

Architecture Katas

Private Event Sept 2023



Neal Ford

Thoughtworks

Director / Software Architect / Meme Wrangler

<http://www.nealford.com>

@neal4d



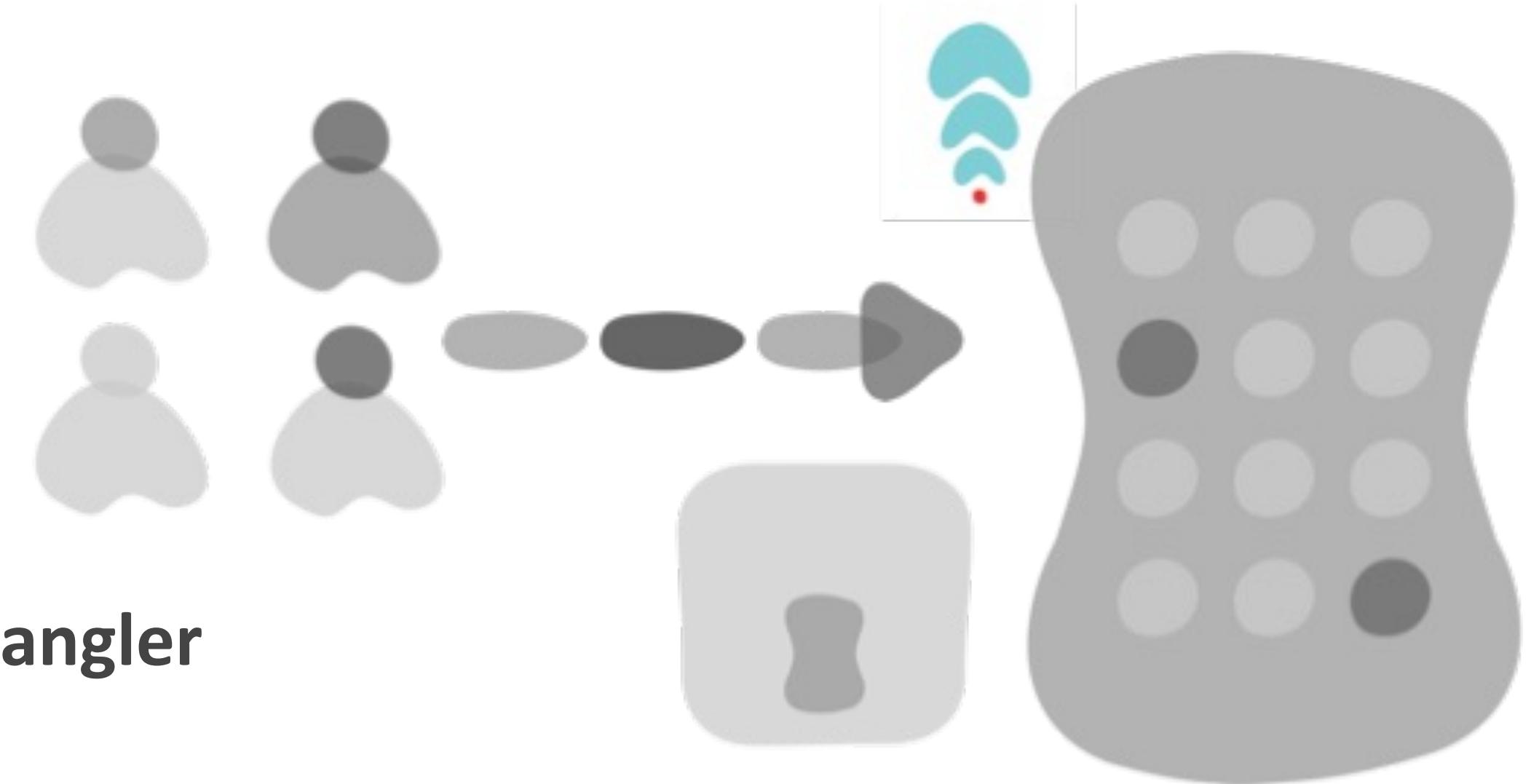
Mark Richards

Independent Consultant

Hands-on Software Architect, Published Author

Founder, DeveloperToArchitect.com

@markrichardssa



Contest Kickoff

Introduction

Where did this
idea come from?

The screenshot shows a web browser window with the URL `archkatas.herokuapp.com` in the address bar. The page title is "Architectural Katas". The main content features a quote by Fred Brooks: "How do we get great designers? Great designers design, of course." --Fred Brooks. Below it is another quote by Ted Neward: "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", "Join", and "Contact". Each section has a brief description and a corresponding button. At the bottom, there is a copyright notice: "© Neward & Associates 2012".

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 »](#)

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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

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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', 'Updated Fundamentals of Software Architecture Images', and 'Architectural Katas'. Below the header is a section titled 'Architectural Katas' with a quote by Fred Brooks: "How do we get great designers? Great designers design, of course." attributed to Fred Brooks. Another quote by Ted Neward 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. The page also contains an 'About' section describing the purpose of Architectural Katas and a note about project requirements.

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
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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

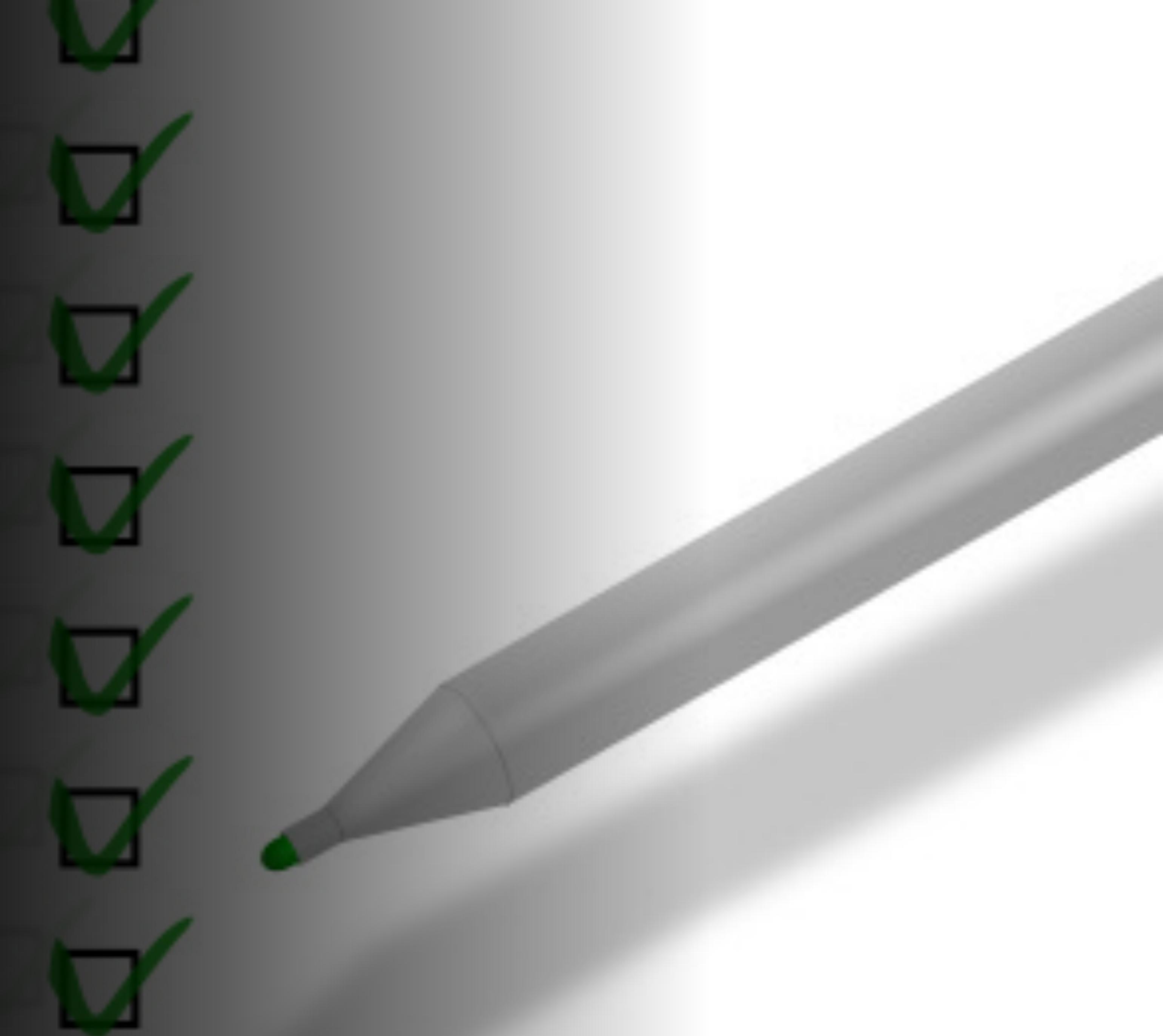
10:00am – 12:00pm EST

This course has ended.

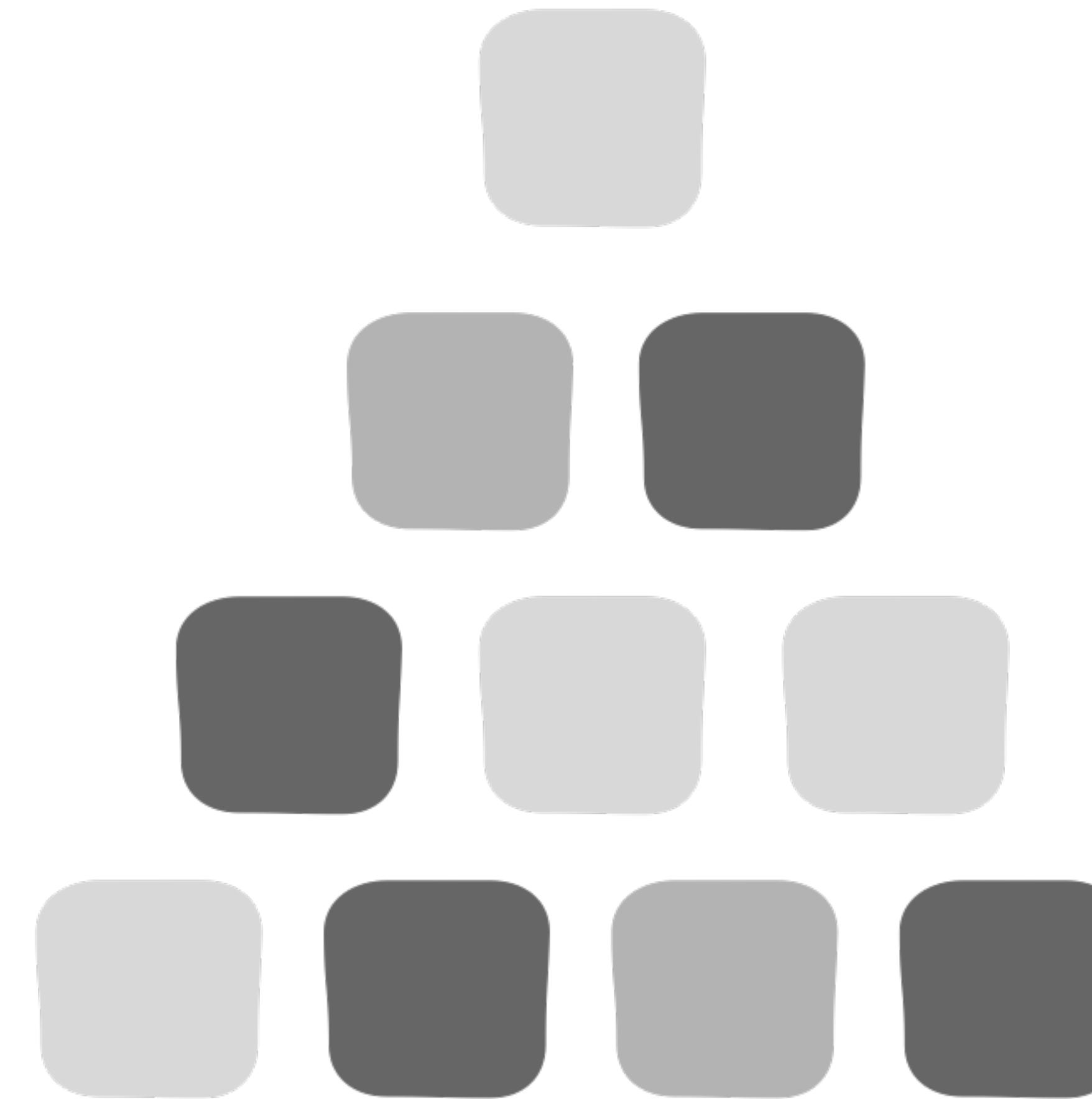
[What you'll learn](#) [Instructor](#) [Schedule](#)

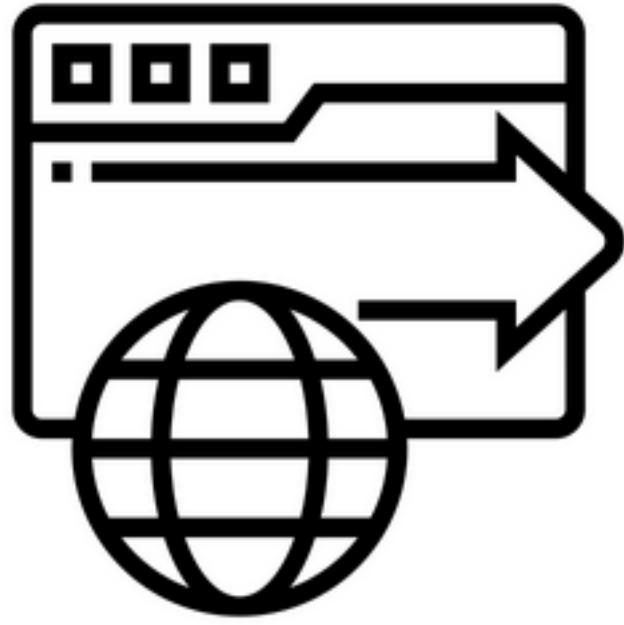
New information after 10/20 kickoff:

The Process



structural design in architecture





requirements | use cases | story cards | DDD event-storm output | ?

performance

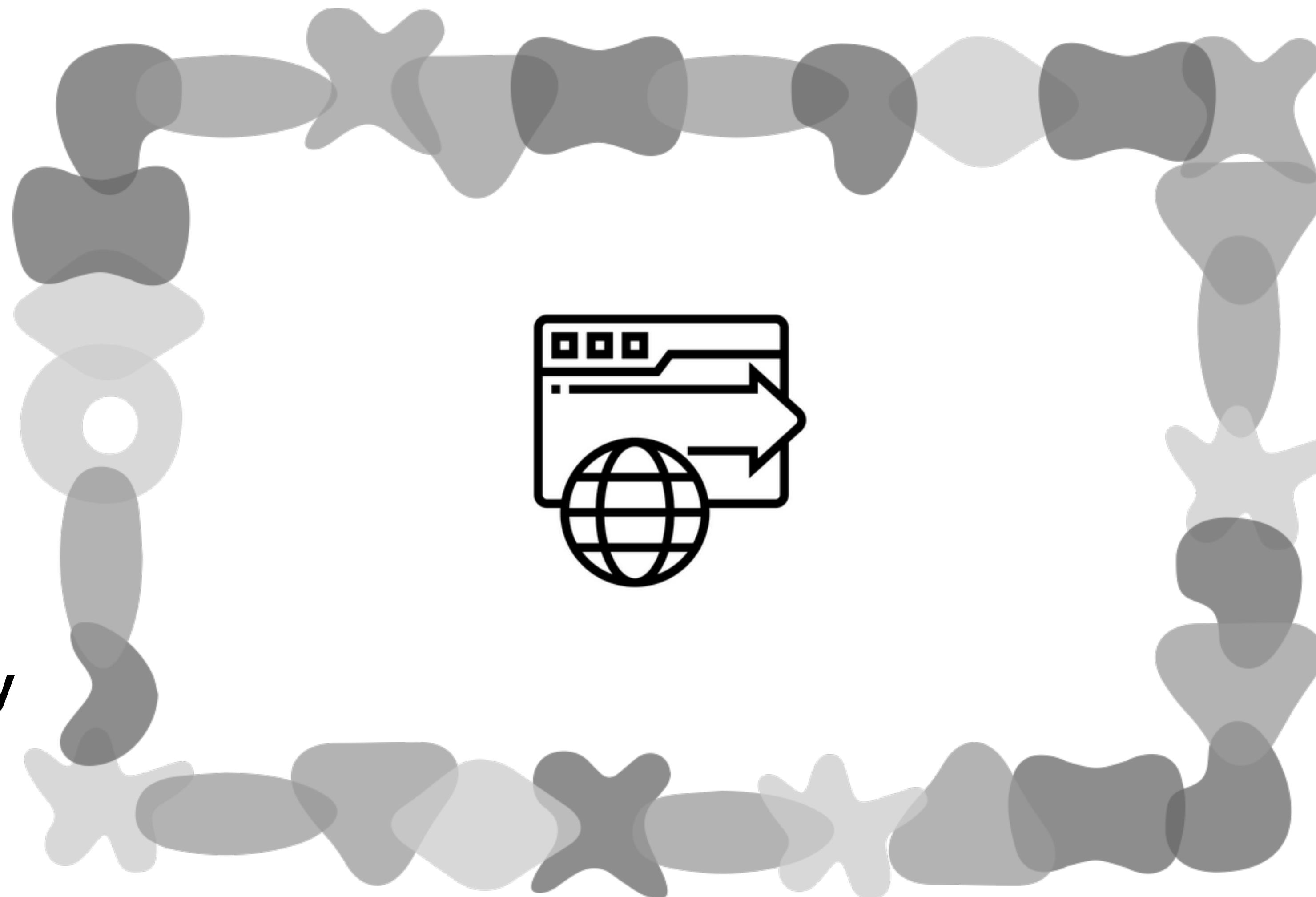
reliability

security

deployability

scalability

elasticity



performance

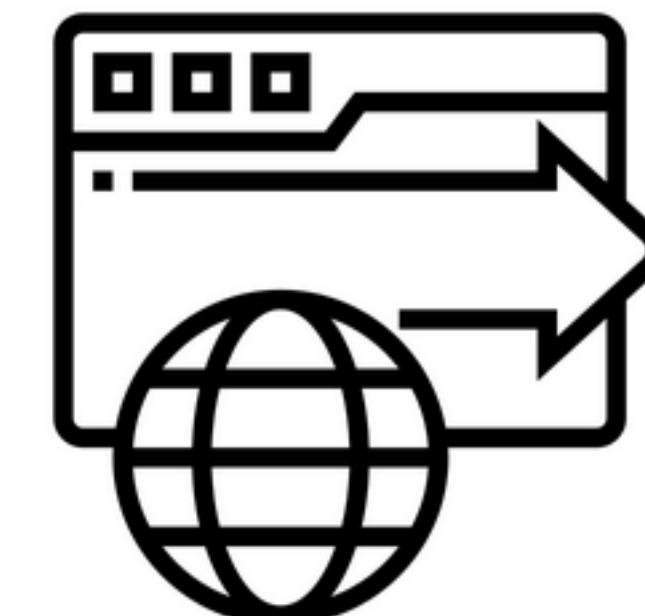
reliability

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Your Architectural Kata is...

Going Going Gone!

An auction company wants to take their auctions online to a nationwide scale--customers choose the auction to participate in, wait until the auction begins, then bid during the live auction as if they were there in the room, with the auctioneer.

- **Users:** scale up to hundreds of participants (per auction), potentially up to thousands of participants, and as many simultaneous auctions as possible
- **Requirements:**
 - bidders can see a live video stream of the auction and see all bids as they occur
 - auctions must be as real-time as possible
 - both online and live bids must be received in the order in which they are placed
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- **Additional Context:**
 - auction company is expanding aggressively by merging with smaller competitors
 - if nationwide auction is a success, replicate the model overseas
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availability reliability performance

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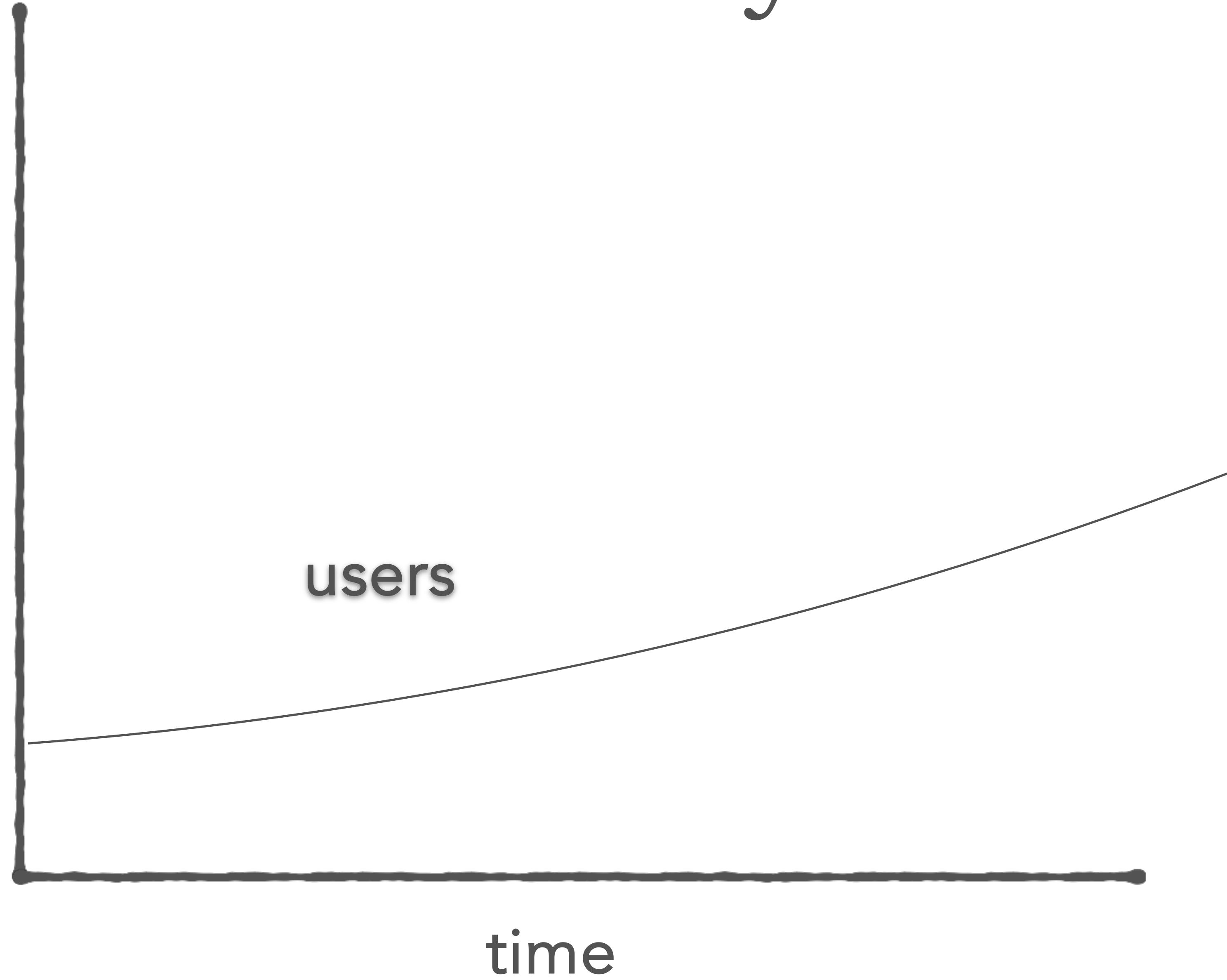
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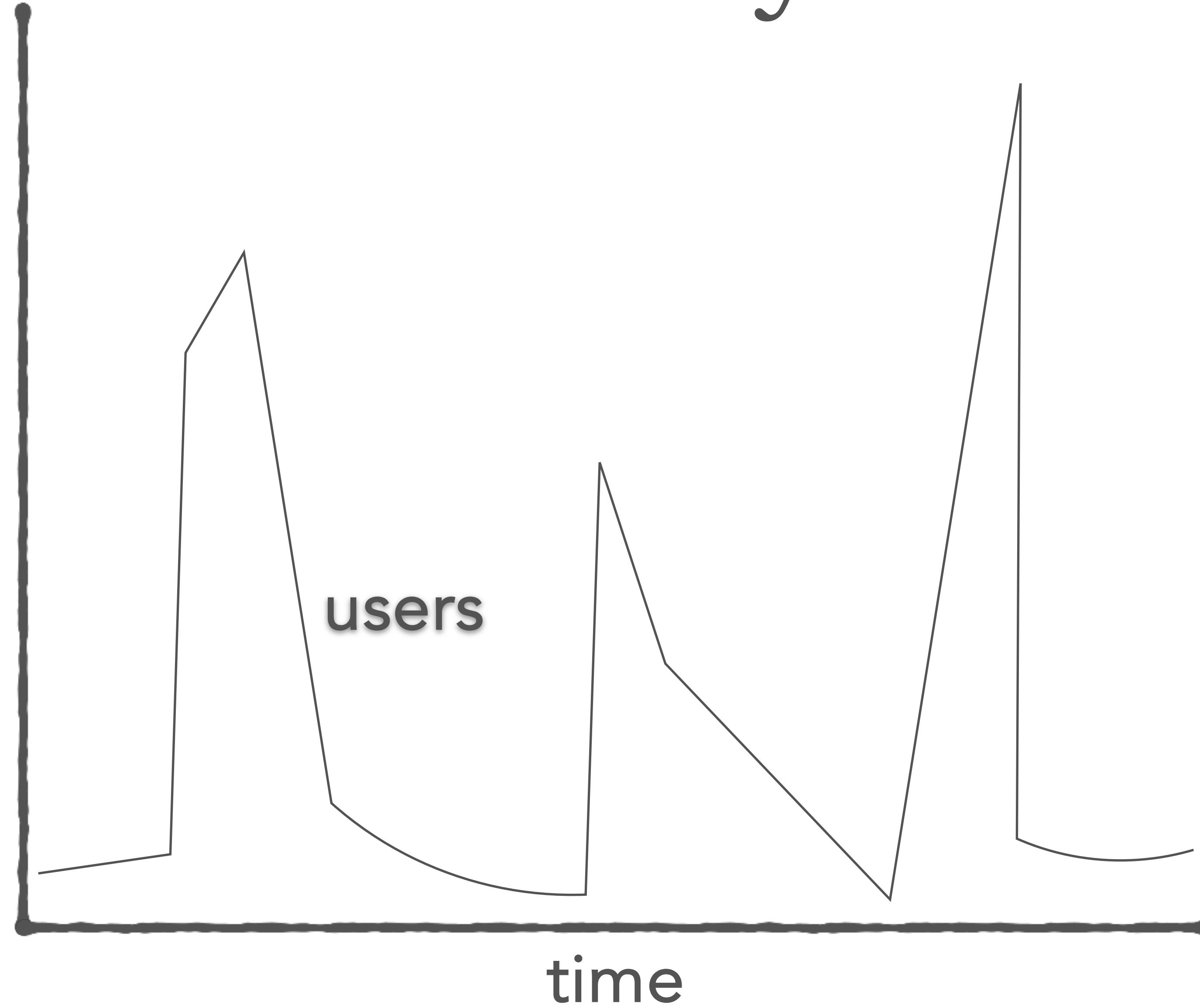
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availability reliability performance scalability elasticity

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concurrency

availability reliability performance scalability elasticity (security)

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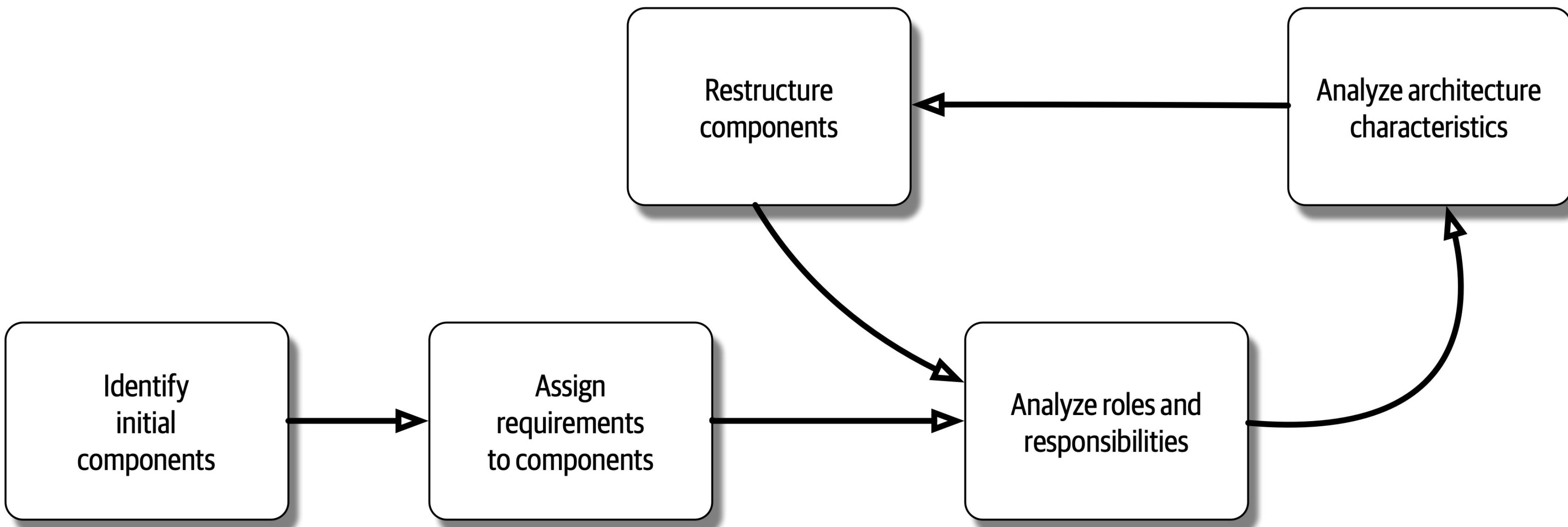
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concurrency

availability reliability performance scalability elasticity (security)

component identification



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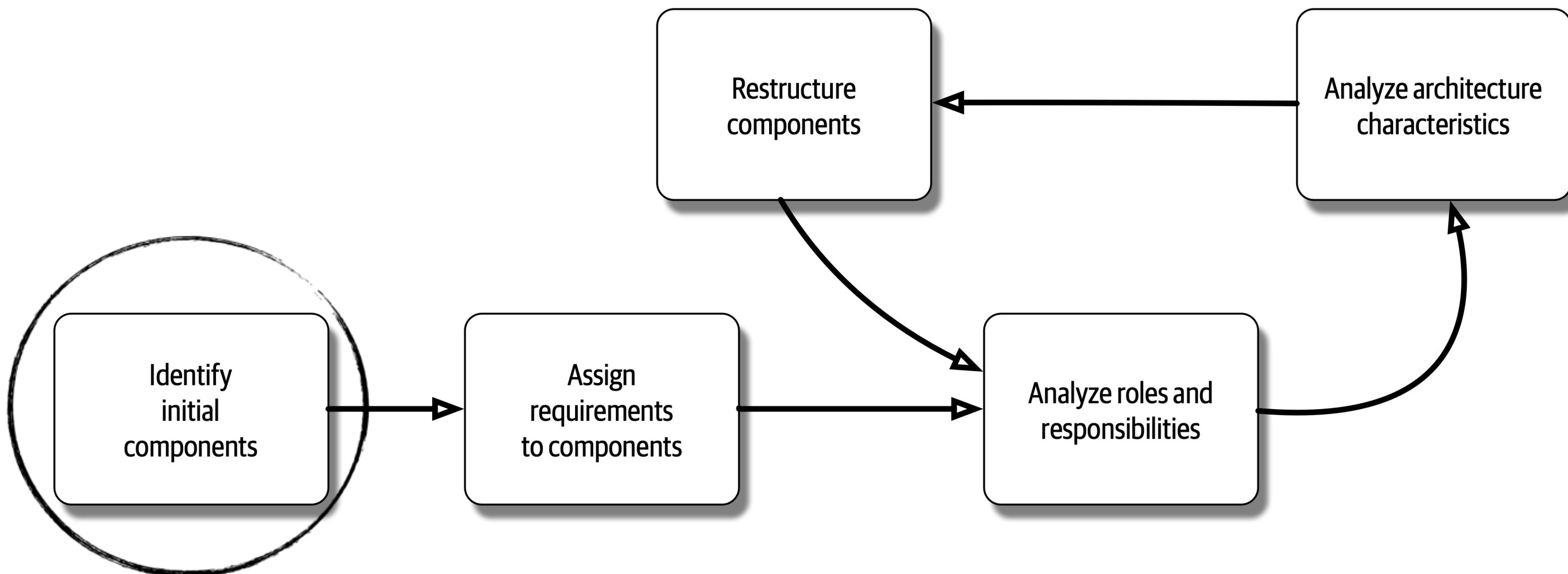
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Going Going Gone!



