

Hands-on Visual Communication for Software Architecture

Using technical diagrams to take your
project from presentation to production



Jacqui Read

Consultant Software Architect
Founder, ReadTheArchitecture.com



tinyurl.com/jcqvcw



fosstodon.org/@tekiegirl



@tekiegirl

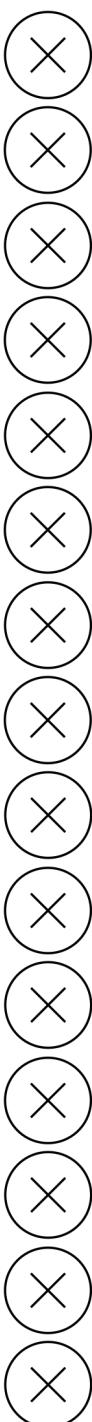


JacquiRead.com

Effective visual communication



Patterns & Antipatterns



Avoid pitfalls and improve
your diagrams

Introduction

Today

Communication
Essentials

Clarify the
Clutter

Accessibility

Narrative

Notation

Composition

Smaller
Exercises

Larger
Exercises

Communication Essentials

the foundations of successful visual communication

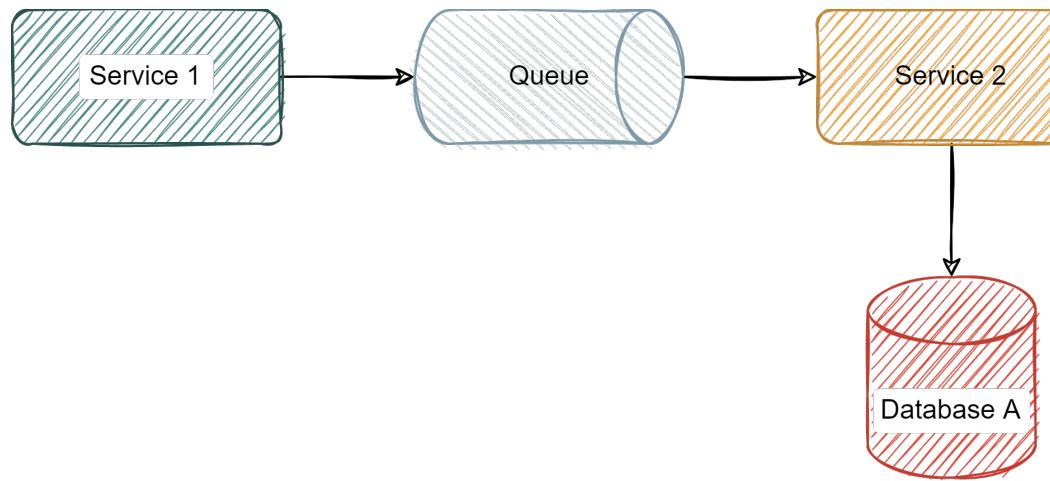
Pattern

Meta Style

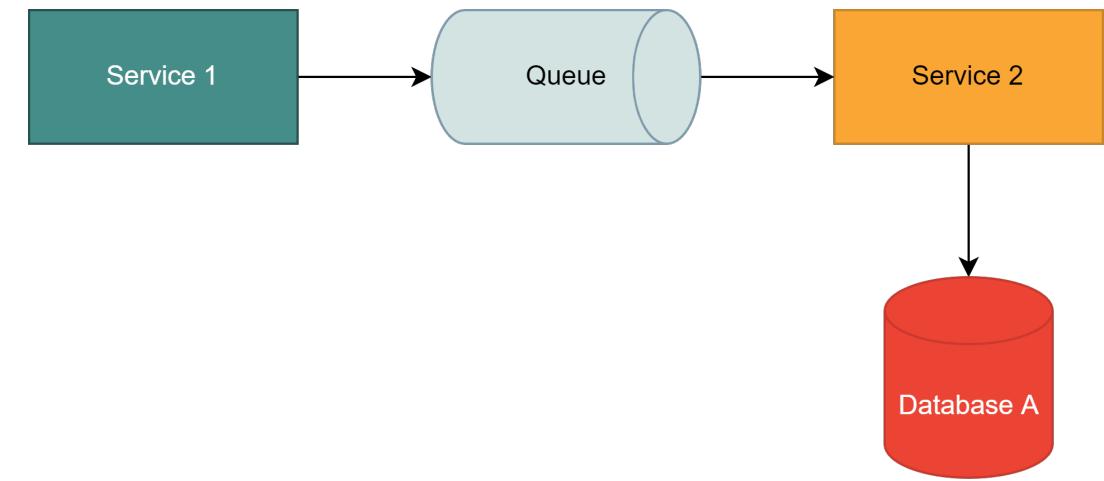
AKA: using style to communicate



Style Communicates

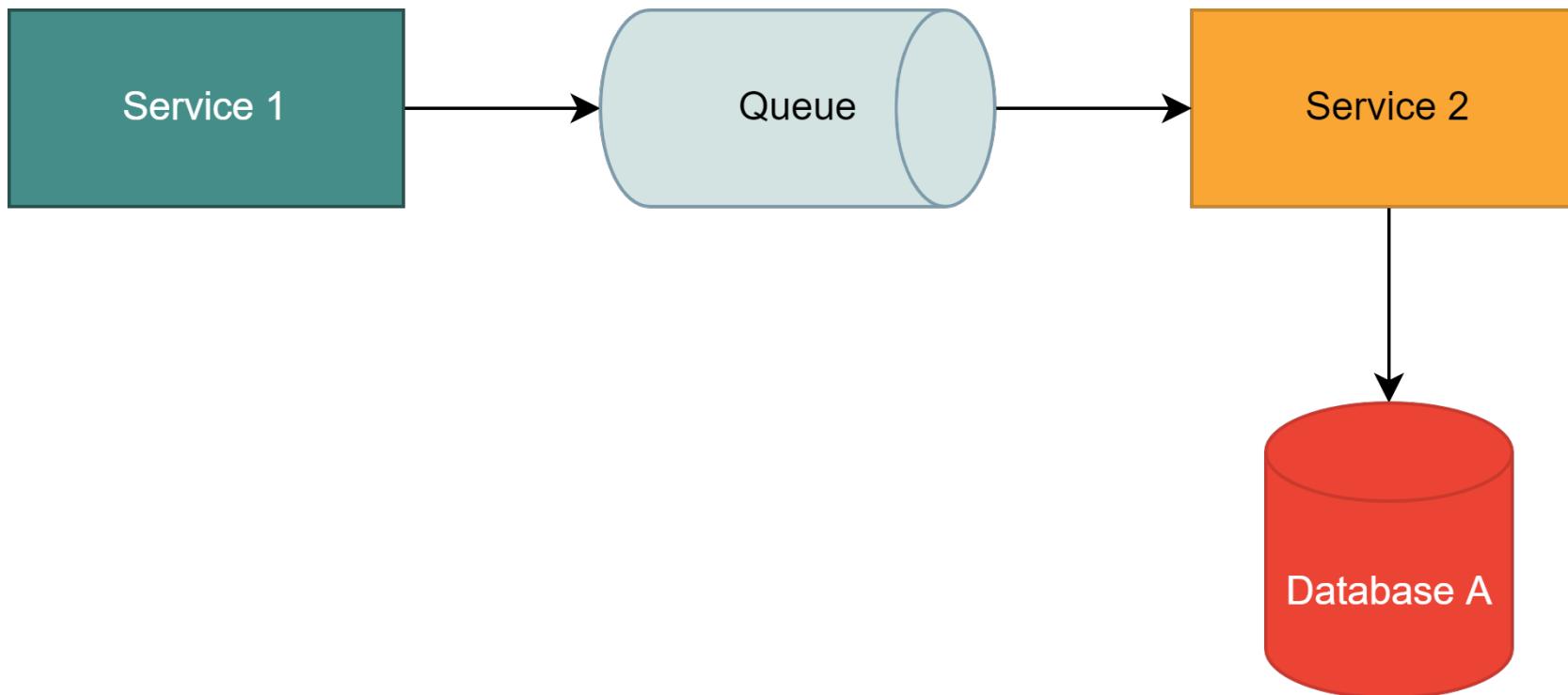


1

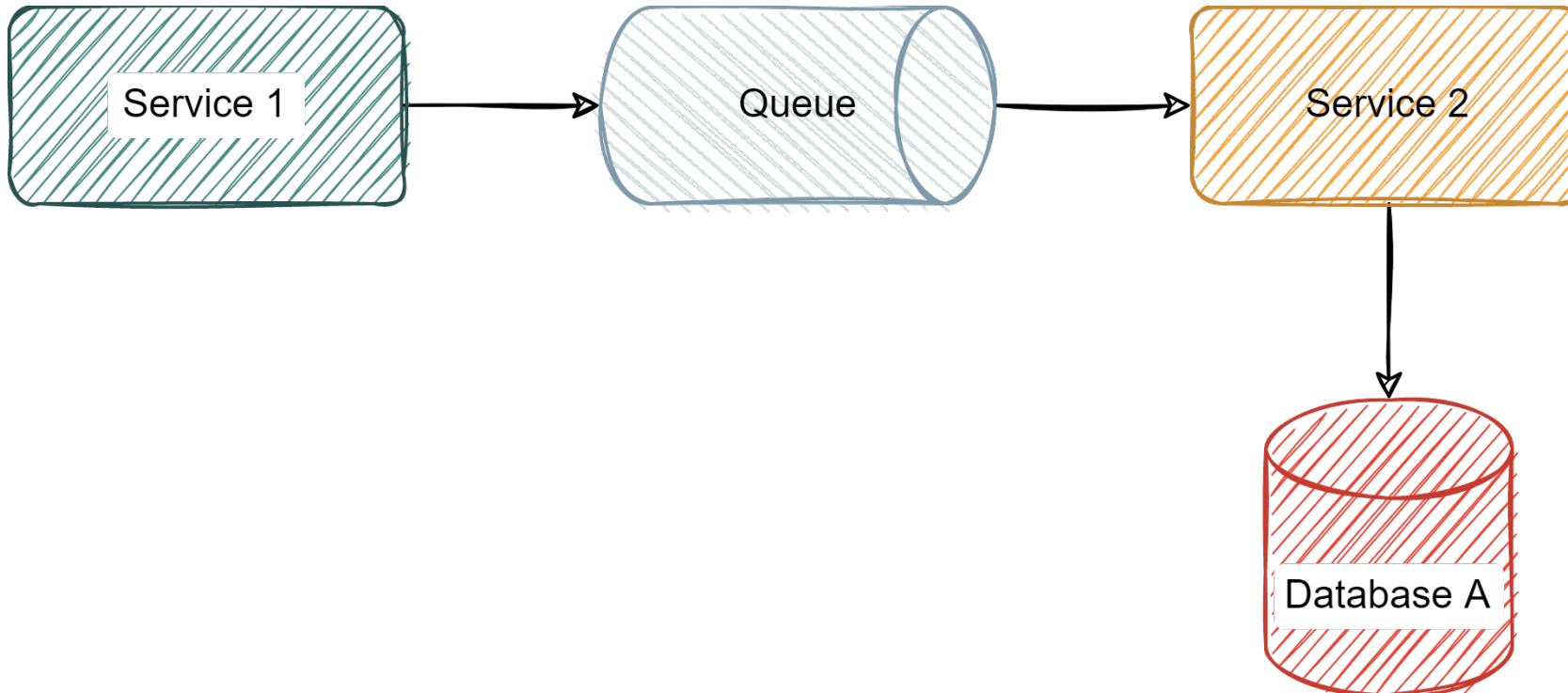


2

Style Communicates

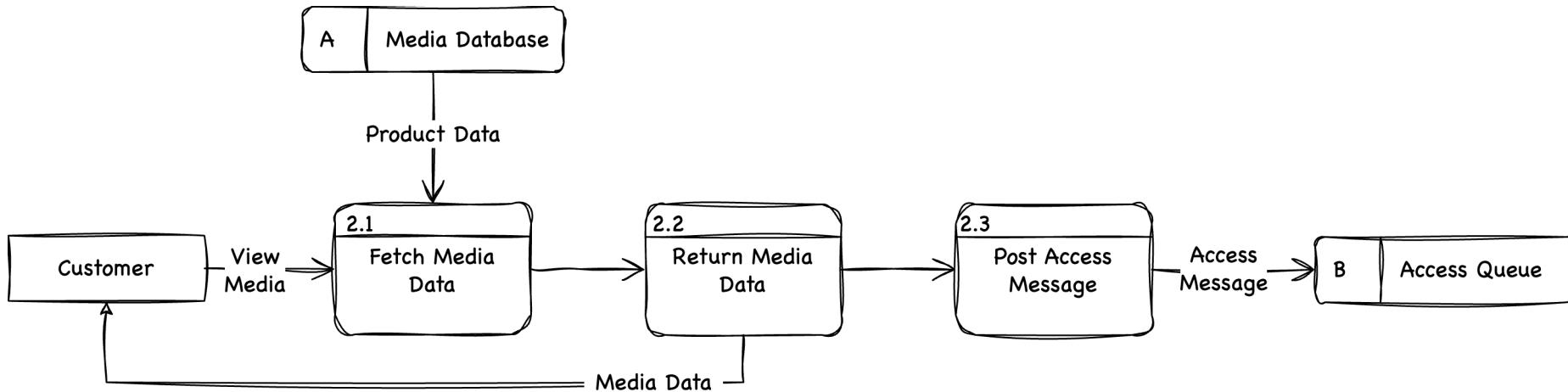


Style Communicates



Which style is correct?

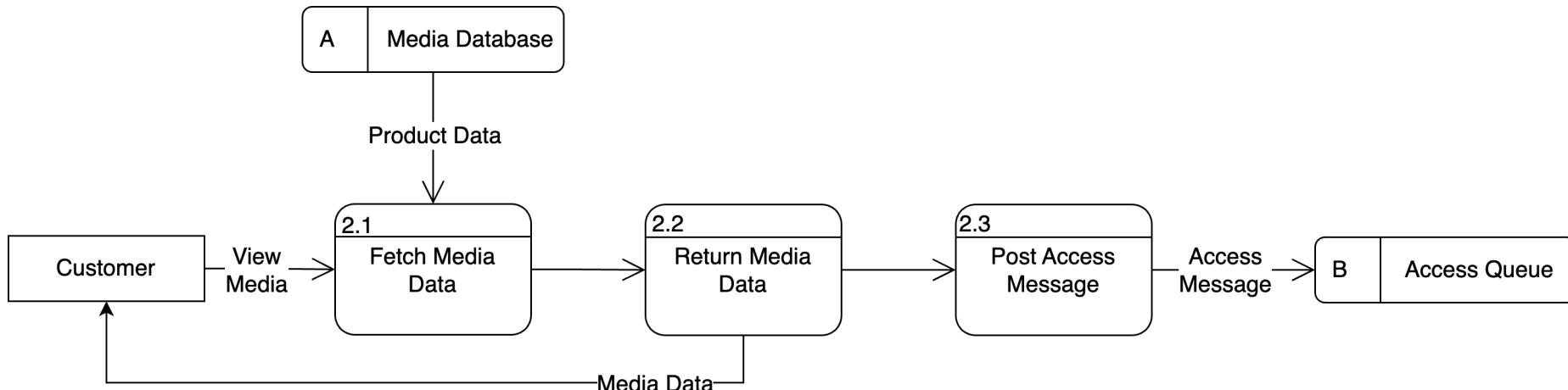
1



Polyglot Media

Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

2



Polyglot Media

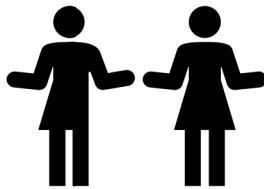
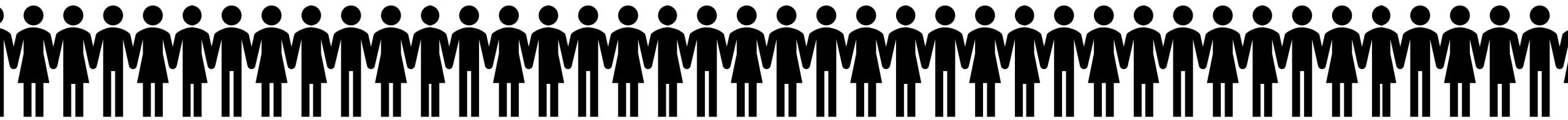
Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

Pattern

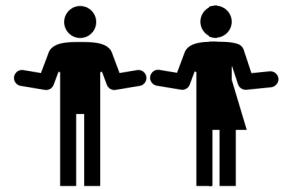
Face in the Crowd

AKA: know your audience



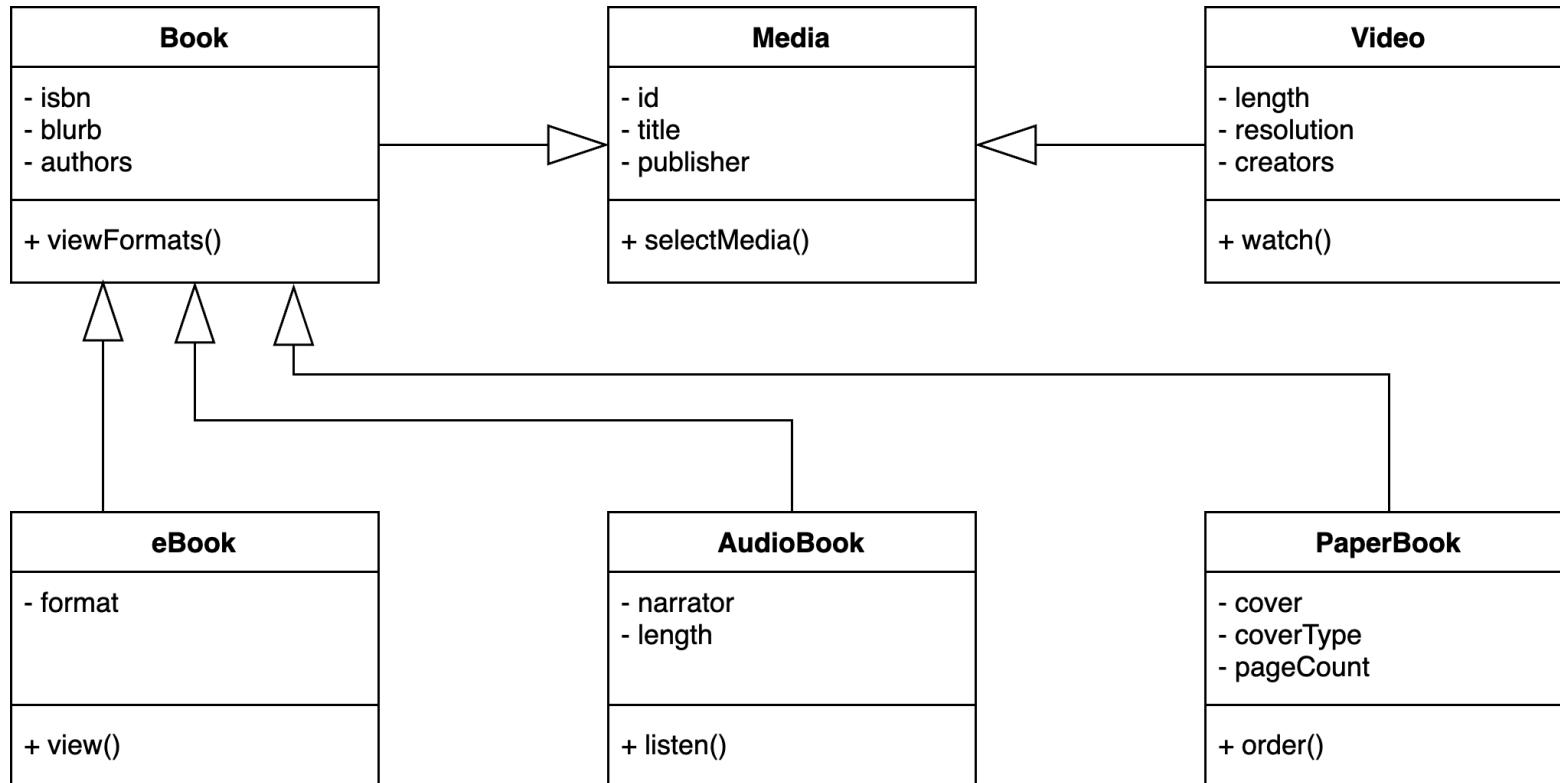


Who is your
diagram for?



