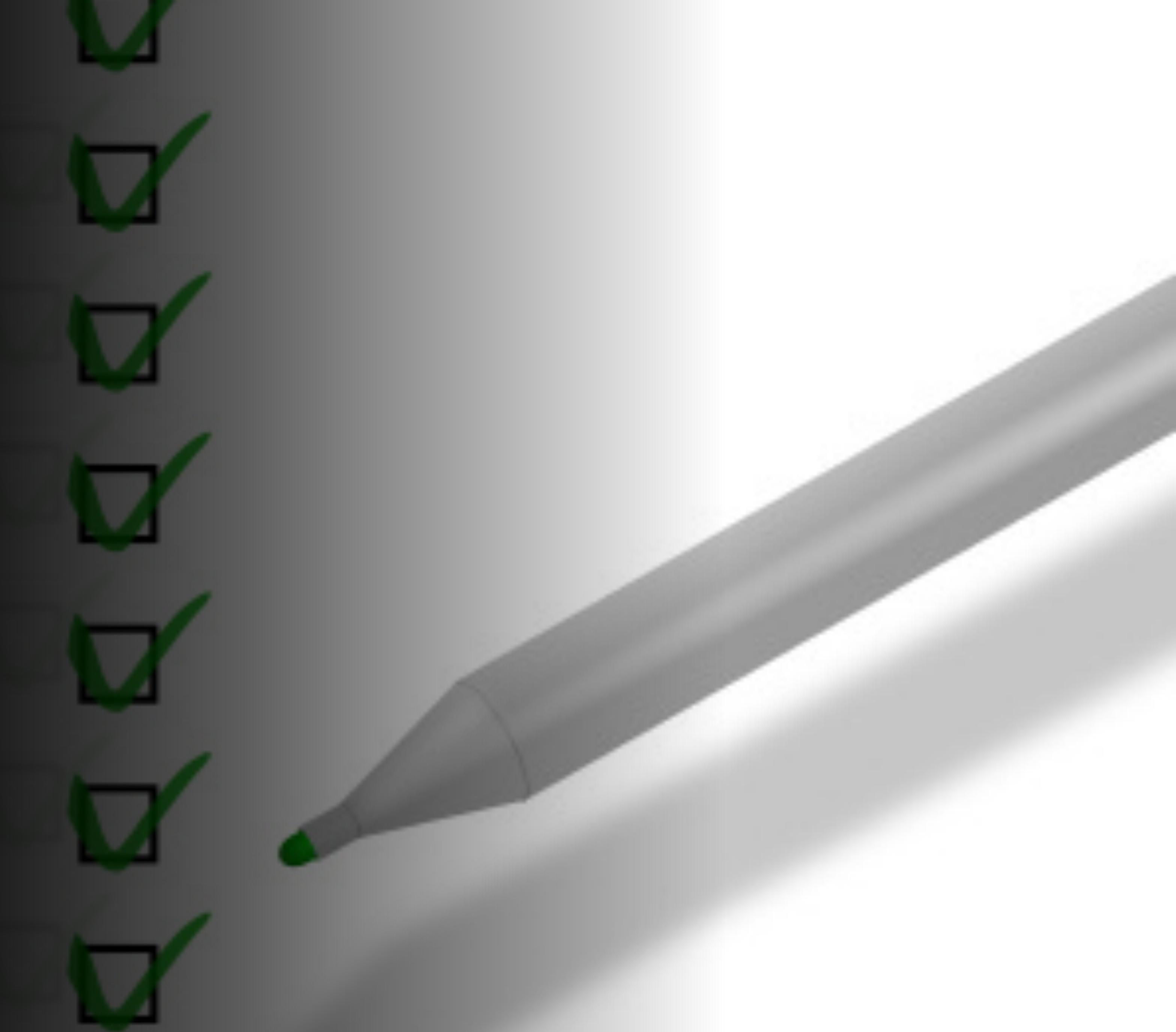
# Hey Blue! - Charity Redeems Points

1. Police officers and citizens can donate points to a registered charity
2. The charity organization browses the retail stores through the HeyBlue! app, looking for something to buy with their points
3. The charity organization redeems their points for selected items from the retail store



# Contest Details

---



# Dates

- All teams must submit a google form (<https://forms.gle/Ufe1G7VKxrdPKxhV8>) by Wednesday, October 26<sup>th</sup> at 12PM Eastern to participate
- Solutions are due in your GitHub repo by Tuesday, November 8th, 11:59PM Eastern
- Semifinalists will be announced at the second event on Friday, November 18th
- Questions? Email us at [katas@oreilly.com](mailto:katas@oreilly.com)