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Going Going Gone!

the “entity trap”

auctions

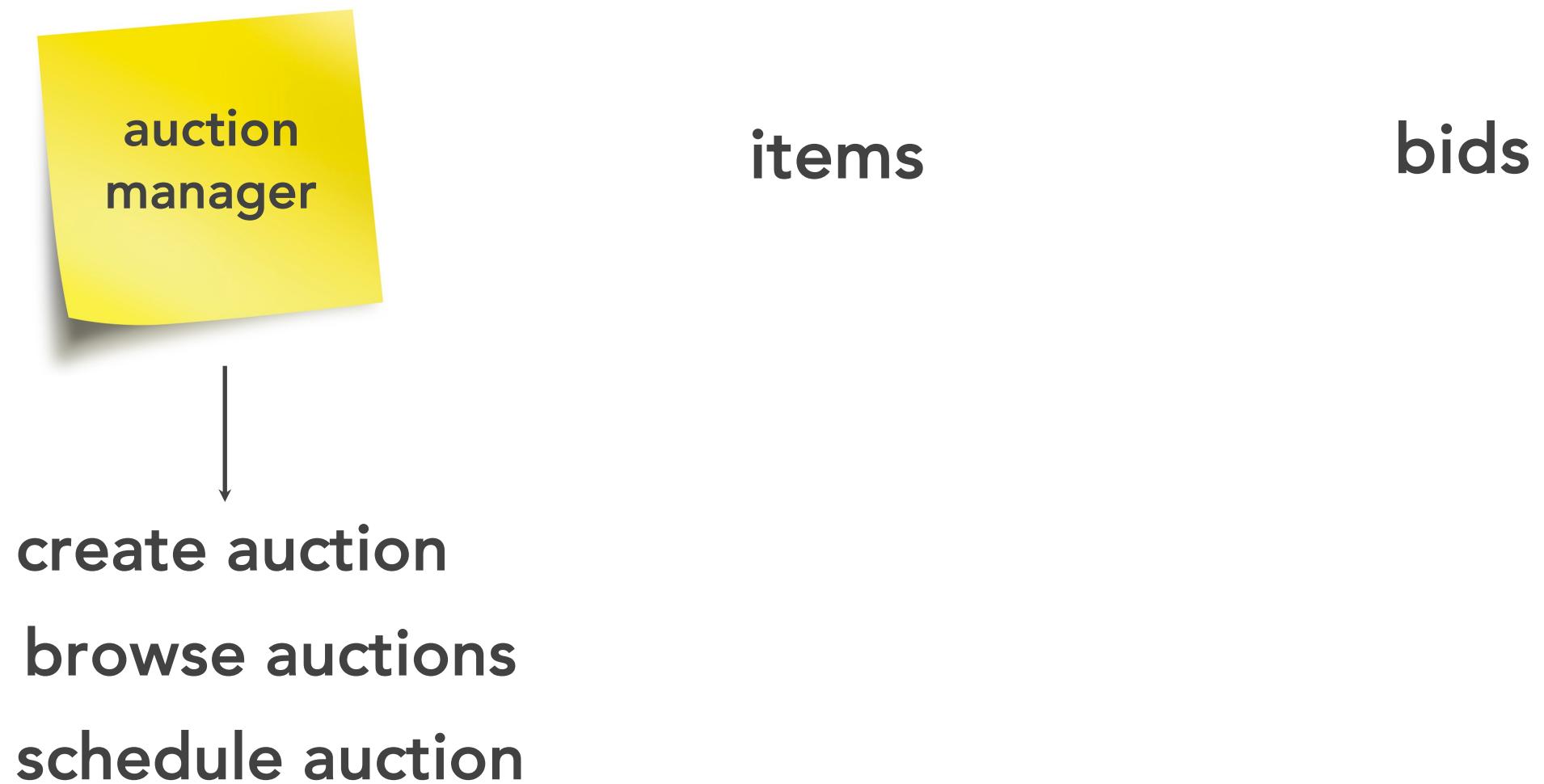
items

bids

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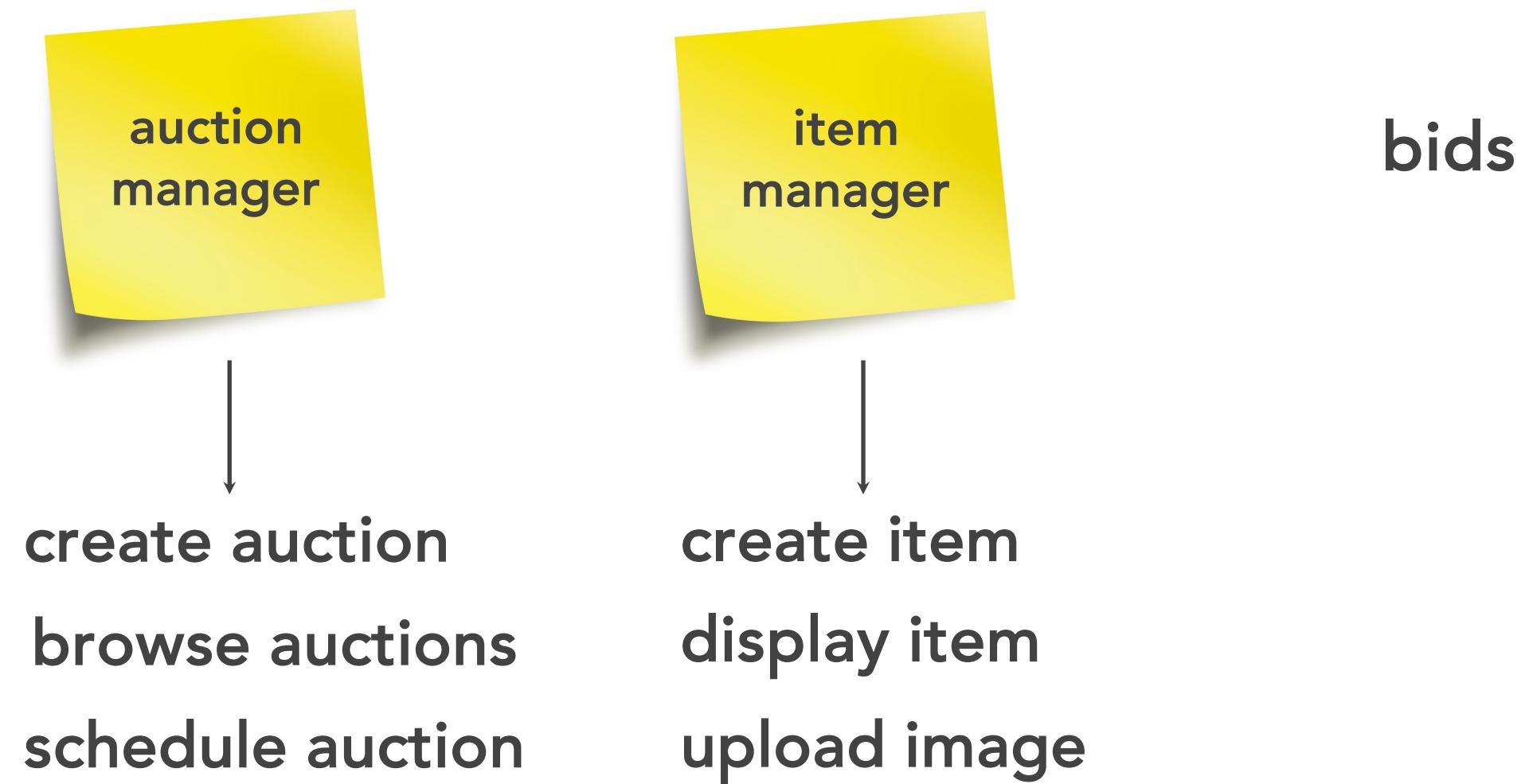
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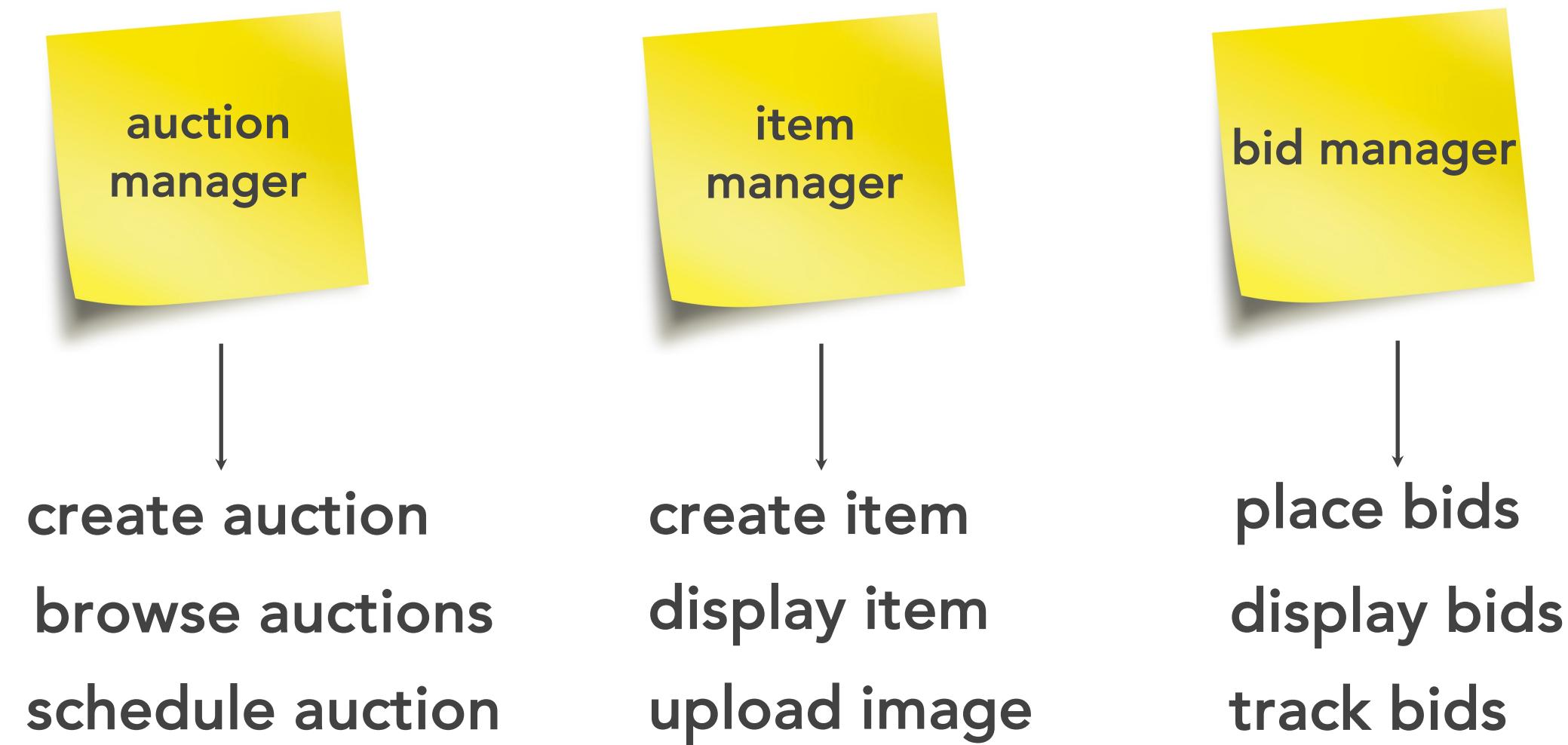
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the “entity trap”



Your Architectural Kata is...

Going Going Gone!

workflow approach

create auction —> find auction —> sign up —> watch auction —> place bid

Your Architectural Kata is...

Going Going Gone!

workflow approach

create auction —→ find auction —→ sign up —→ watch auction —→ place bid



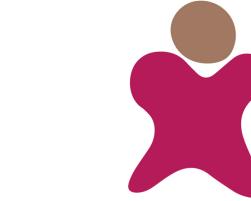
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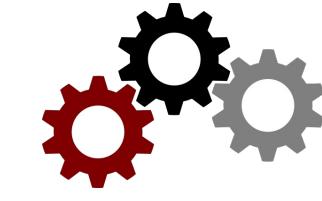
actor/action approach



bidder



auctioneer



system

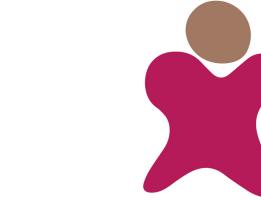
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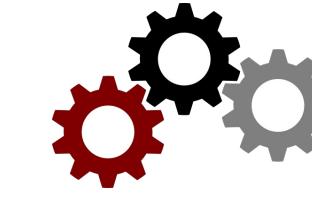
actor/action approach



bidder



auctioneer



system



view live video stream

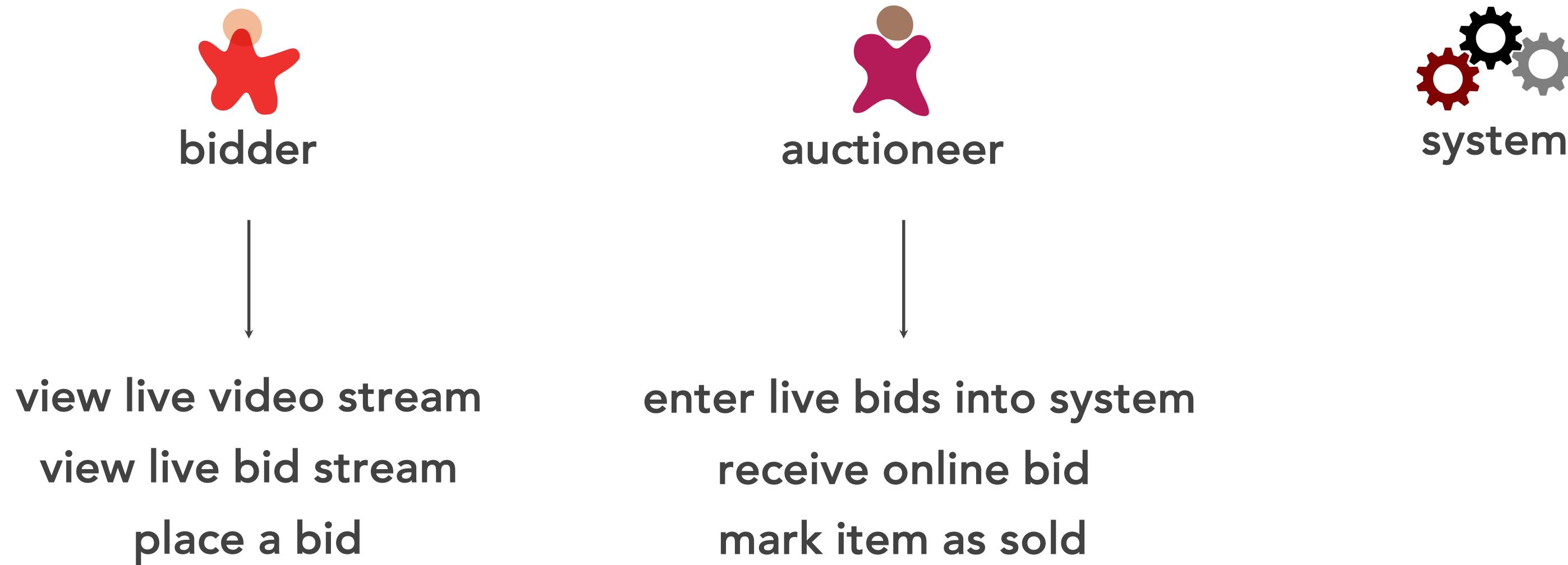
view live bid stream

place a bid

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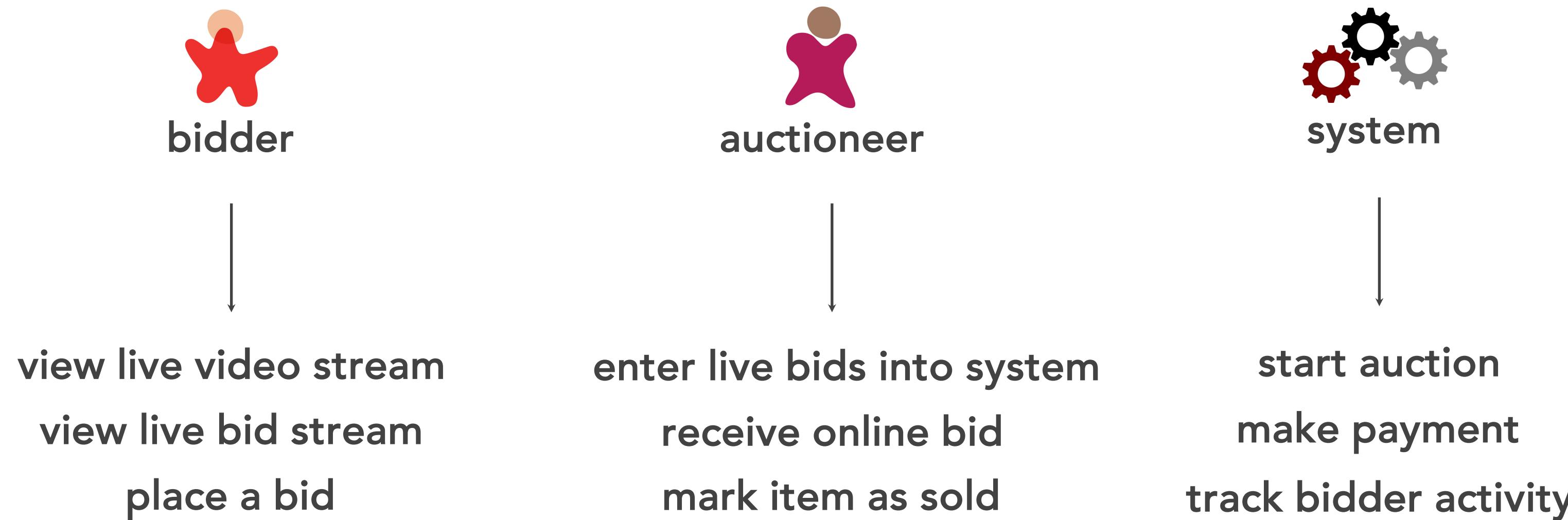
actor/action approach



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actor/action approach



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bidder

- view live video stream
- view live bid stream
- place a bid



auctioneer

- receive online bid
- enter live bids into system
- mark item as sold



system

- start auction
- make payment
- track bidder activity

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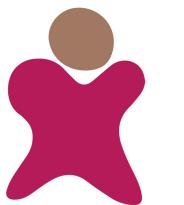
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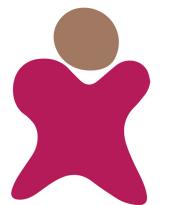
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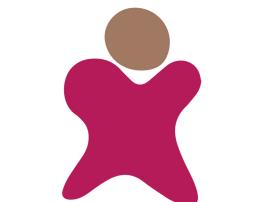
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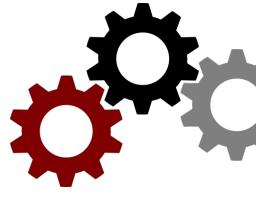
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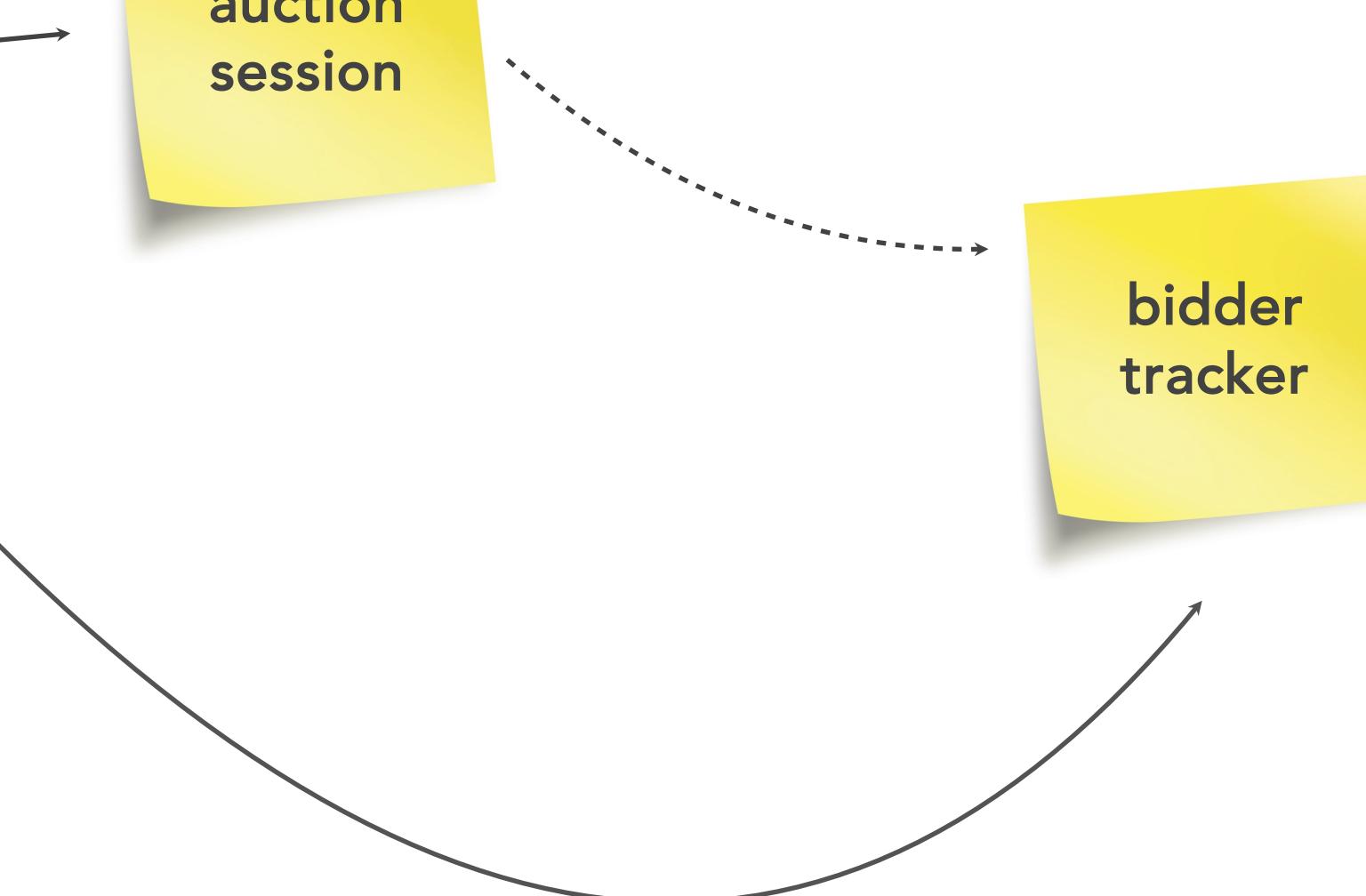
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- enter live bids into system
- mark item as sold



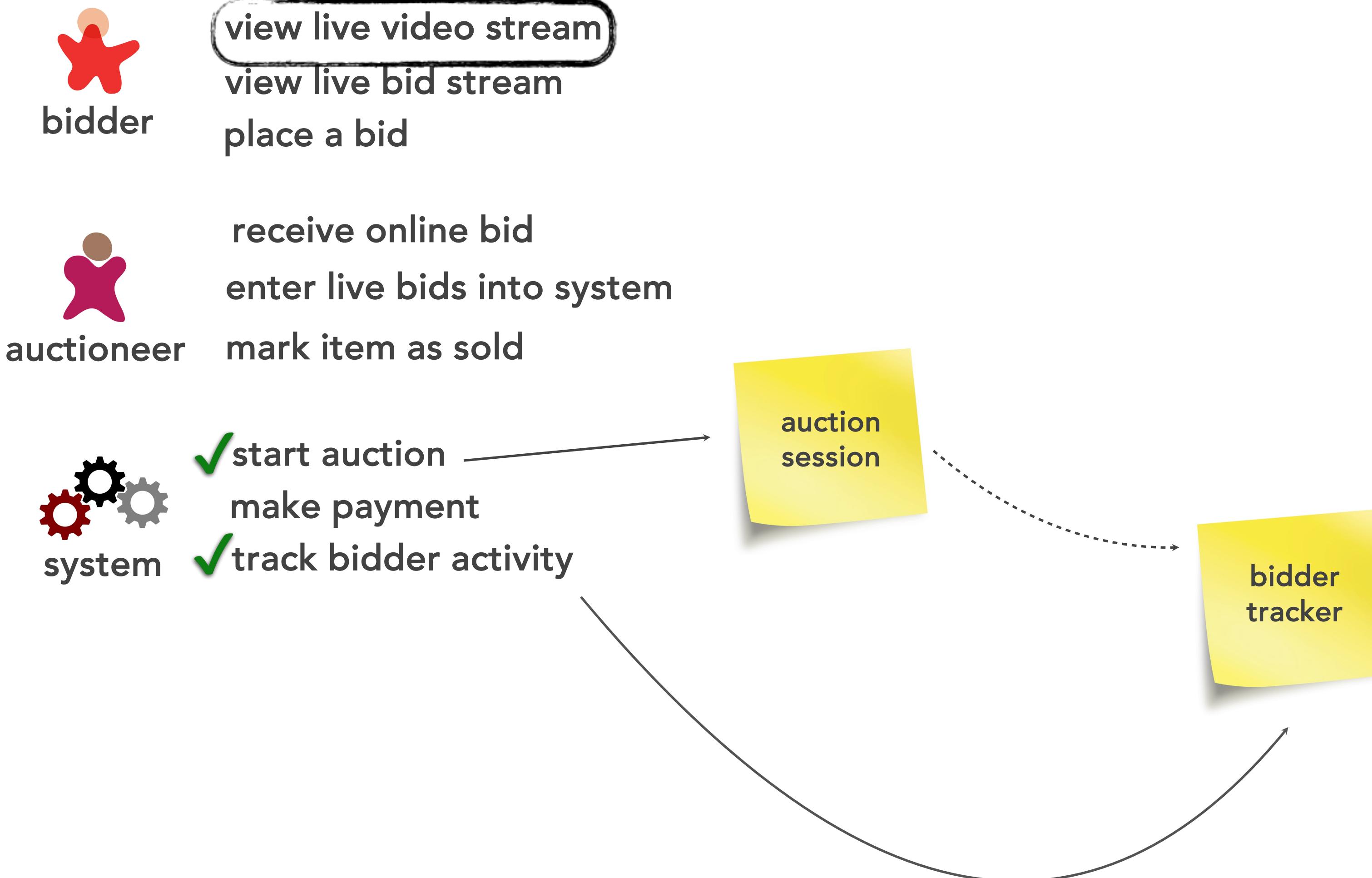
system

- ✓ start auction
- make payment
- track bidder activity**



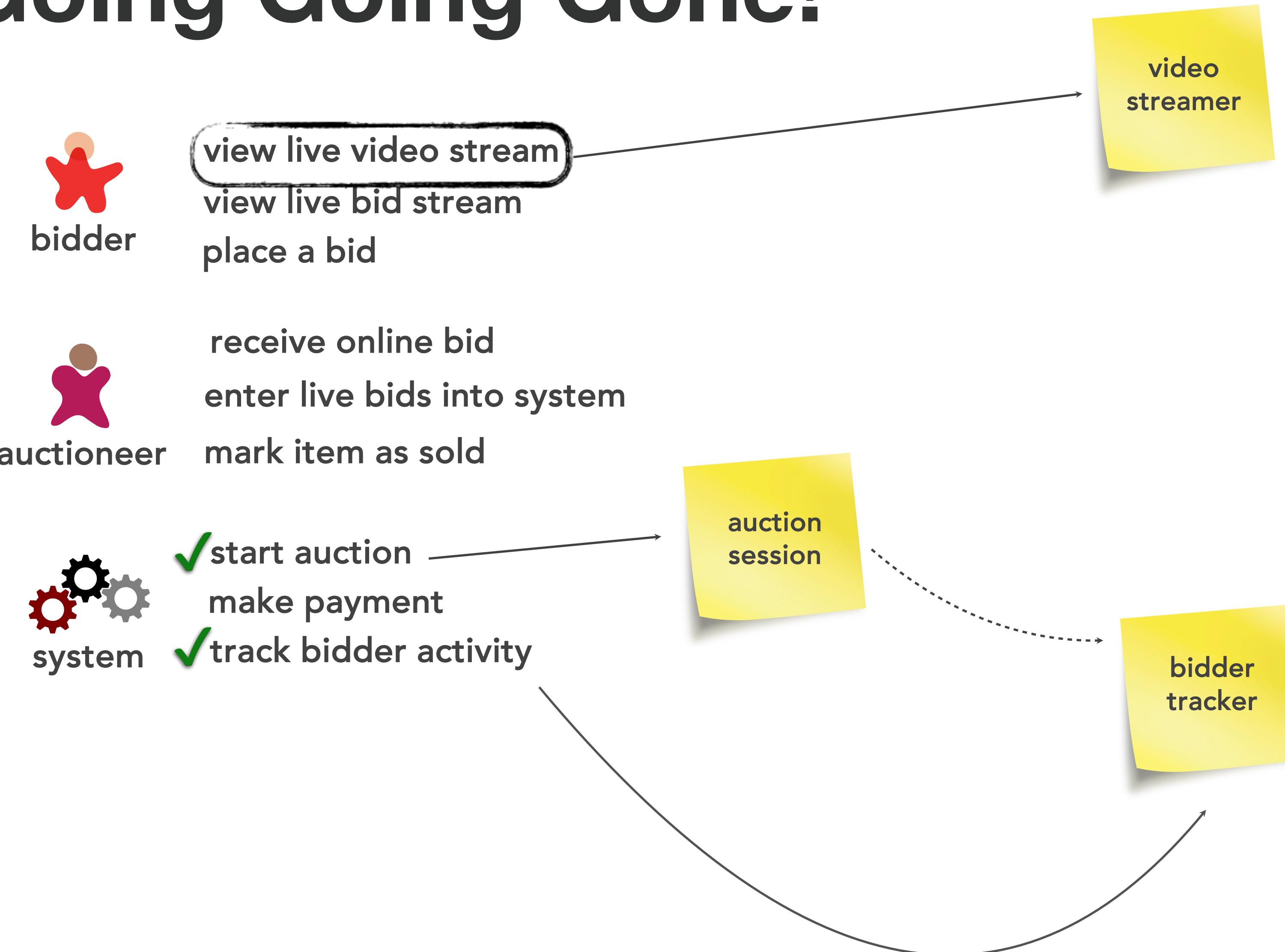
Your Architectural Kata is...

Going Going Gone!



Your Architectural Kata is...

Going Going Gone!



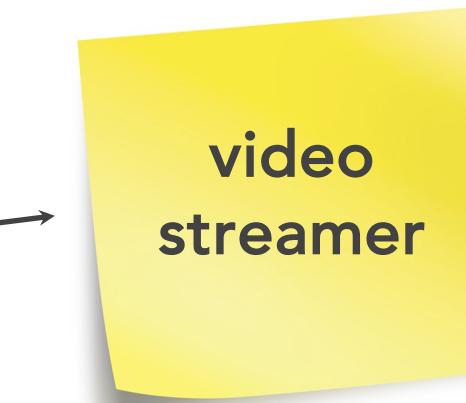
Your Architectural Kata is...

Going Going Gone!