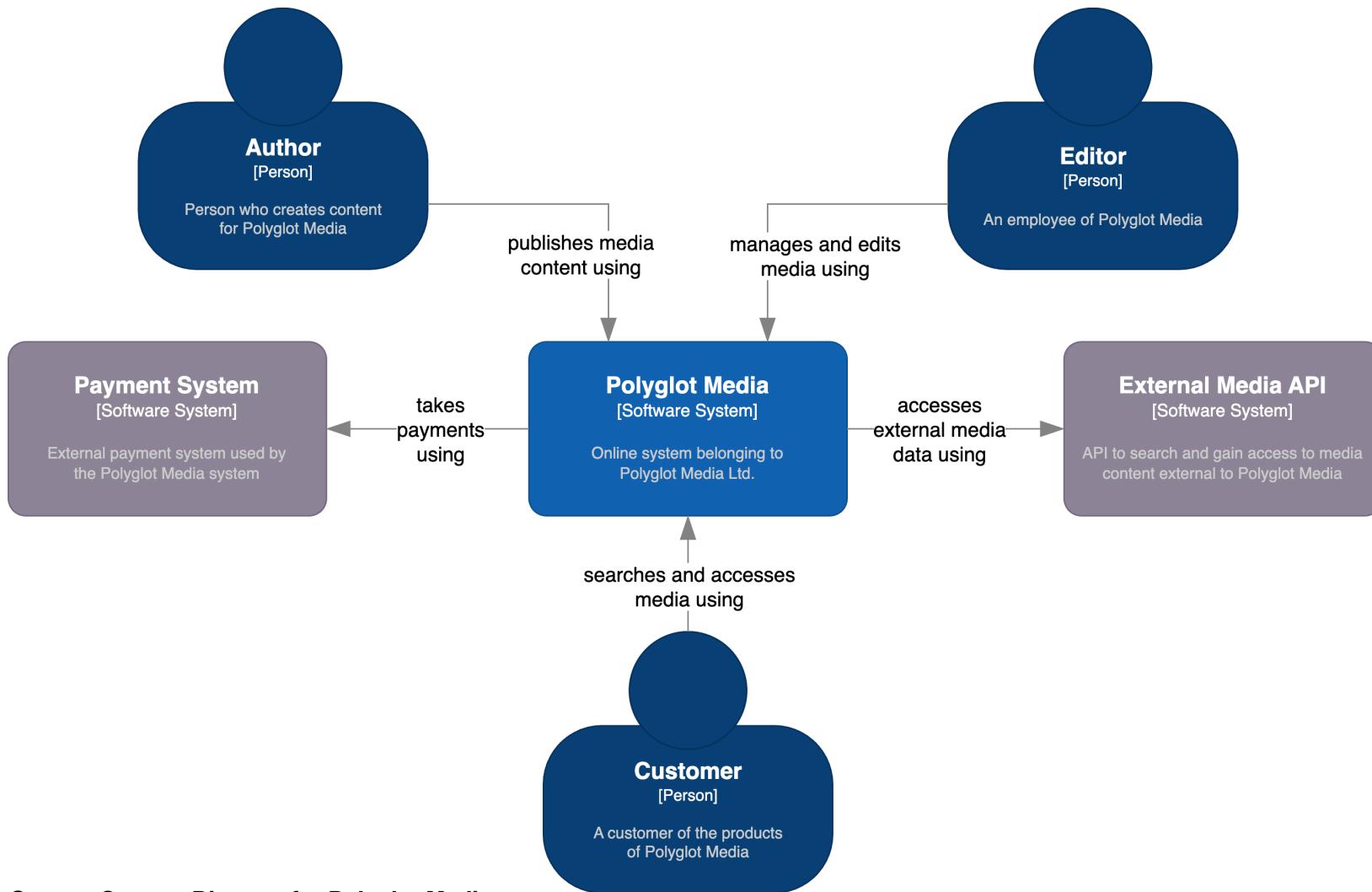
Exercise

Who is this for?



Media
Class Diagram

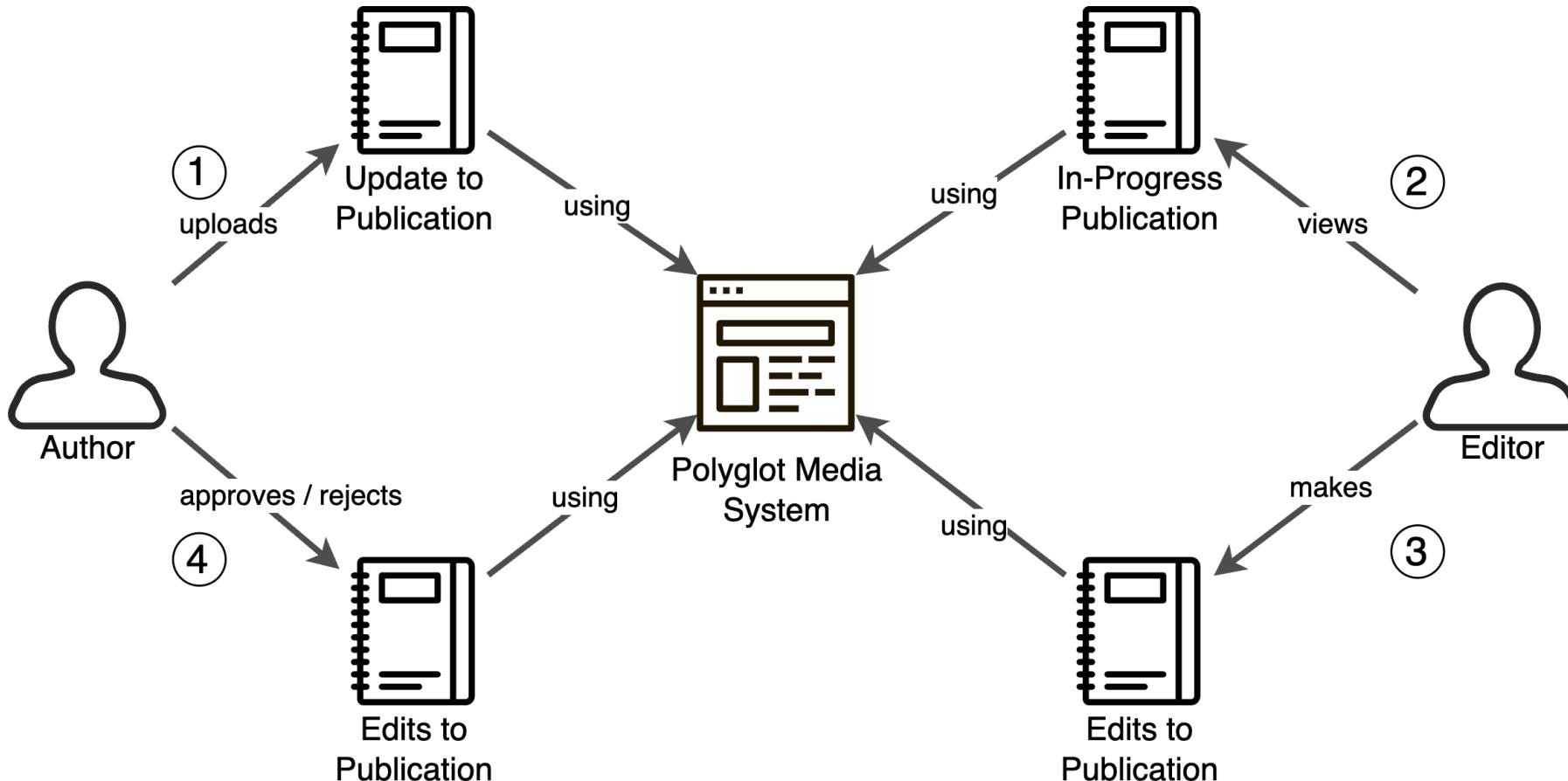
Who is this for?



System Context Diagram for Polyglot Media

Showing the high-level interactions with the Polyglot Media system.

Who is this for?



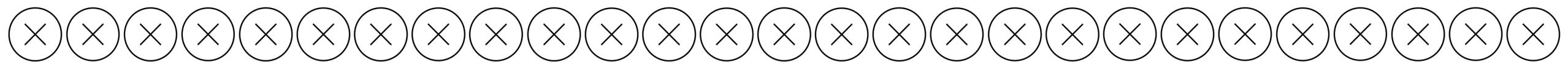
Polyglot Media

High-Level Domain Story I Publication editing process

Antipattern

Multi-Storey Diagram

AKA: mixing levels of abstraction



A 'Sin' in Coding

Presentation

Business

Persistence

Database

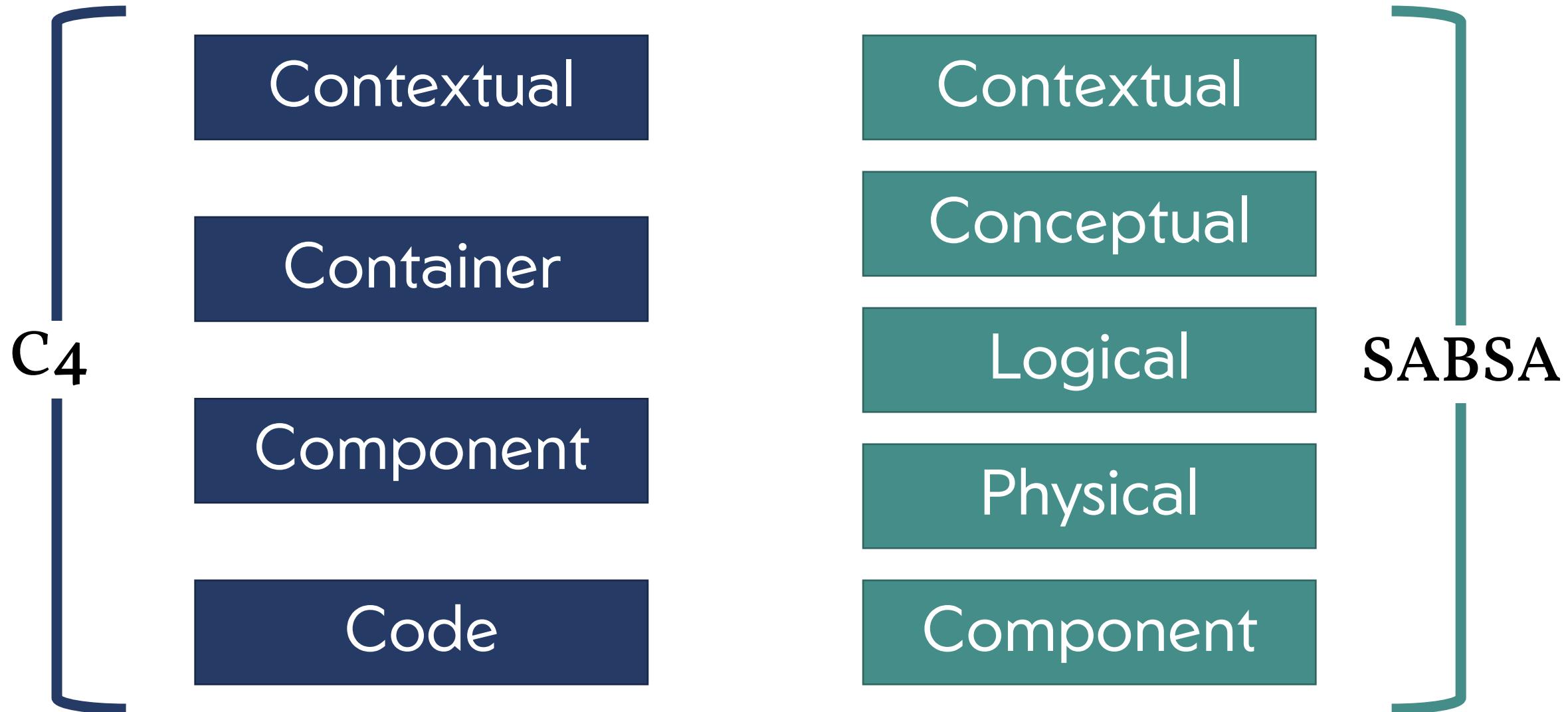
Presentation

Application

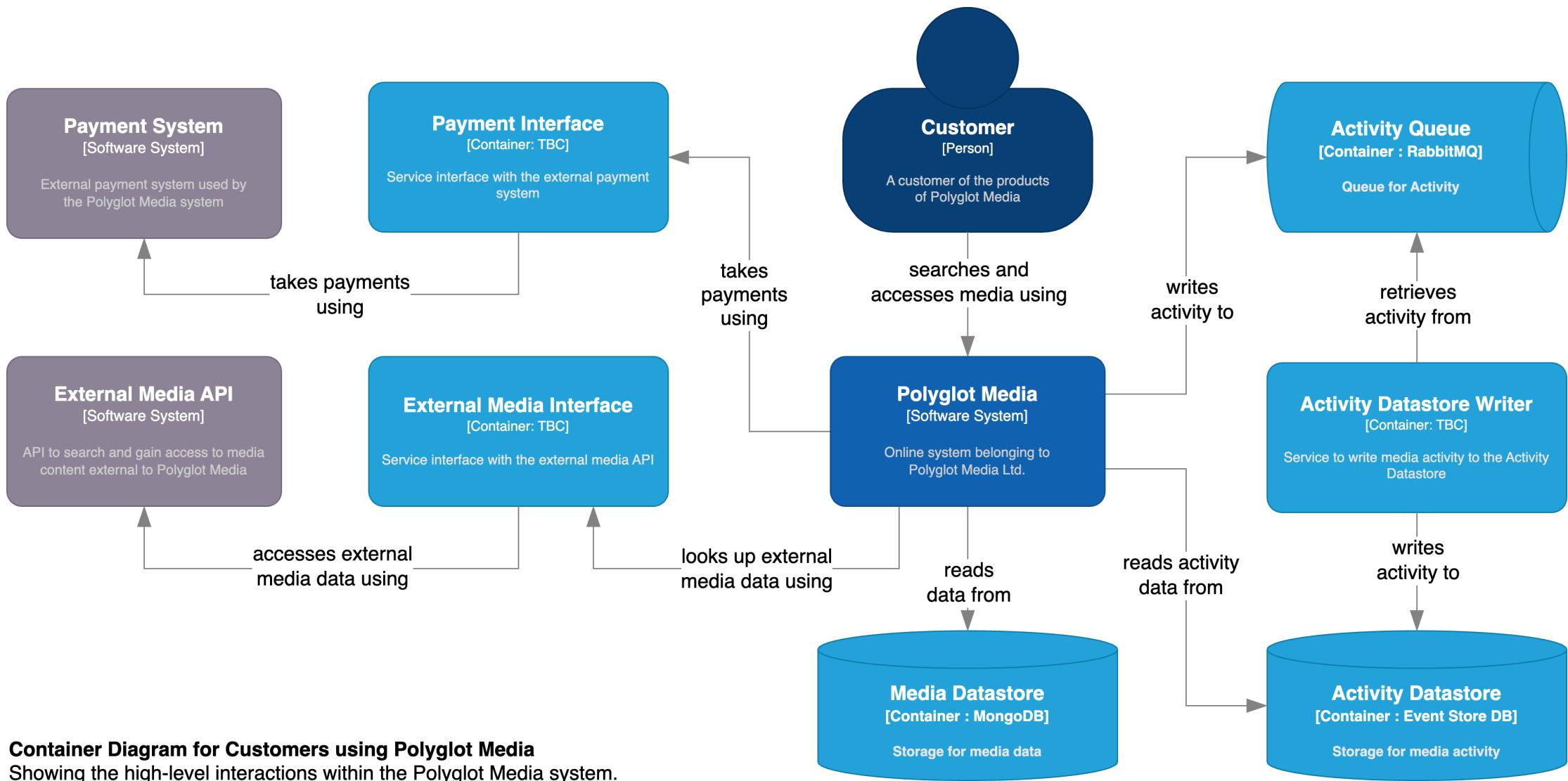
Domain

Infrastructure

Levels of Abstraction in Architecture

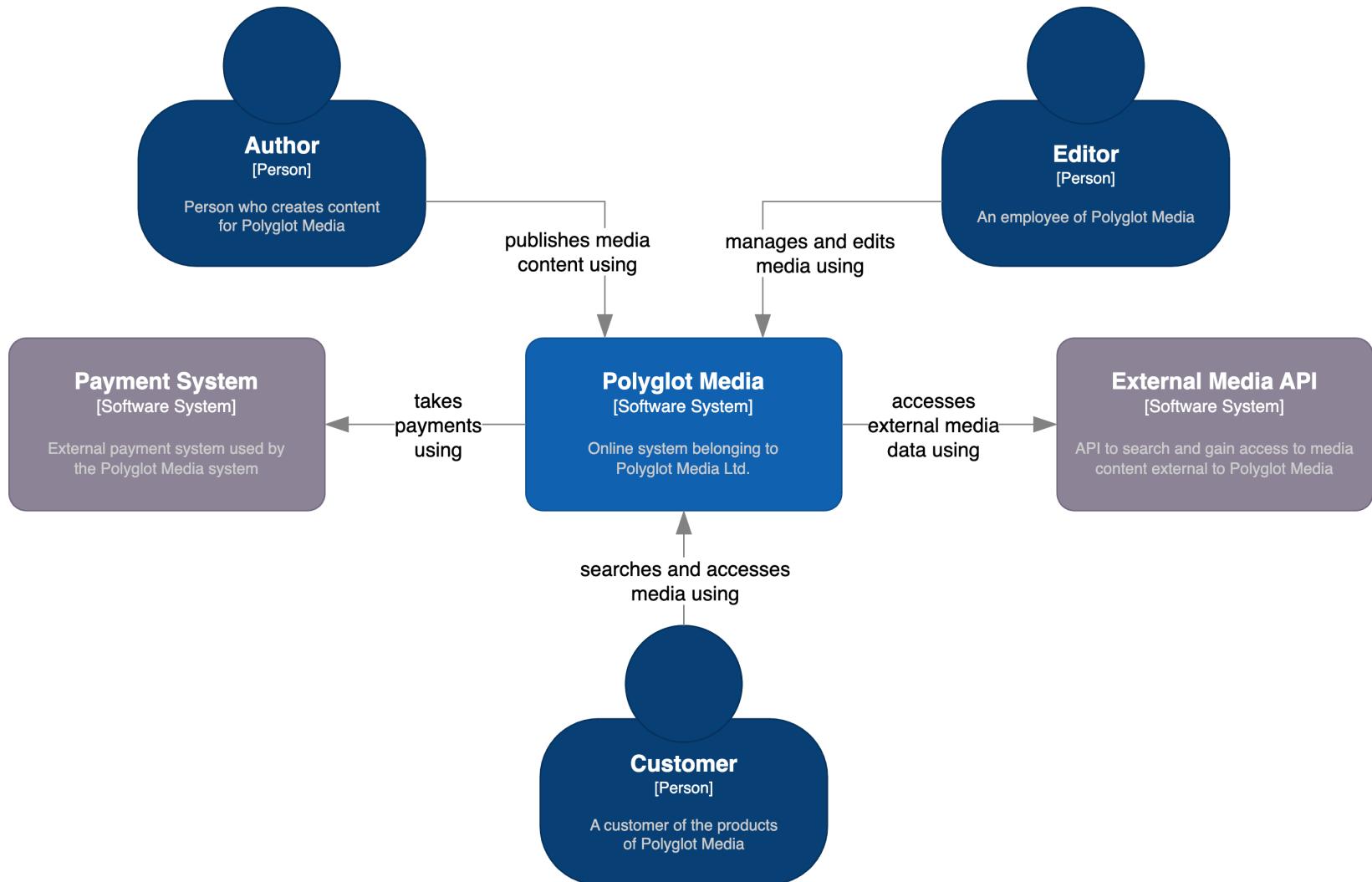


What's wrong here?