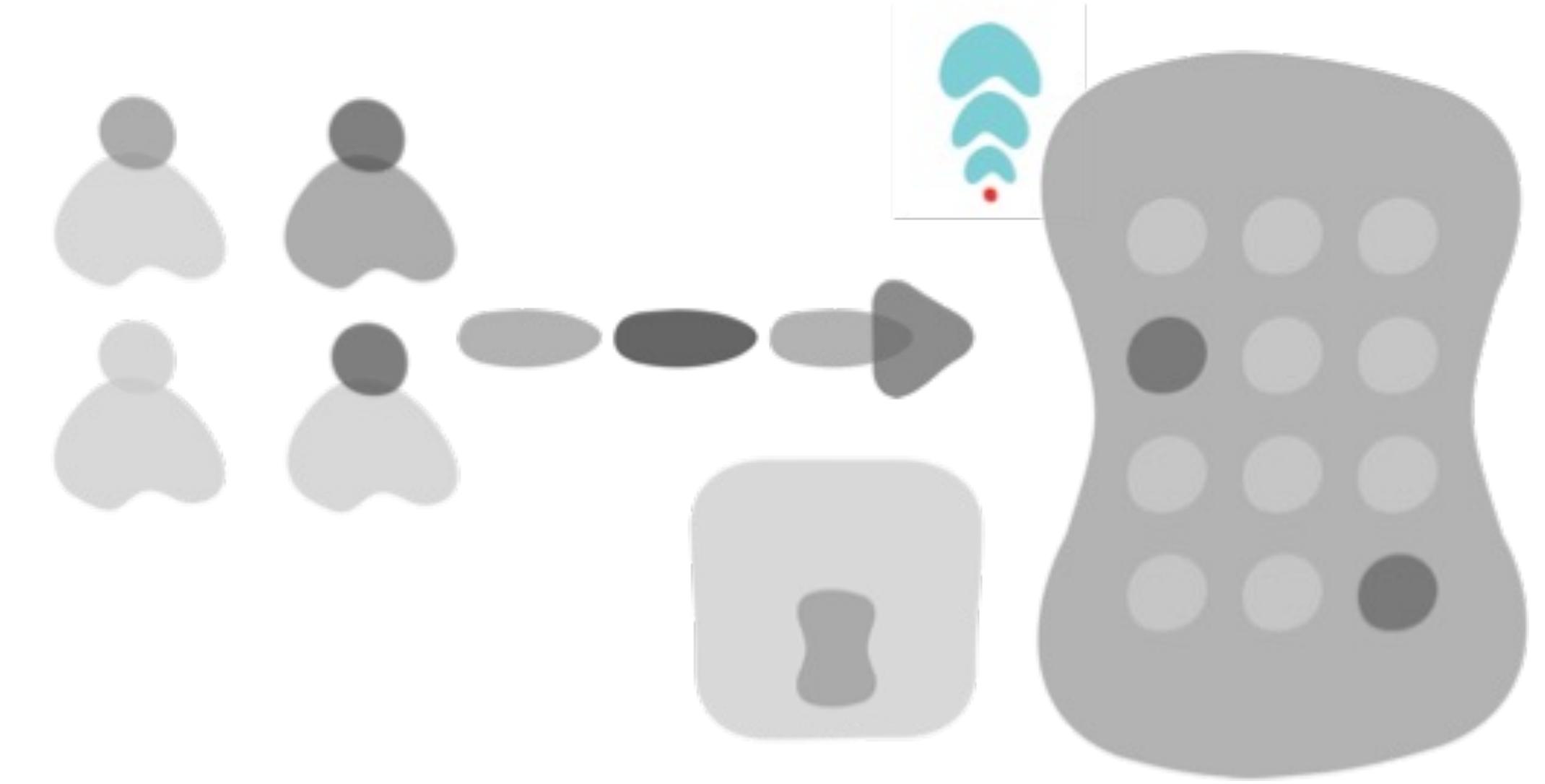
# Resources

Website: <https://heyblue.app/>

Verdie School Nonprofit:  
<https://www.verdiecoschool.org/heyblue>

# Architecture Katas On-line

## Fall 2022



**Neal Ford**  
**Thoughtworks**  
**Director / Software Architect / Meme Wrangler**  
<http://www.nealford.com>  
**@neal4d**