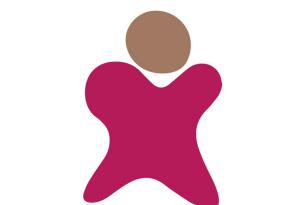


bidder

- ✓ view live video stream
- view live bid stream**
- place a bid

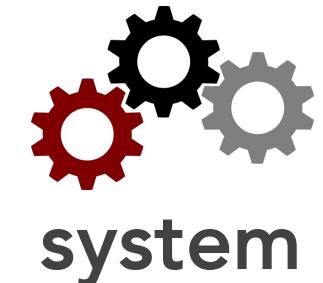


video
streamer



auctioneer

- receive online bid
- enter live bids into system
- mark item as sold



system

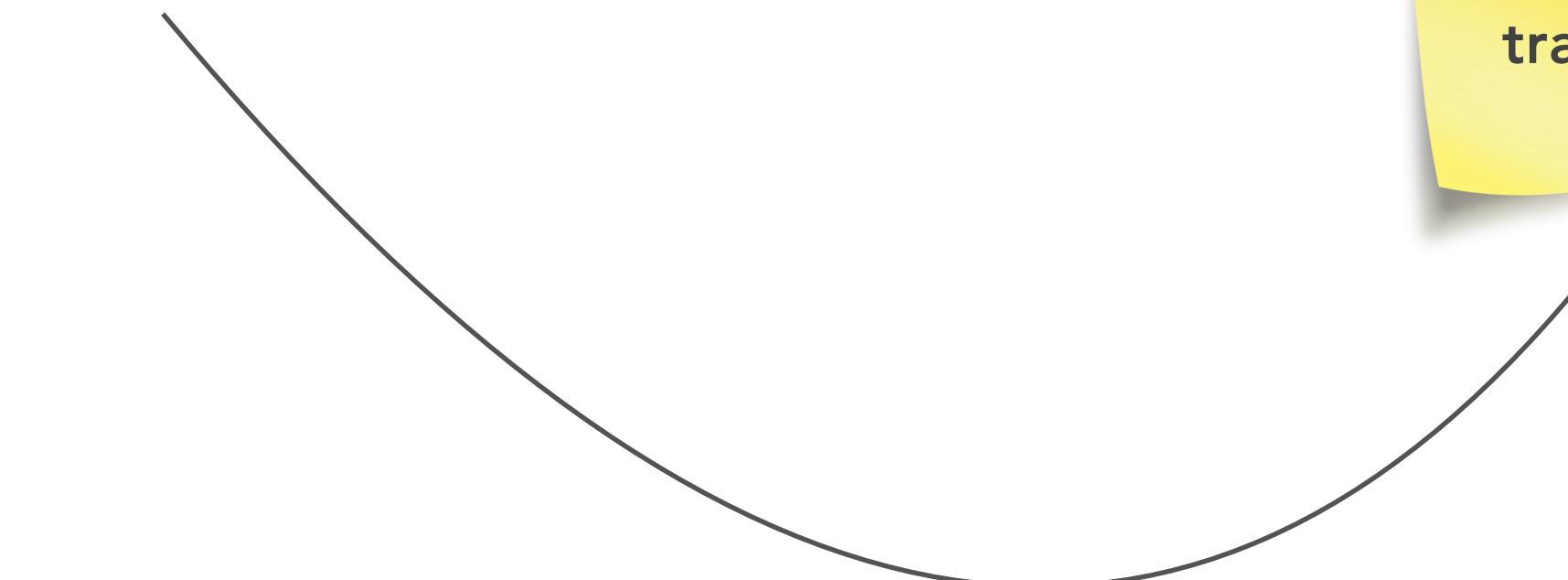
- ✓ start auction
- make payment
- ✓ track bidder activity



auction
session

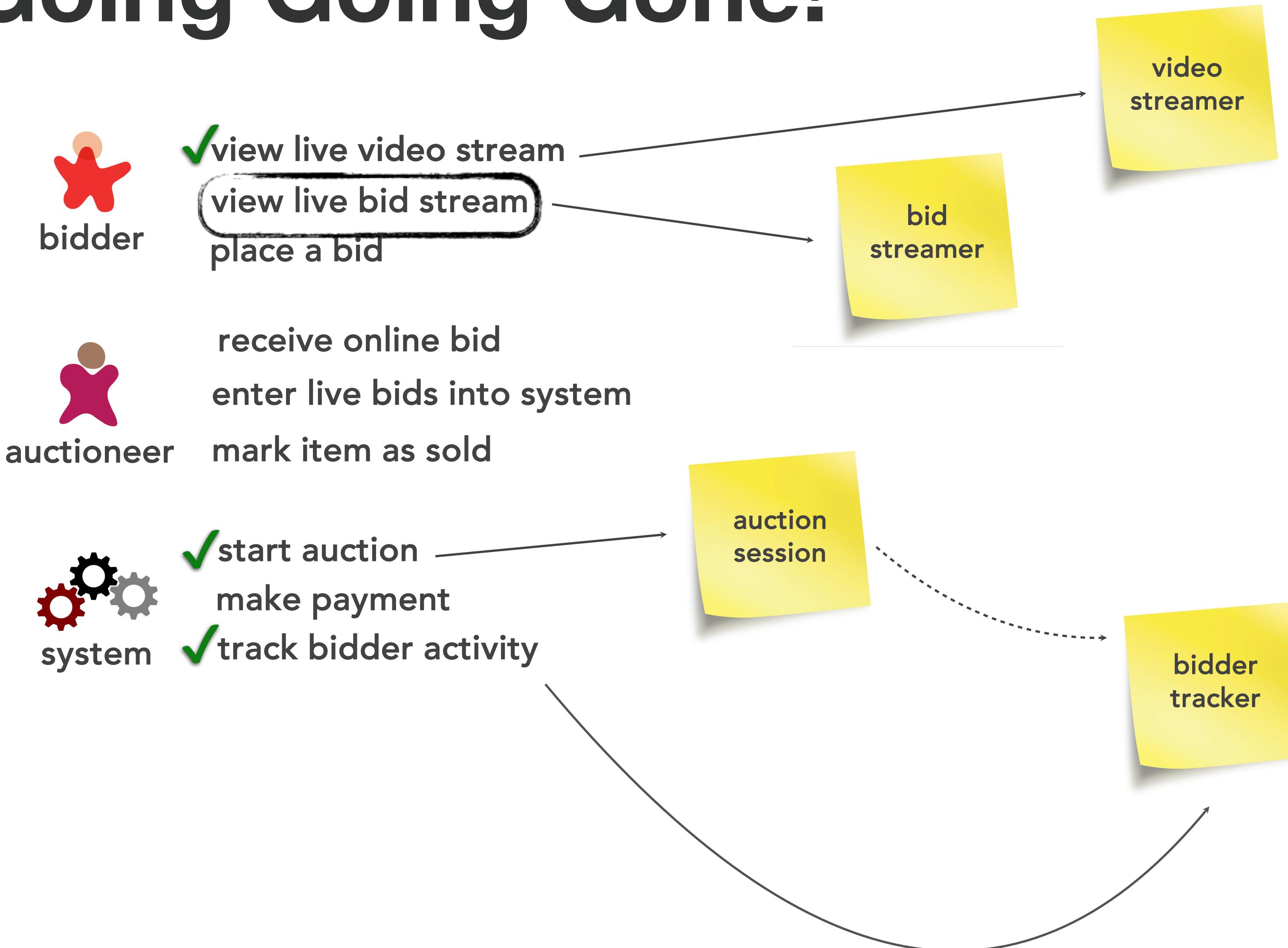


bidder
tracker



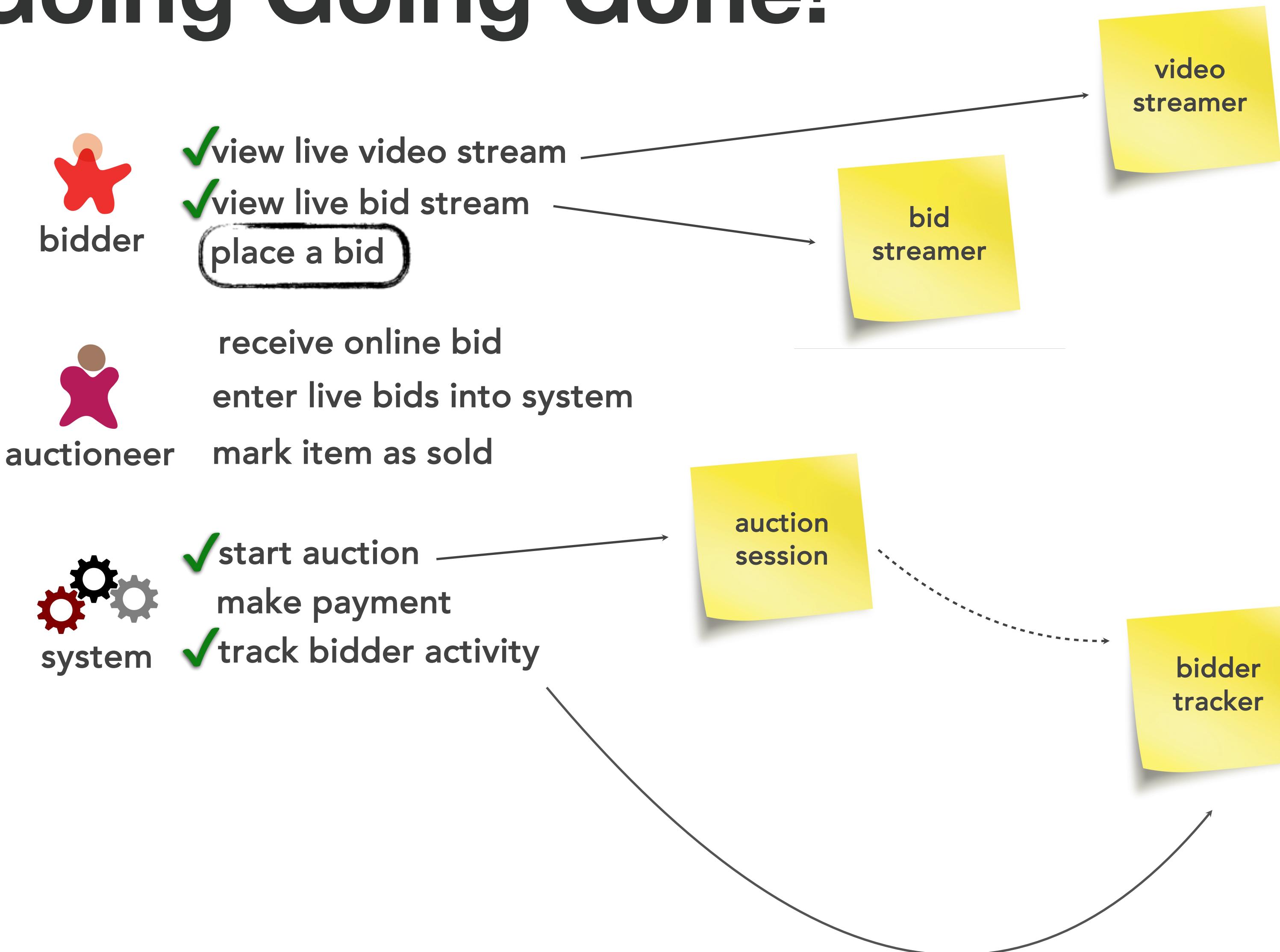
Your Architectural Kata is...

Going Going Gone!



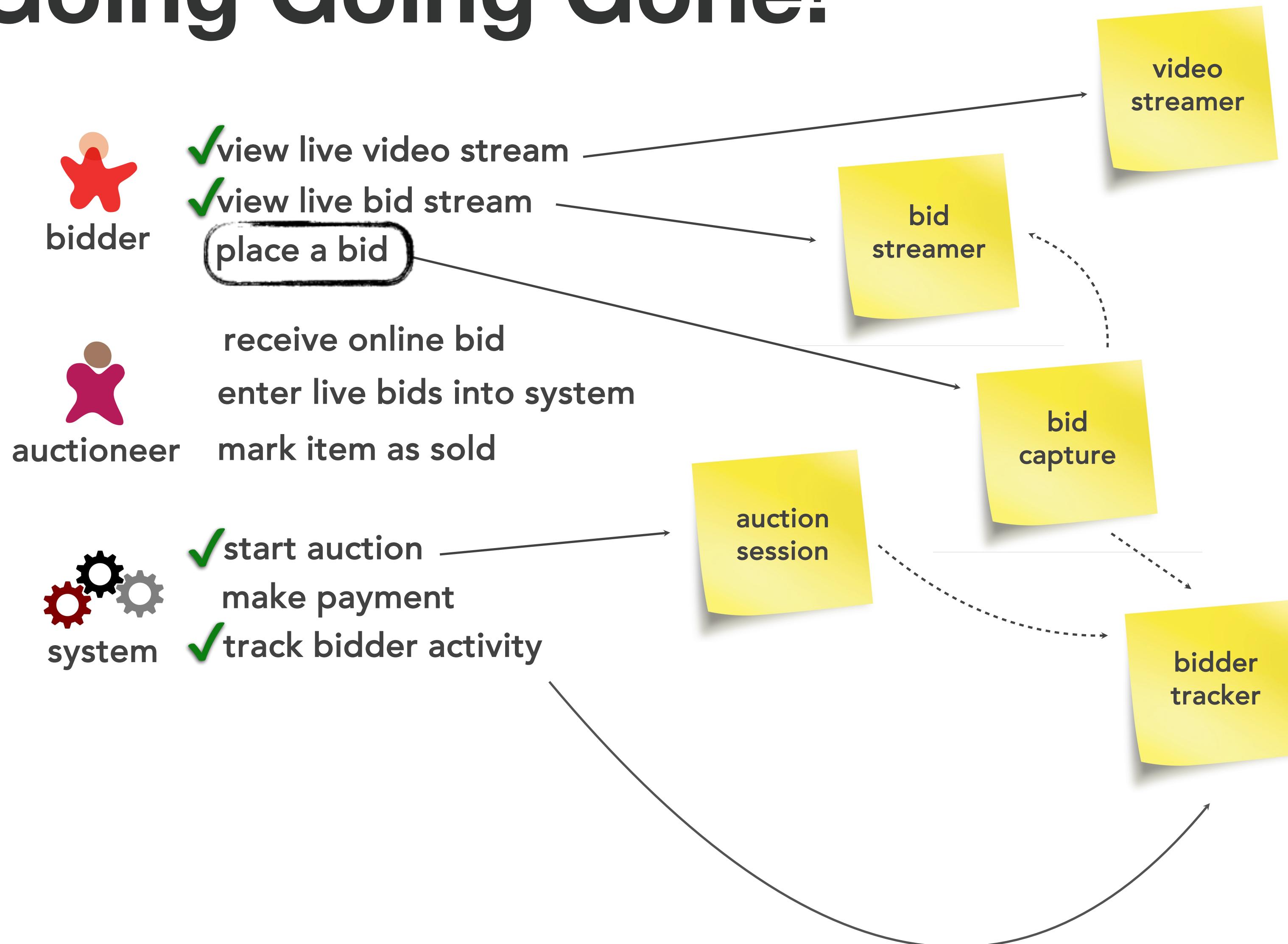
Your Architectural Kata is...

Going Going Gone!



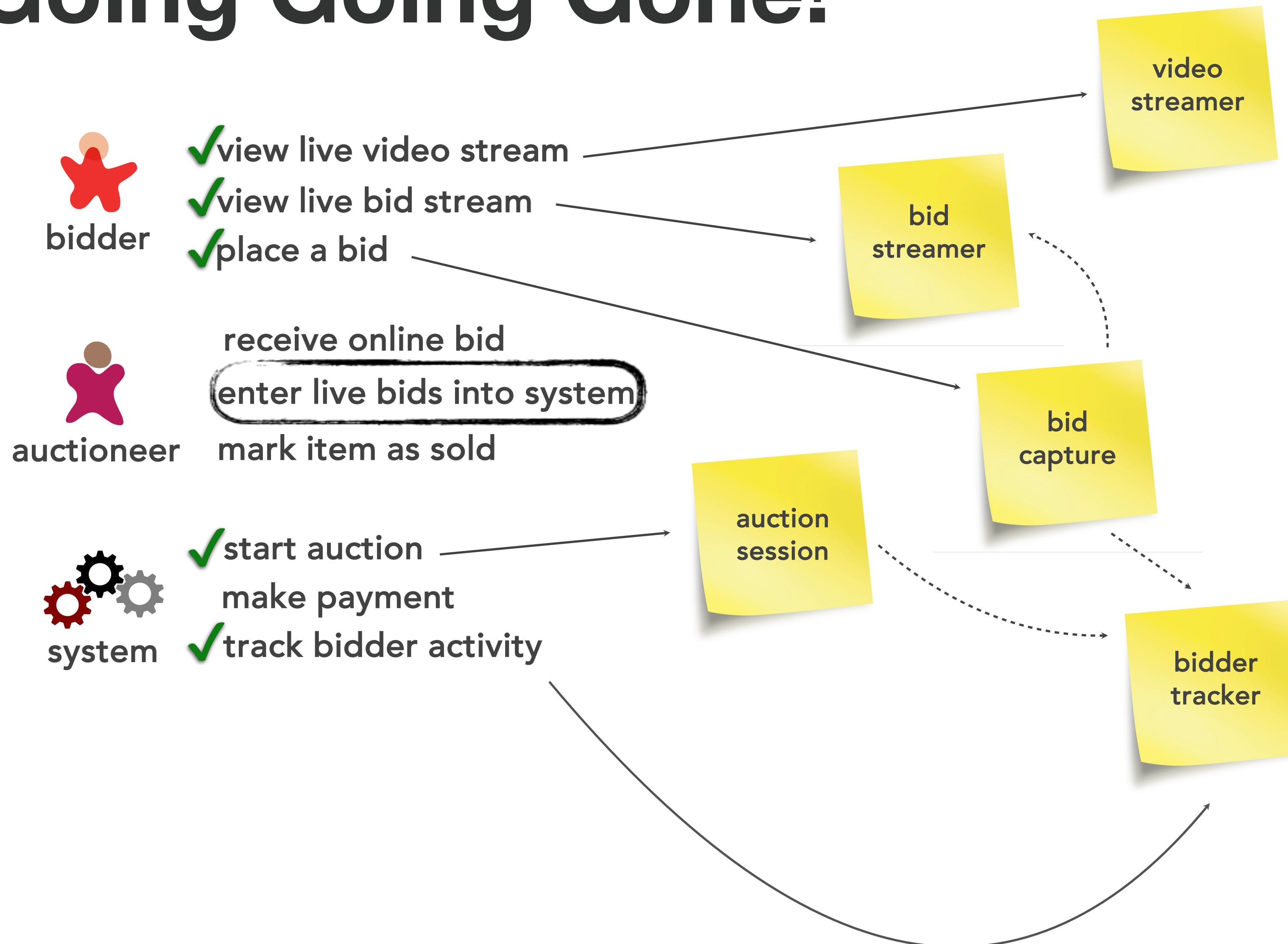
Your Architectural Kata is...

Going Going Gone!



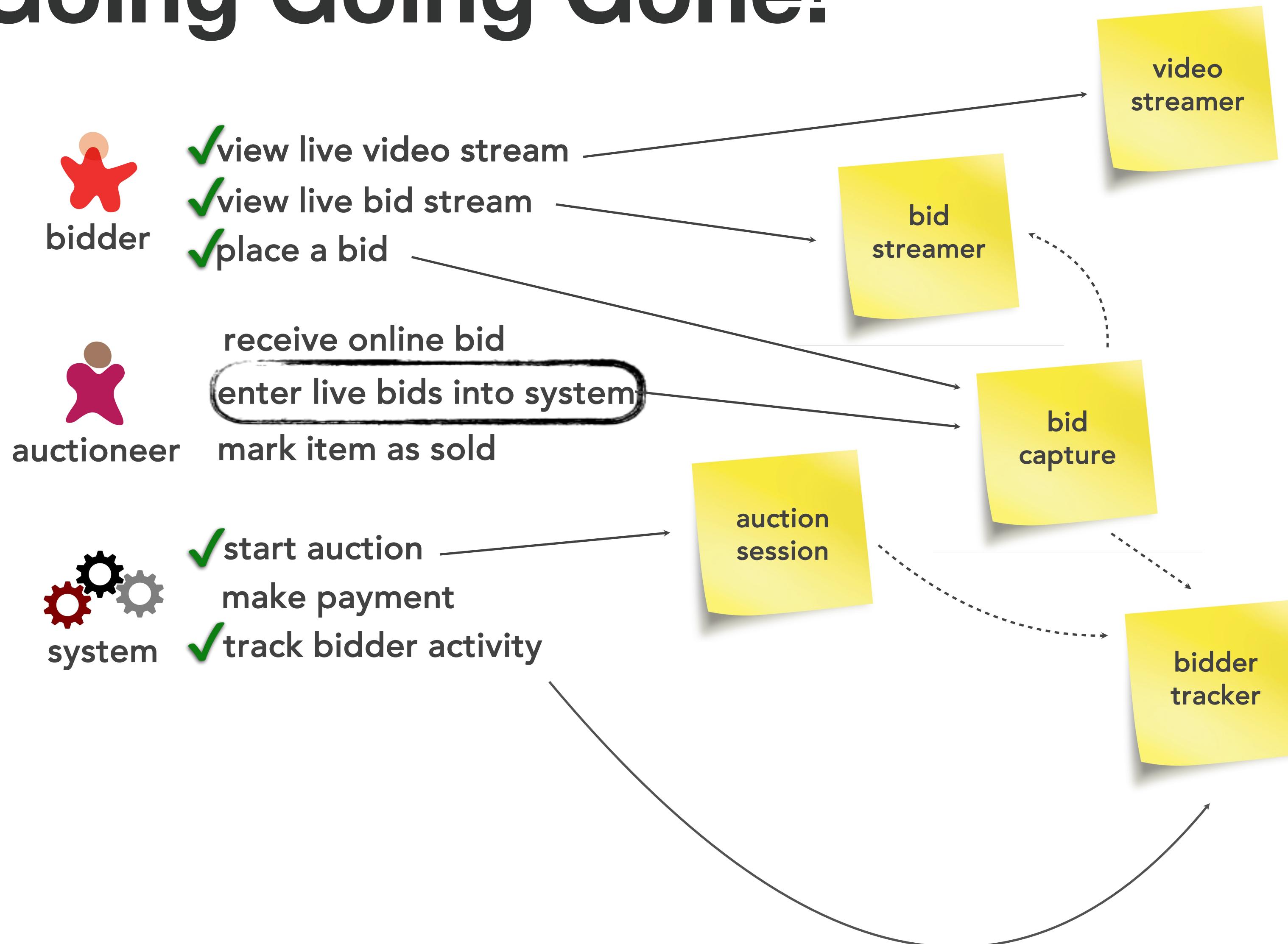
Your Architectural Kata is...

Going Going Gone!



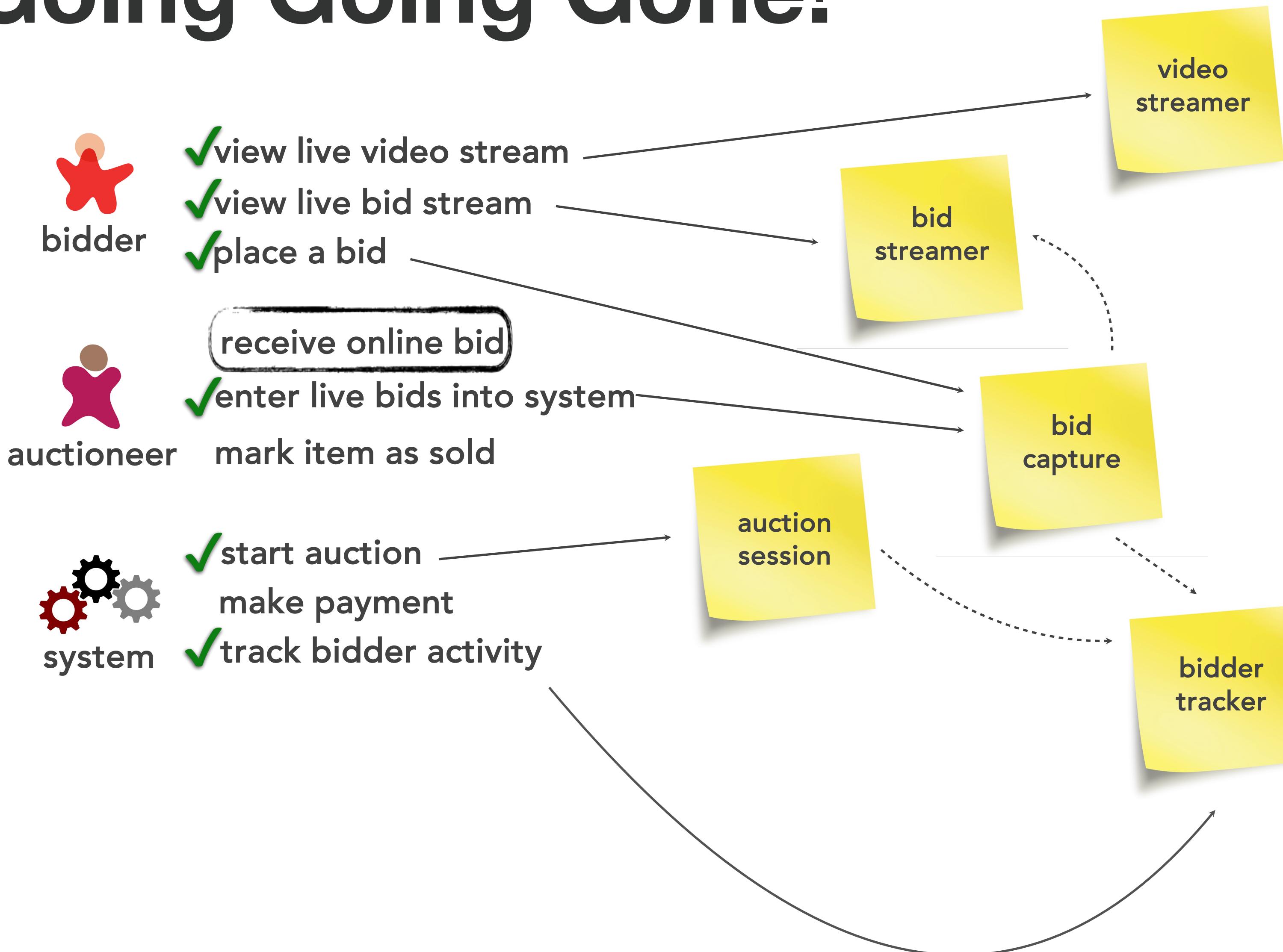
Your Architectural Kata is...

Going Going Gone!



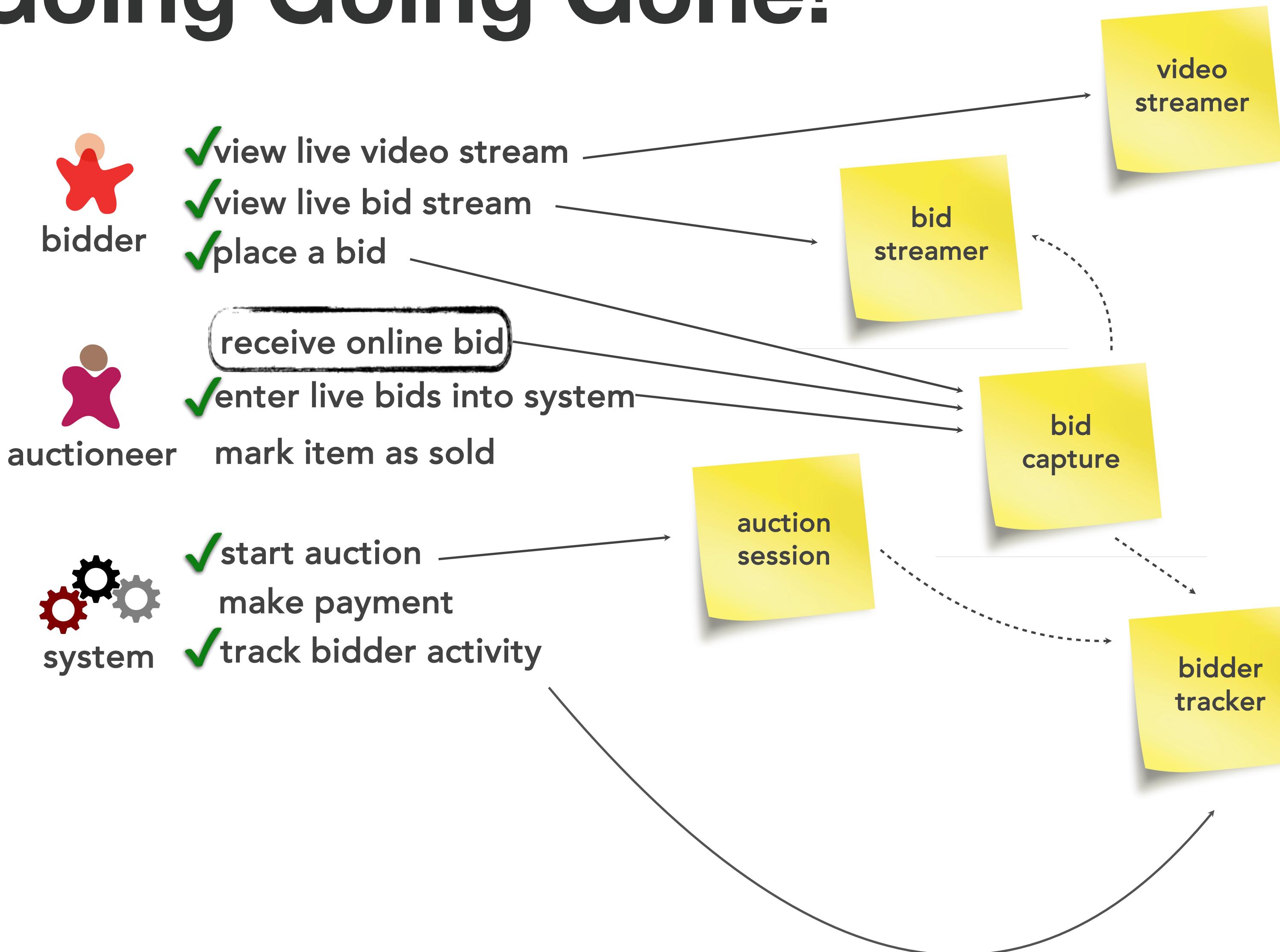
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Going Going Gone!



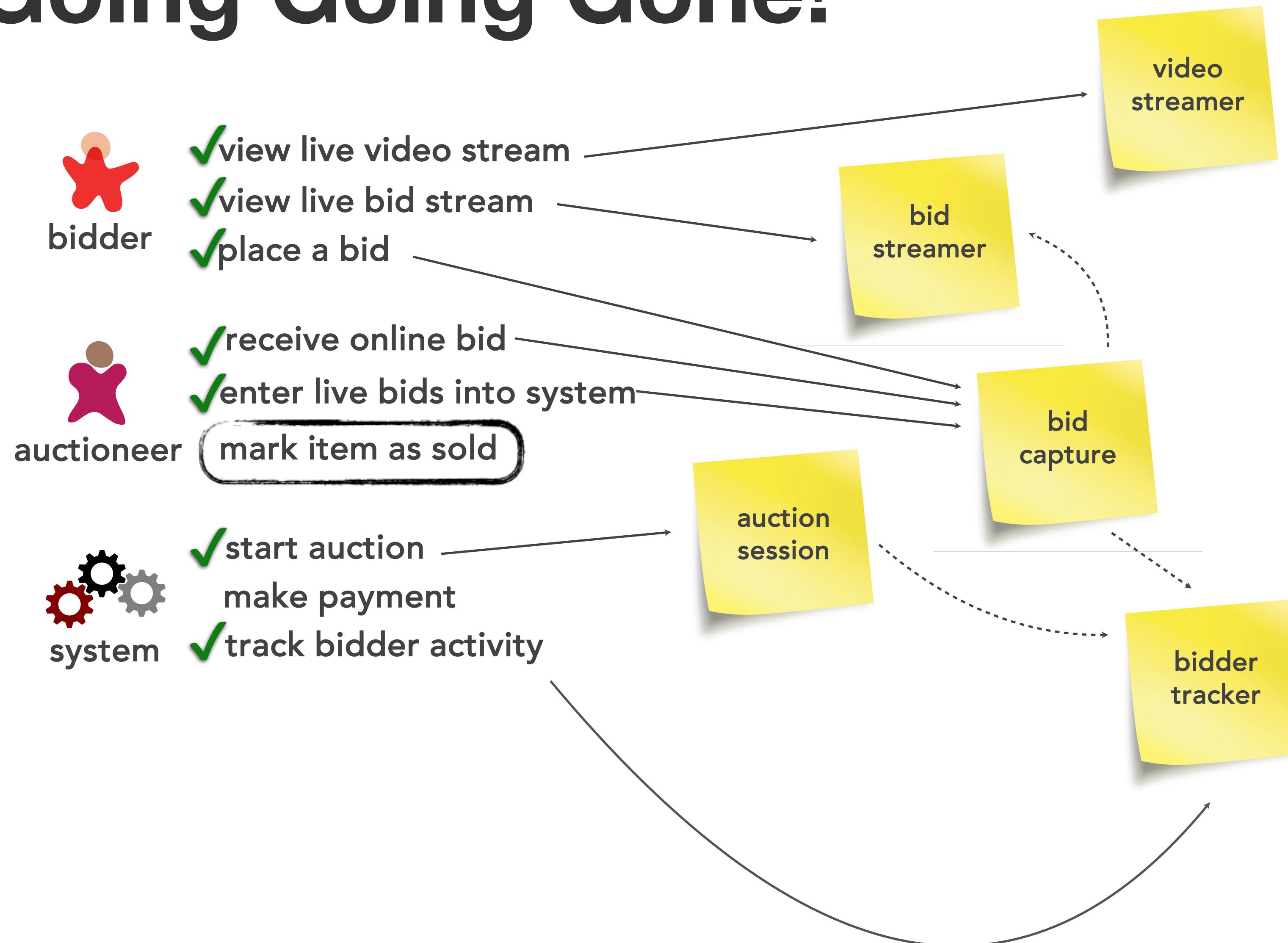
Your Architectural Kata is...

Going Going Gone!



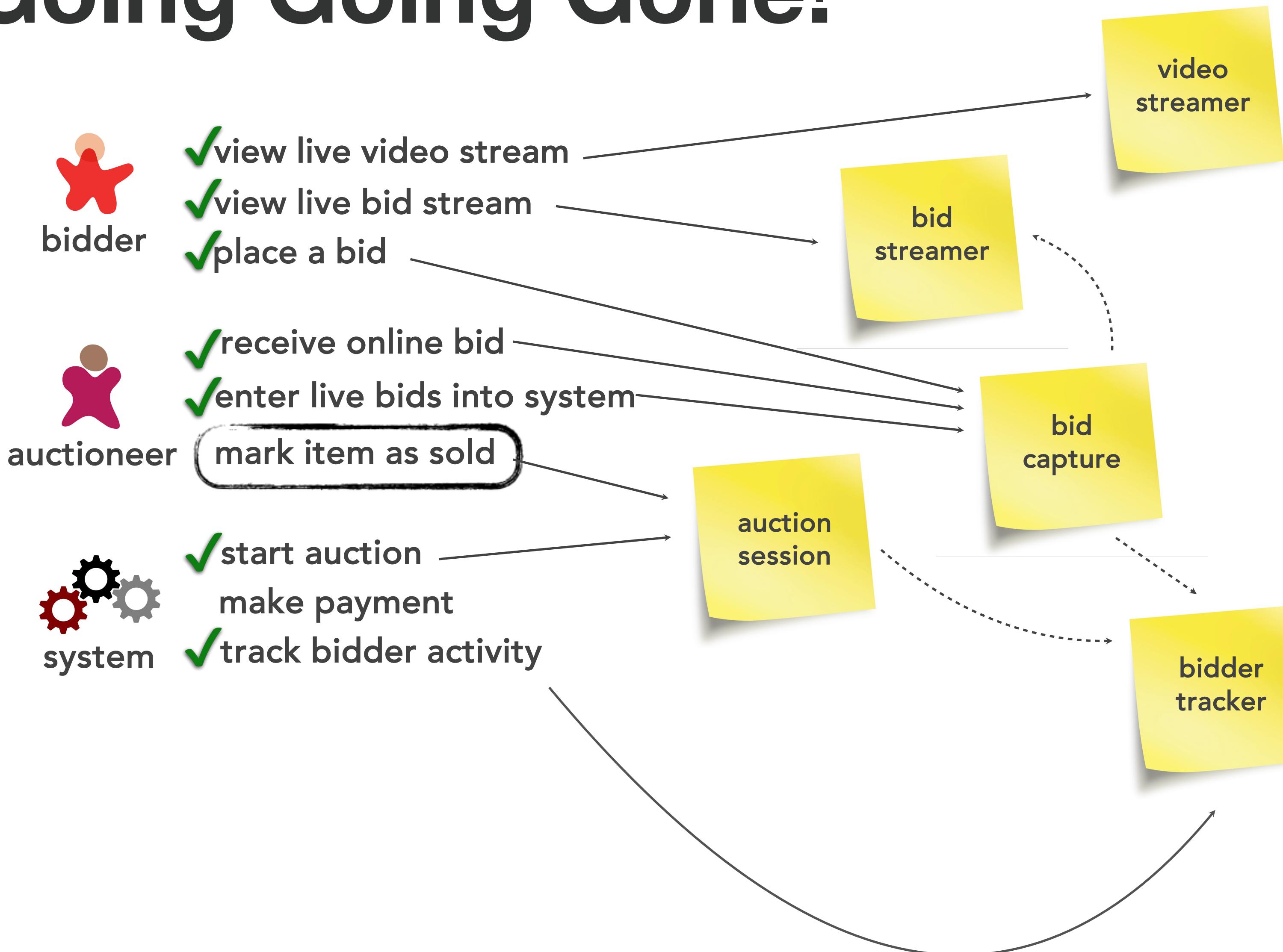
Your Architectural Kata is...