Context Diagram

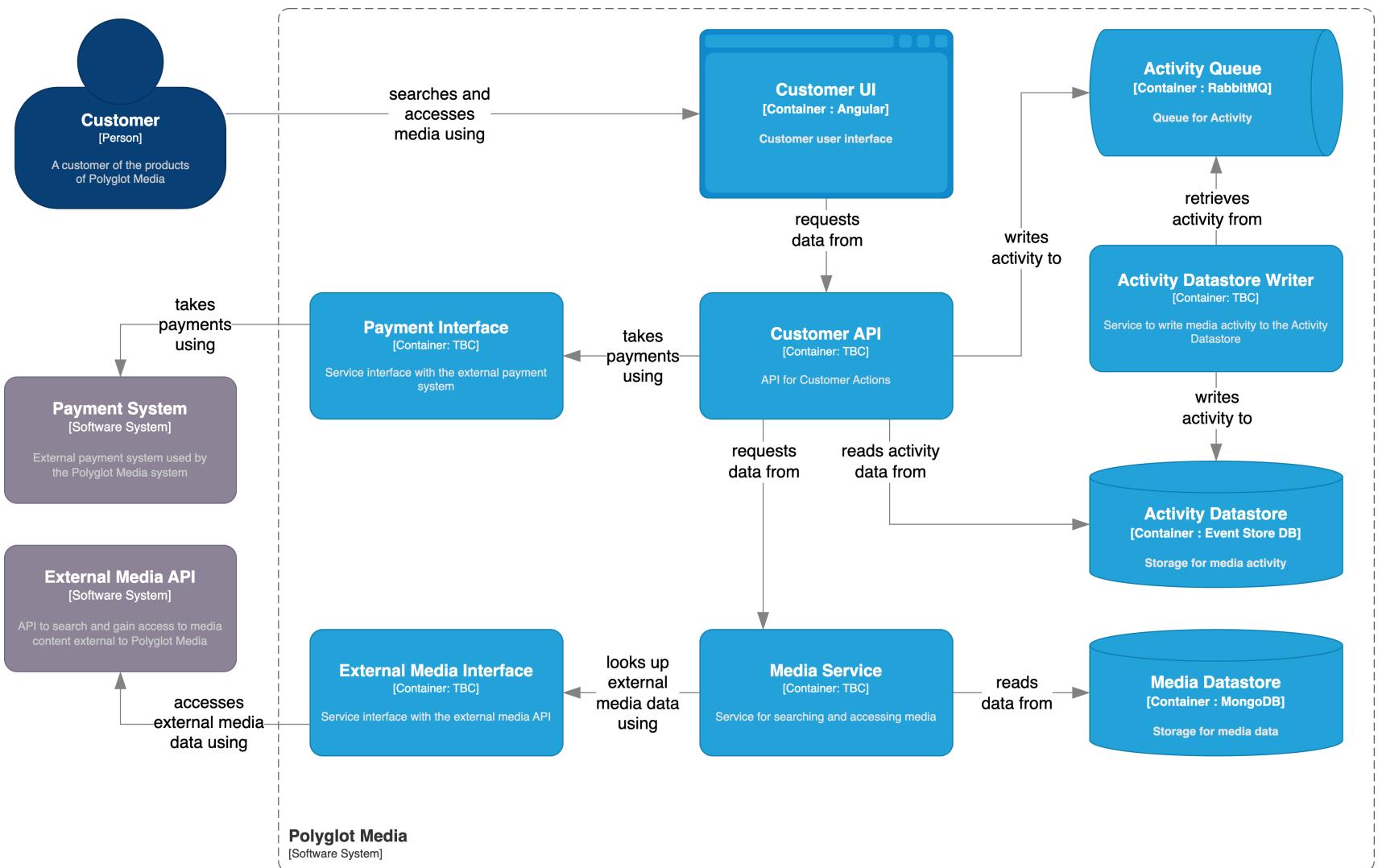


System Context Diagram for Polyglot Media

Showing the high-level interactions with the Polyglot Media system.



Container Diagram



Container Diagram for Customers using Polyglot Media
Showing the high-level interactions within the Polyglot Media system.

Clarify the Clutter

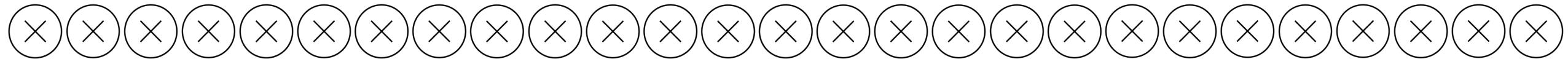
less can definitely be more

Antipattern

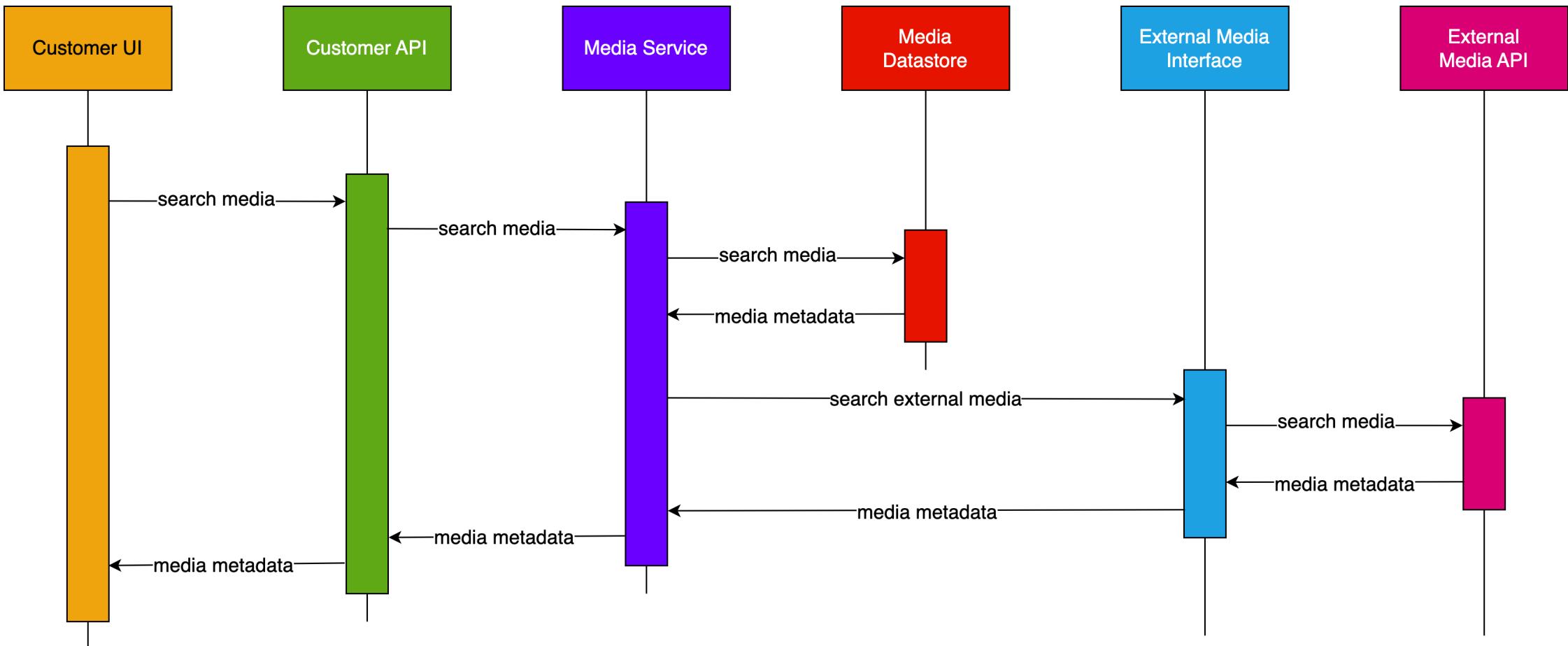
Explosion of Unicorns



AKA: Too many colours



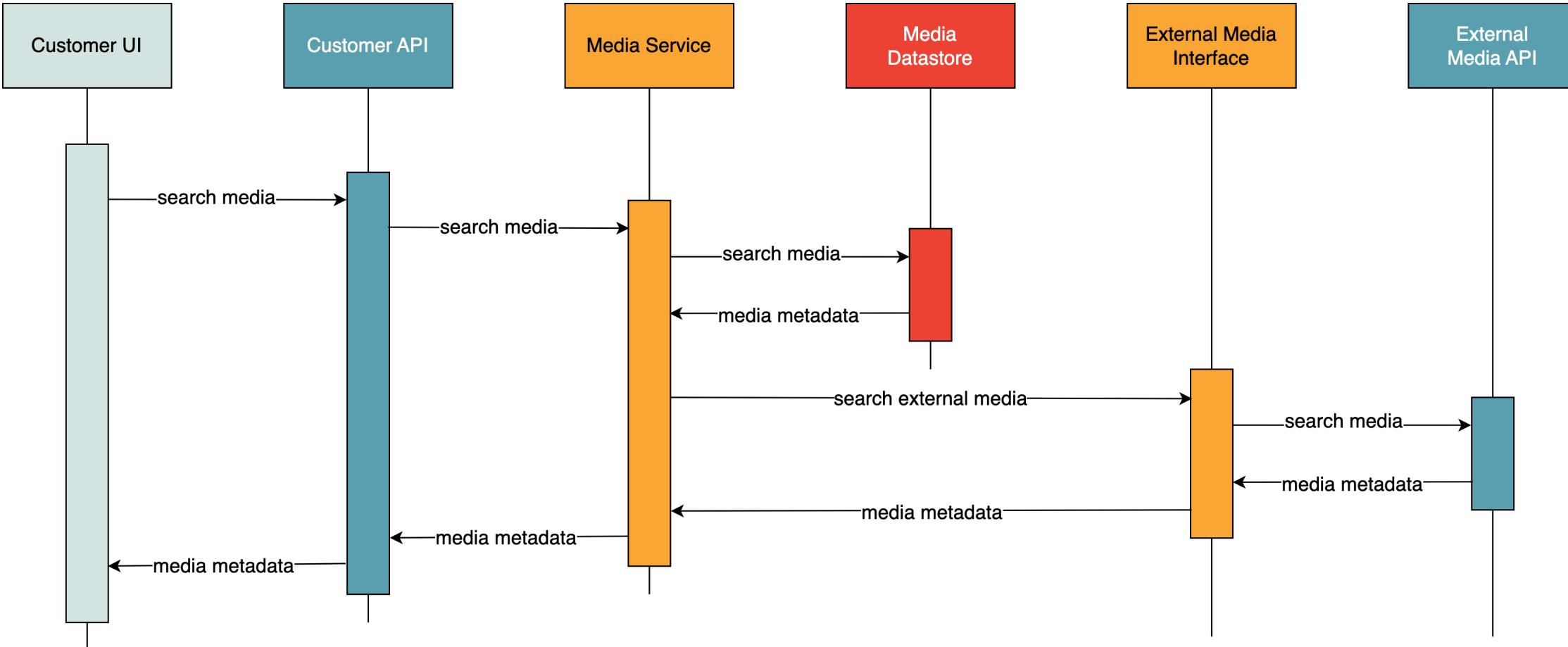
Rainbow Flow



Polyglot Media

Author submission process, post login

Group by type or function



Polyglot Media

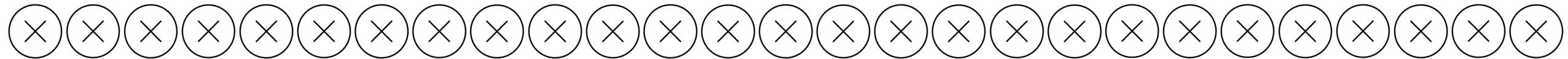
Author submission process, post login

Antipattern

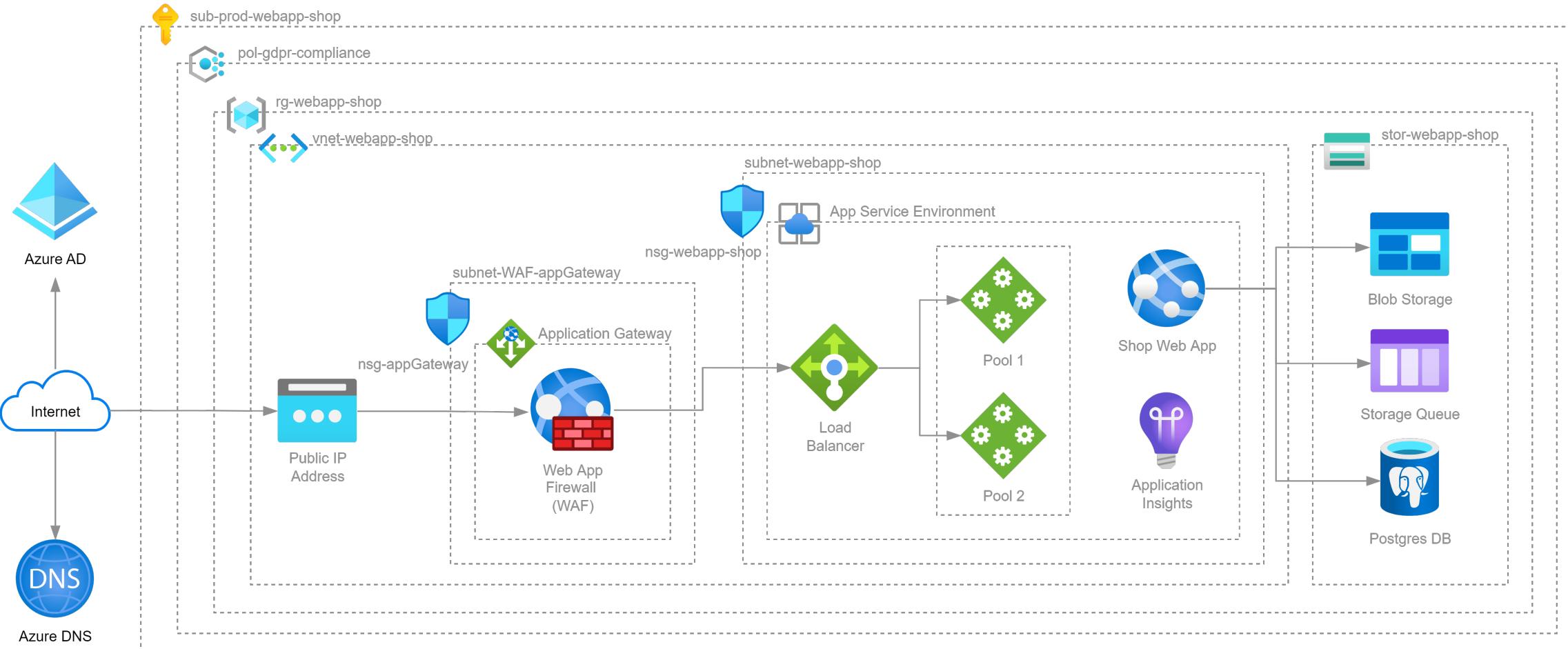
Boxed-In



AKA: too many boxes

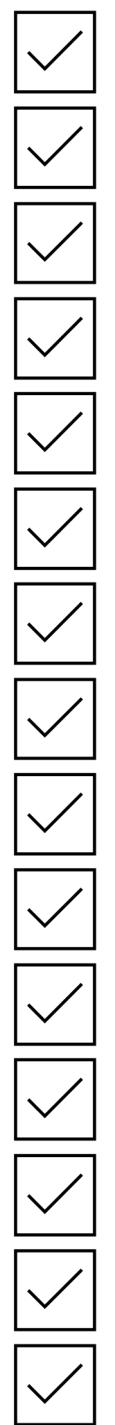


Boxes & Lines



Online Shop Web Application
Azure Resources

Decluttered



Azure AD

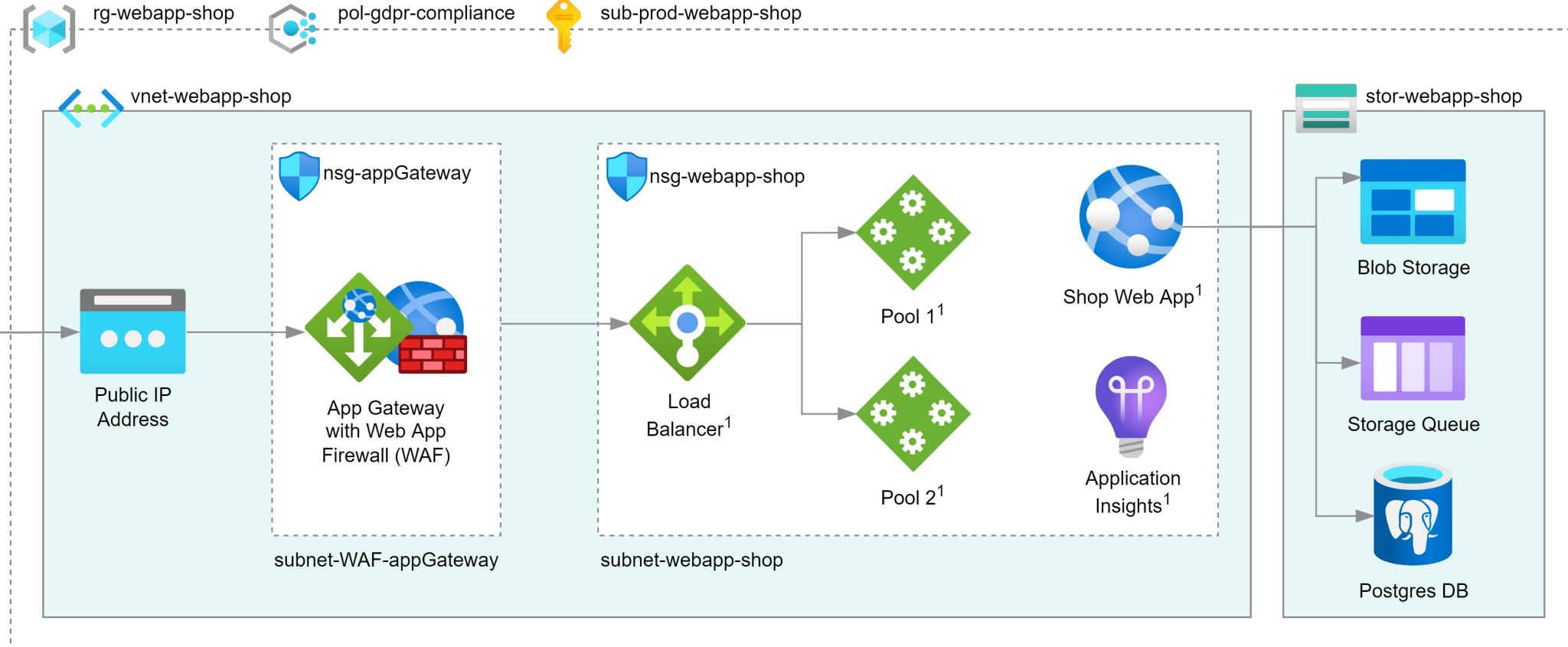


Internet



Azure DNS

Online Shop Web Application
Azure Resources



1. Within App Service Environment

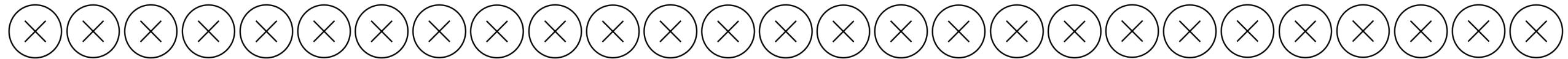


Antipattern

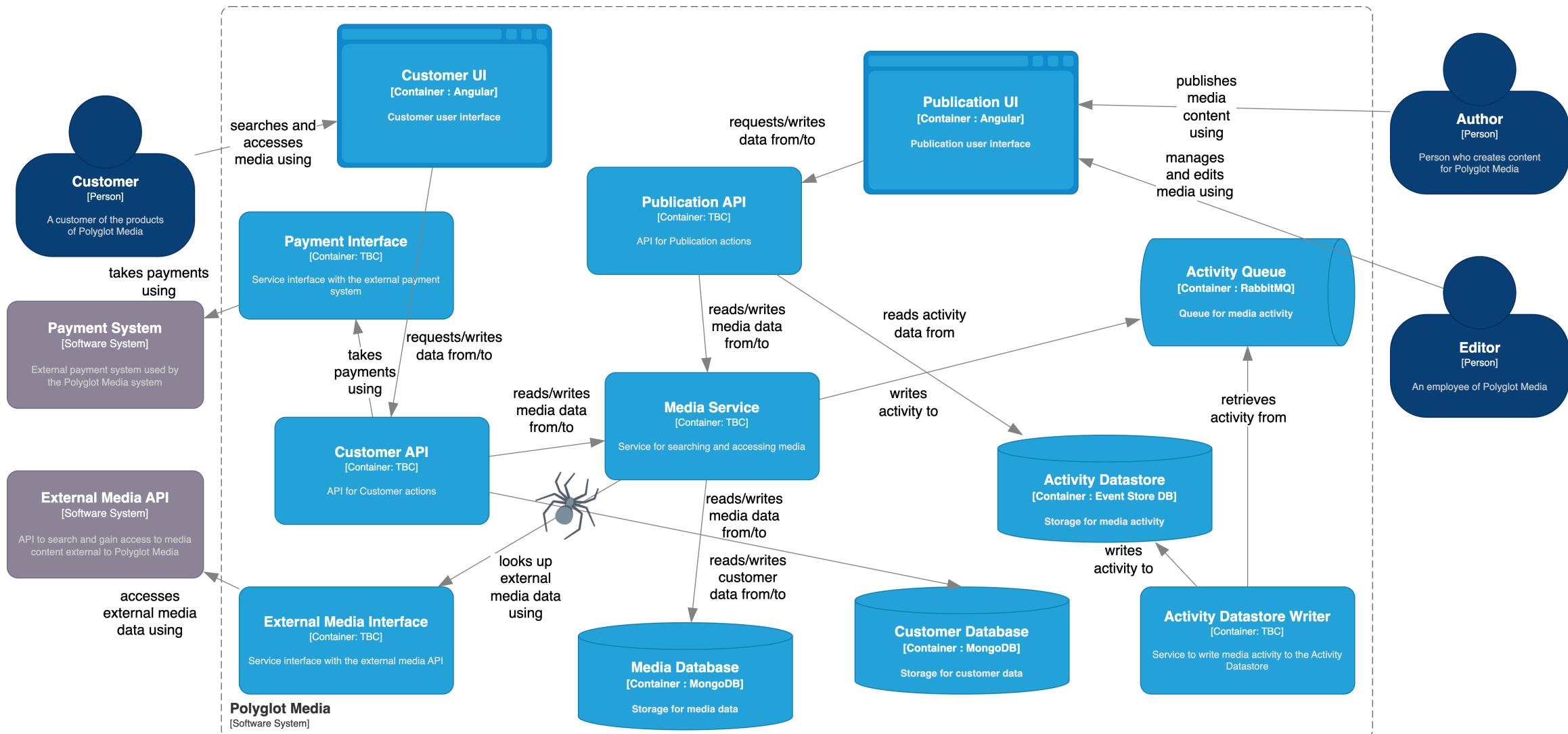
Spider's Web



AKA: unclear relationships



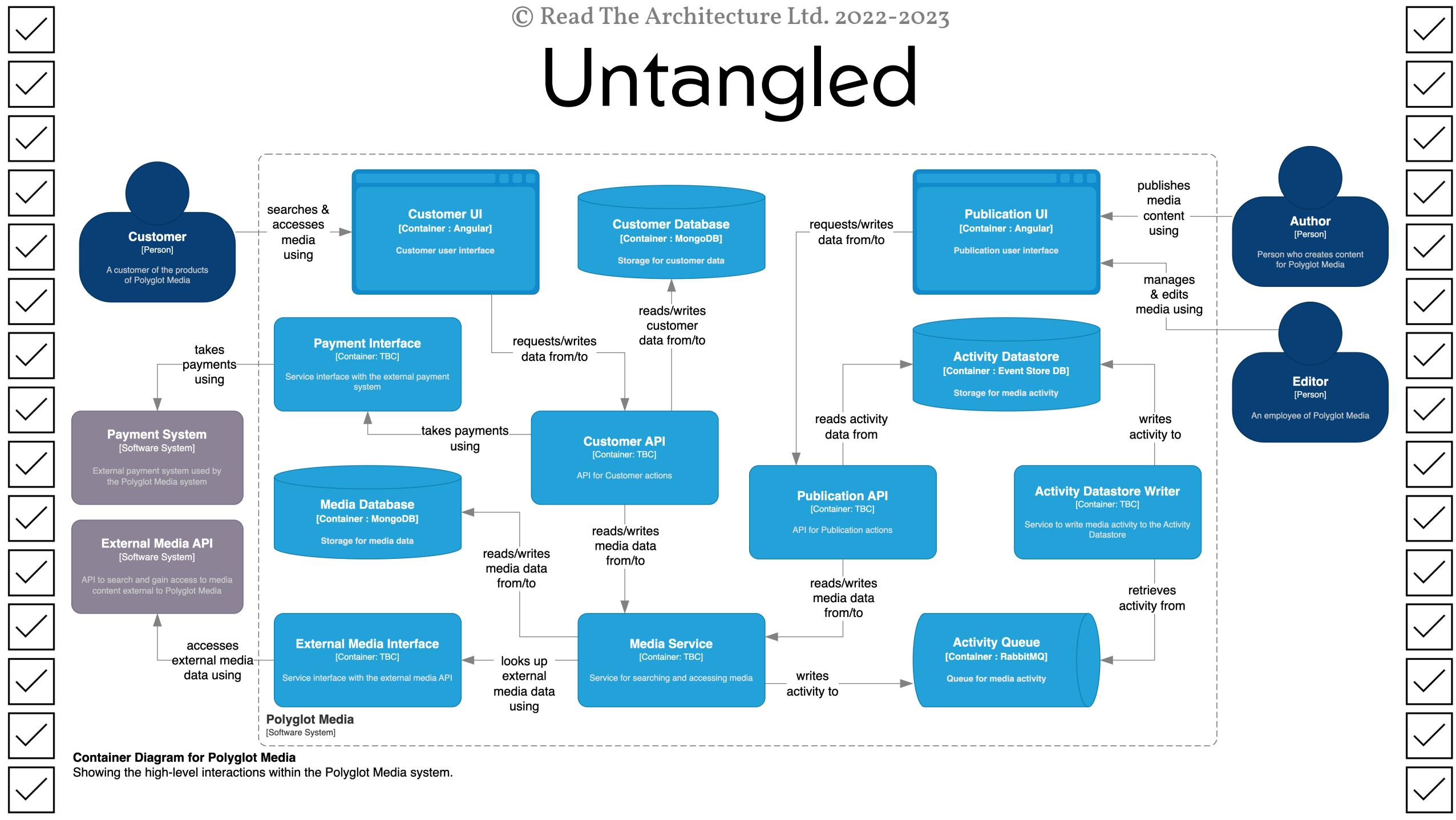
Welcome little fly...



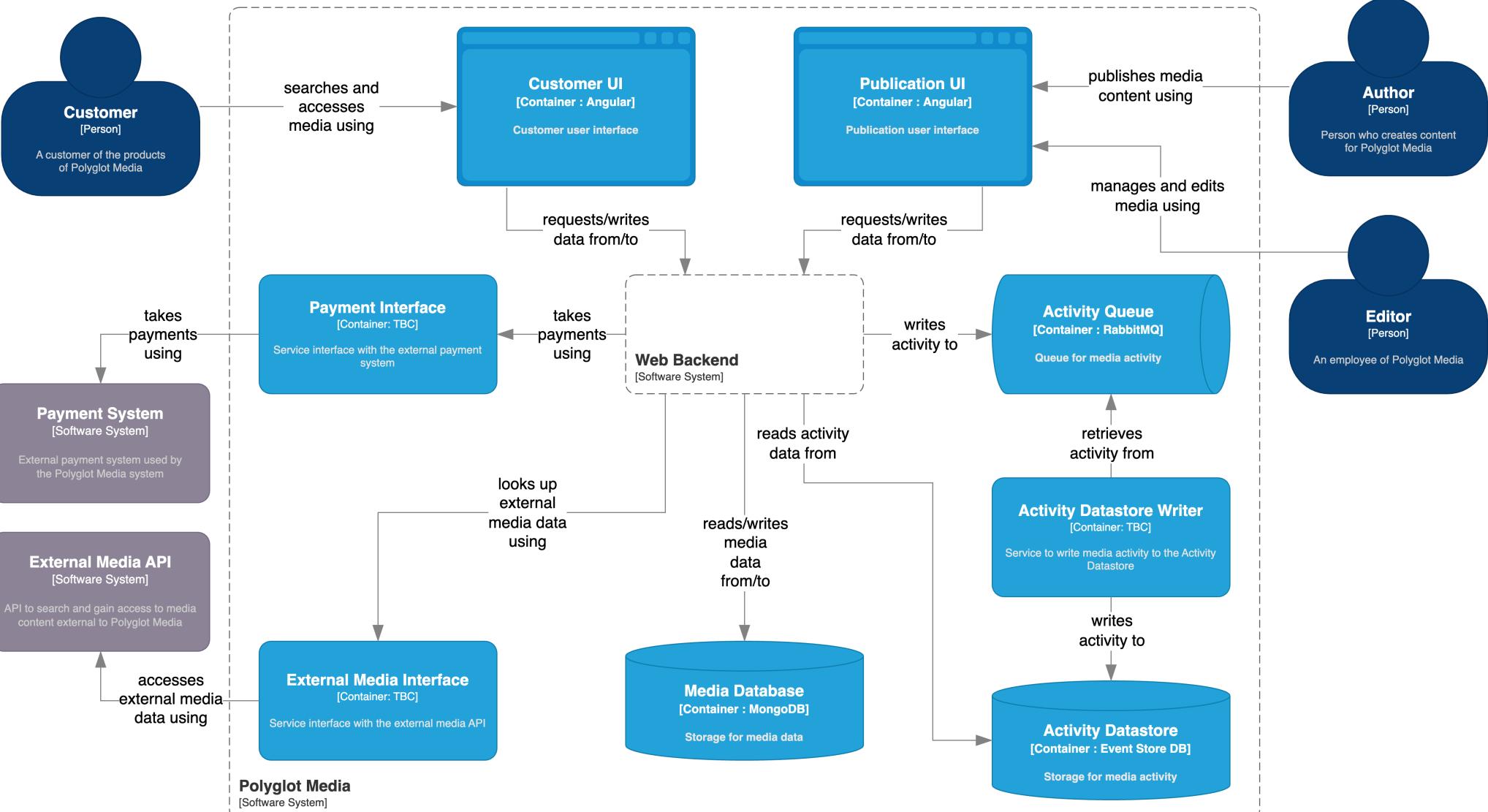
Container Diagram for Polyglot Media

Showing the high-level interactions within the Polyglot Media system.

Untangled



Reduced



Container Diagram for Media in Polyglot Media

Showing the high-level Media interactions within the Polyglot Media system.

Pattern

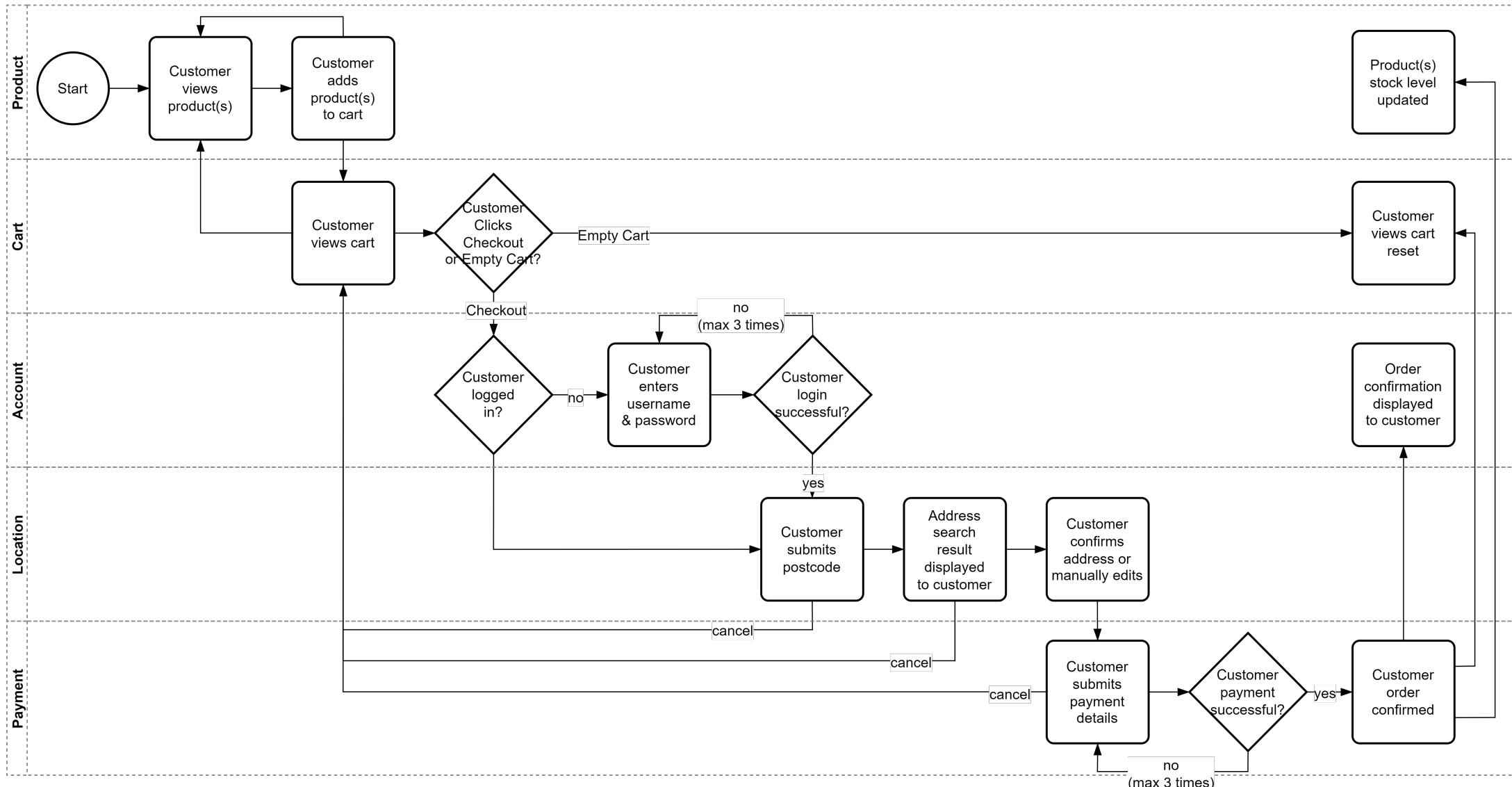
Notes on a Theme



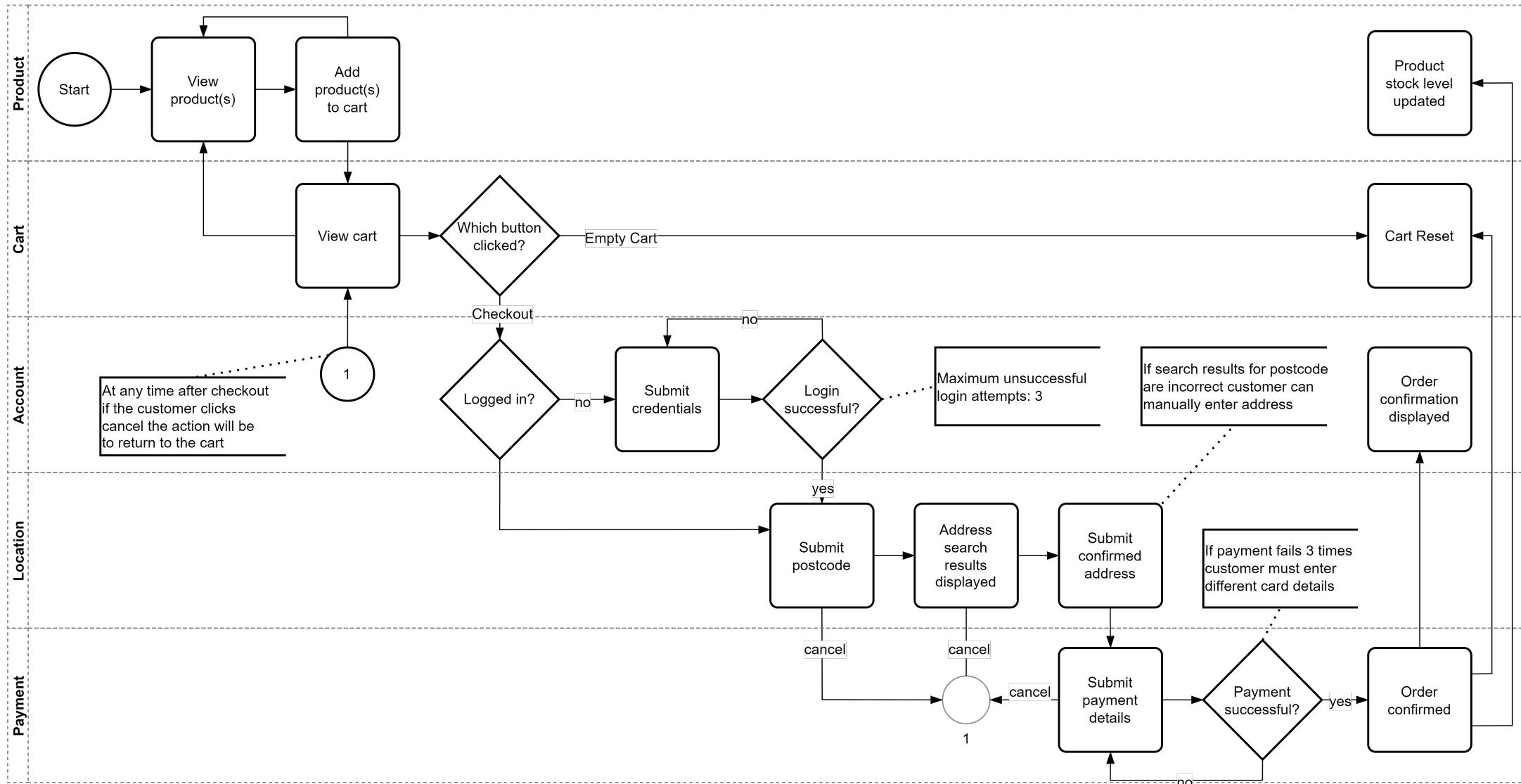
AKA: remove excess text from the main diagram



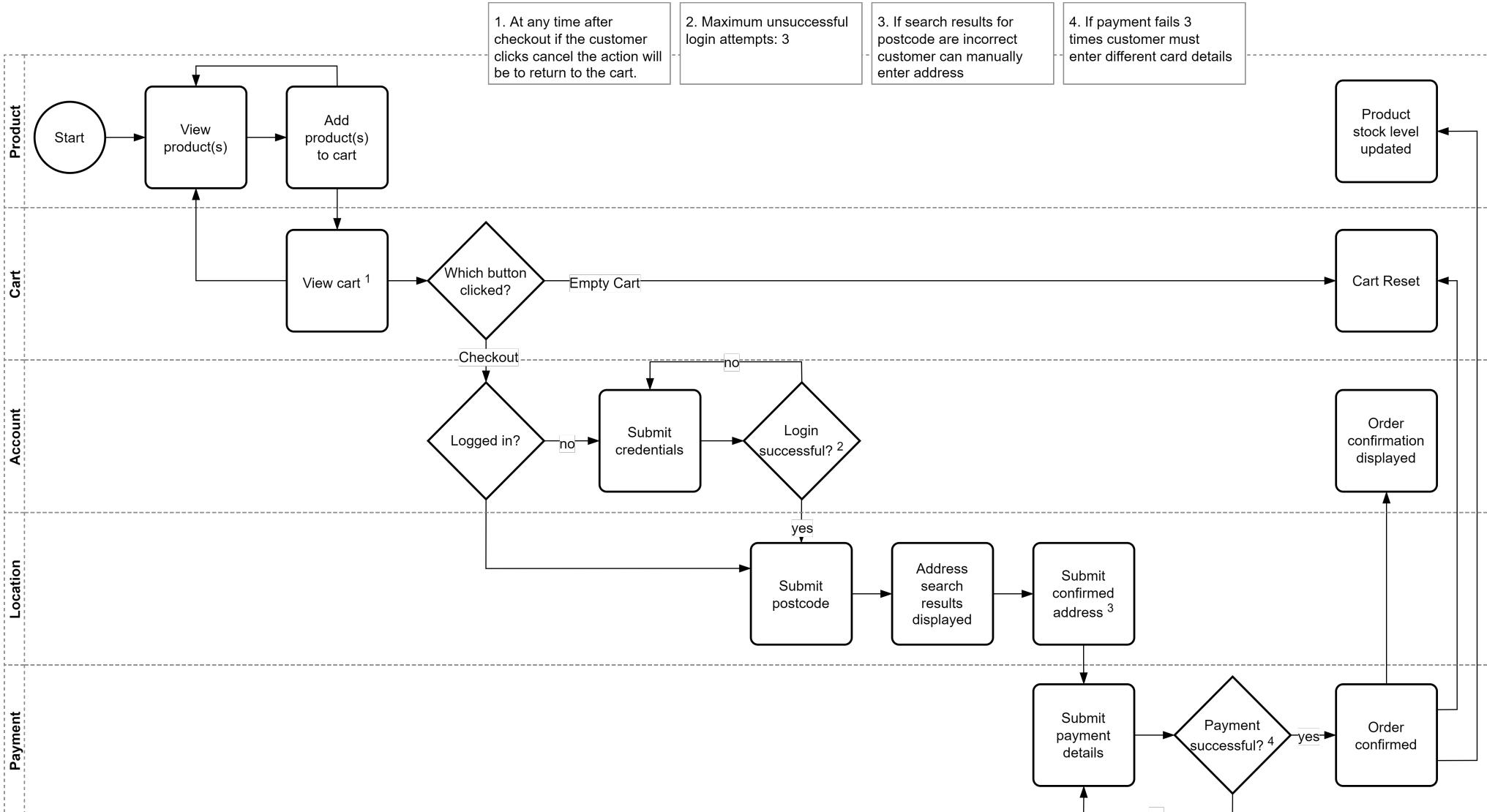
Too much text



Annotations & References



Referenced Notes



Exercise

Accessibility

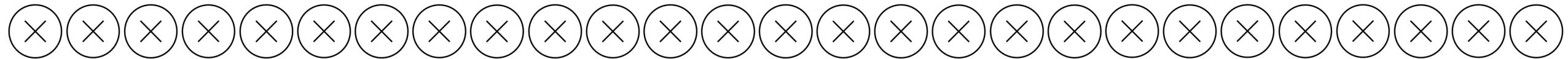
go beyond screen-readers in your accessibility
considerations

Antipattern

Colour is Key



AKA: relying on colour to communicate



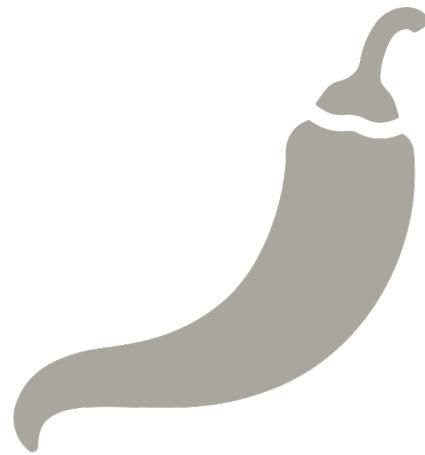
Can you pass me the yellow one?