Going Going Gone!



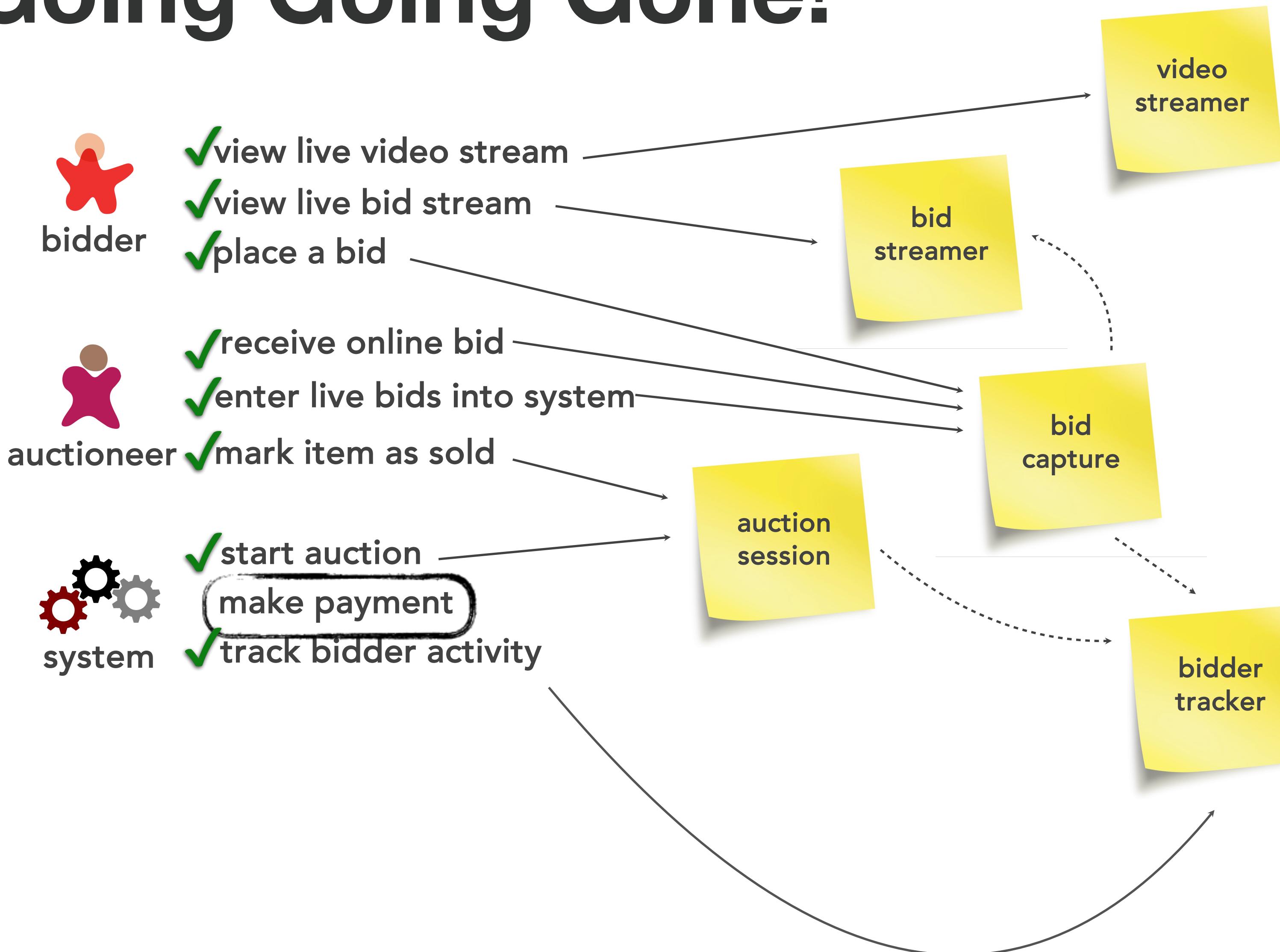
Your Architectural Kata is...

Going Going Gone!



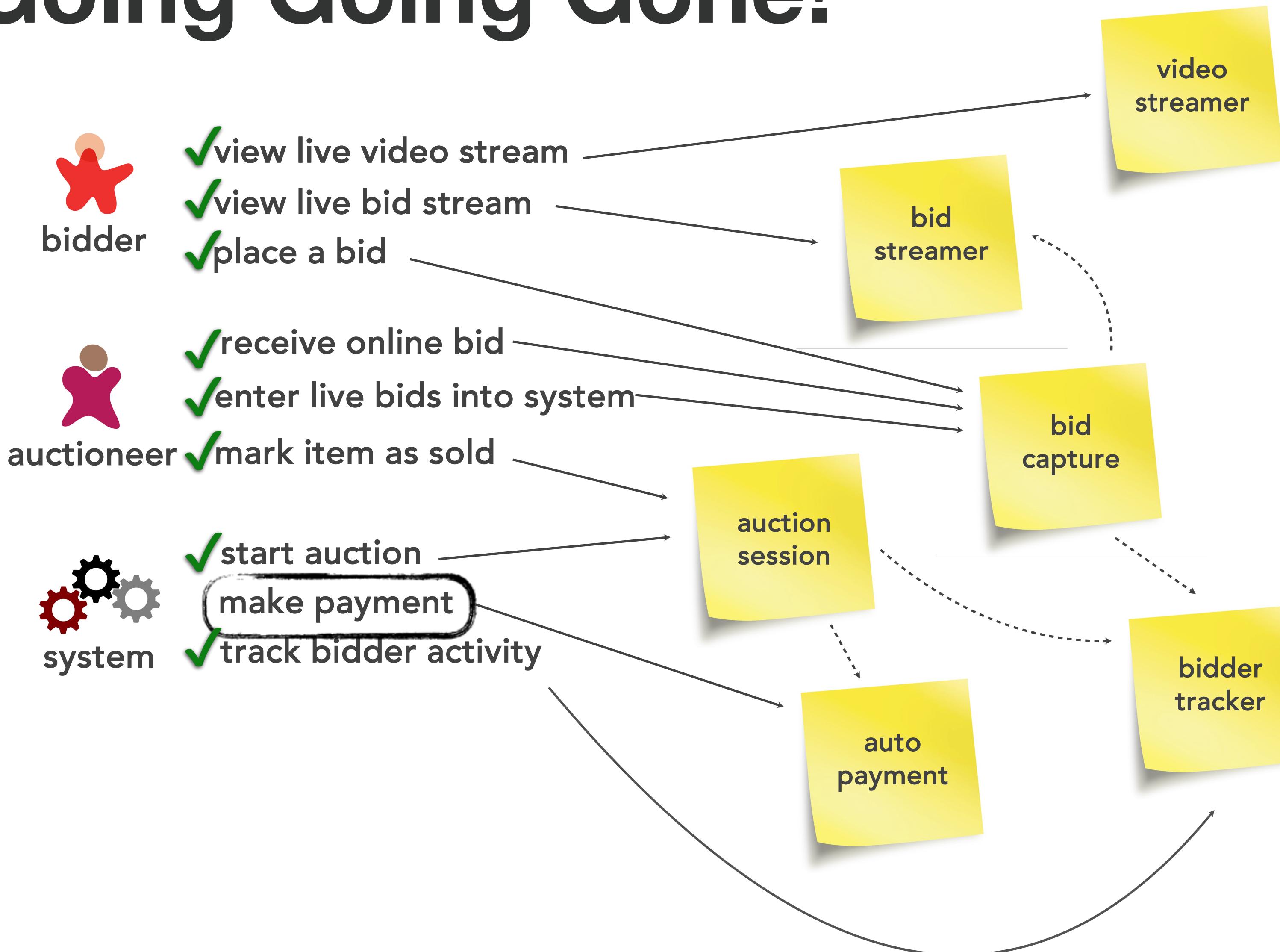
Your Architectural Kata is...

Going Going Gone!



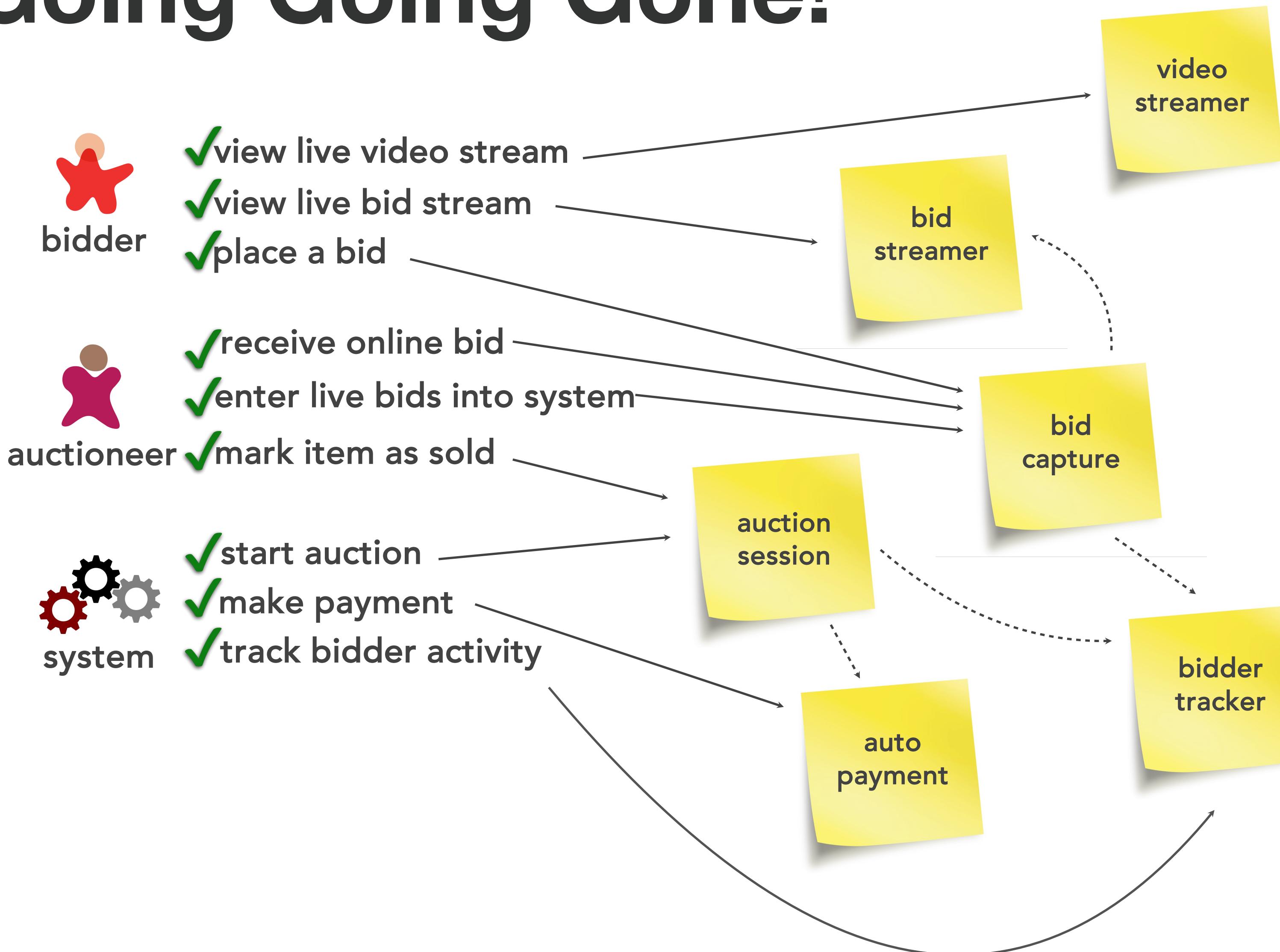
Your Architectural Kata is...

Going Going Gone!



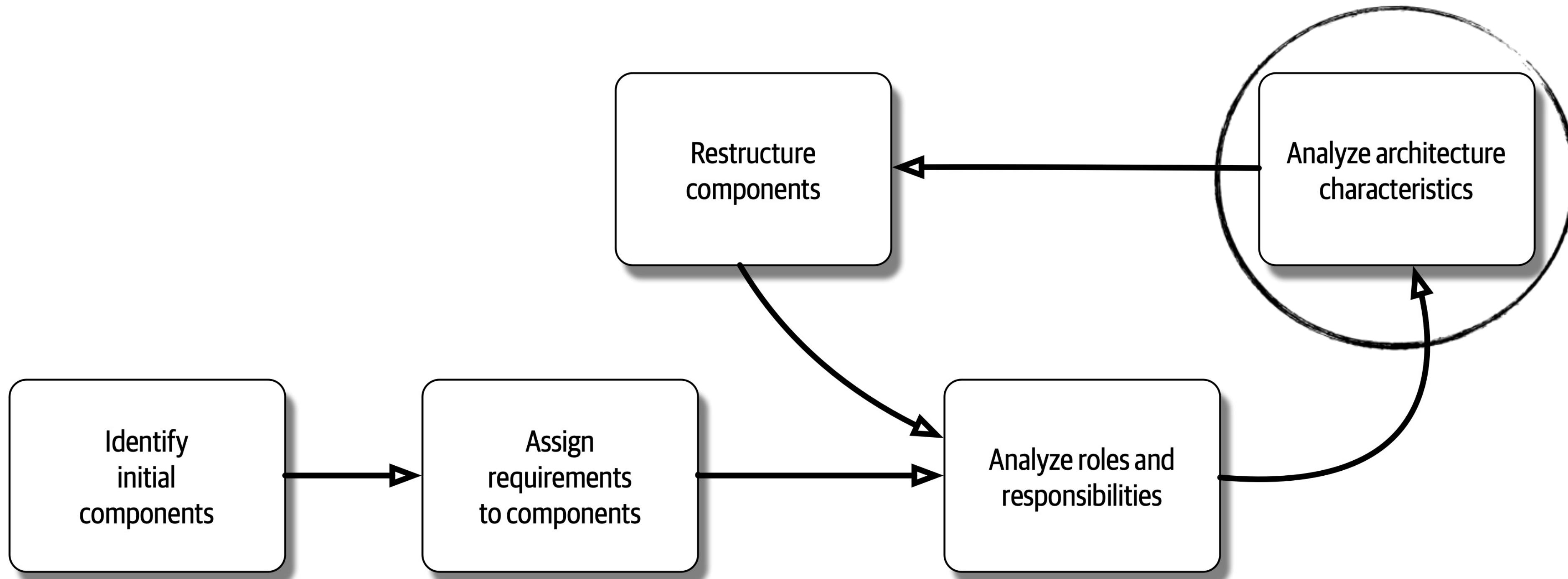
Your Architectural Kata is...

Going Going Gone!



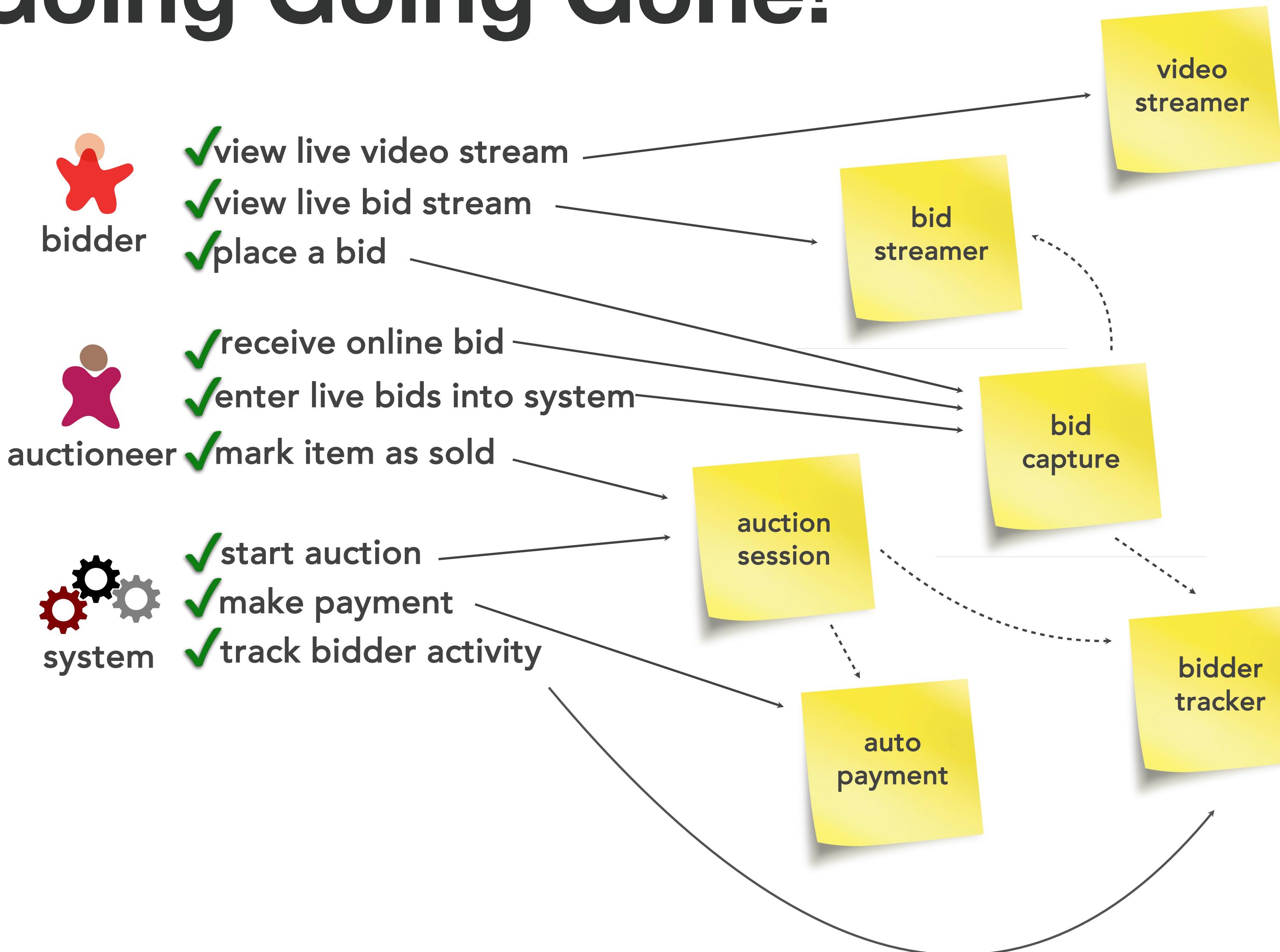
Your Architectural Kata is...

Going Going Gone!



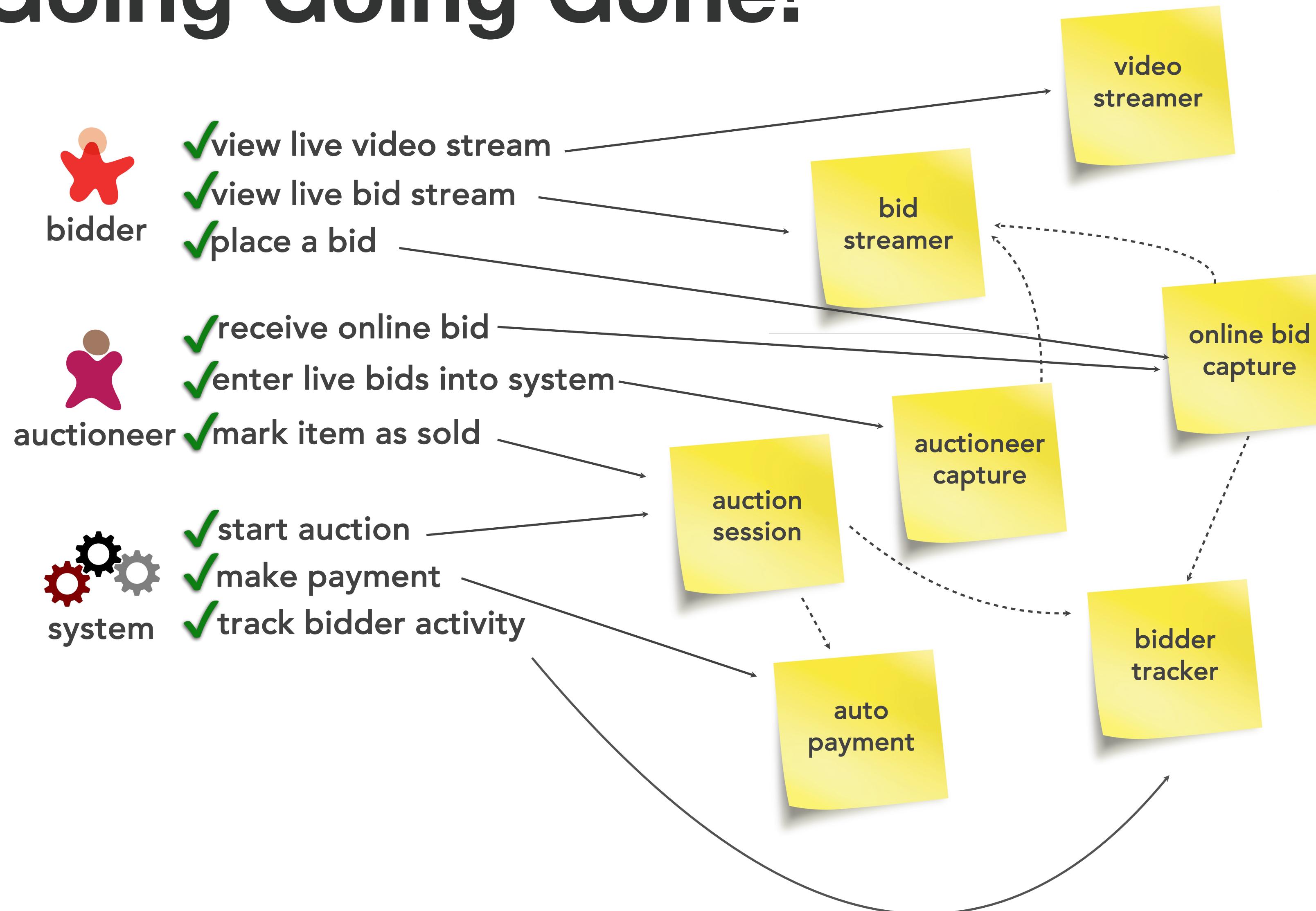
Your Architectural Kata is...

Going Going Gone!



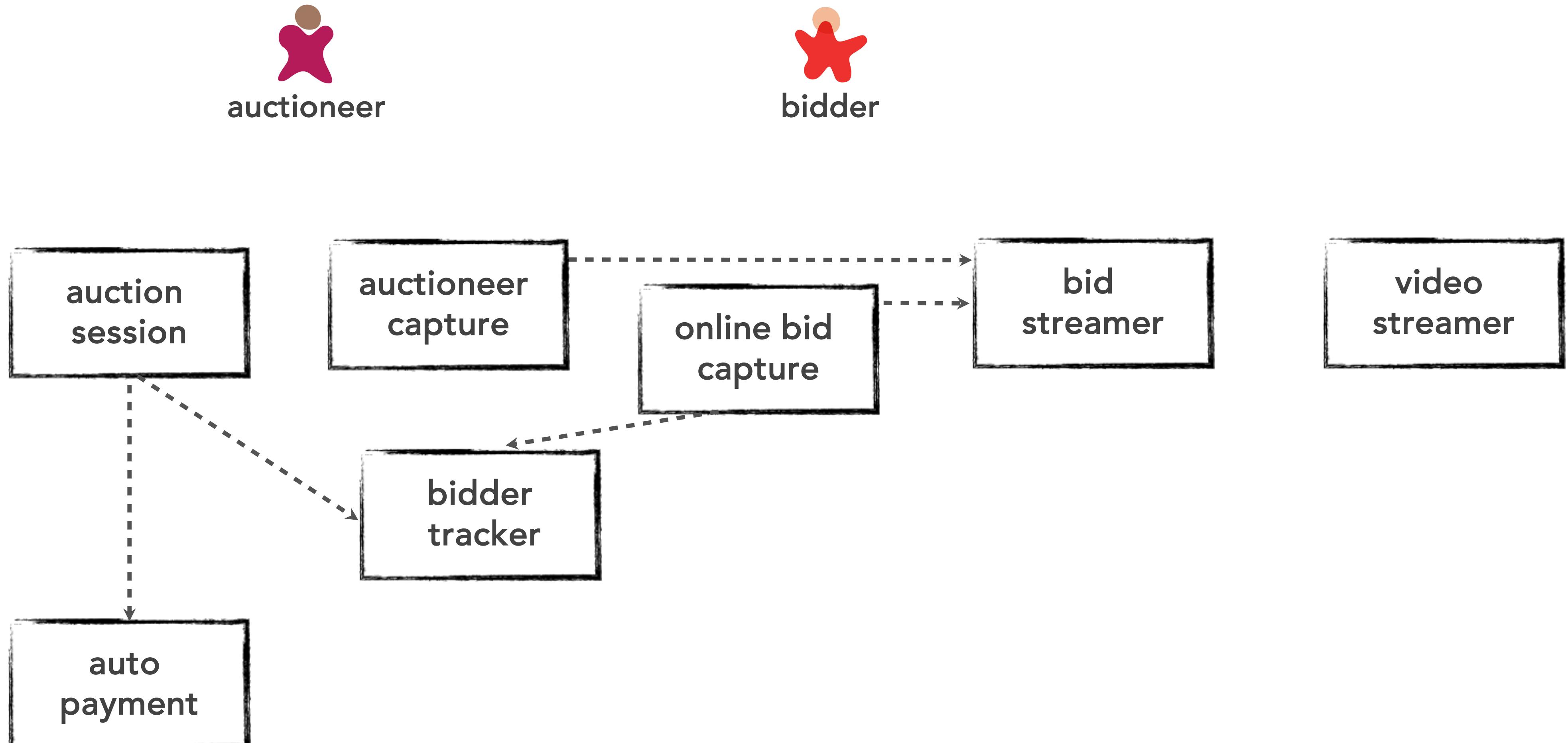
Your Architectural Kata is...

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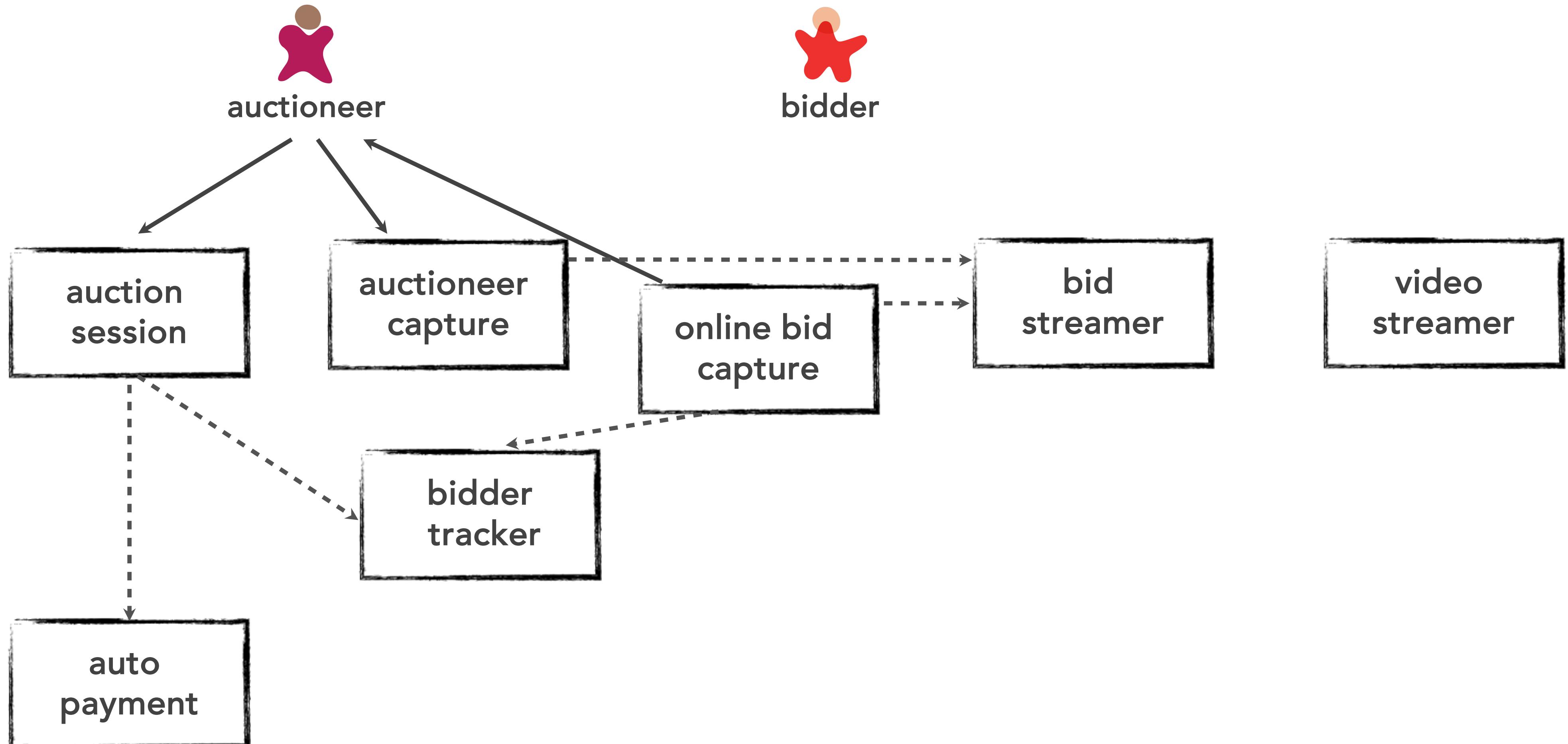
Your Architectural Kata is...

Going Going Gone!



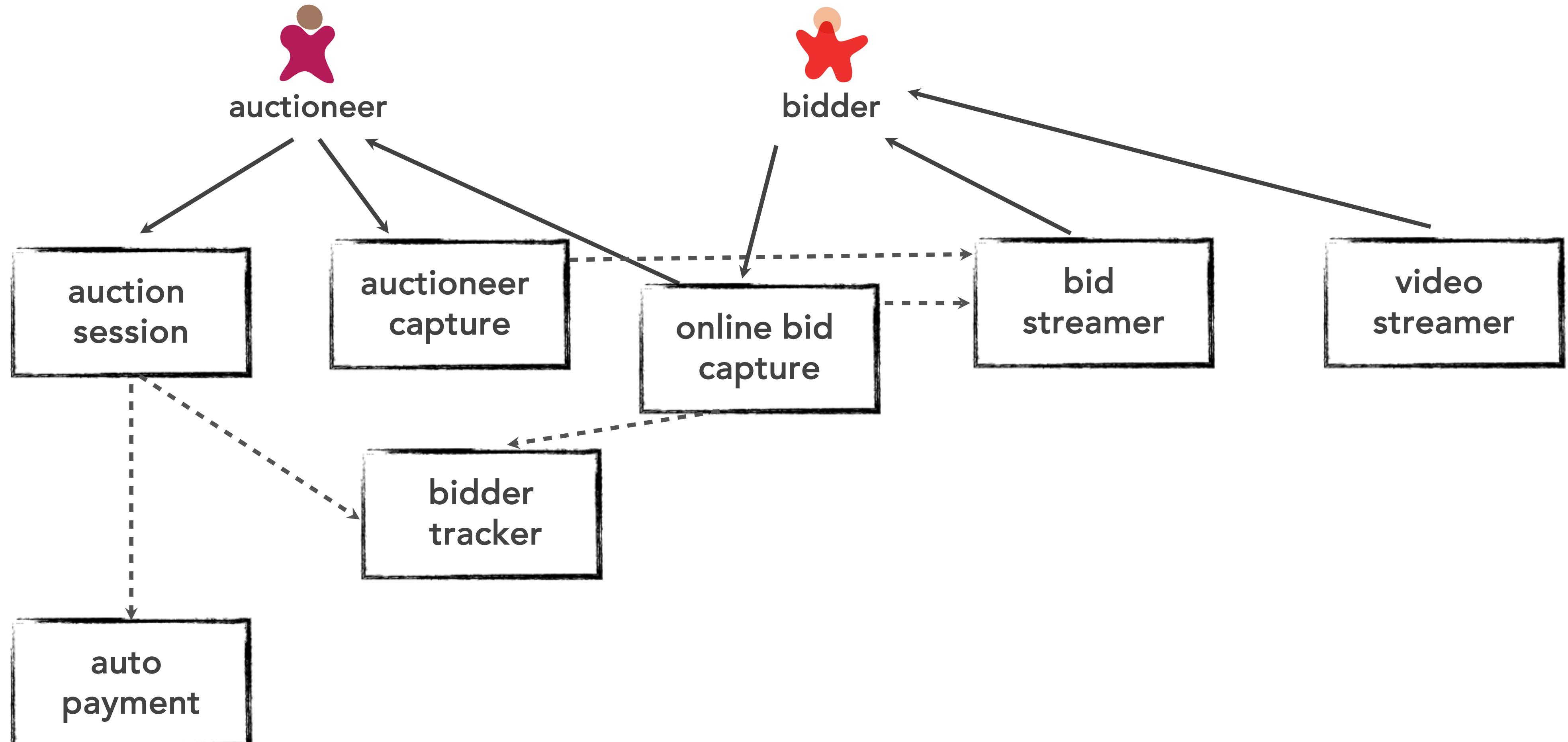
Your Architectural Kata is...

Going Going Gone!