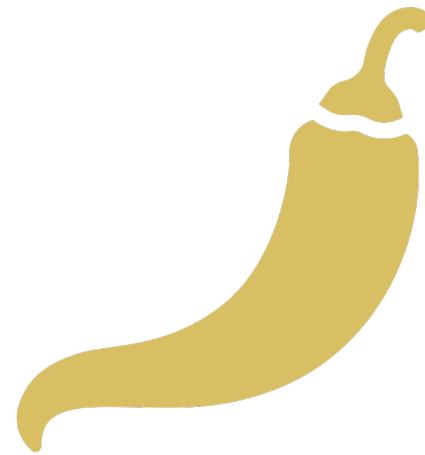
a



b



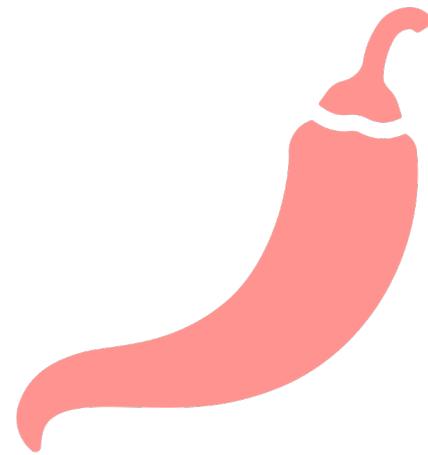
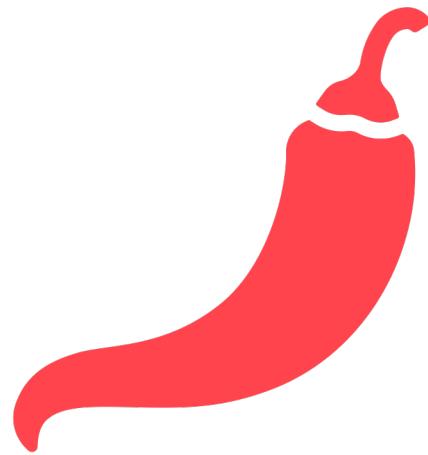
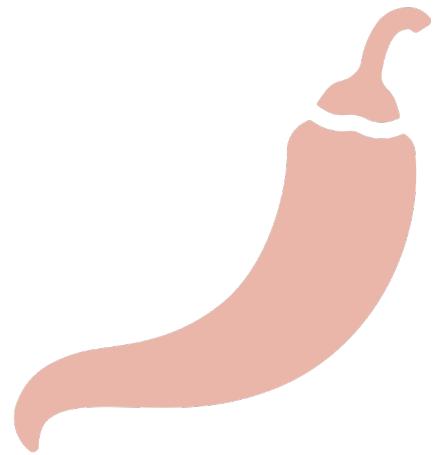
c



d

Simulated Protanopia

Can you pass me the yellow one?



e

f

g

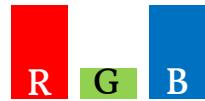
h

Simulated Tritanopia

Protanomaly



Deuteranomaly



Tritanomaly



Protanopia



Deuteranopia



Tritanopia



Achromatopsia



Approximately 4.5% of the world's population is colour vision deficient

I in 12 men &
I in 200 women
are colour blind

More than 350 million people
worldwide

rainbow - Ecosia - Images + ↻

ecosia.org/images?q=rainbow

ECOSIA rainbow 🔍

Q All Images News Videos Maps More Settings

Search region: United Kingdom All sizes All colors All types Any time All layouts All usage rights

God's Rainbow Rainbow Color Art Rainbow Drawing Rainbow Art Awesome Rainbow Fire Rainbow Rainbow Candy Rainbow Fabric Rainbow Kids Rainbow Stuff Rainbow Neon Lights Pretty Rainbow

Normal Protanopia Protanomaly Deutanopia Deutanomaly ✓ Tritanopia Tritanomaly Achromatopsia Achromatomaly Low-Contrast


The rainbow's colors in Cottontail Fizz are in t...
www.reddit.com


The Rainbow | ferrebeekeeper
ferrebeekeeper.wordpress.com


Rainbow Sky | By popular d...
www.flickr.com


Big Horn Rainbow...
www.burnsland.com


A Full Double Rainbow - Burnsland - Photo...
www.burnsland.com


Rainbow ~ Jineralknowledge
jineralknowledge.com


There is a common element in the pass...
www.democraticunderground.com


Double Rainbow | First time to spot a double...
www.flickr.com


301 Moved Permanently
rainbowveins44.wordpress.com


Strange and mysterio...
strangesounds.org


Striking Double Rainbow Photograph by Brent Thomas
fineartamerica.com


Ravishing Rainbow...
www.boredart.com


Colorful Rainbow Photos | AmO
amolife.com


The 14 Most Beautiful Rainbow Photos...
www.mostbeautifulthings.net


The Rainbow Connection—To Physics
www.sciencefriday.com


Bill's Log: A Rainbow of Pro...
bills-log.blogspot.com

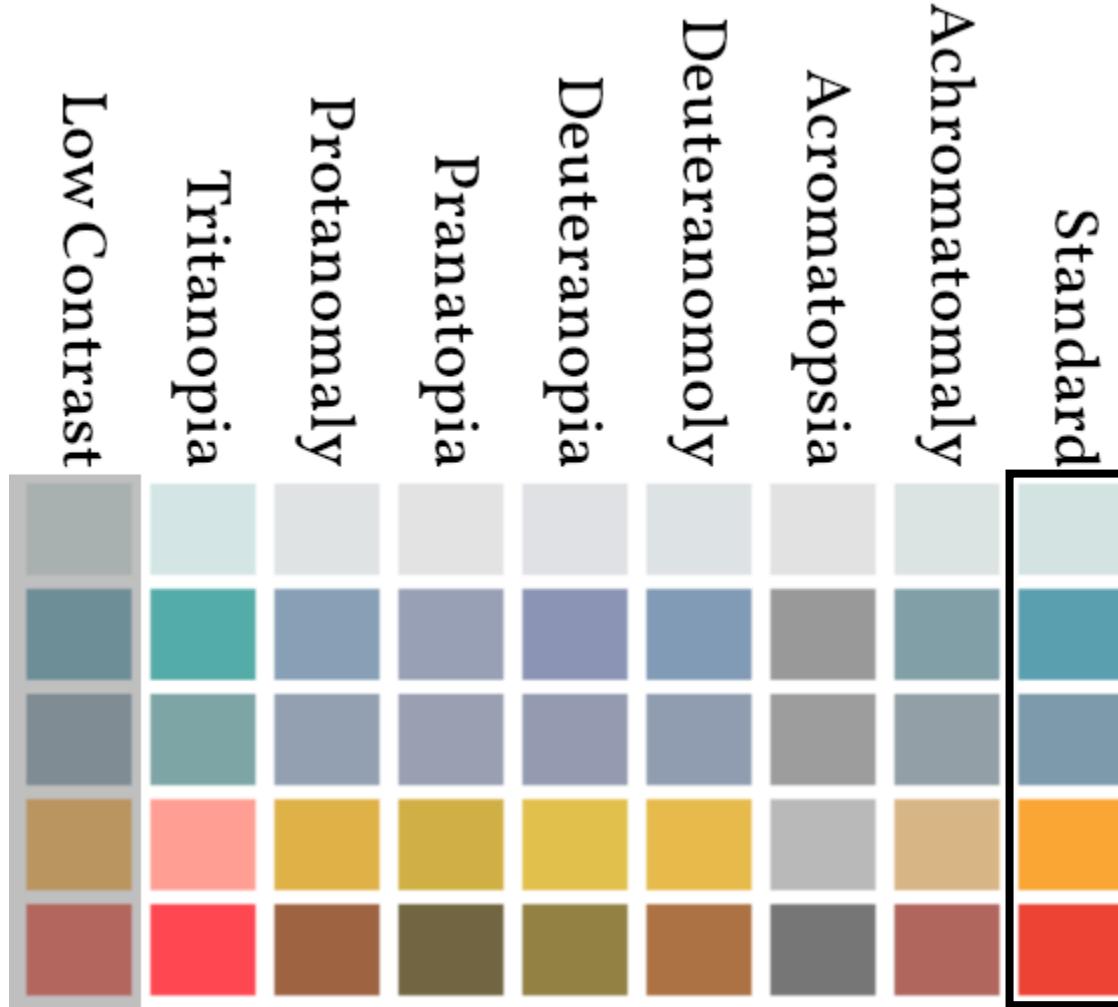

Amazing rainbow! : Adelaide
www.reddit.com


What causes a double rainbow? | The Weather Guys
wxguys.ssec.wisc.edu

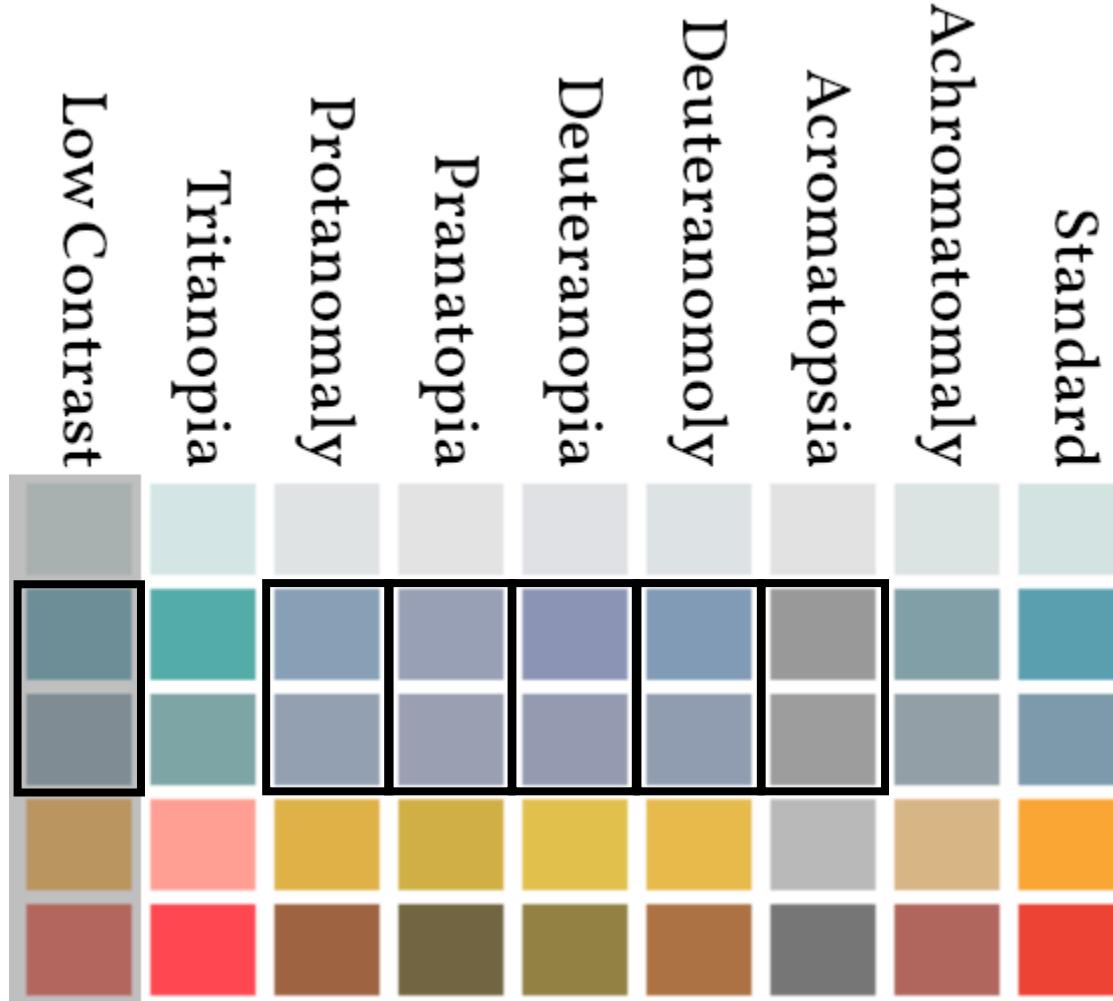
A palette I created



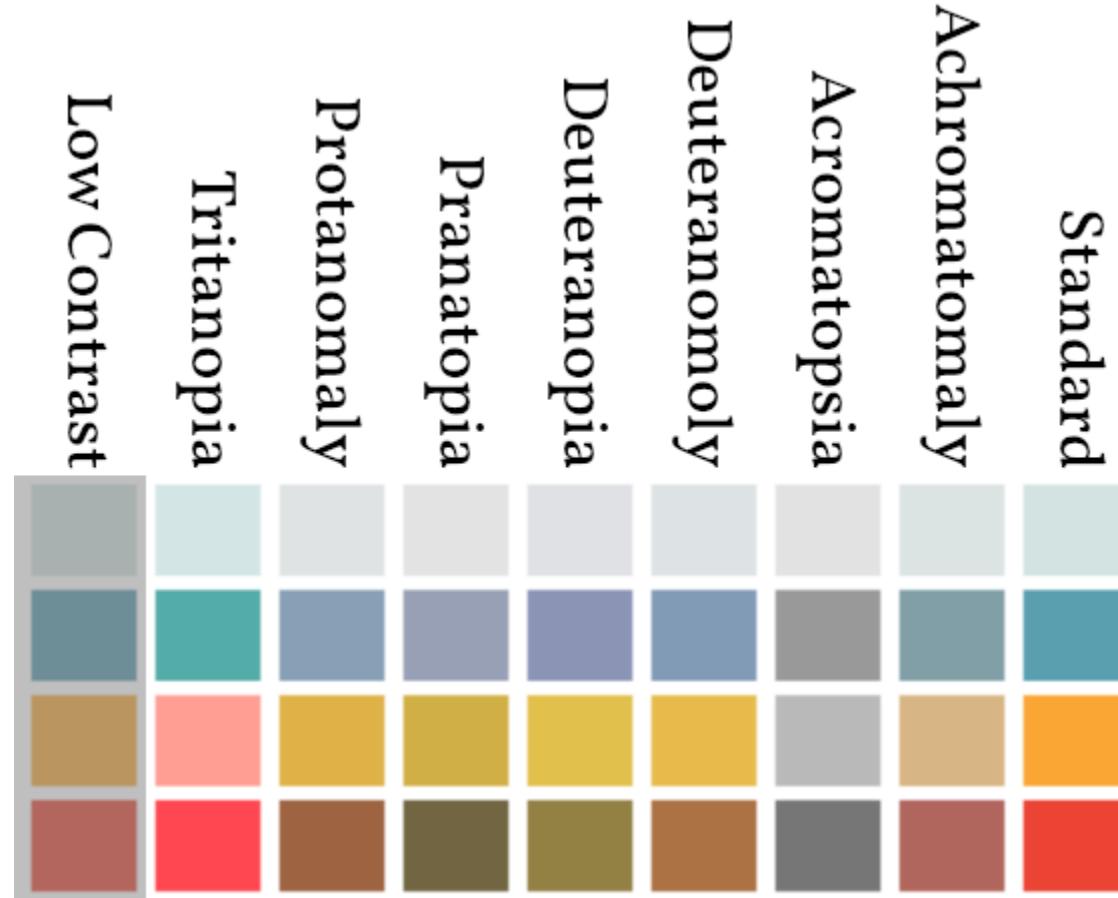
A pallet I created



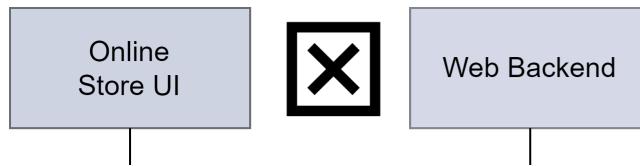
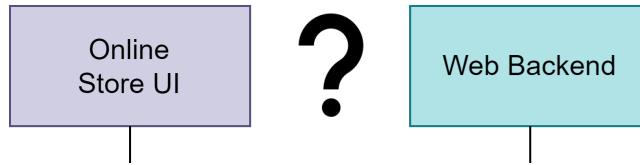
A palette I created



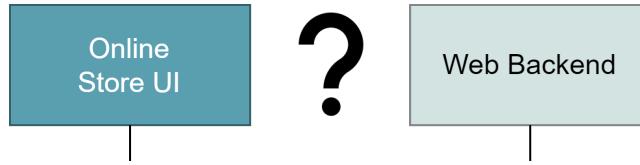
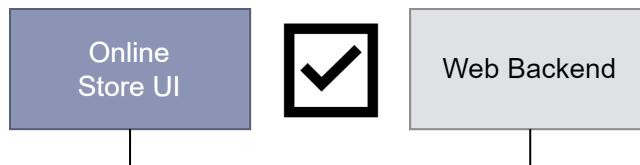
An accessible palette I created