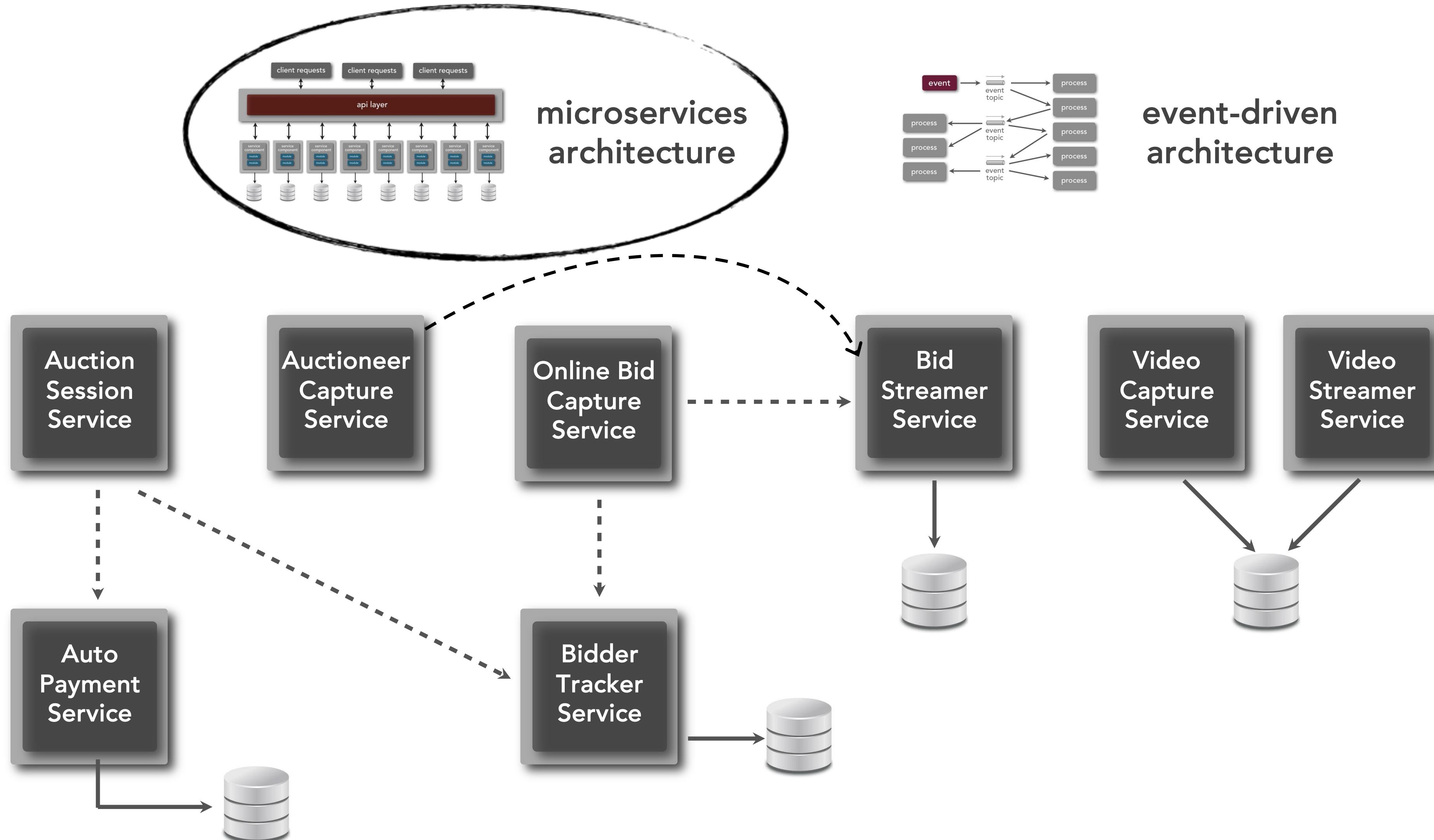
Your Architectural Kata is...

Going Going Gone!



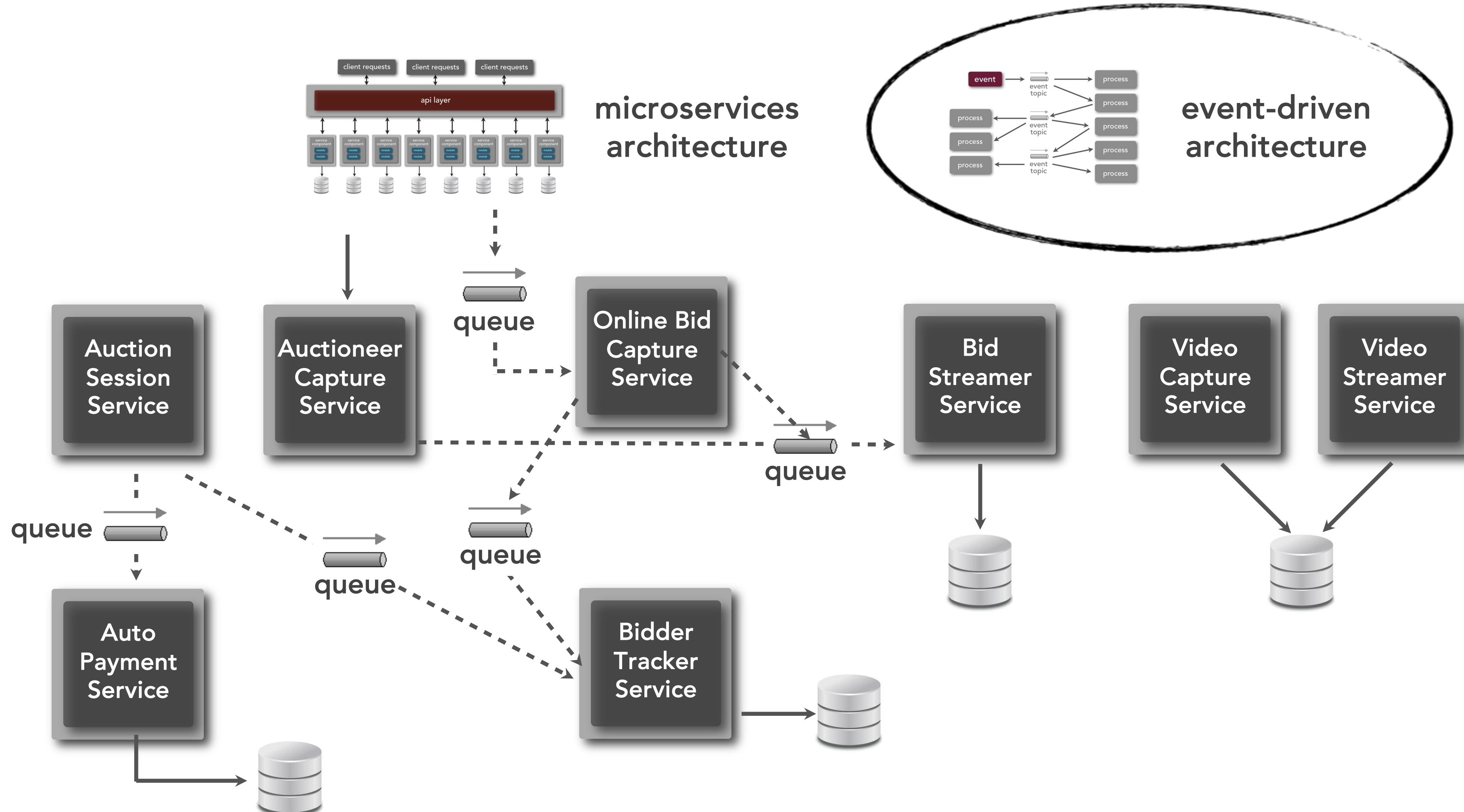
Your Architectural Kata is...

Going Going Gone!

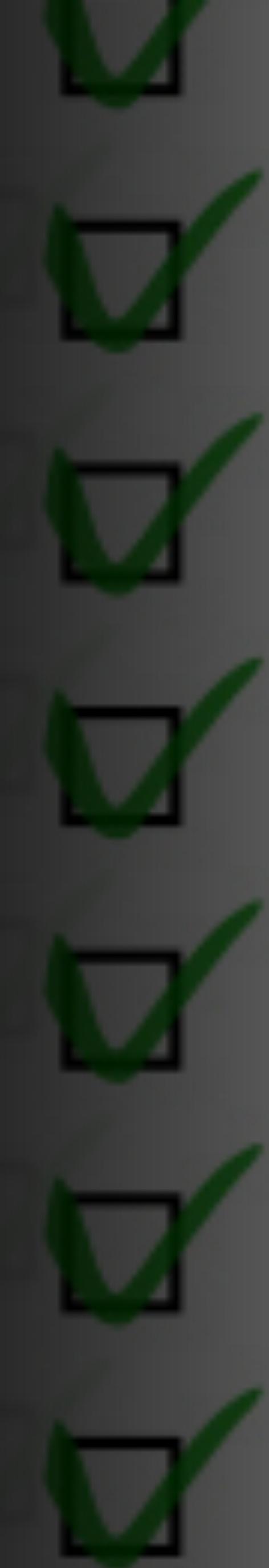


Your Architectural Kata is...

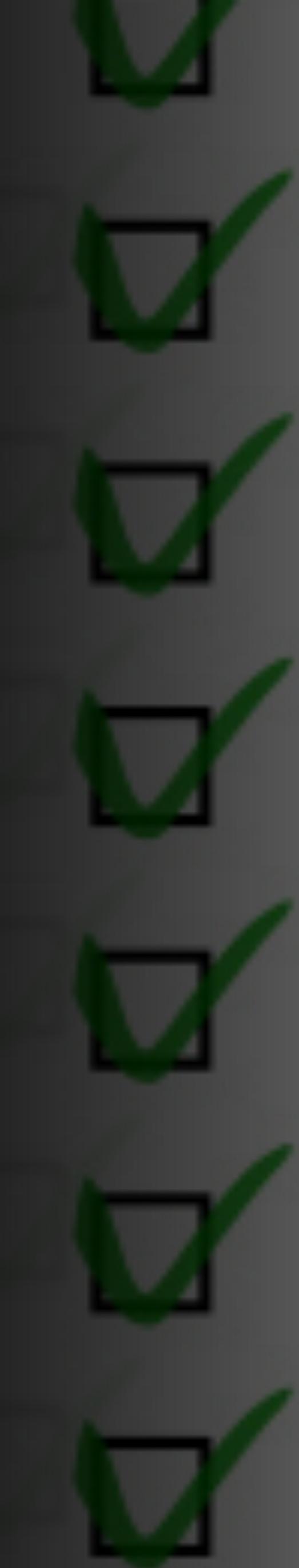
Going Going Gone!



Judges Criteria



Meet the Judges



Jacqui Read



Jacqui Read, an internationally recognized software and enterprise architect with over 13 years of industry experience, is the author of *Communication Patterns: A Guide for Developers and Architects* and founder of Read the Architecture, an innovation hub providing architecture consultancy and training services. She specializes in helping businesses large and small create and enhance architecture practices, construct evolutionary architectures, and untangle and extract value from data and knowledge. Jacqui also runs software architecture katas for teams and companies, teaches public and private workshops, and speaks at international conferences on topics such as architecture decisions, technical communication, and architecture practices. Her professional interests include collaborative modeling, knowledge management, DDD, and socio-technical architecture. Outside of work she enjoys gardening and attempting to strum her ukulele and sing at the same time. Her website is JacquieRead.com.

Clare Sudbery



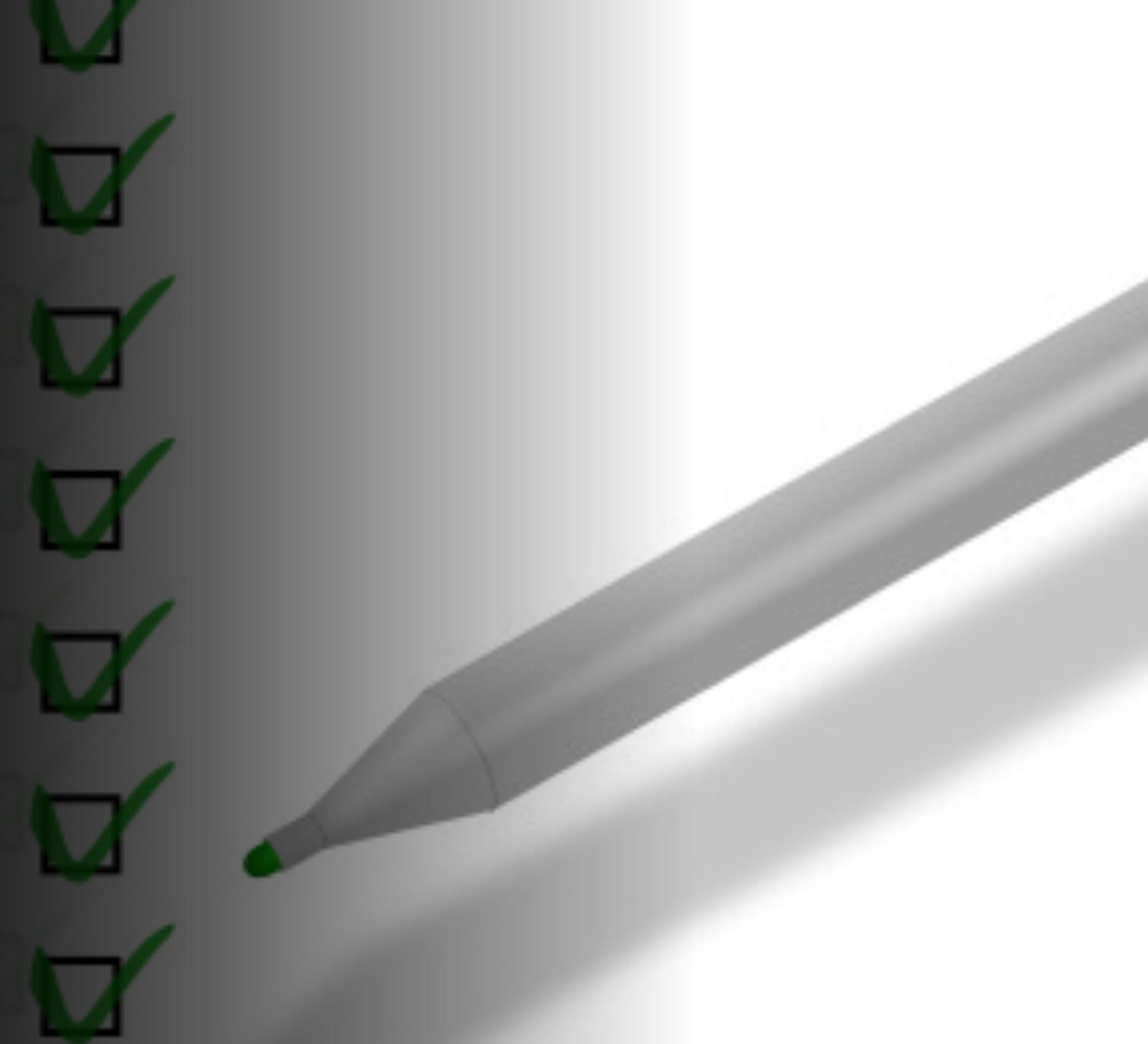
Clare Sudbery is an independent technical coach with 23 years of software engineering experience. She specializes in TDD, refactoring, continuous integration, and other extreme programming (XP) practices. With her passion for helping underrepresented groups flourish in tech, Clare taught the Coding Black Females' Return to Tech program and co-ran the Made Tech Academy, helping inexperienced engineers to learn on the job. Clare hosted season one of the acclaimed *Making Tech Better* podcast and publishes posts in her Medium blog, *A Woman in Technology*. She has written about trunk-based development and refactoring for O'Reilly and for Martin Fowler's site and regularly presents workshops and keynotes at events all over the world.

Robin Losey



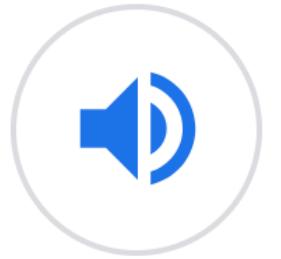
Robin Losey is a seasoned IT executive with over 20 years of transformational leadership experience, including 15 years as IT managing director at FedEx. He now leverages that experience by championing innovation, modern architecture, and business agility practices for the benefit of his clients through Stellar Agility's consulting and training services.

Clarity of narrative, organization, and supporting documentation



Narrative and Organization

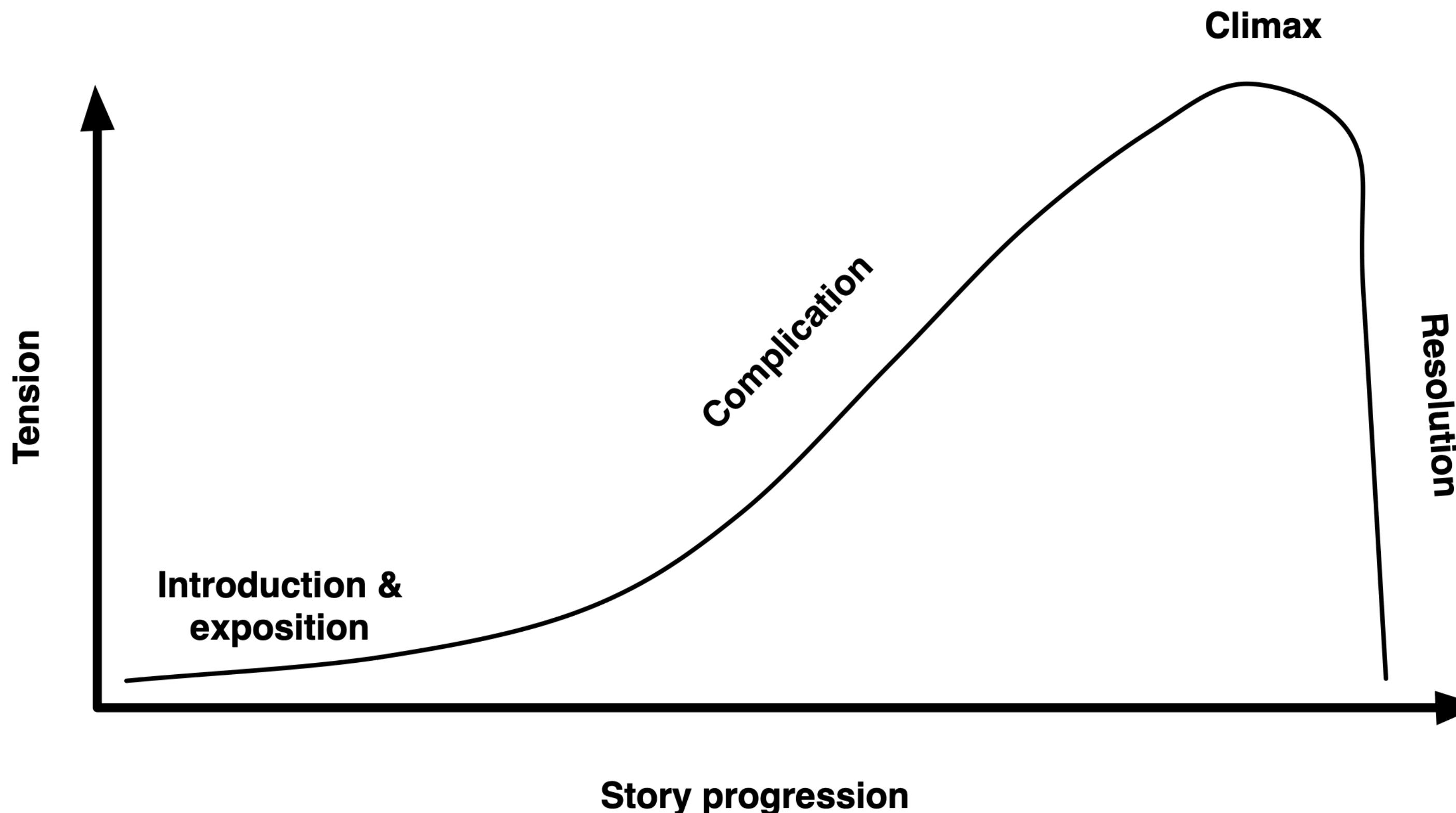
A narrative tells the story of the architectural solution



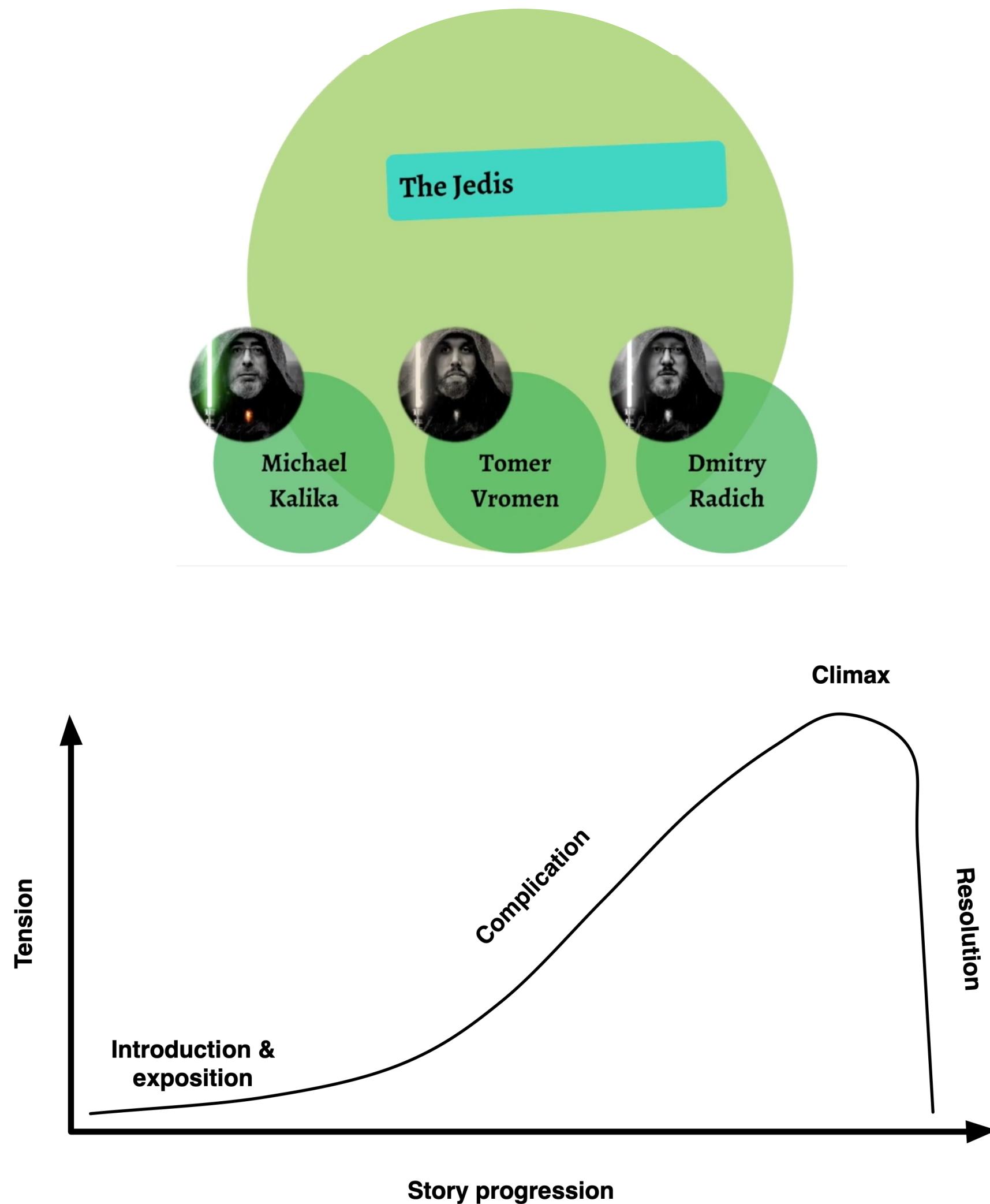
narrative
/'nerətiv/
noun
a spoken or written account of connected events; a story.

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



Prelude

The Vision

The Final Video Presentation

Business Requirements

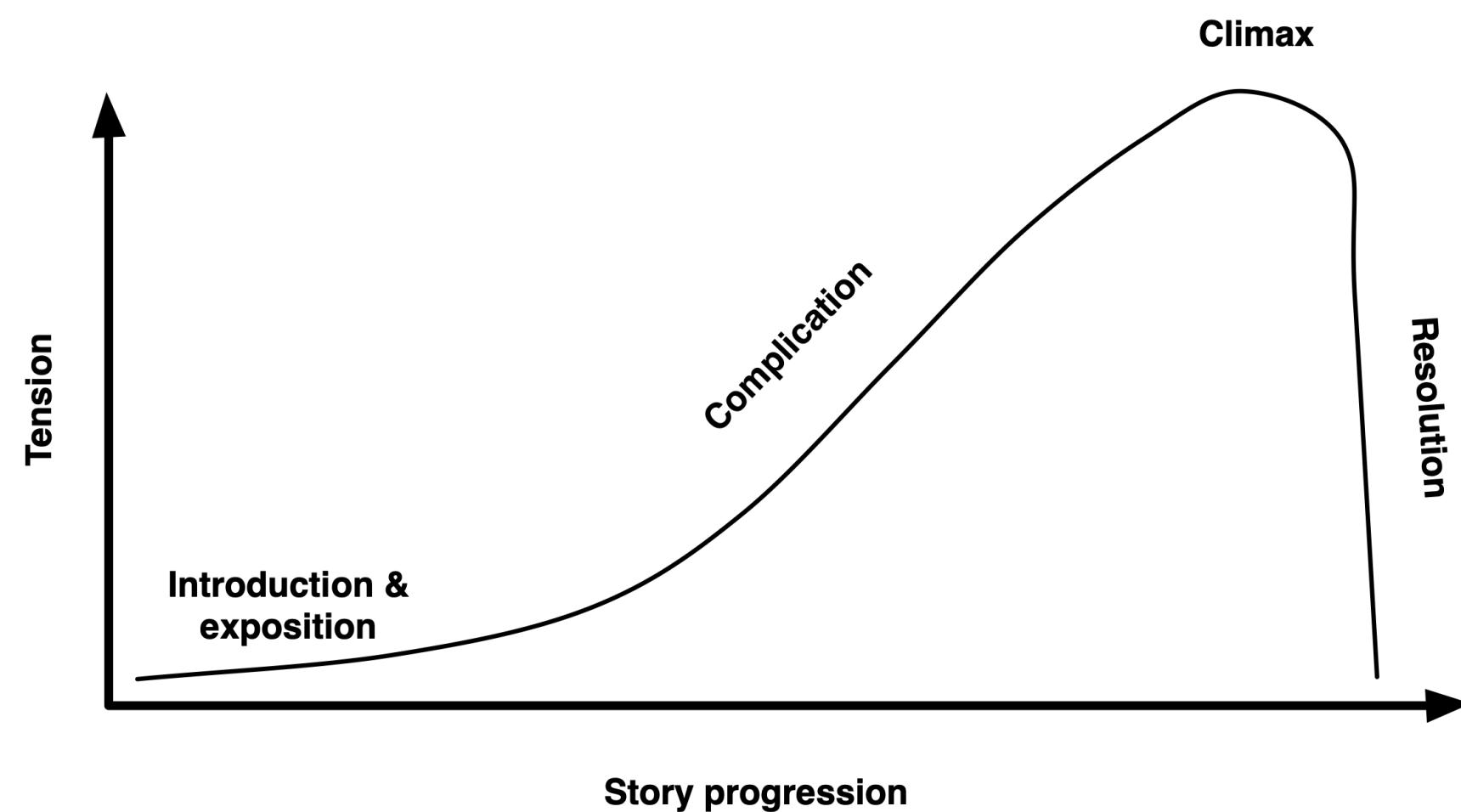
The Strategy

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](#). It's based not only on the interview with the PO, Kwaku Osei, but also with some assumptions made by the author. These assumptions were 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 used to implement the system. It includes the system boundaries and requirements.

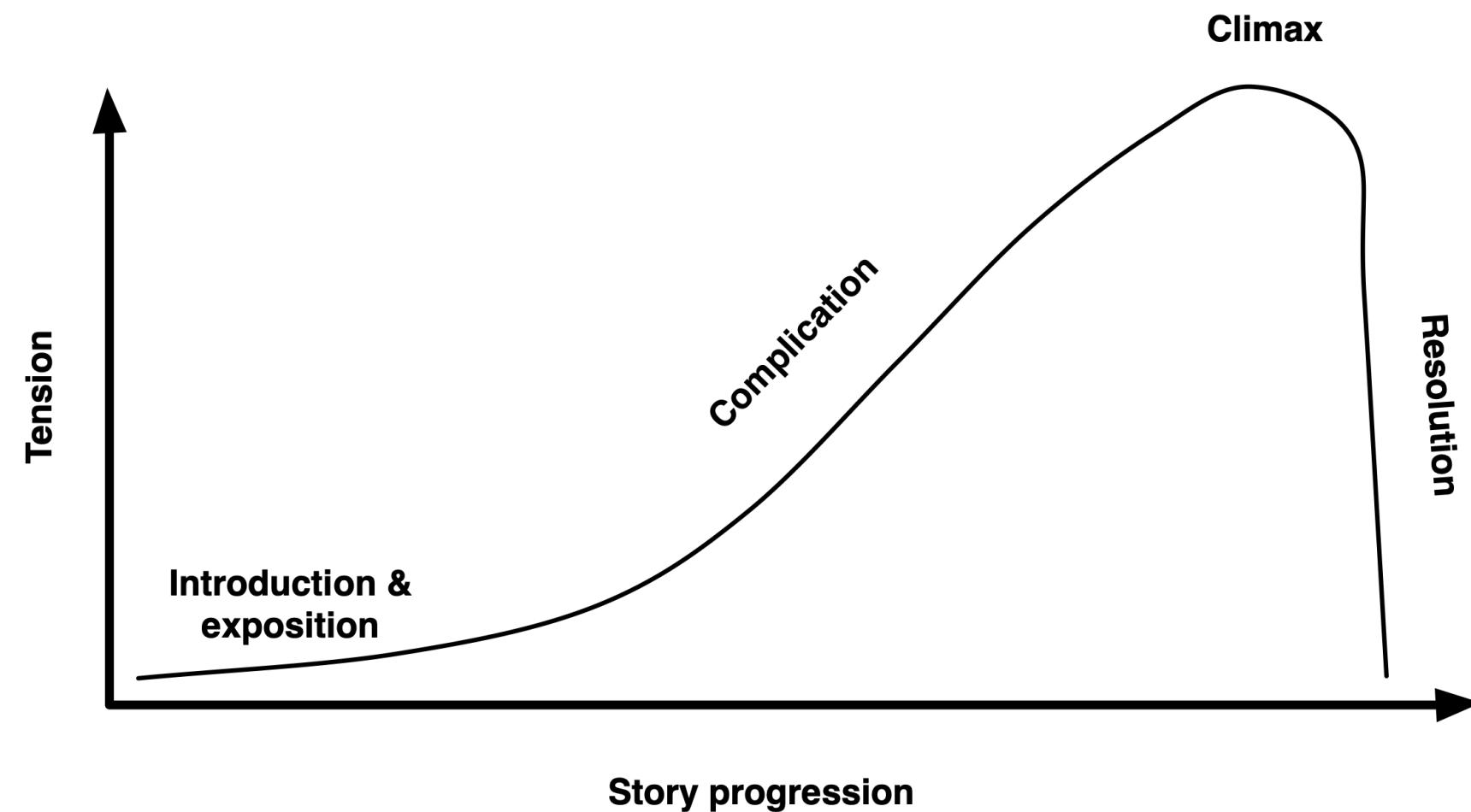
As a starting point, there's a context diagram that gives an overview of the system boundaries. The system is called the *Farmacy Food System*, which is the scope of this proposal.