Diagrams.net Standard Colours

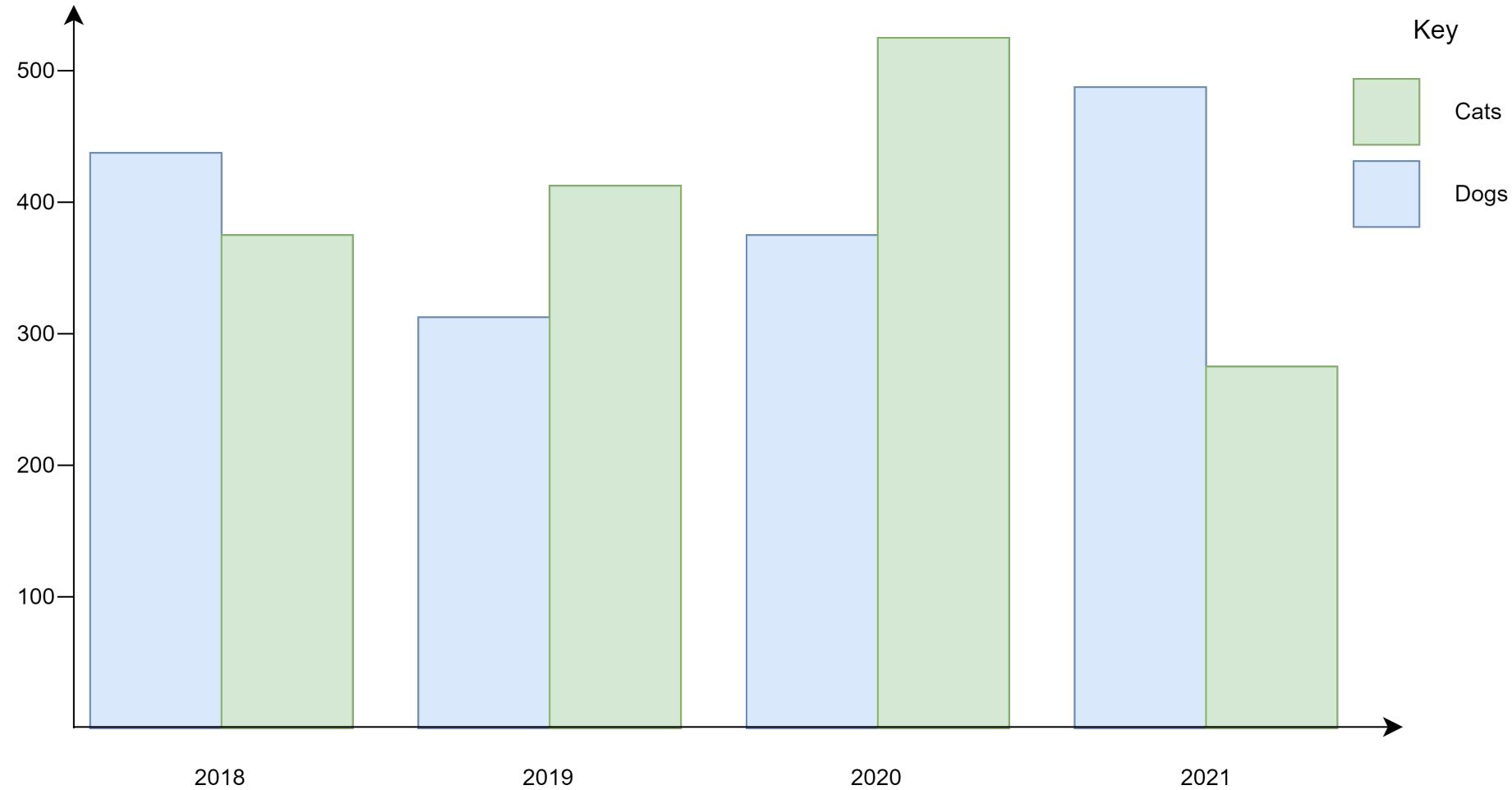


Deuteranopia Simulated

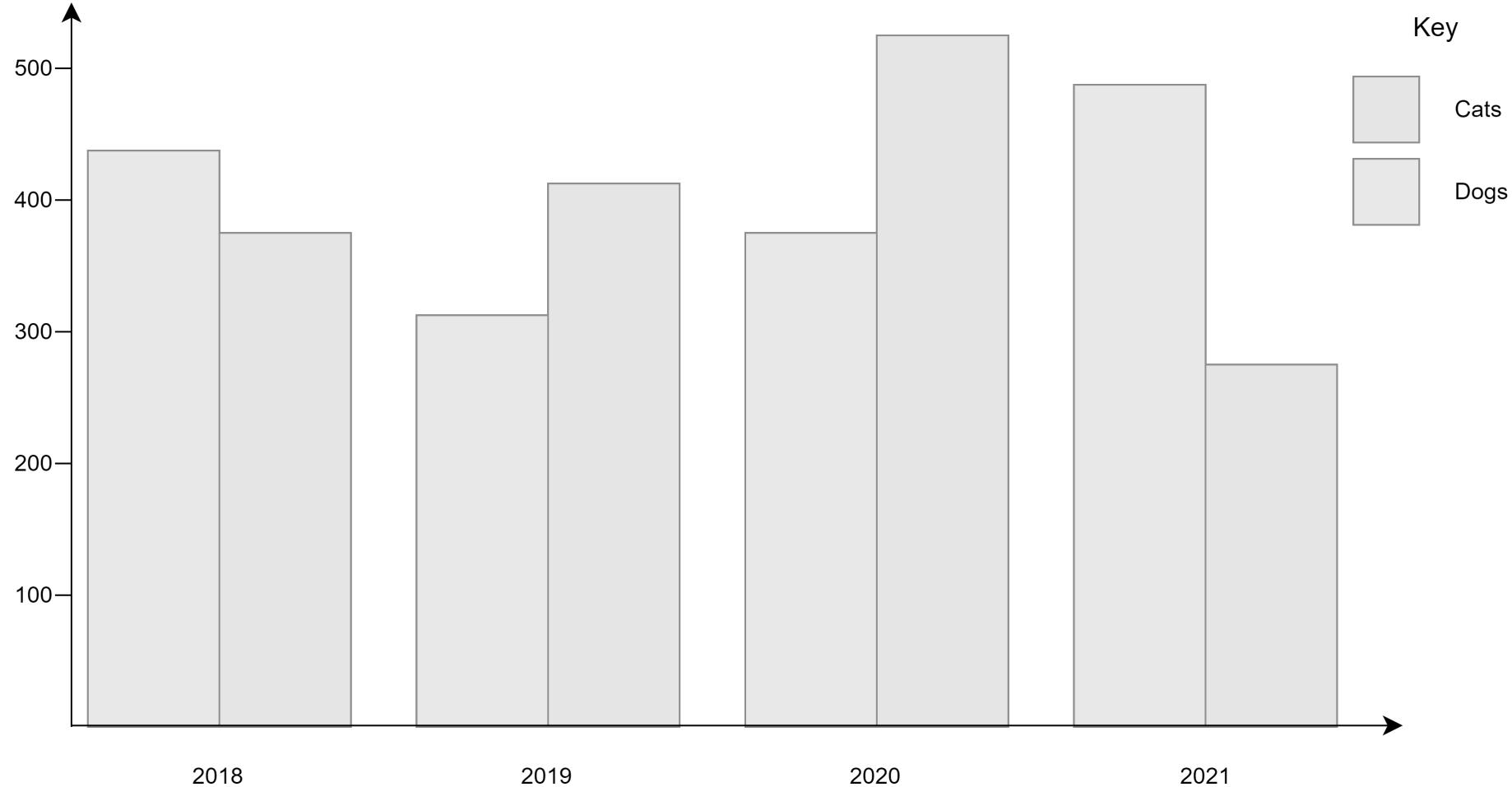


Colour-Deficiency-Friendly

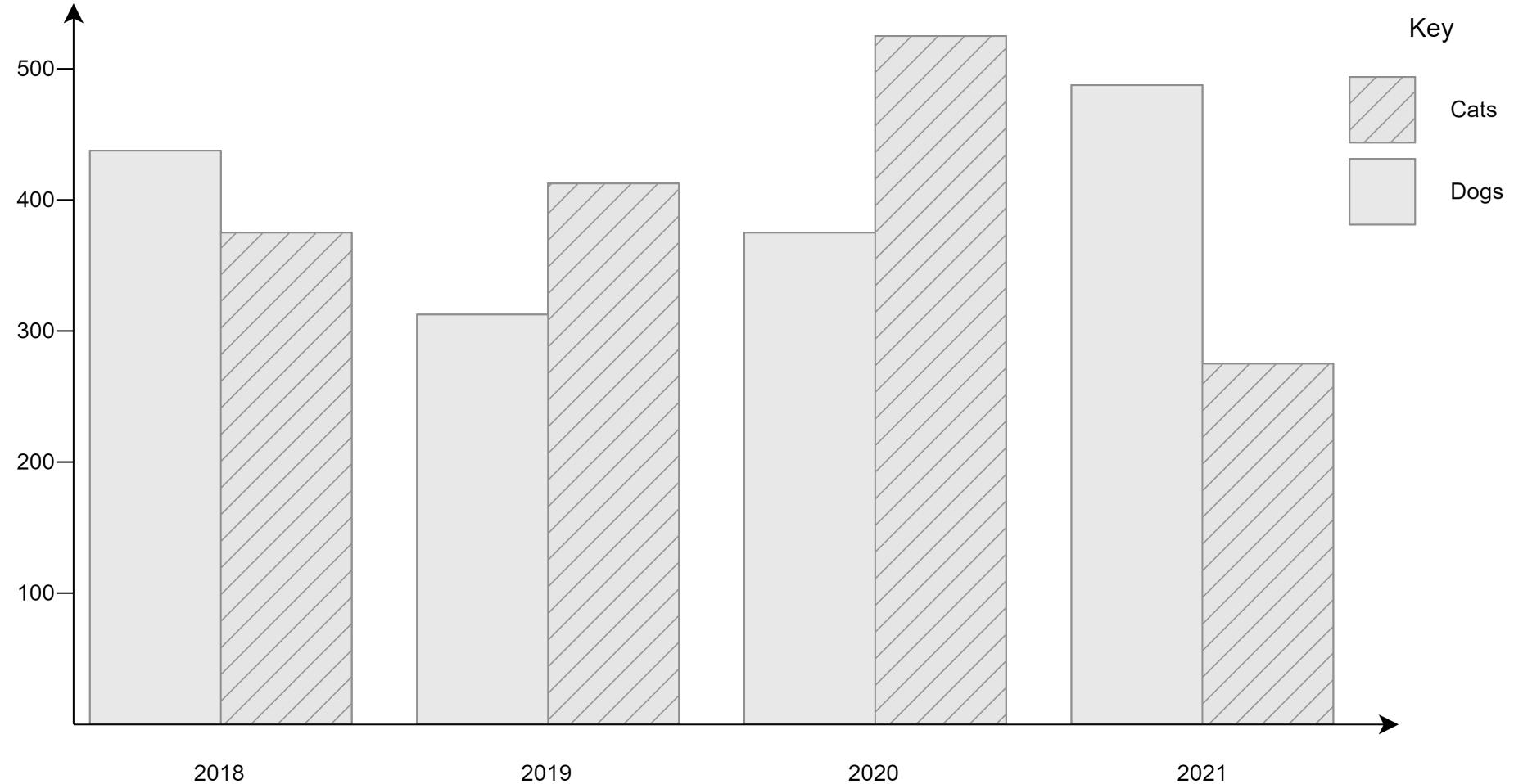
Colour is key?



What about greyscale?



Use pattern



Use symbols



Exercise

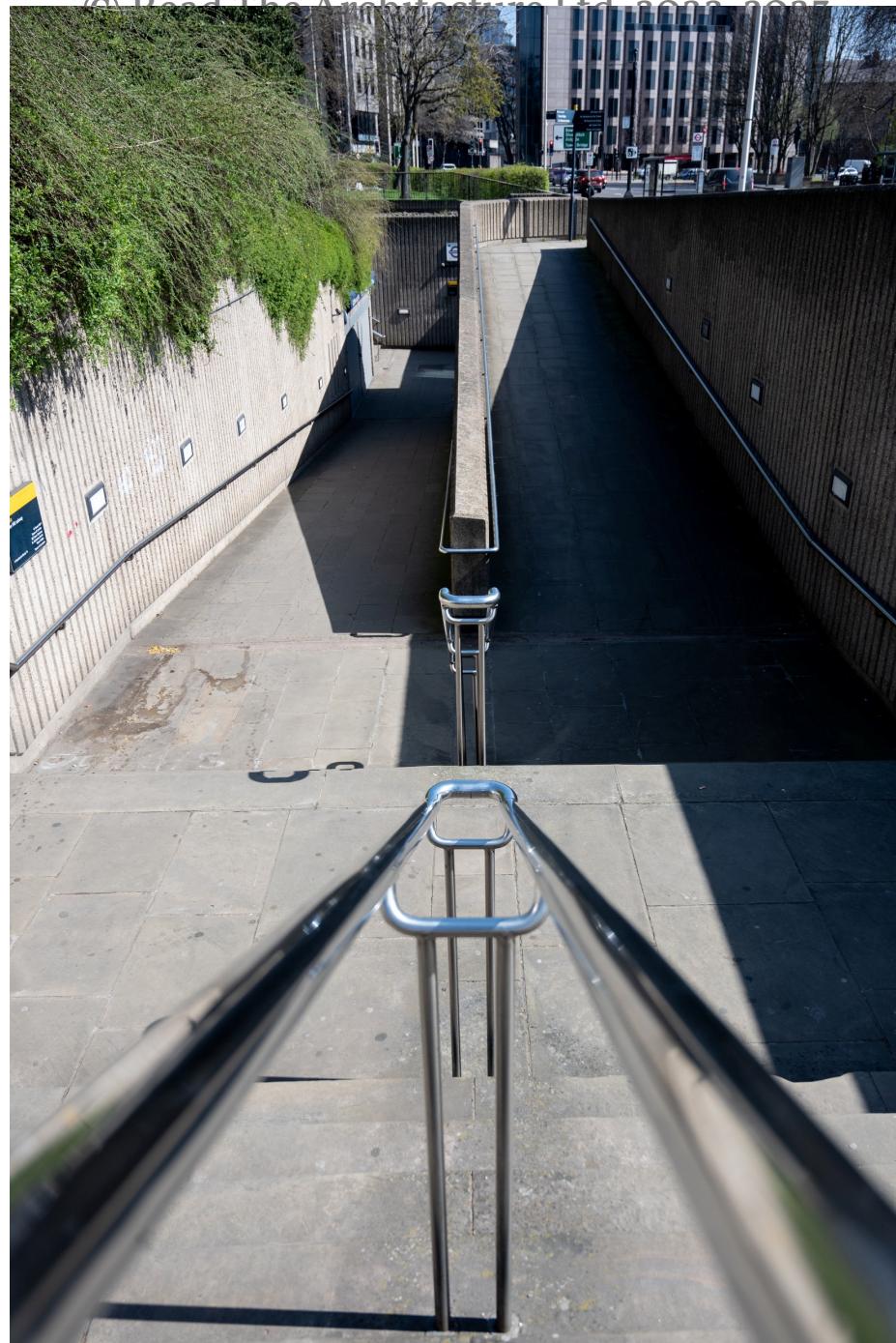
Pattern

Written in Legend



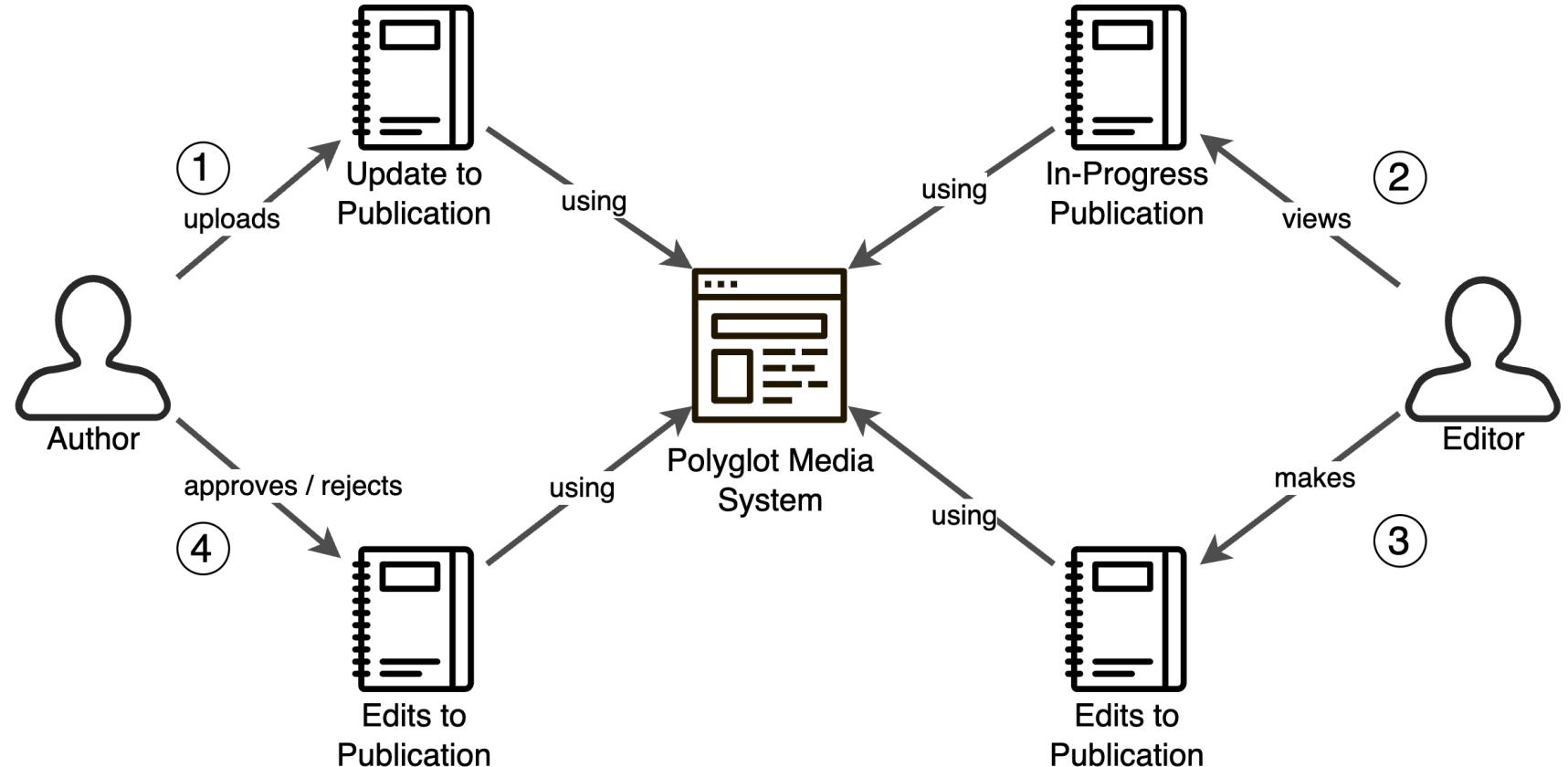
AKA: use a key or legend





© Read The Architecture Ltd 2000-2007

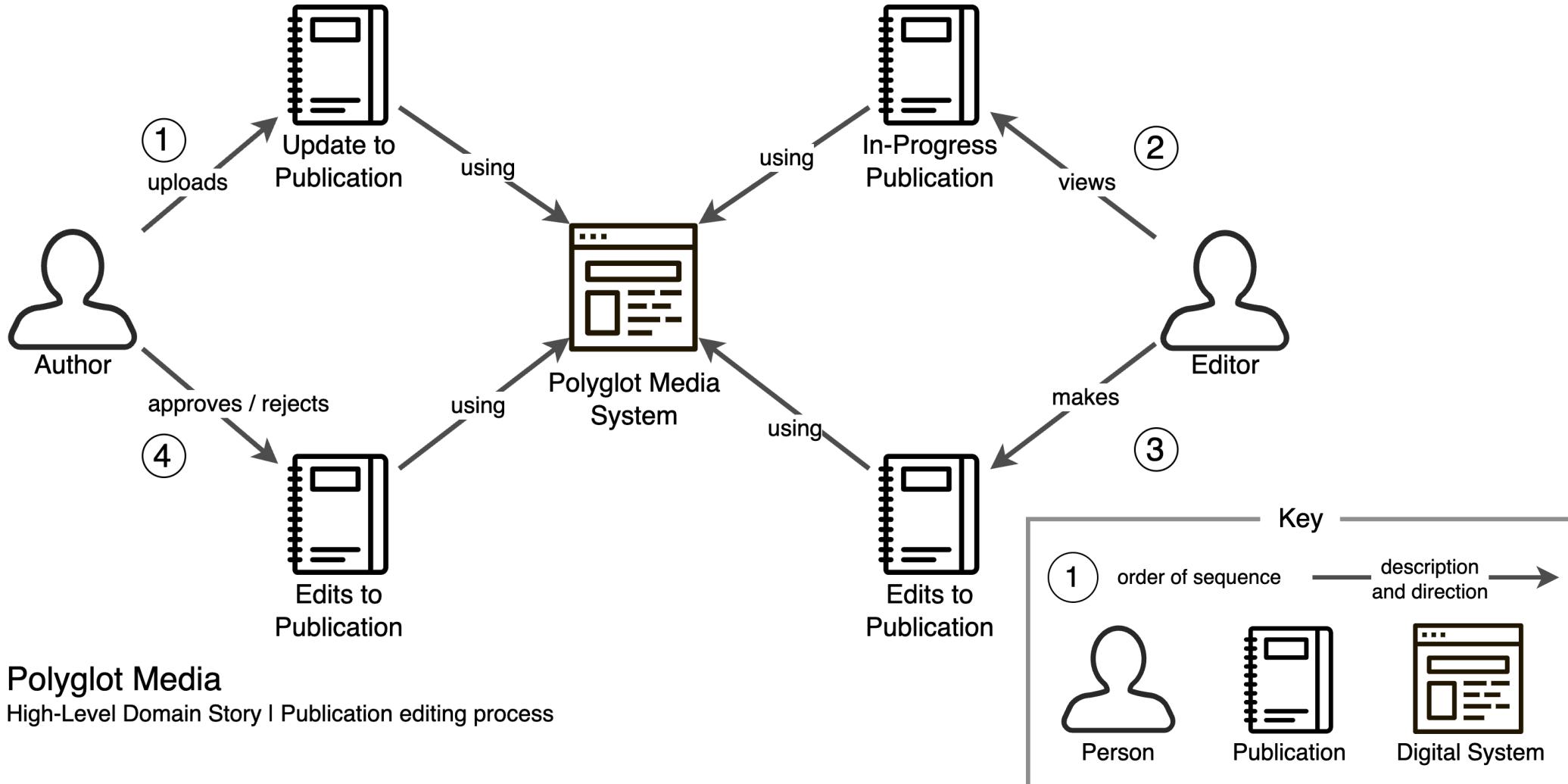
Seems obvious? No.

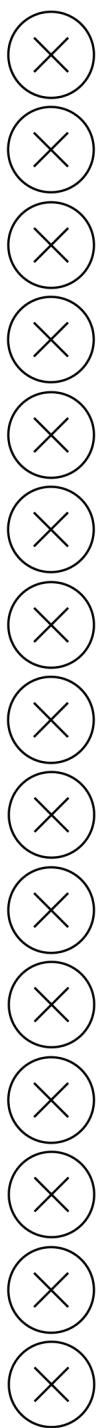


Polyglot Media

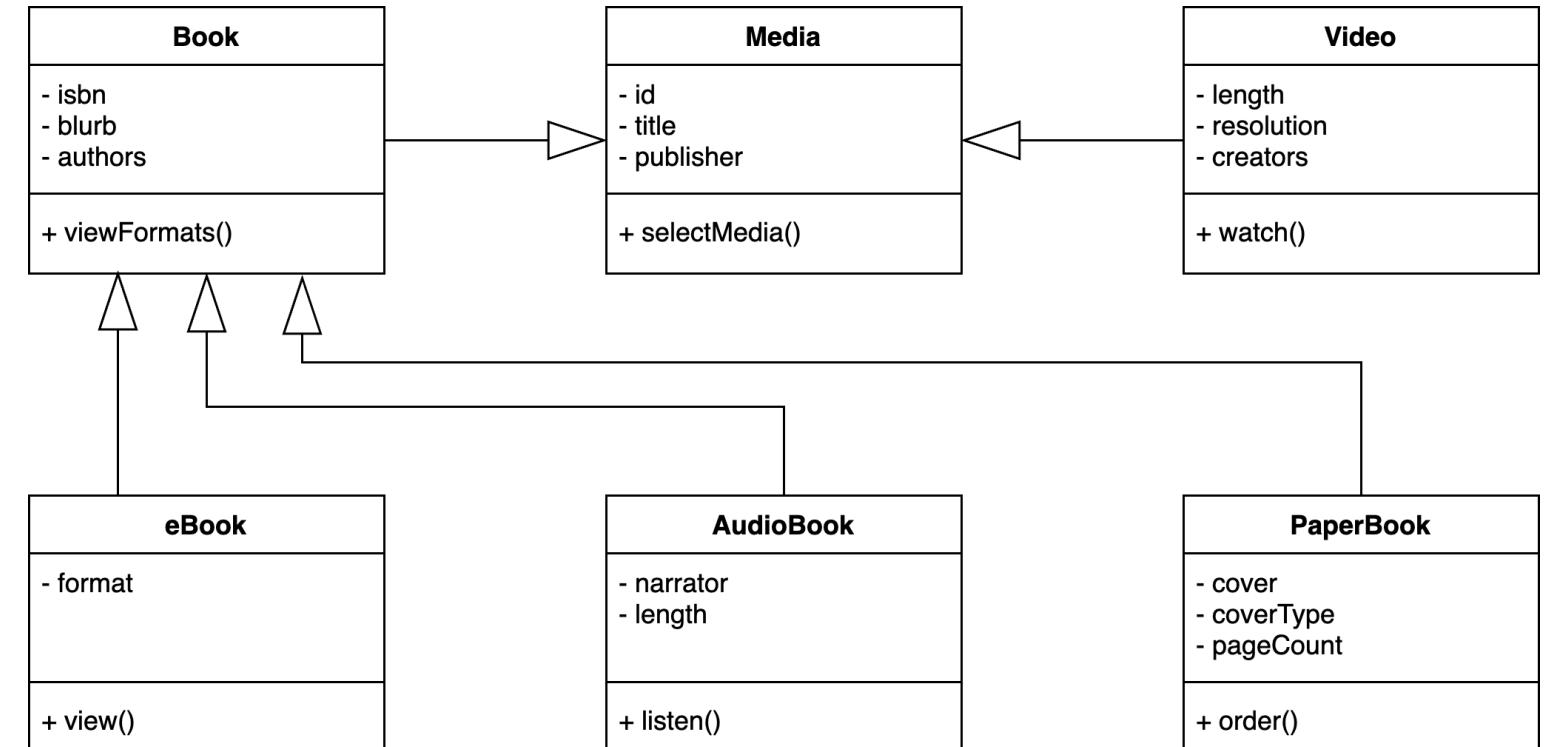
High-Level Domain Story | Publication editing process

Make it Explicit



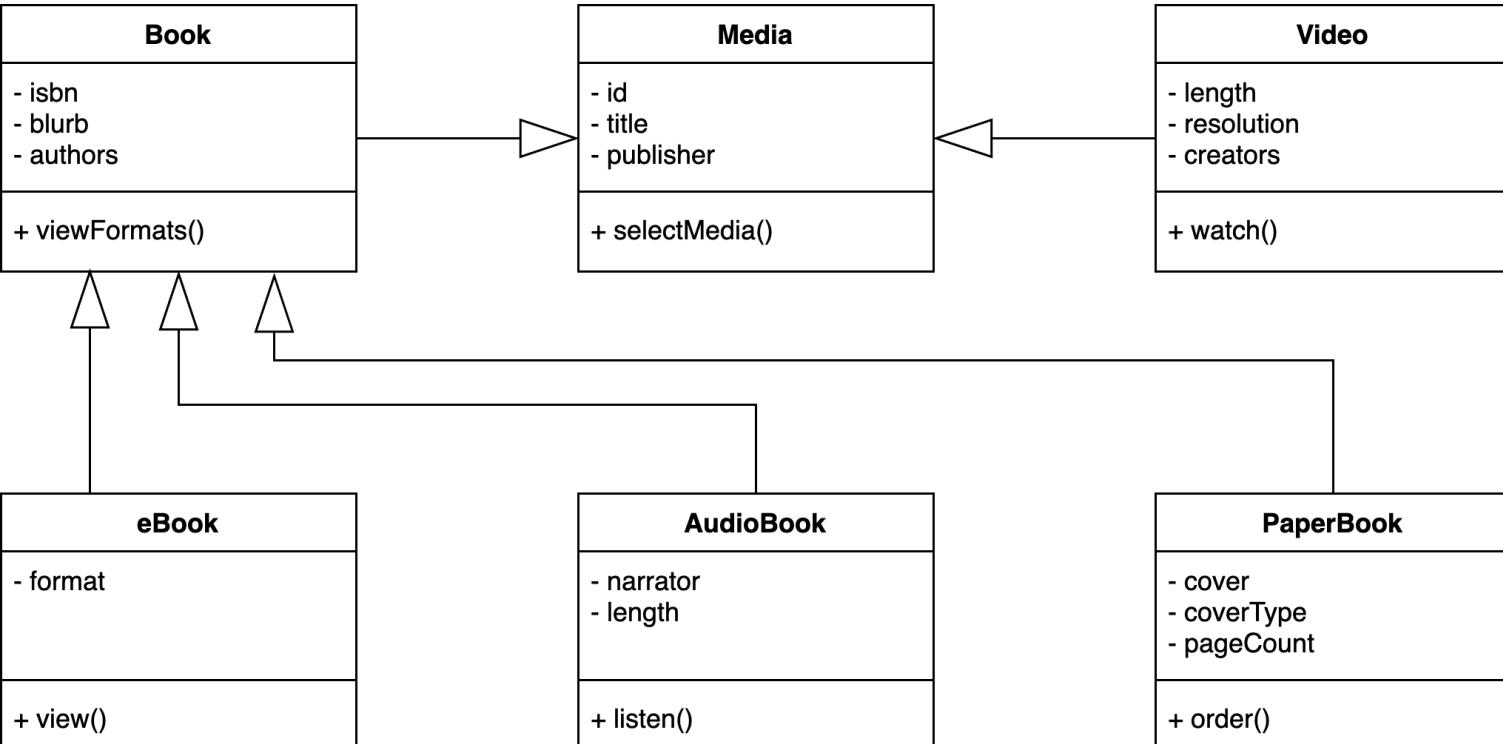


UML, easy? No.

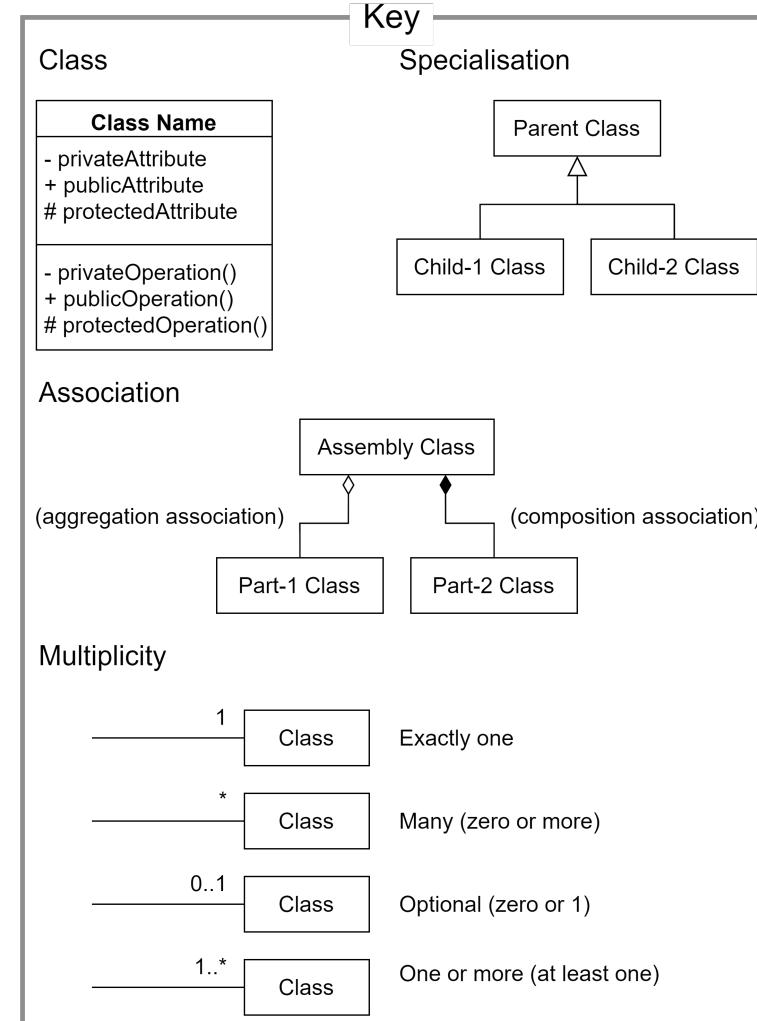


Media
Class Diagram

UML Reminder

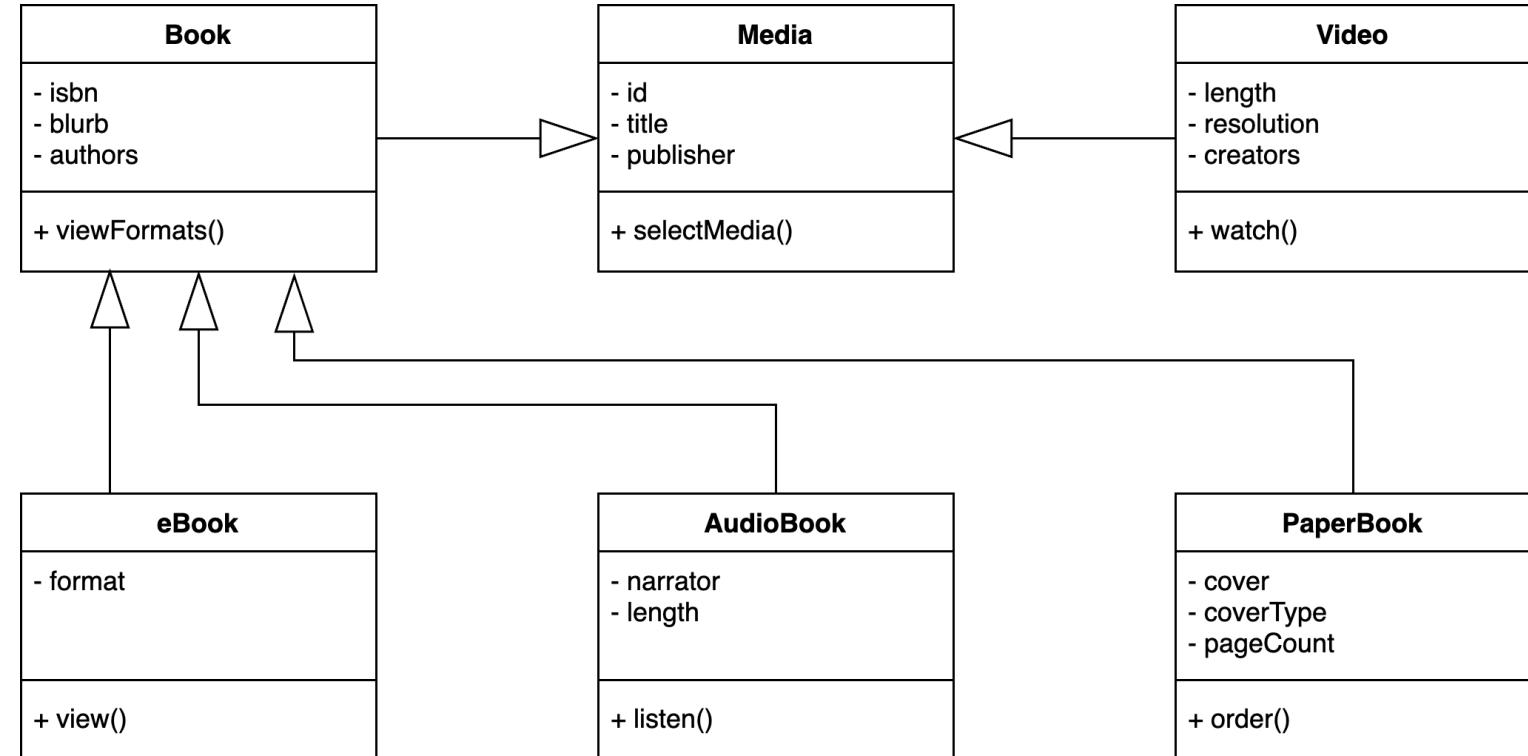


Media
Class Diagram



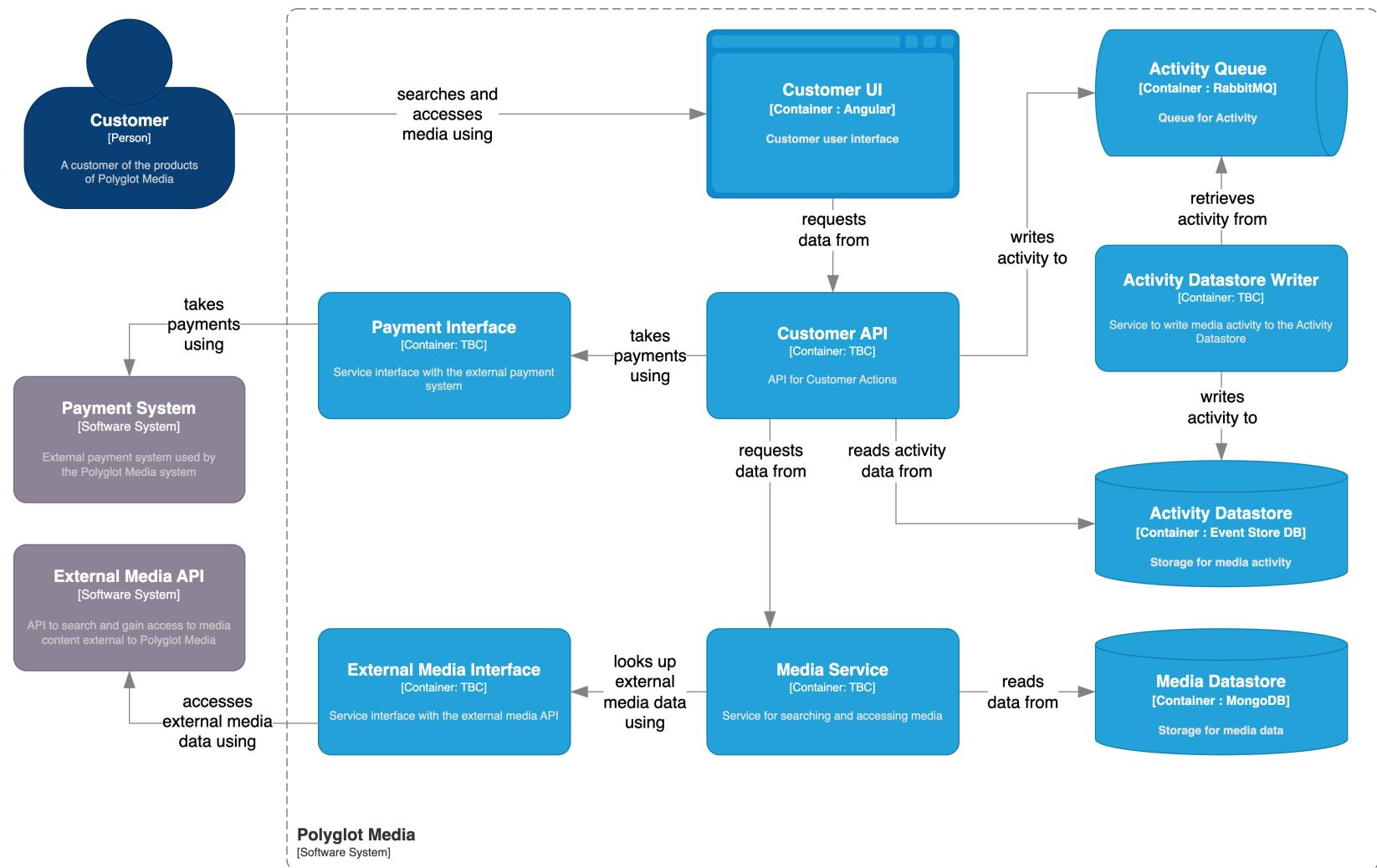
UML Reminder

[View Class Diagram Key/Legend](#)



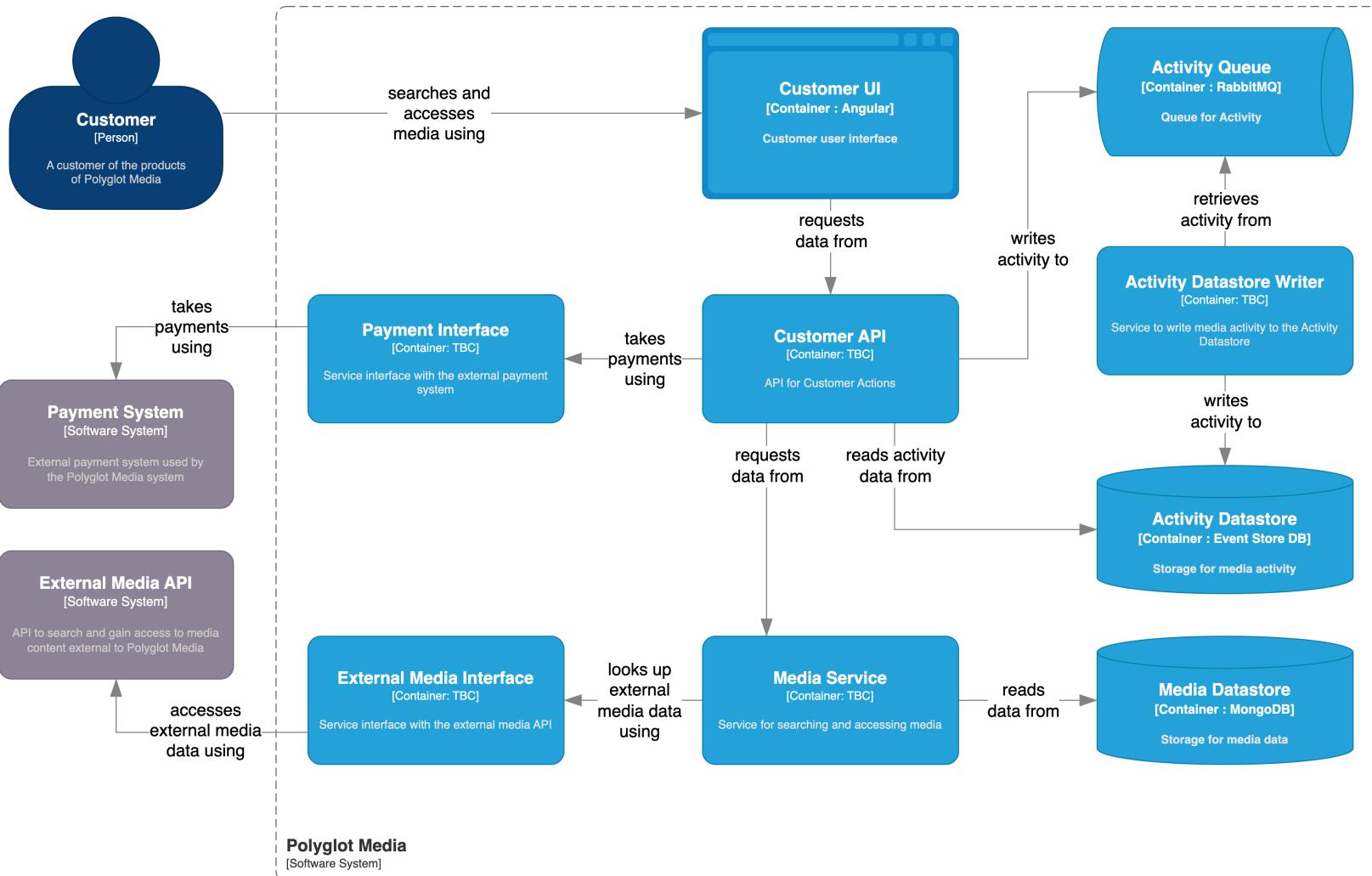
Media
Class Diagram

C4, that's obvious? No.