ADRs

The linked ADRs below record the main architecture decisions recorded during the design process, 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

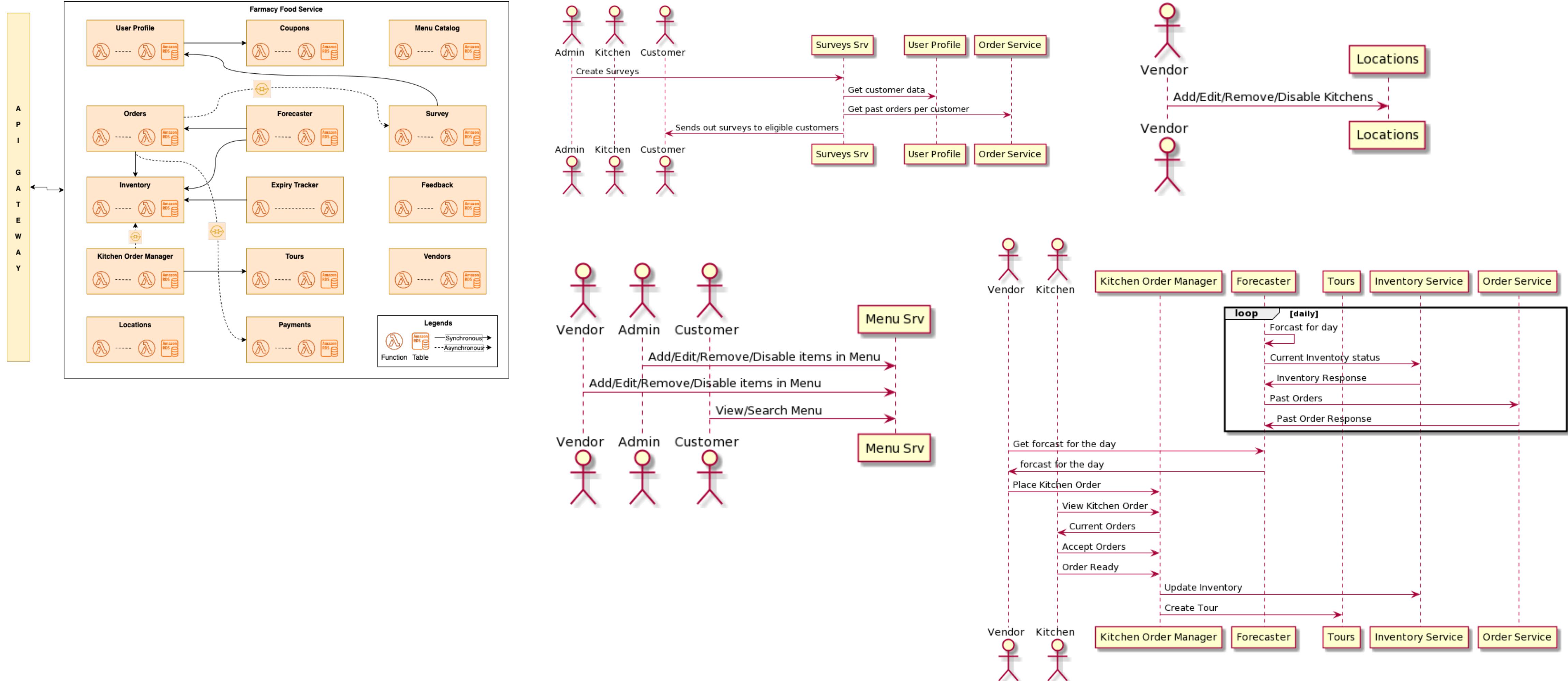
Milestones

ADRs

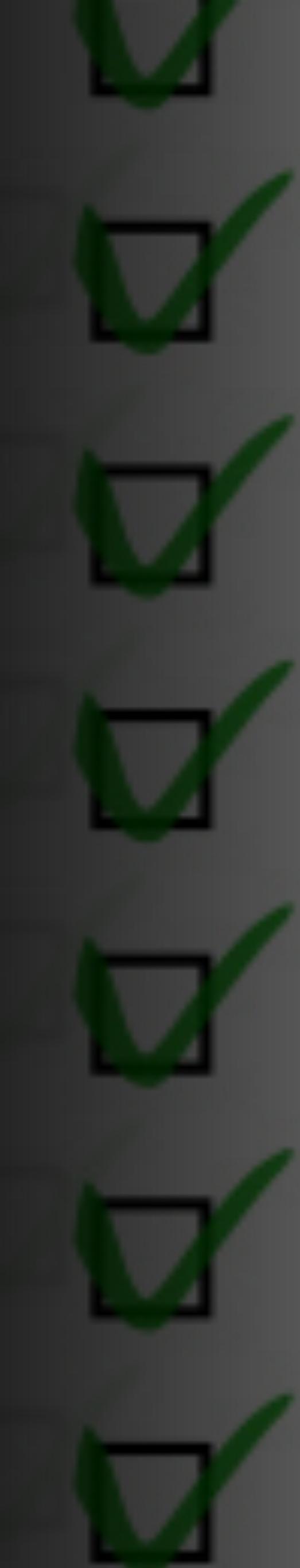
Completeness of solution



Completeness of Solution

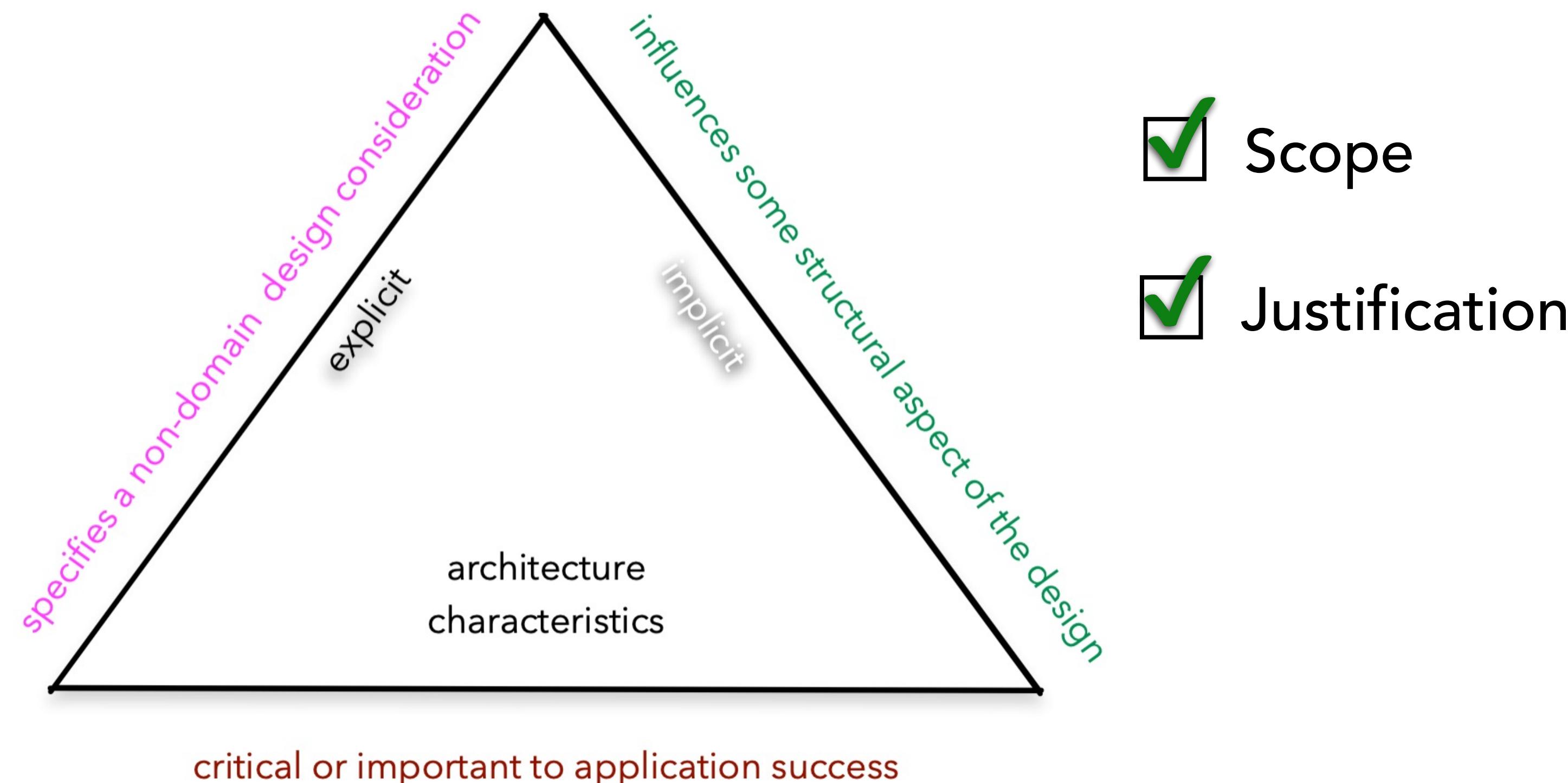


Identification of supporting architecture characteristics



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: _____ _____		

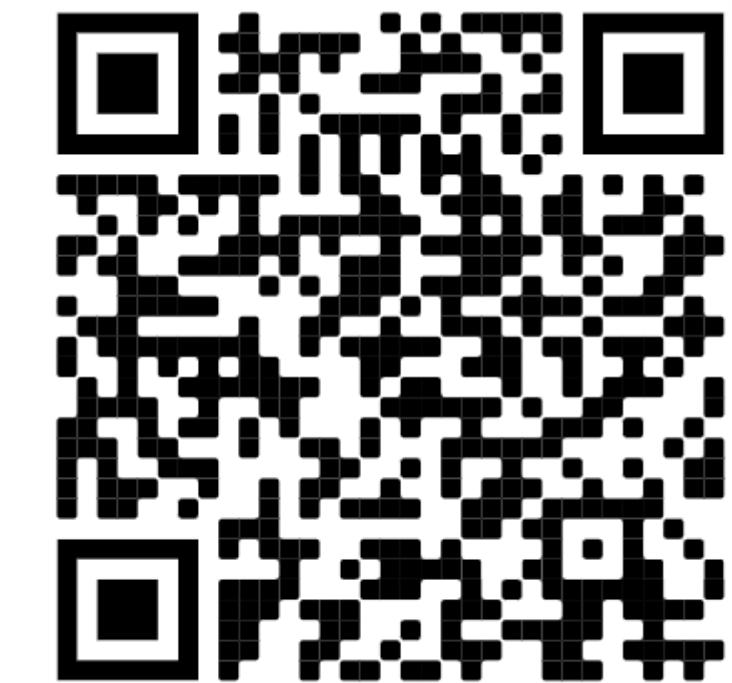
Top 3 Driving Characteristics

<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. _____	

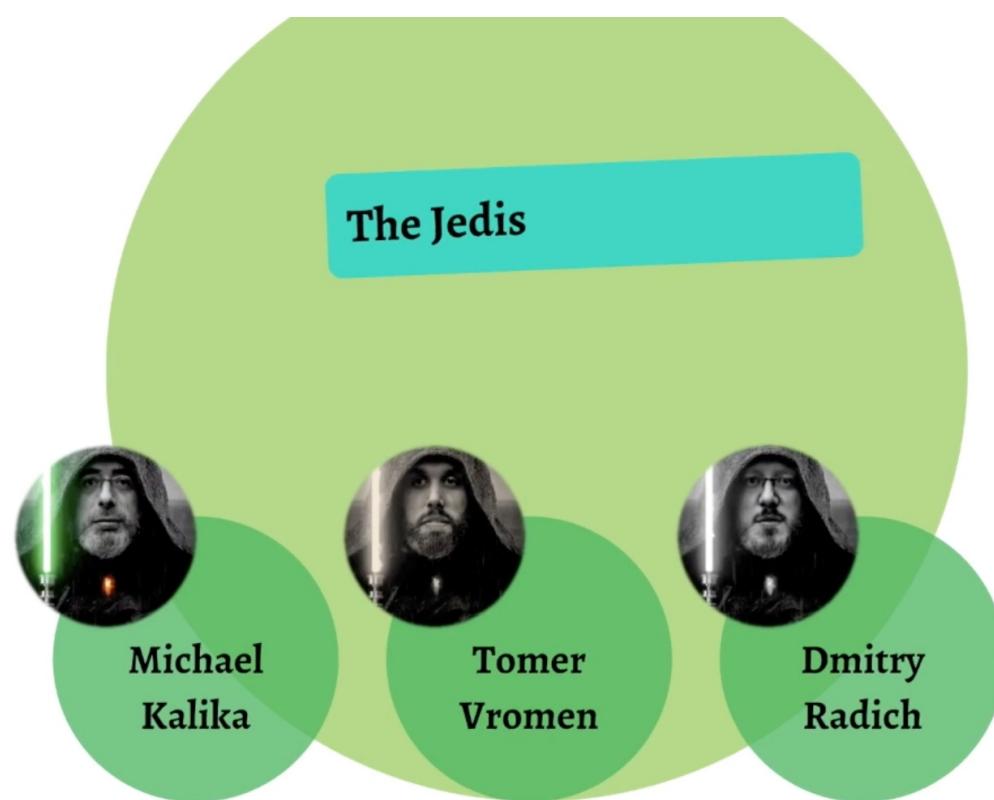
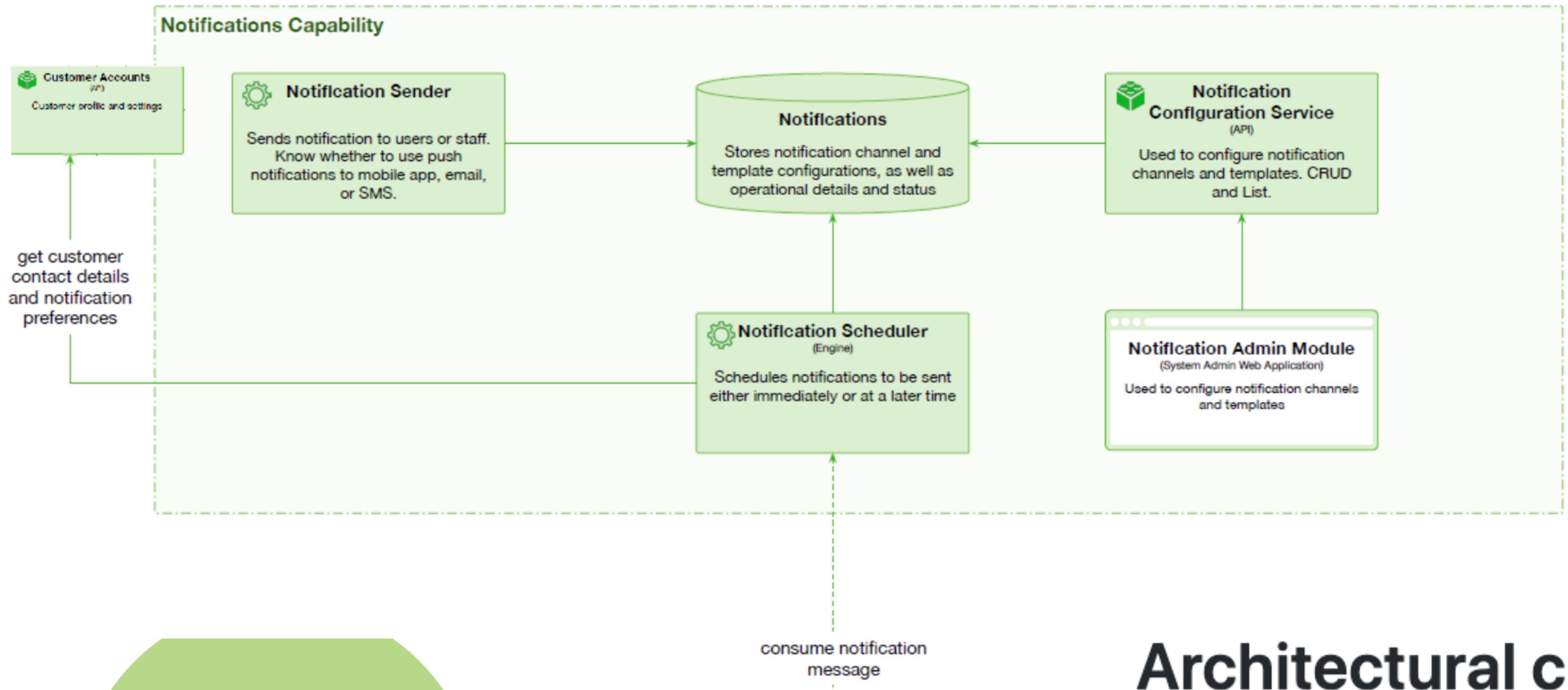
Instructions

- 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.

^a 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.



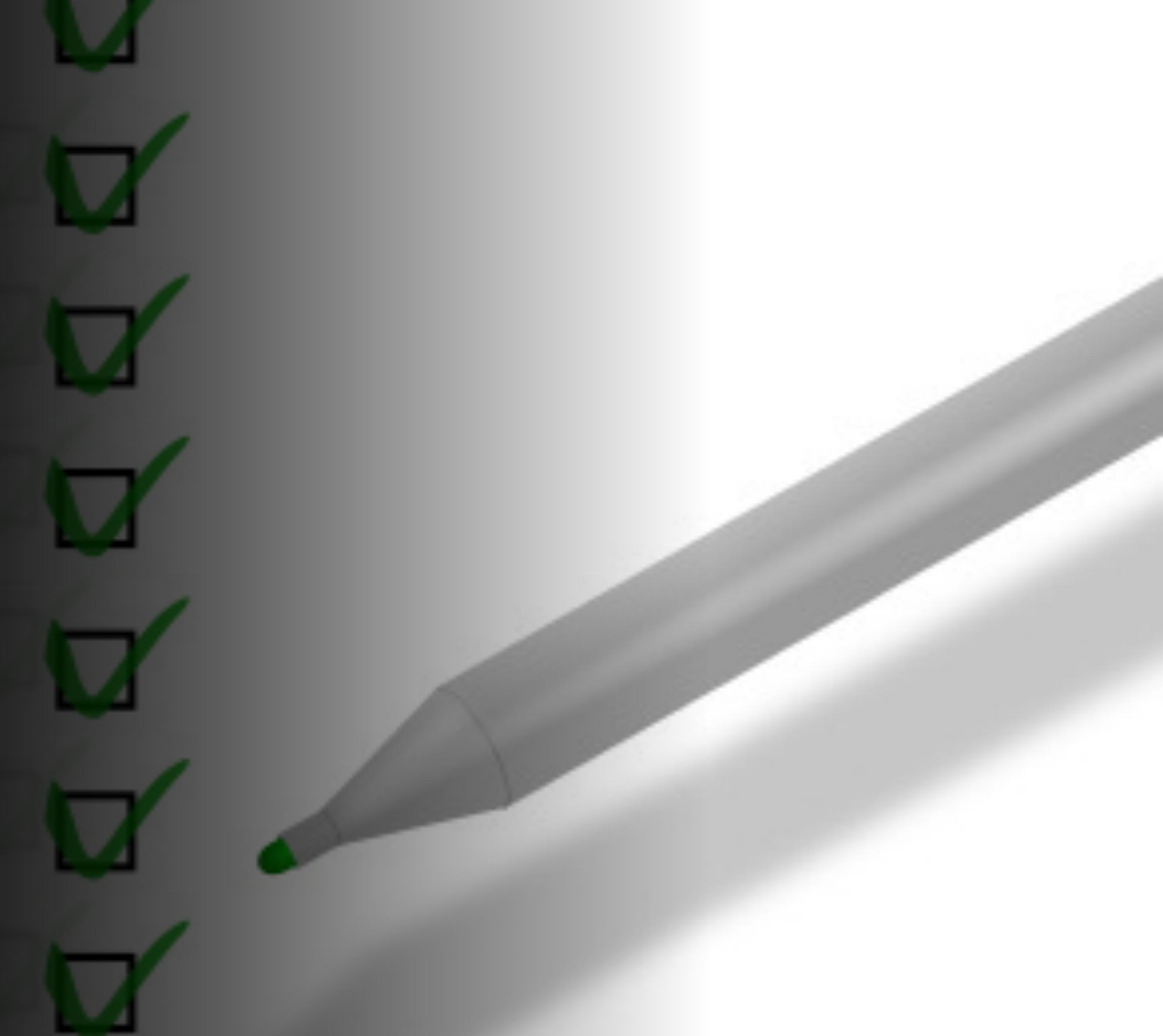
1. Enable Discovery - Agility

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.

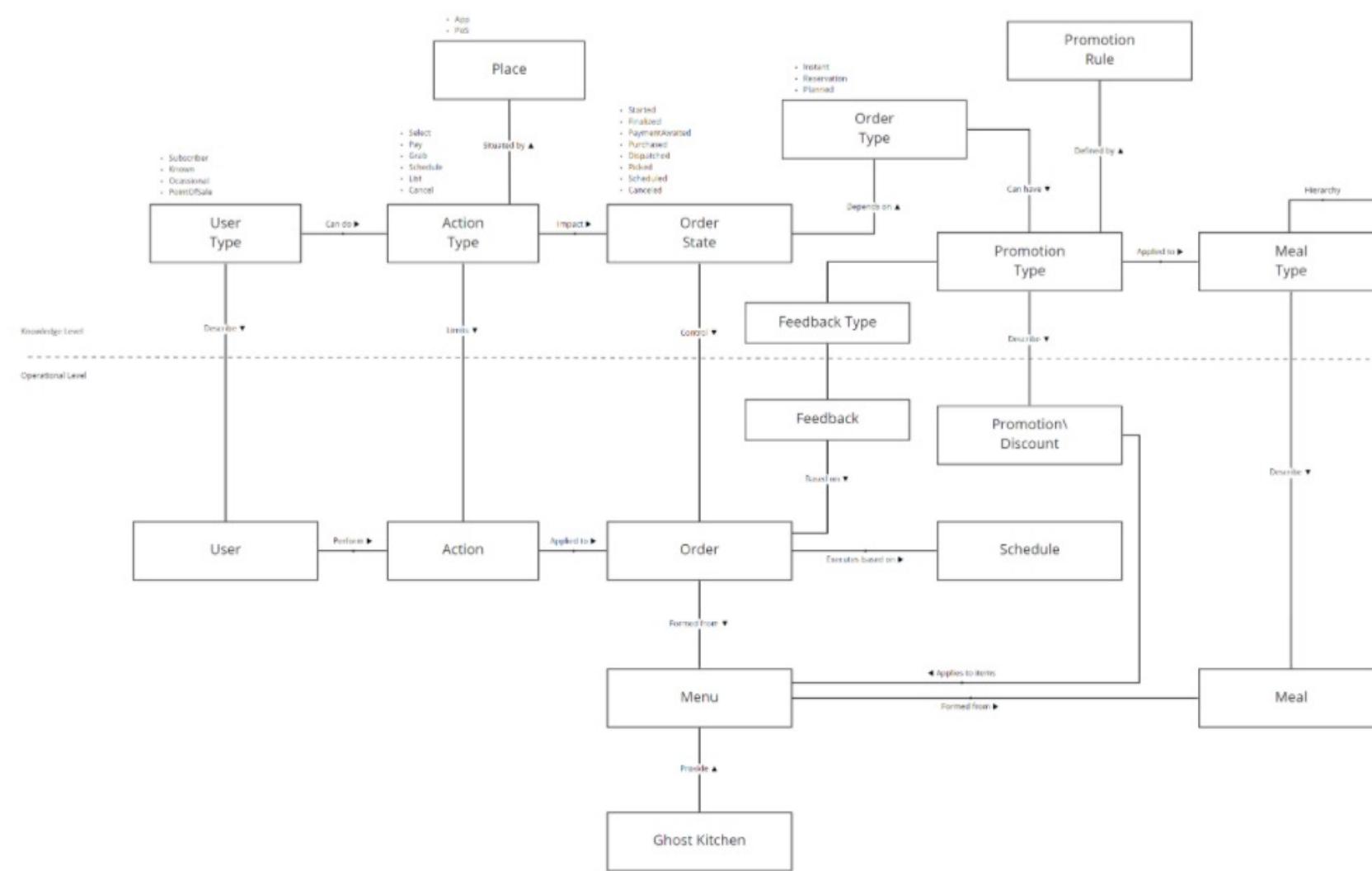


“The goal of a diagram is to convey a clear and shared understanding of the architecture”

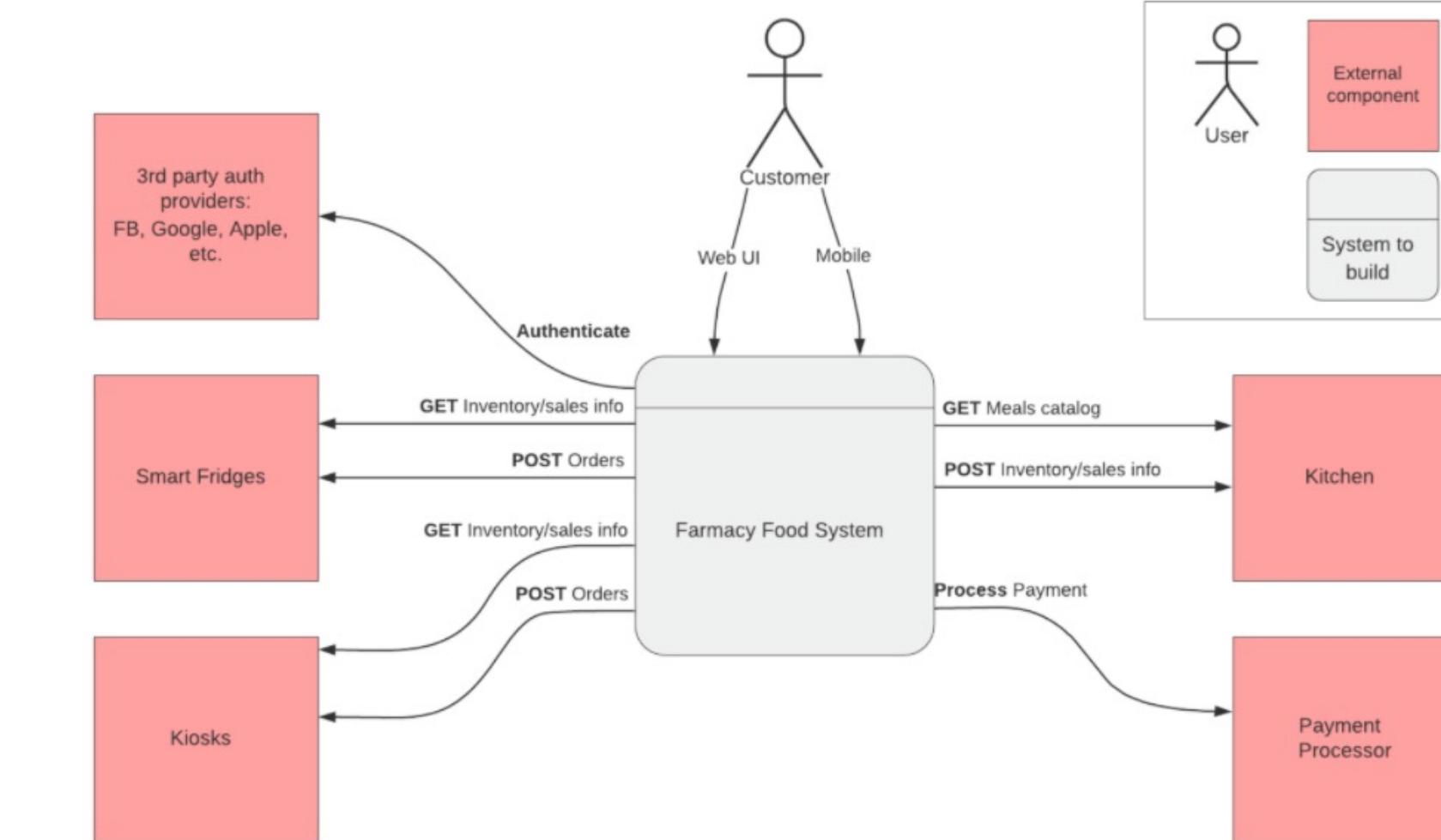
- Neal Ford

Diagrams

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



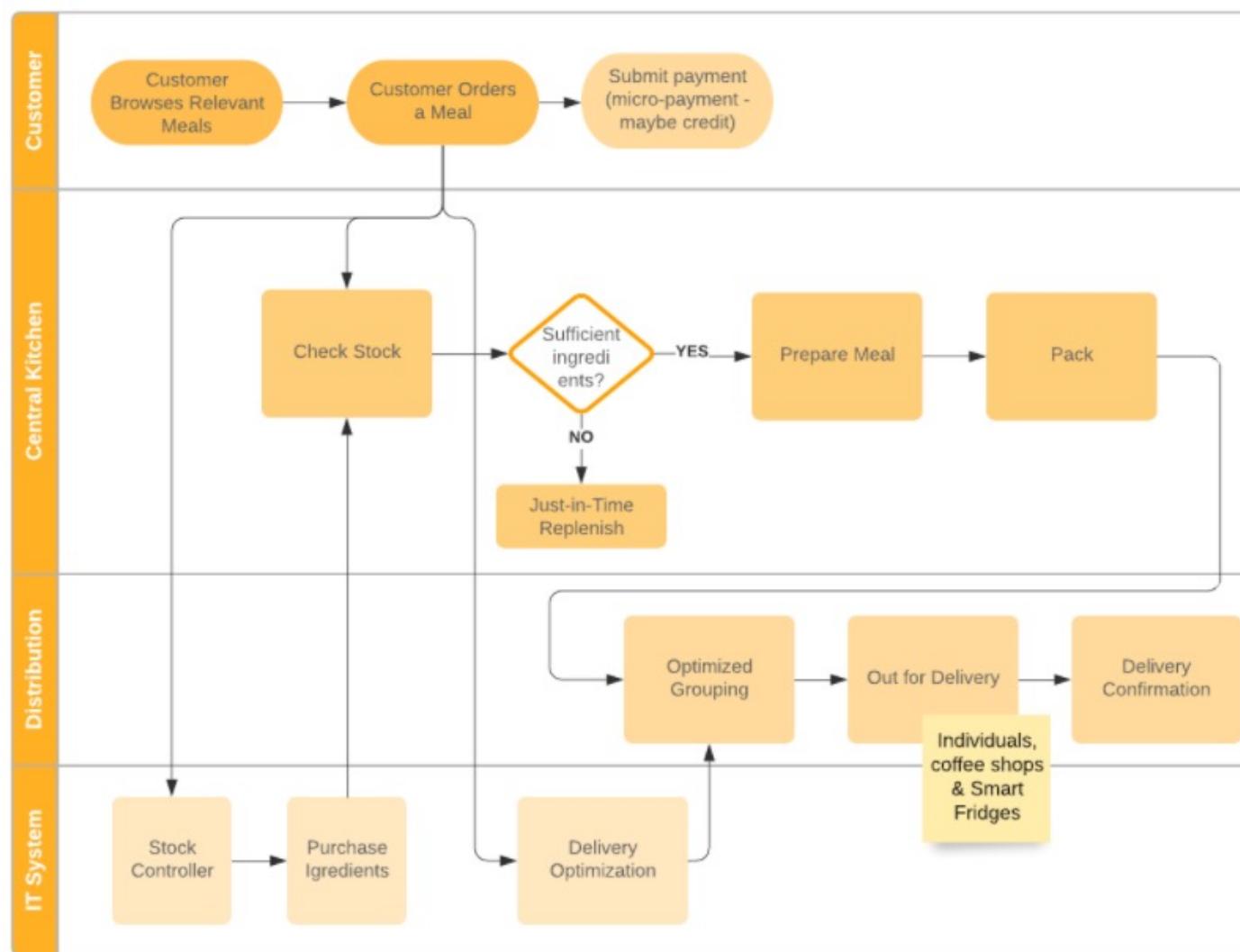
component diagrams



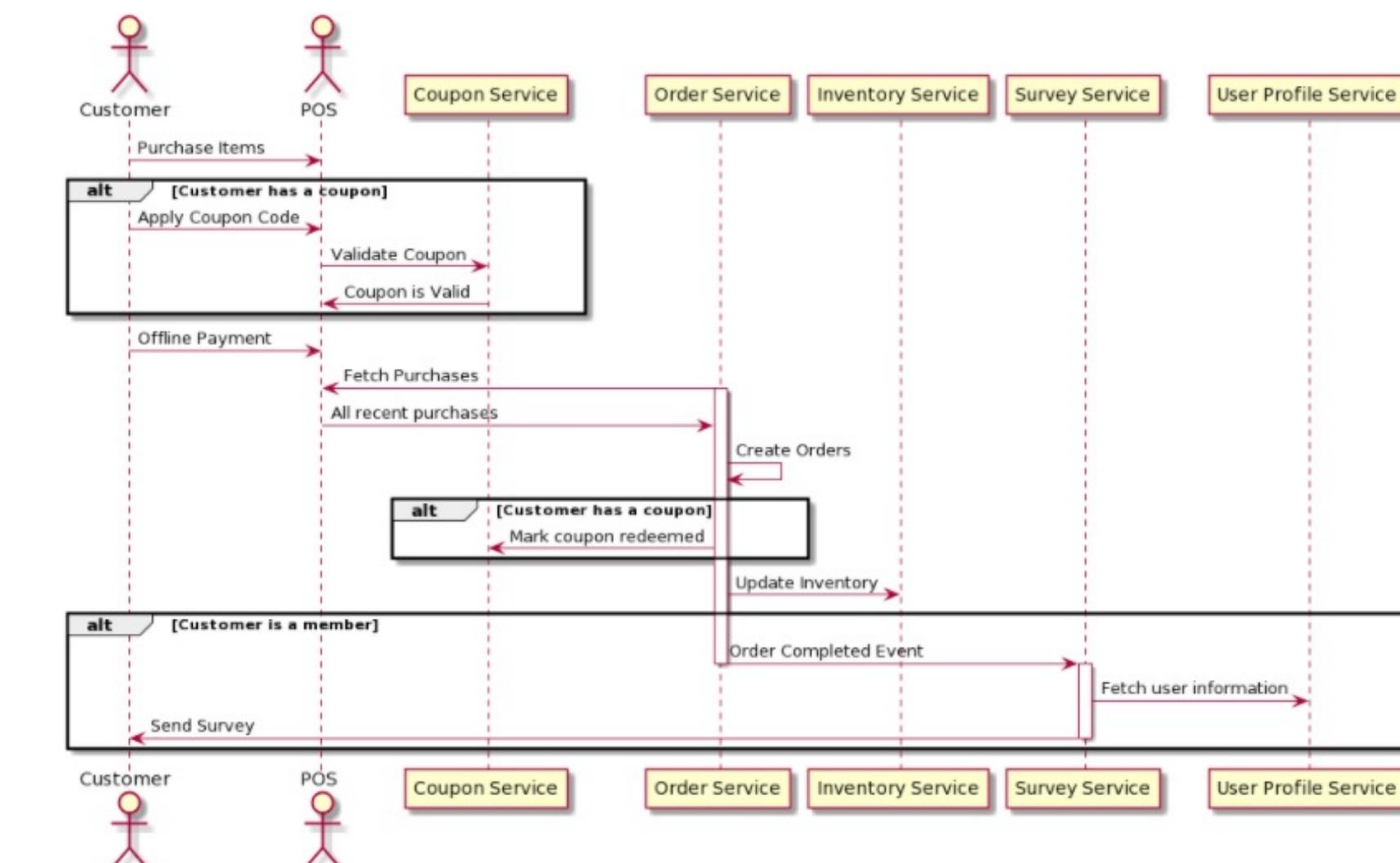
context diagrams

Diagrams

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



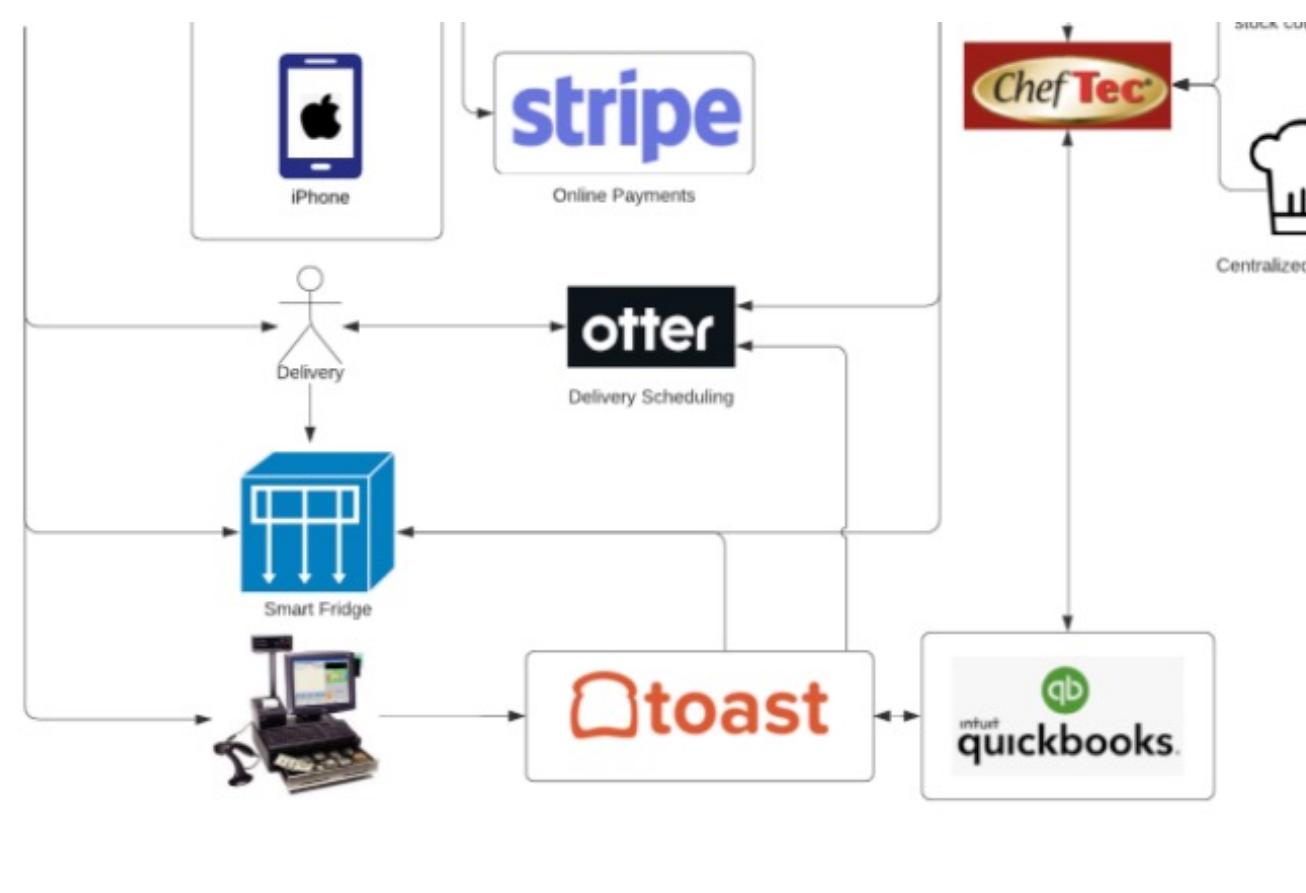
user journey diagrams



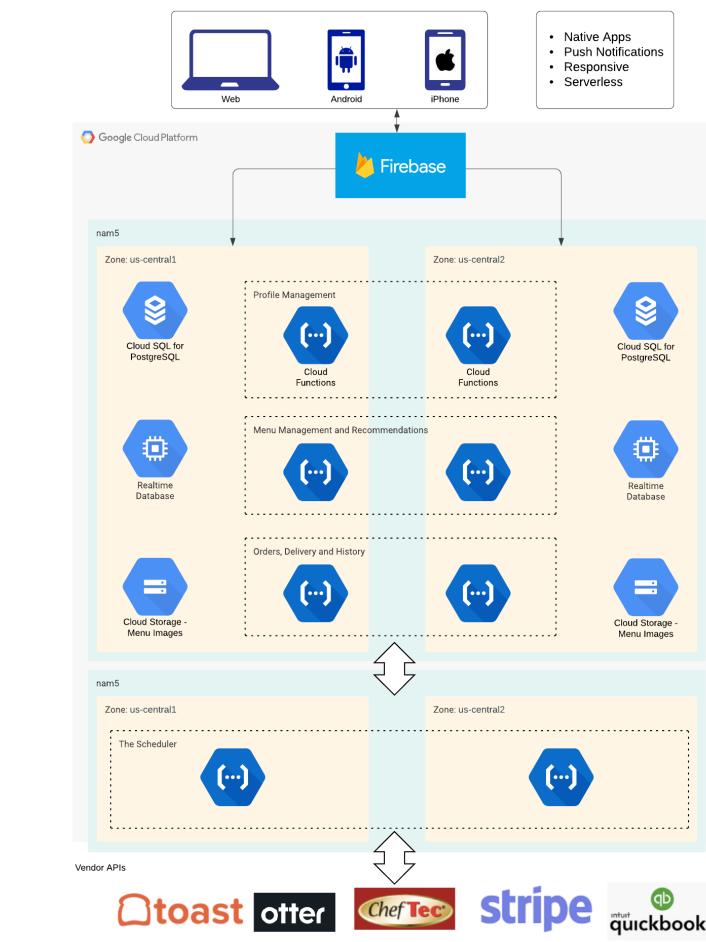
sequence diagrams

Diagrams

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



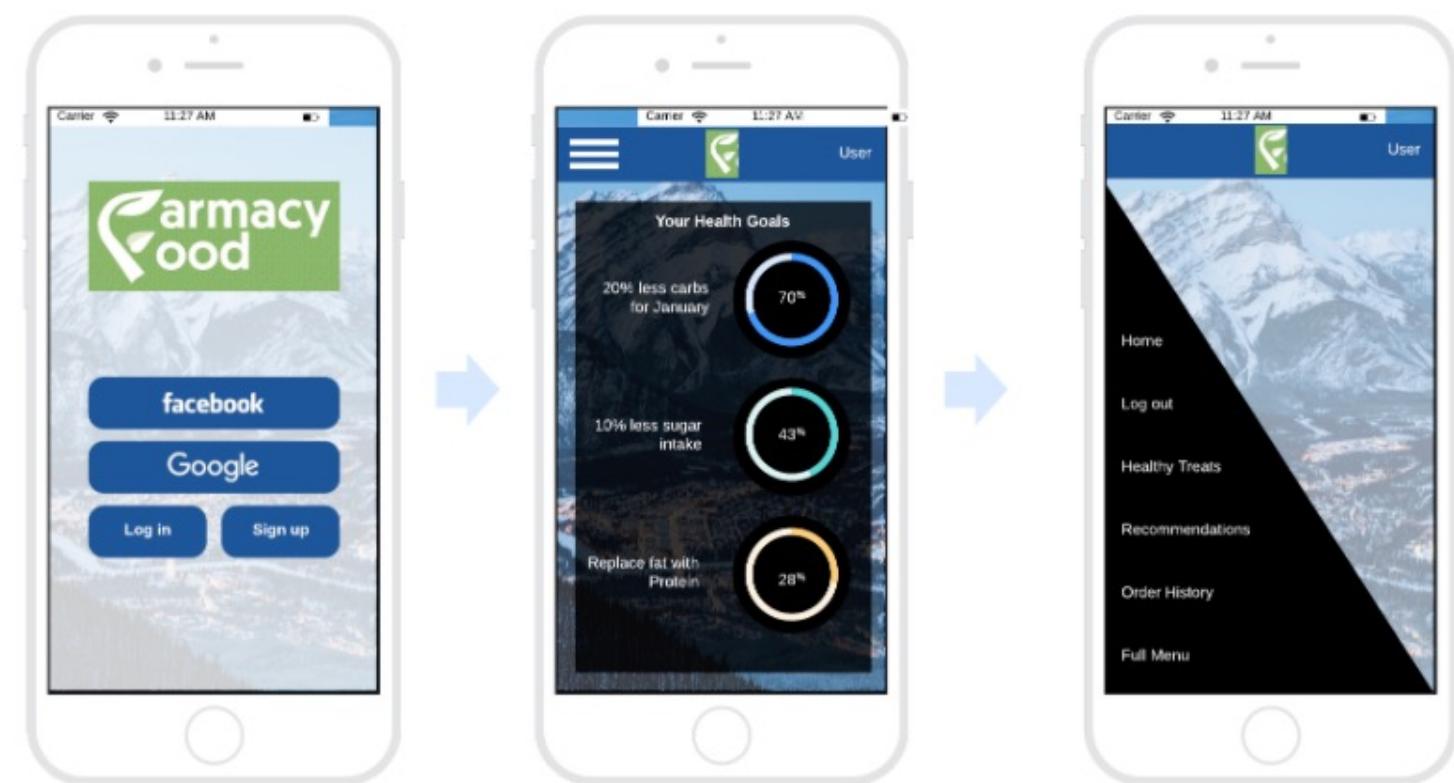
system-level diagrams



deployment diagrams

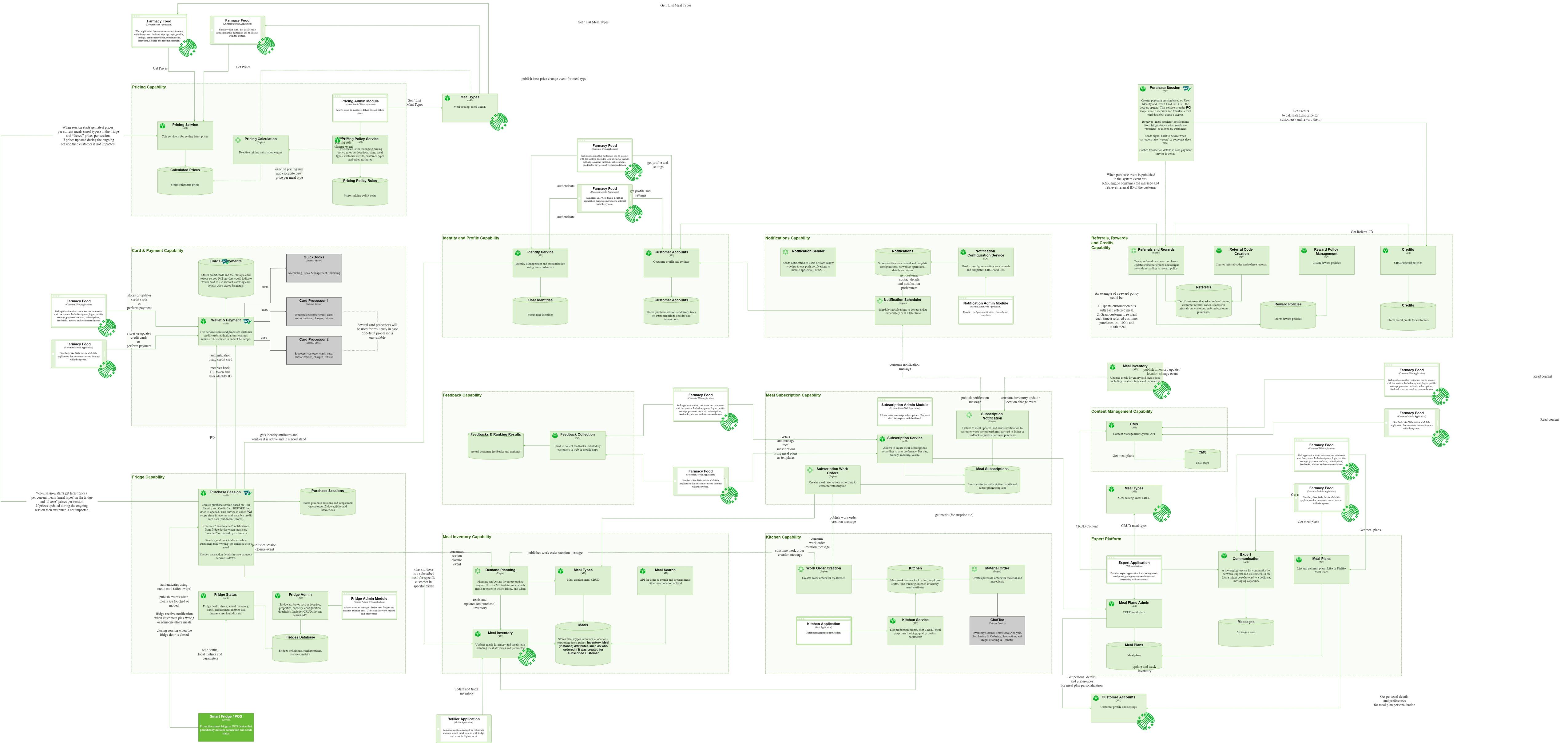
Diagrams

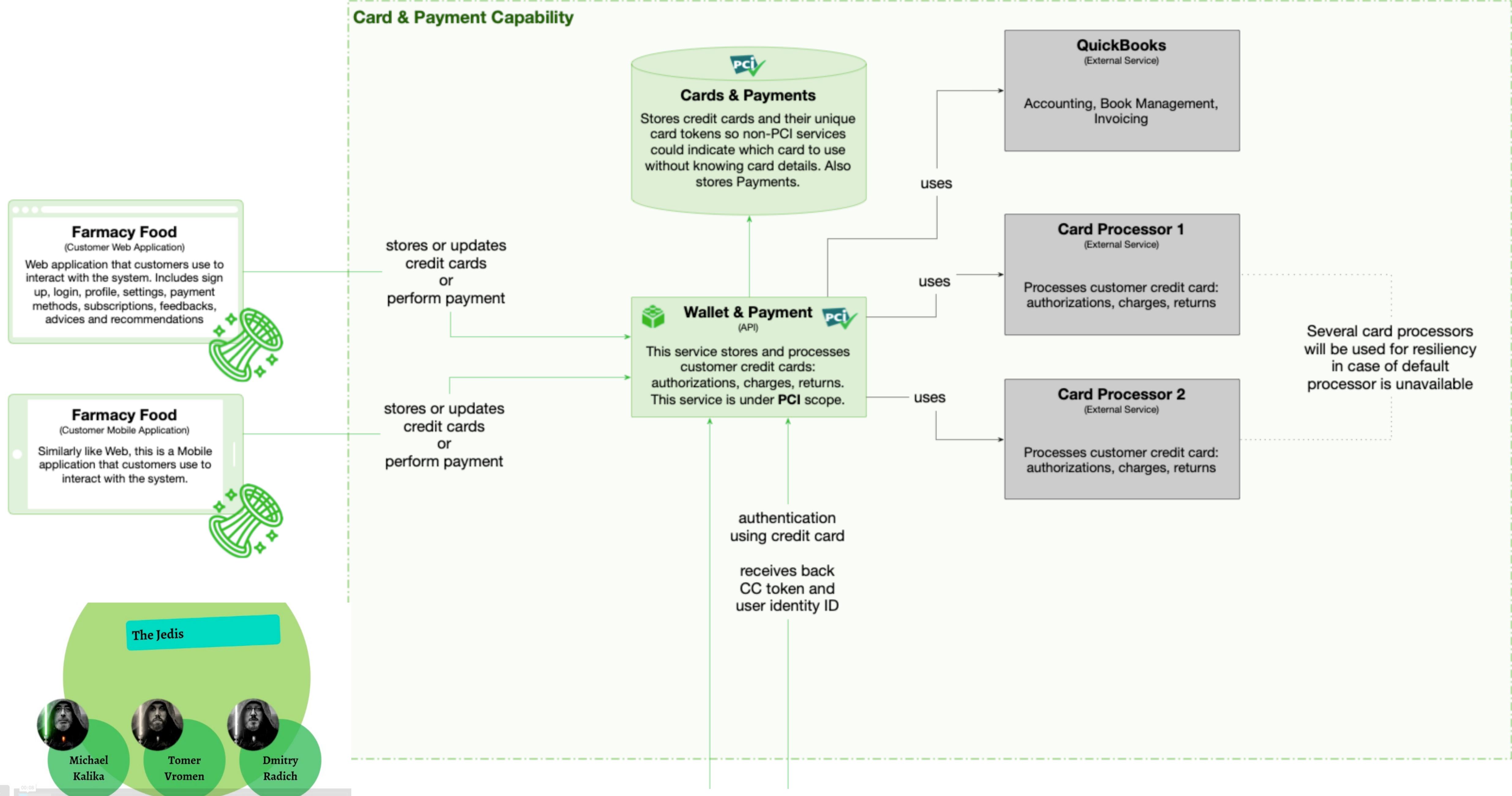
An effective architecture picture is worth more than a 1,000 words.
Architecture represents topology, which benefits from visual representations.



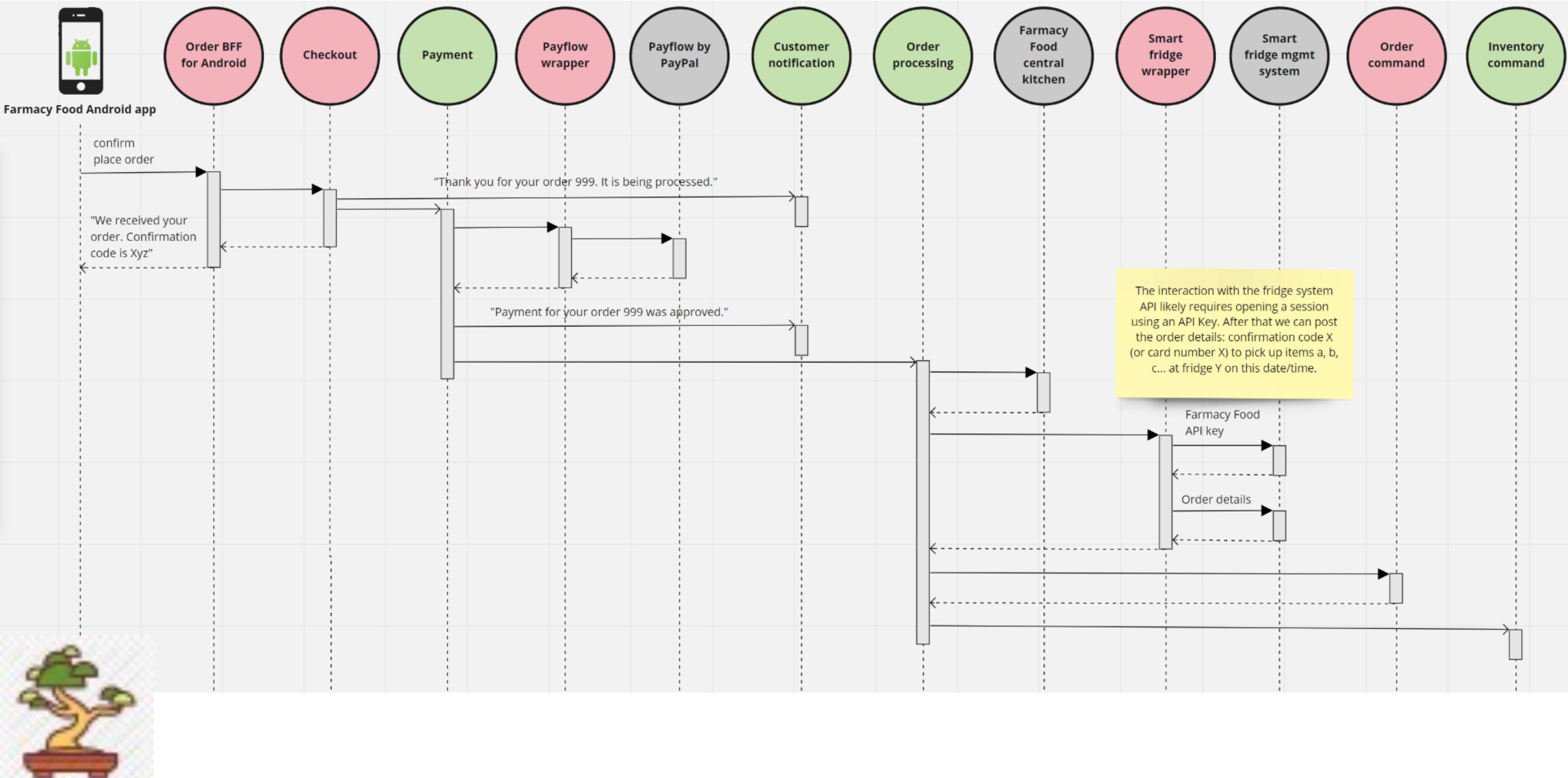
user interface mockups

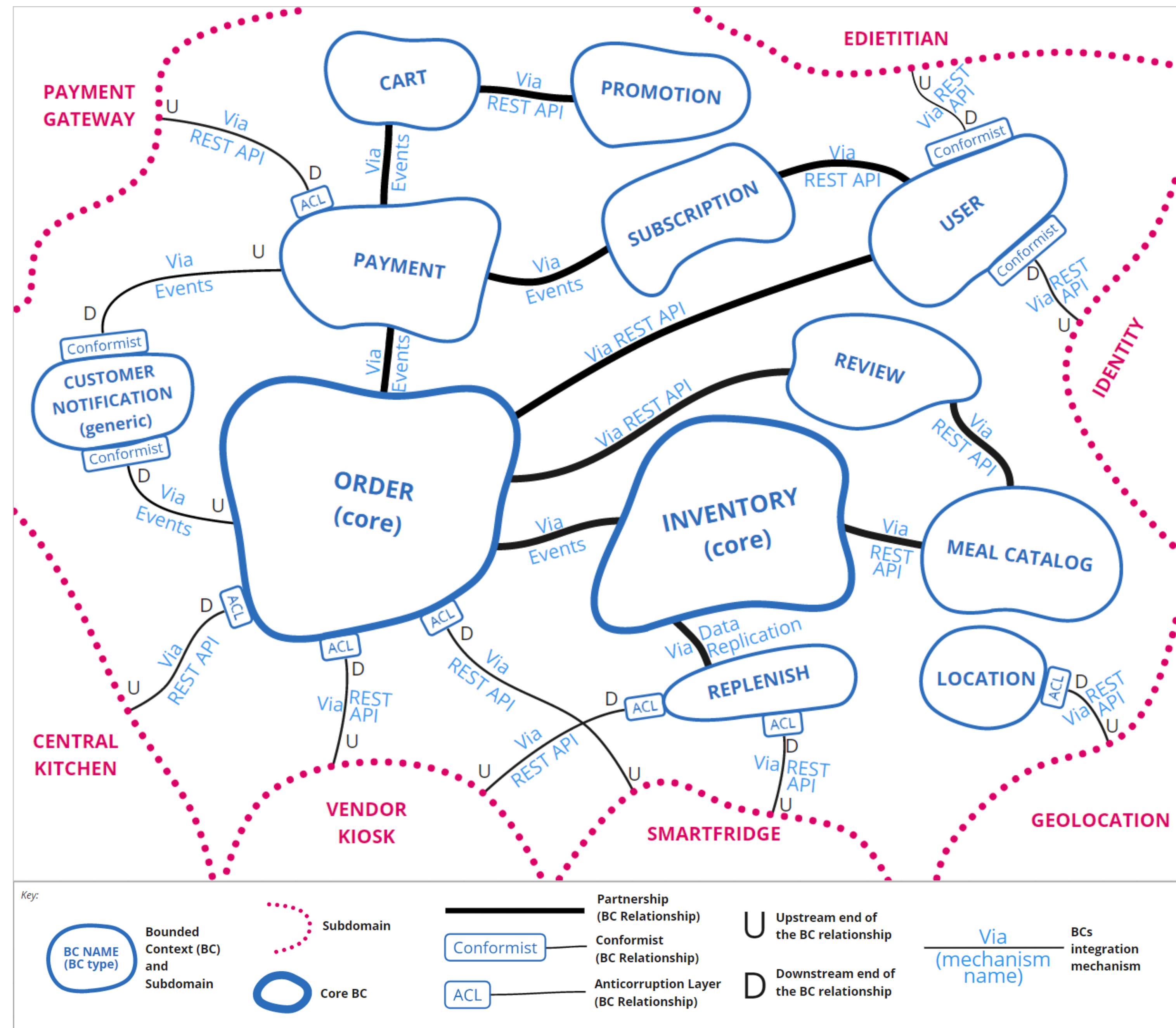
System Component Diagram



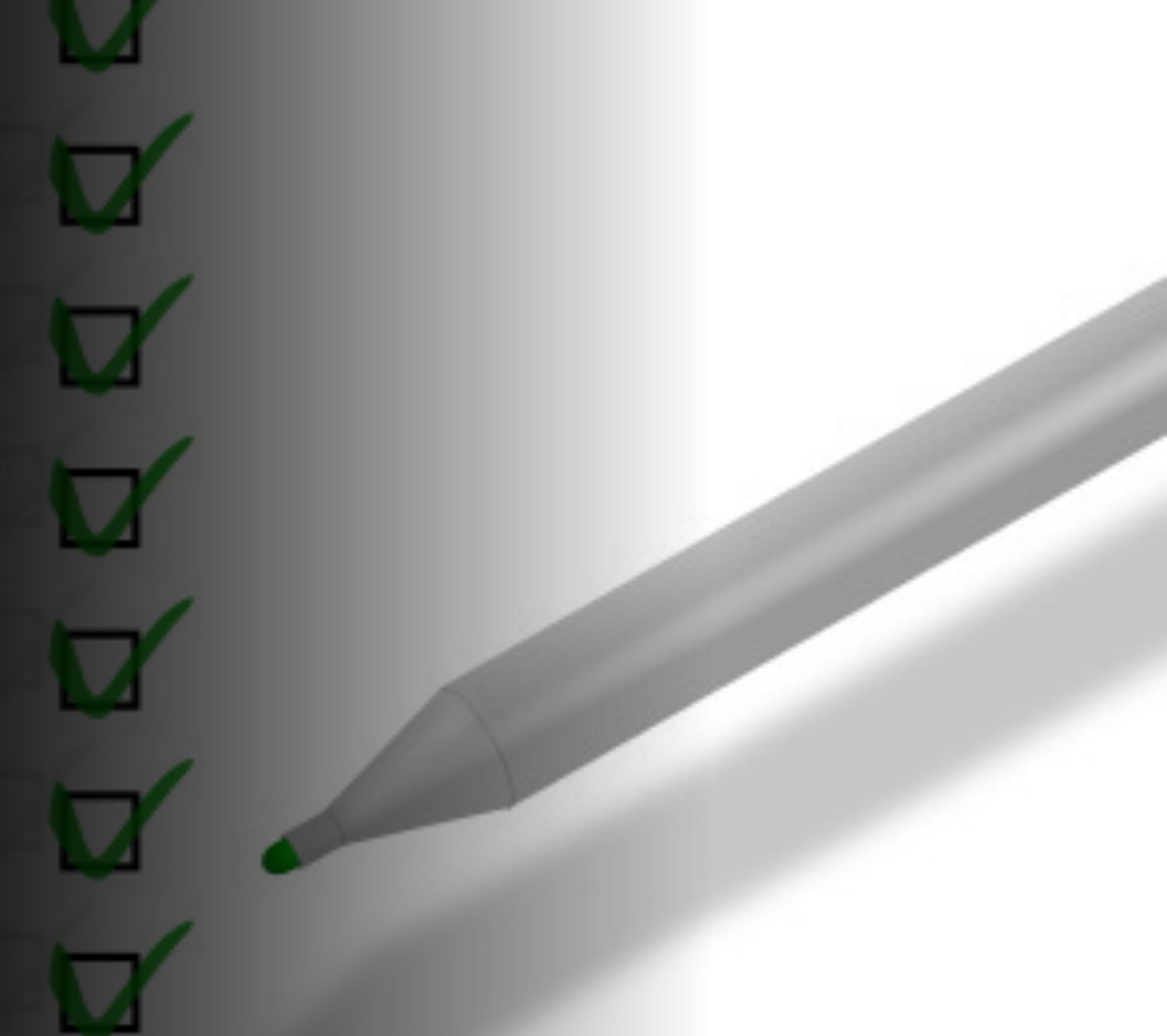


Behavior





Architecture decision records - documentation and justification



O'REILLY®



Fundamentals of Software Architecture

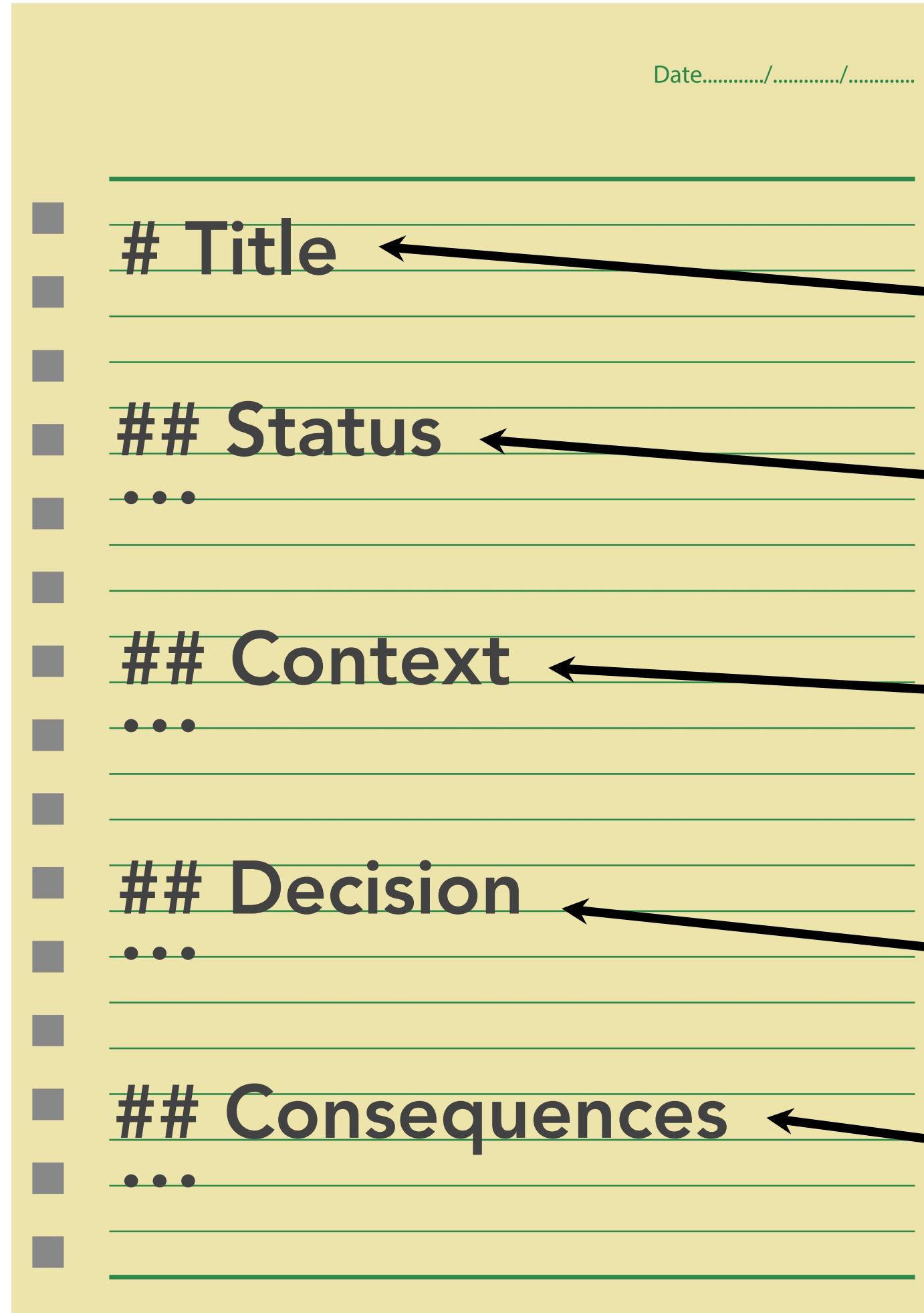
An Engineering Approach

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

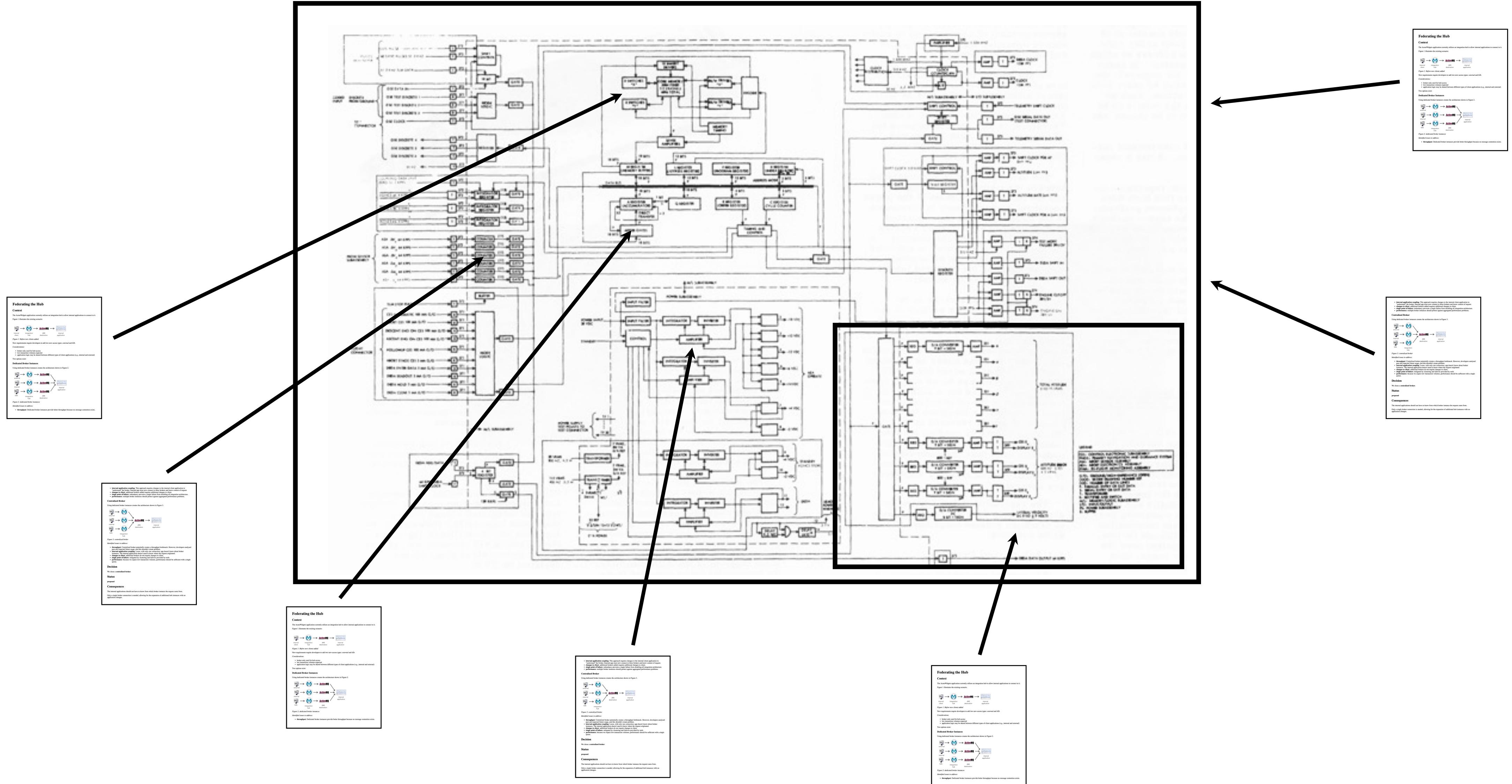
proposed, accepted, superseded

description of the problem and alternative
solutions available (documentation)

decision and justification (the “why”)

trade-offs and impact of decision

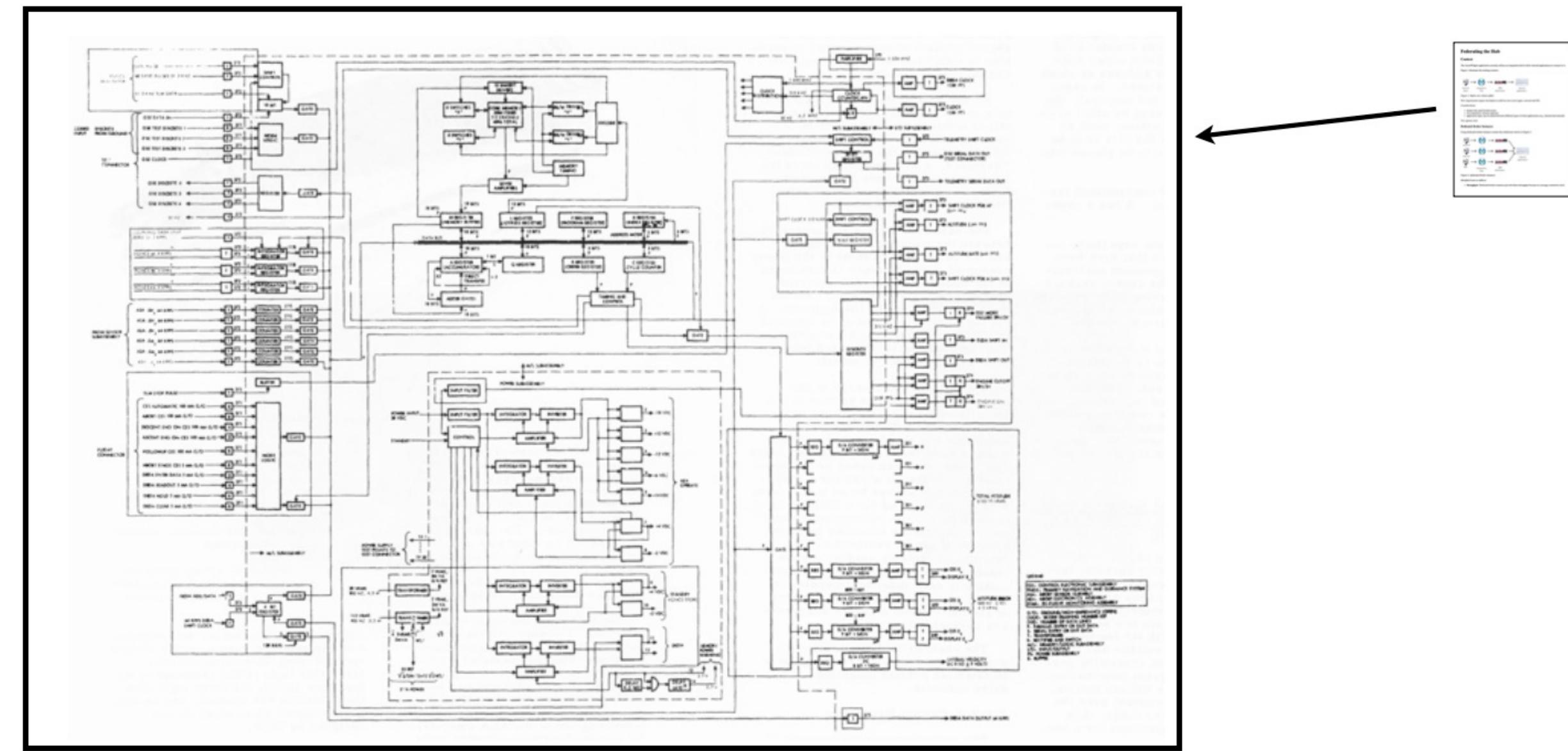
architecture decision records



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

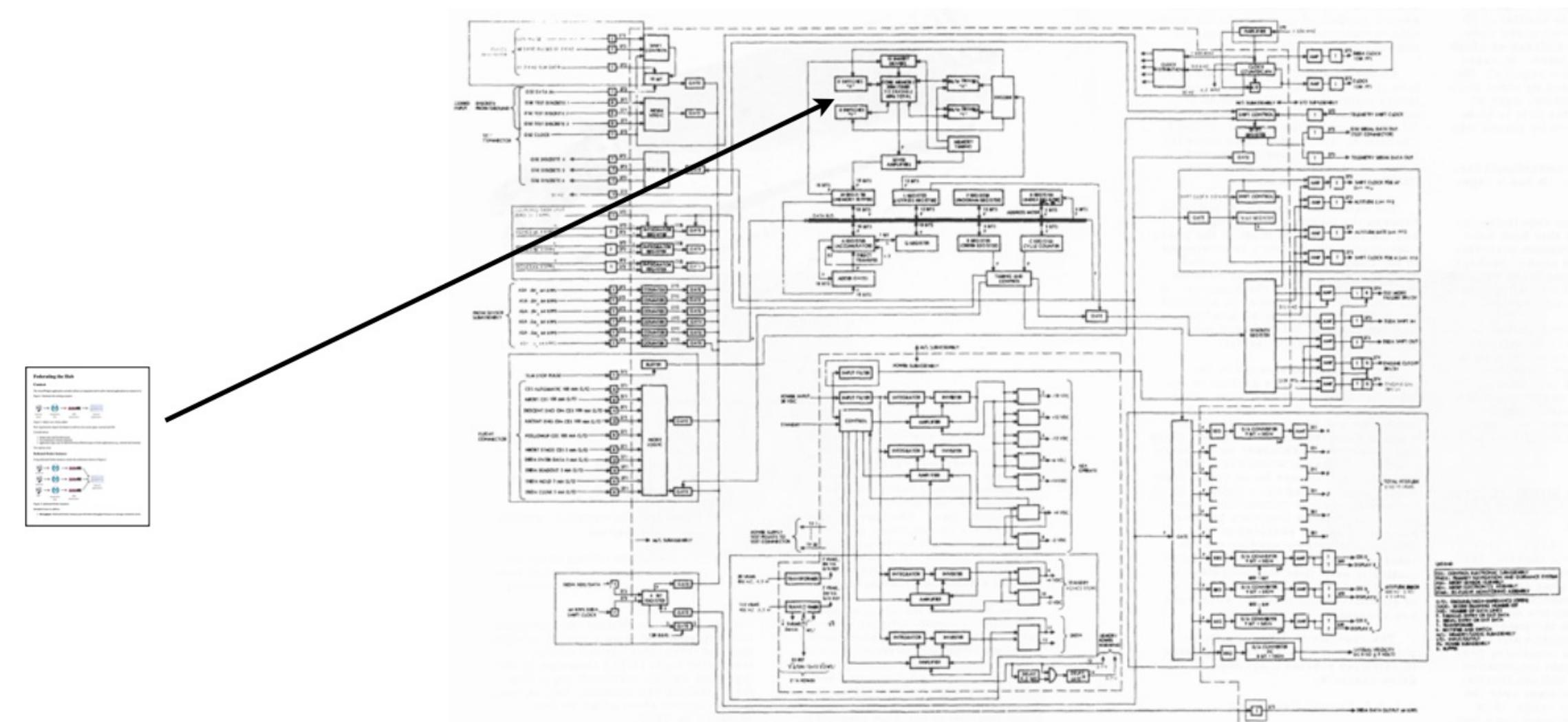
There was some confusion around the purpose of the notification component. Specifically, is this component an event bus for **all** communication or is it a shared component for communicating externally.

Decision

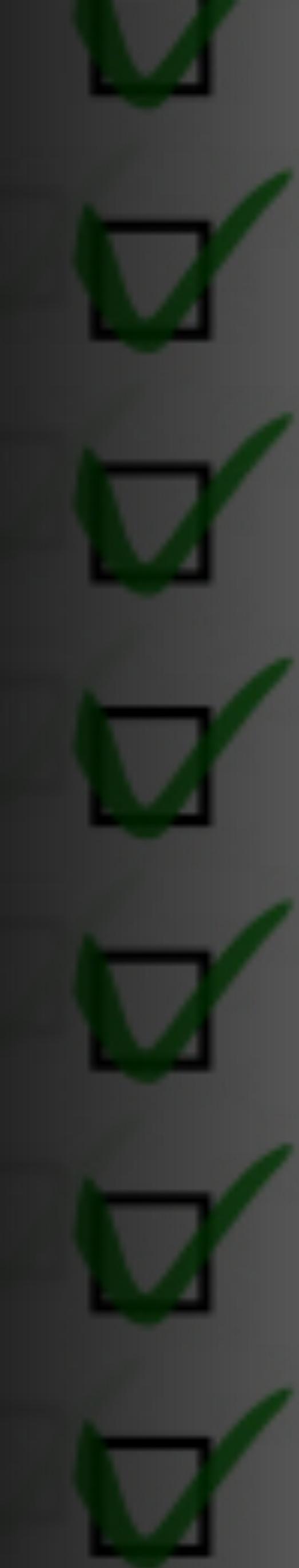
We decided to have a dedicated notification system responsible of sending external notification. The reasons include:



[selfdriveteam](#)

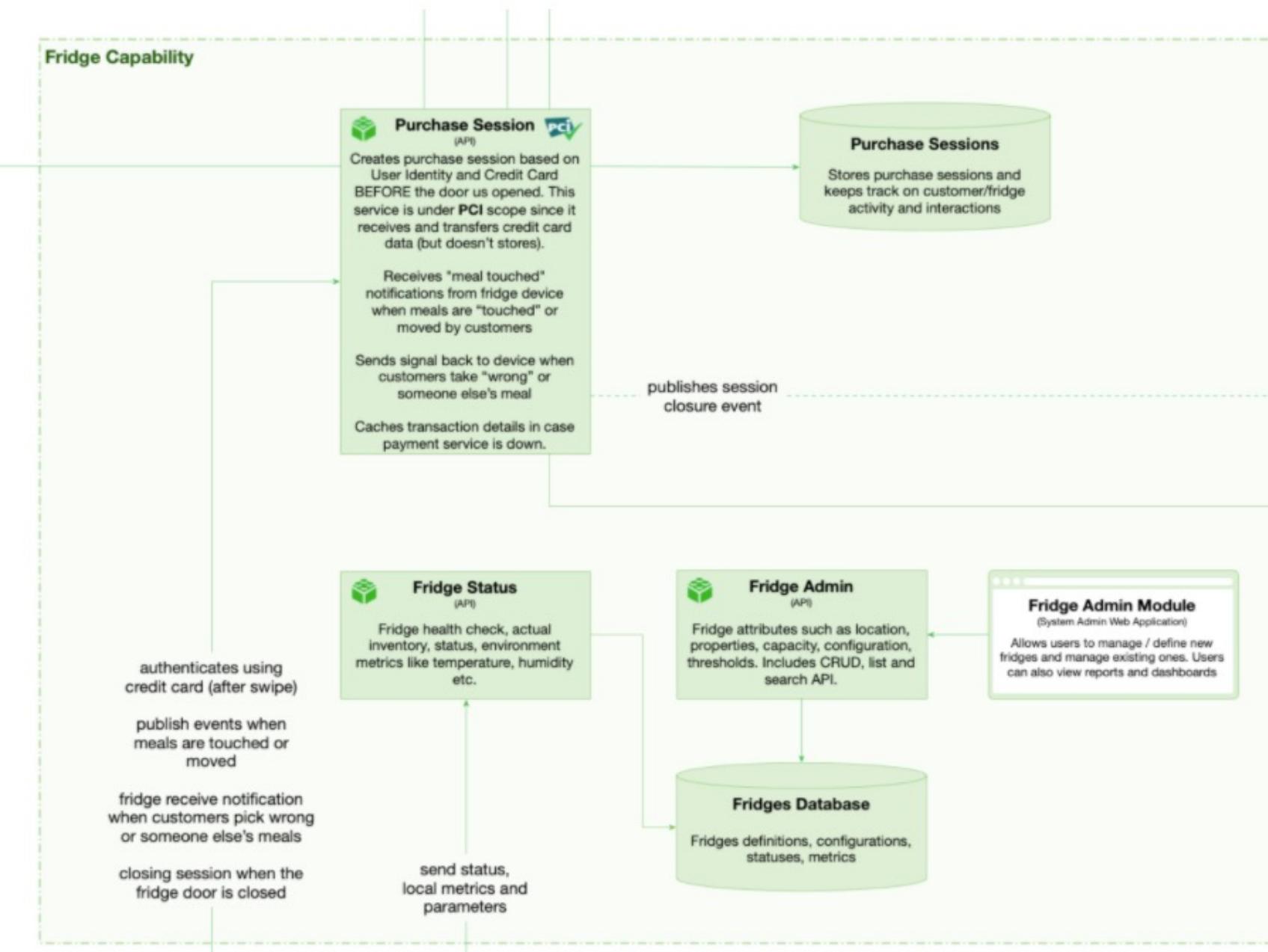


Overall solution



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

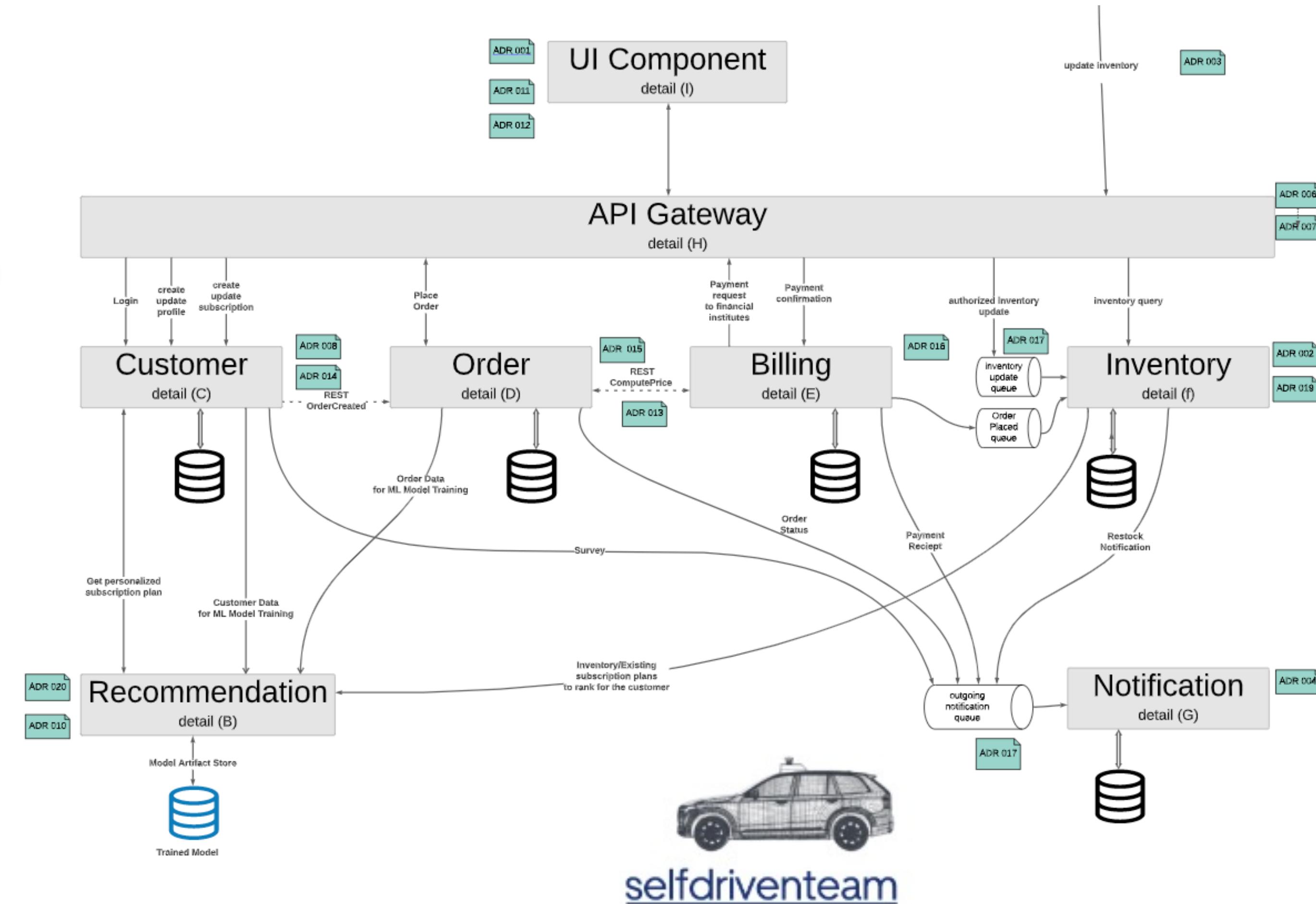
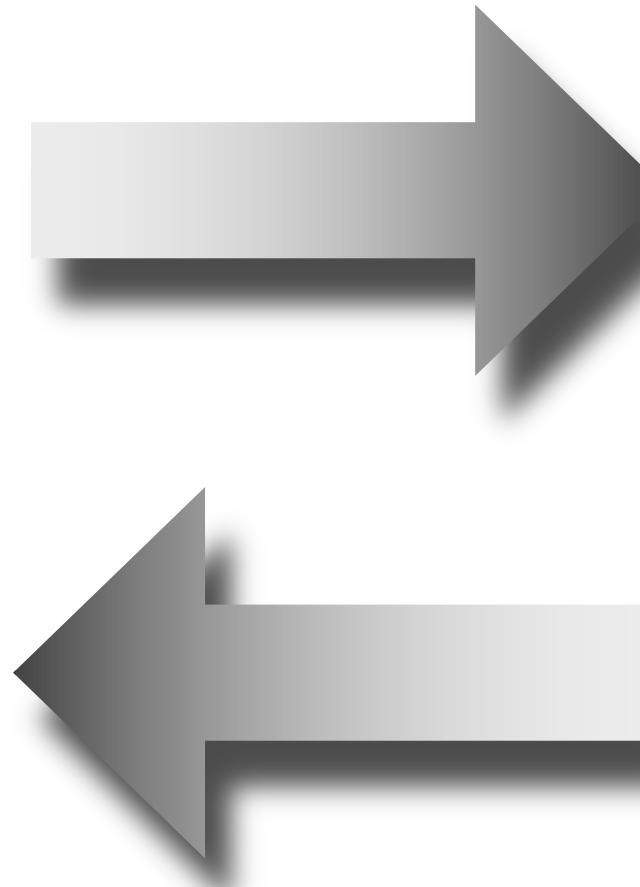
Feasibility

Agility

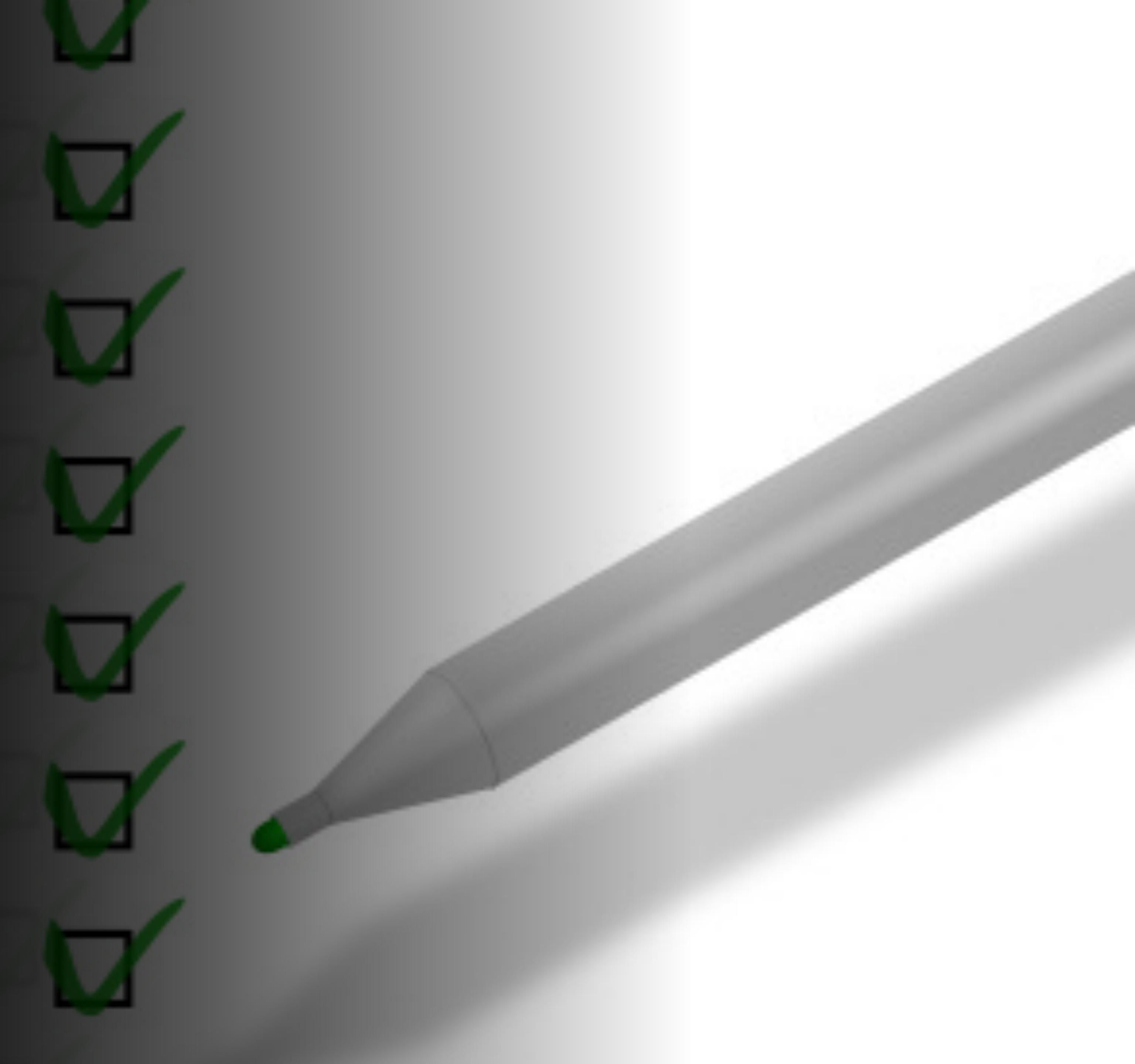
Availability

Security

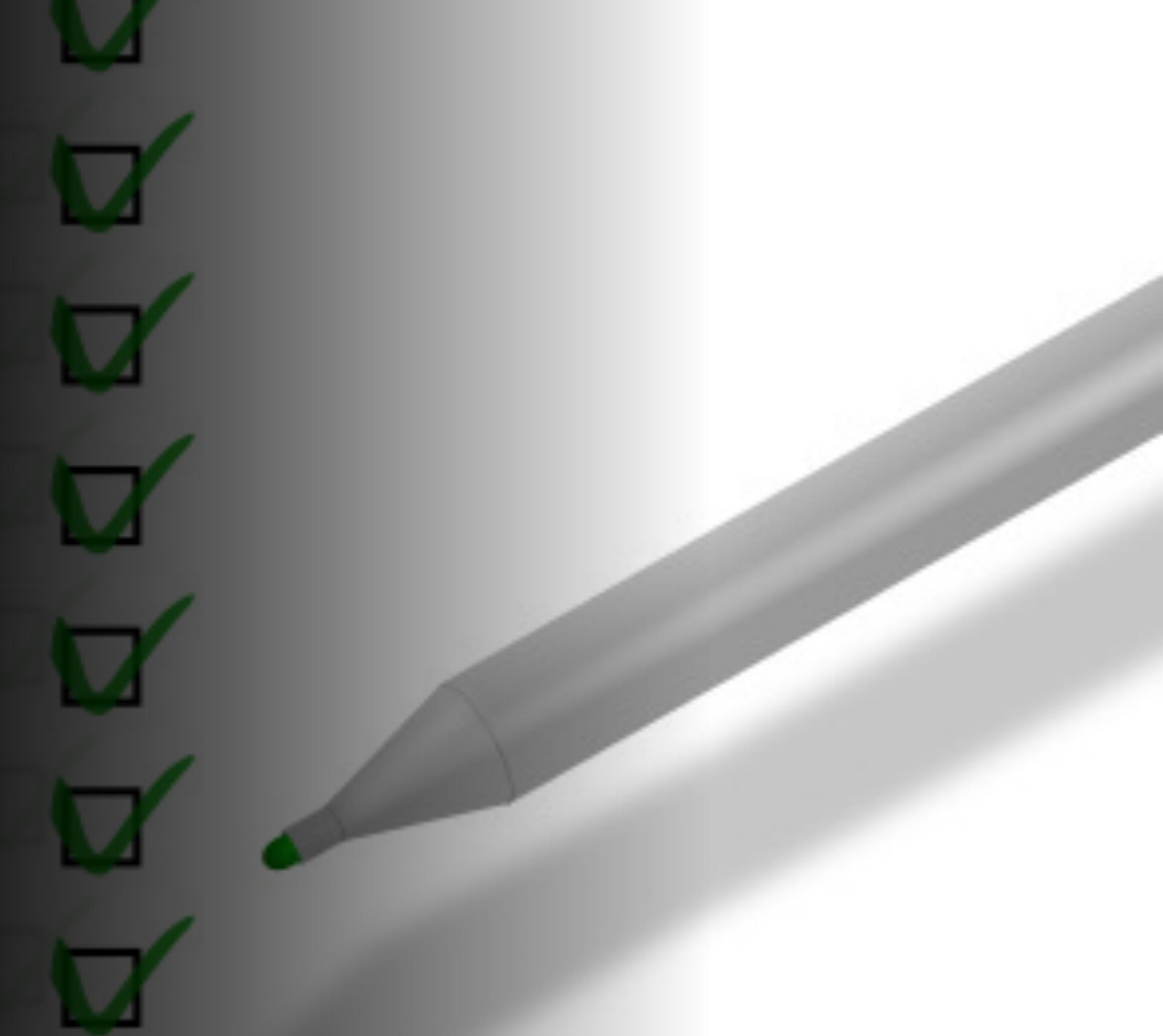
Scalability



Final architecture presentation (semi-finalist)

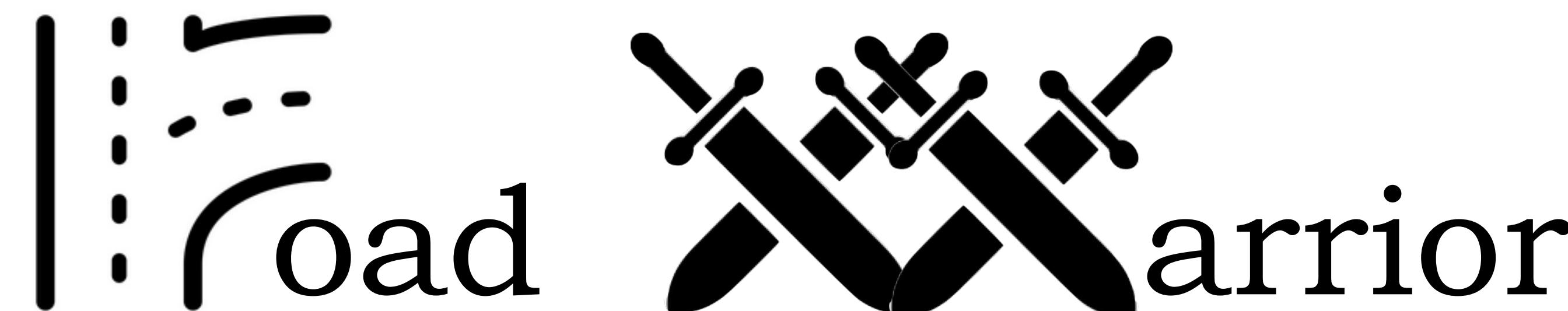


The Problem



The Road Warrior

A new startup wants to build the next generation online trip management dashboard to allow travelers to see all of their existing reservations organized by trip either online (web) or through their mobile device.



users

- ❑ 2 million active users/week
- ❑ total users: 15 million (user accounts)

requirements

- ❑ Poll email looking for travel-related emails
- ❑ Filter and whitelist certain emails
- ❑ The system must interface with the agency's existing airline, hotel, and car rental interface system to update travel details (delays, cancellations, updates, gate changes, etc.).
Updates must be in the app within 5 minutes of an update (better than the competition)
- ❑ Customers should be able to add, update, or delete existing reservations manually as well.

requirements

- ❑ Items in the dashboard should be able to be grouped by trip, and once the trip is complete, the items should automatically be removed from the dashboard.
- ❑ Users should also be able to share their trip information by interfacing with standard social media sites or allowing targeted people to view your trip.
- ❑ Richest user interface possible across all deployment platforms

requirements

- ❑ Provide end-of-year summary reports for users with a wide range of metrics about their travel usage
- ❑ Road Warrior gathers analytical data from users trips for various purposes - travel trends, locations, airline and hotel vendor preferences, cancellation and update frequency, and so on.

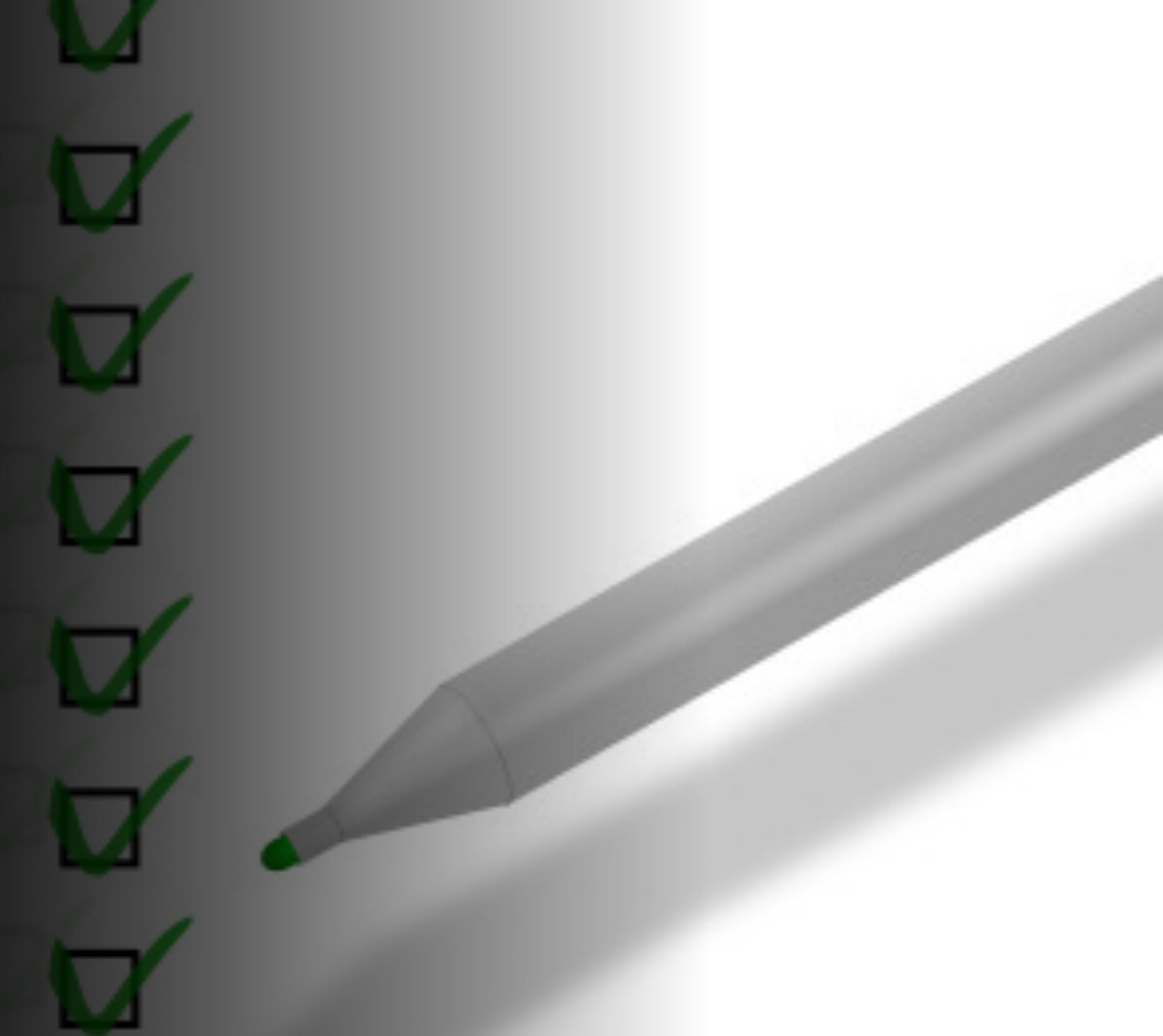
additional context

- ❑ must integrate seamlessly with existing travel systems (i.e, SABRE, APOLLO)
- ❑ Must integrate with preferred travel agency for quick problem resolution (help me!)
- ❑ must work internationally

technical requirements

- ❑ Users must be able to access the system at all times (max 5 minutes per month of unplanned downtime)
- ❑ Travel updates must be presented in the app within 5 minutes of generation by the source
- ❑ Response time from web (800ms) and mobile (First-contentful paint of under 1.4 sec)

Contest Details



Architecture Katas

Private Event Sept 2023



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