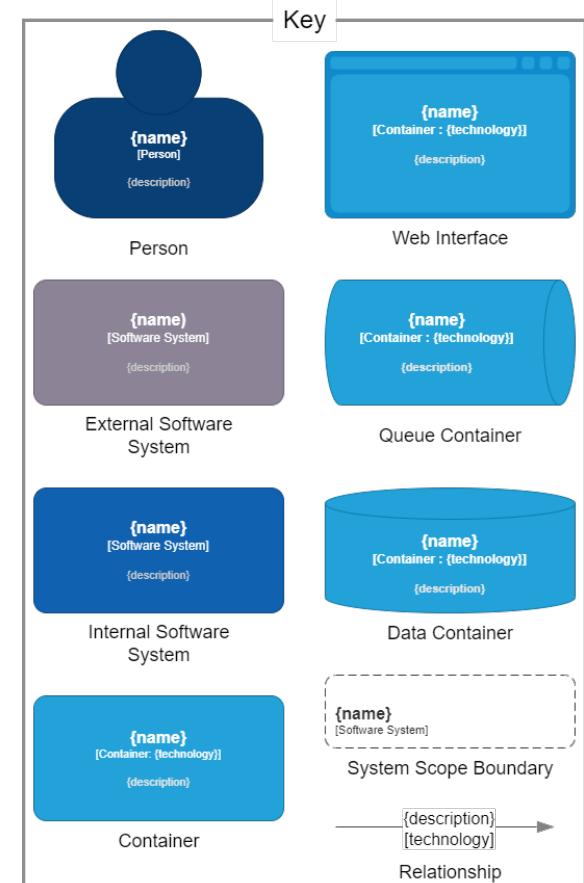


Container Diagram for Customers using Polyglot Media
Showing the high-level interactions within the Polyglot Media system.

Explained



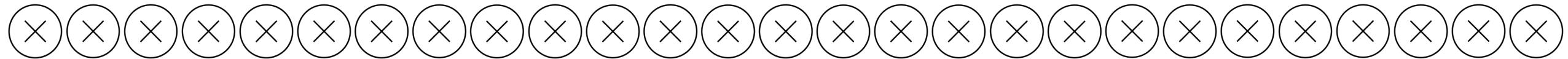
Container Diagram for Customers using Polyglot Media
Showing the high-level interactions within the Polyglot Media system.



Antipattern

MLAH

AKA: Multiple-Letter Acronym Hell



A few acronyms you may know...

or not

DRY:

DFD:

SPA:

BLT:

Next time you use an acronym...

think
SIDI

State It
Define It



Pattern

Pure & Simple

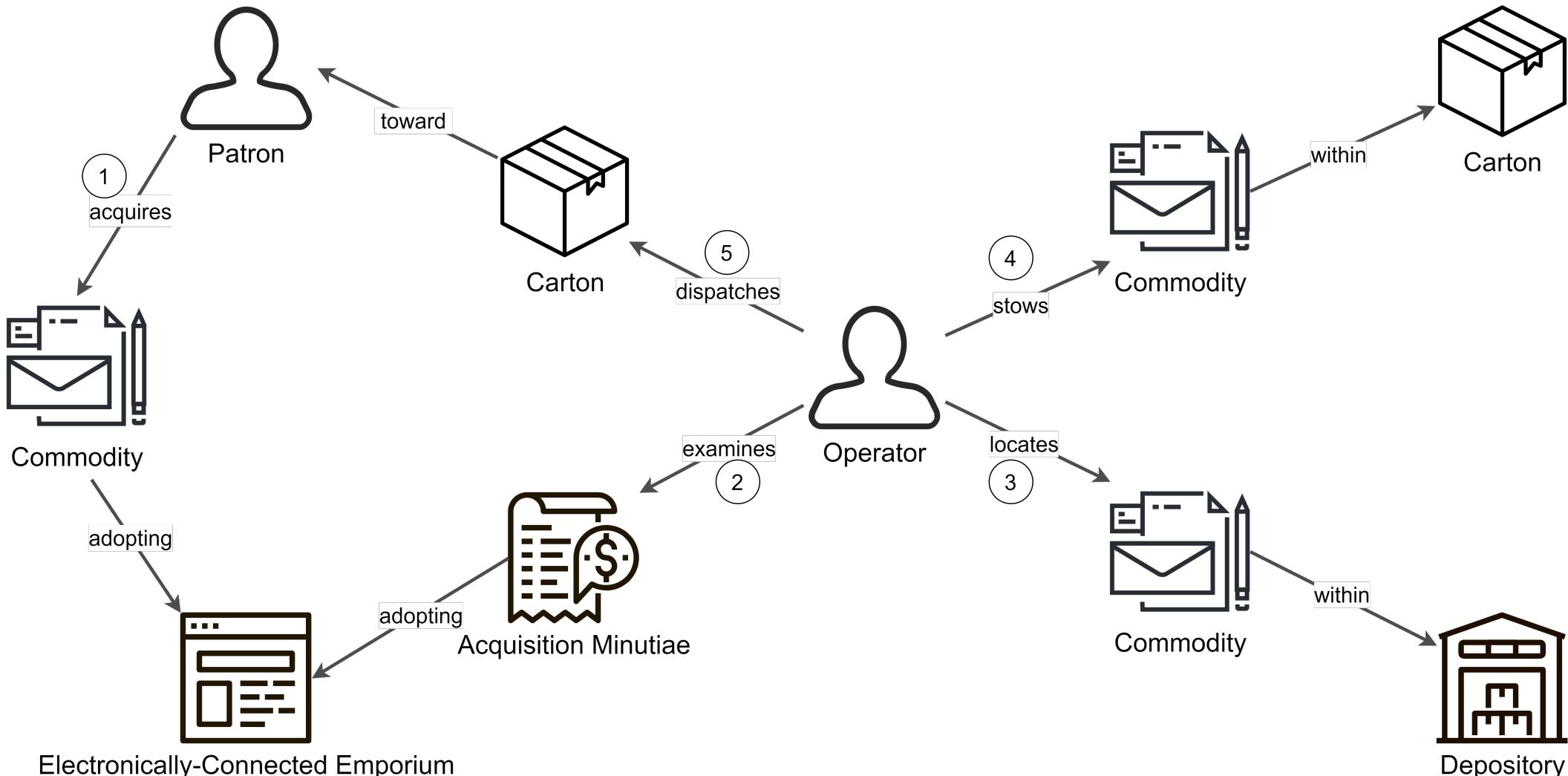
AKA: use simple and concise language



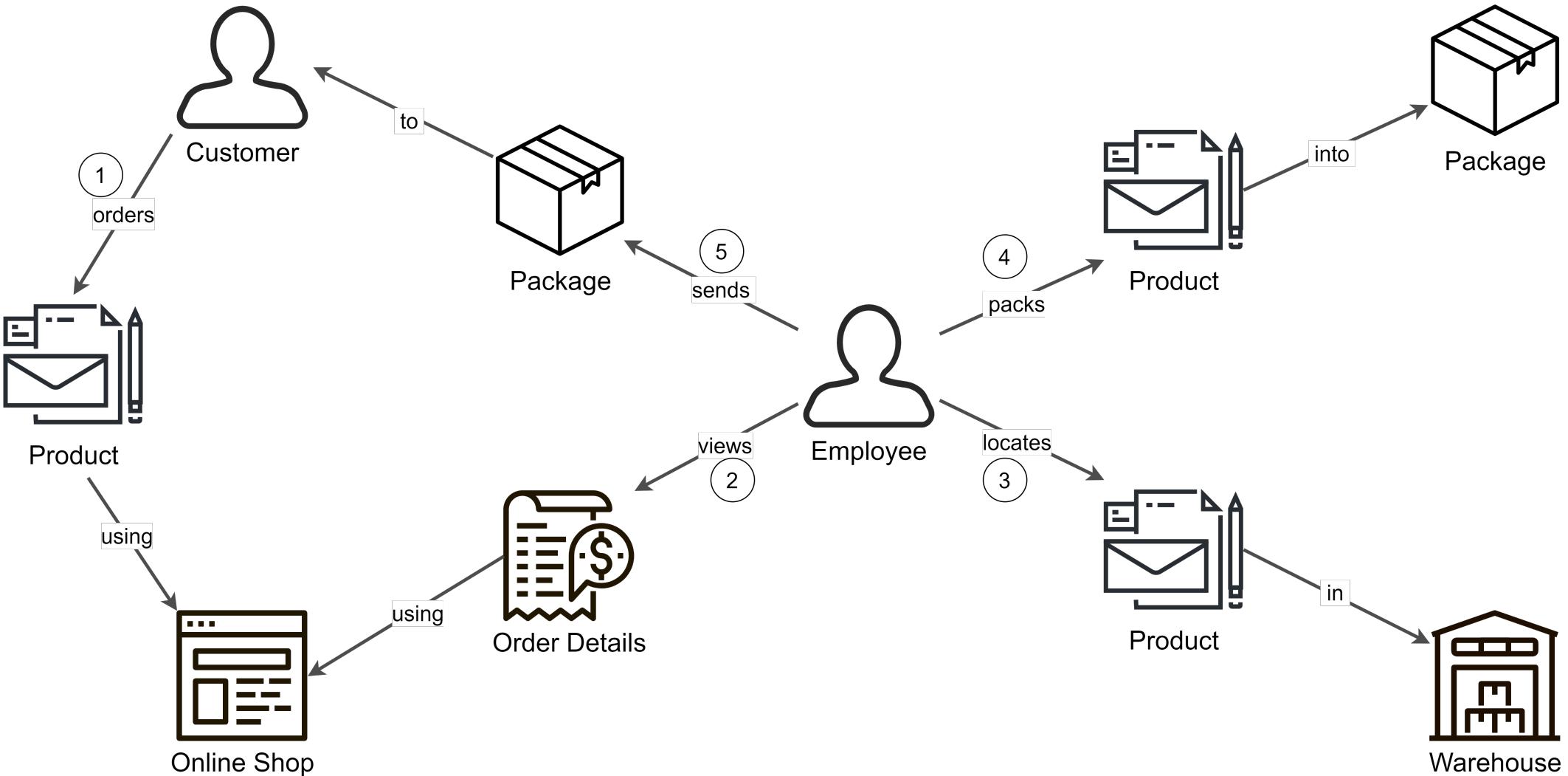
You need to know 4000 English
word families to understand
95% of newspaper stories

A person is not disabled;
it is their environment that
disables them.

Pardon?



Simplified



Online Shop

High-Level Domain Story | Customer orders and receives a product

Locate: find, discover the place of

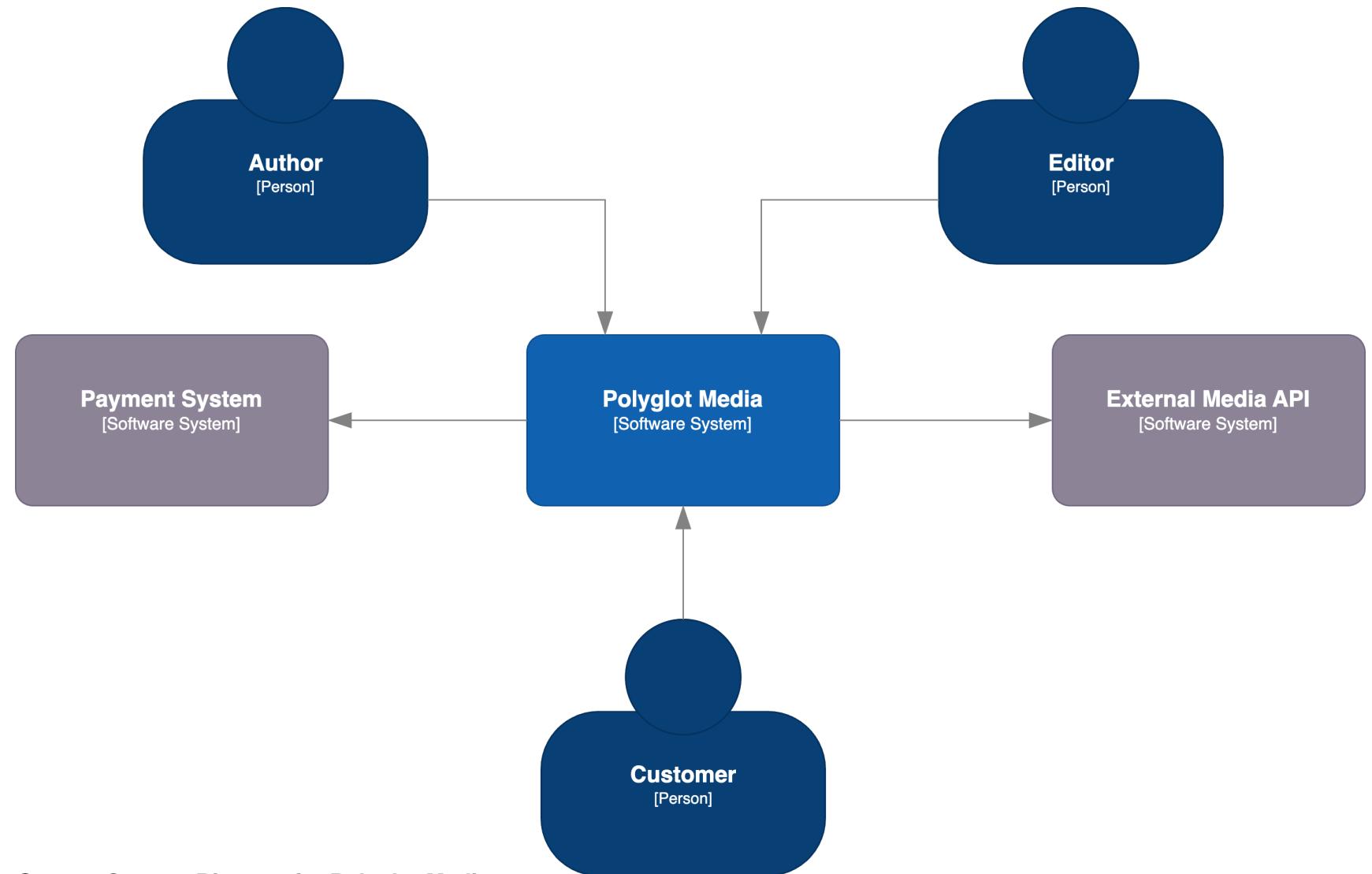
Pattern

Get a Handle on it

AKA: use appropriate labels



It's not clear



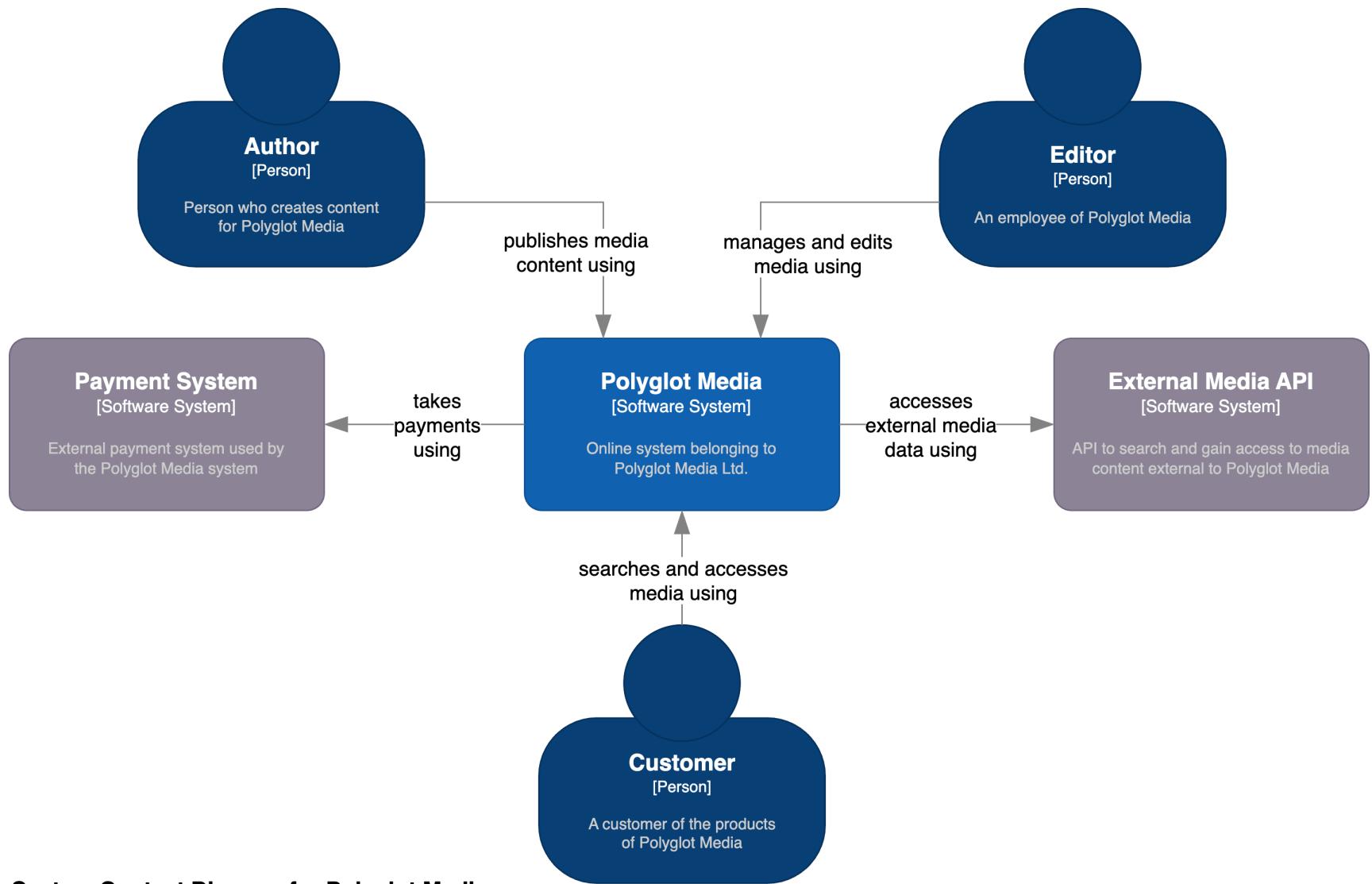
System Context Diagram for Polyglot Media

Showing the high-level interactions with the Polyglot Media system.

Whenever I have to think to understand what the code is doing, I ask myself if I can refactor the code to make that understanding more immediately apparent.

- Martin Fowler

Explicit information



System Context Diagram for Polyglot Media
Showing the high-level interactions with the Polyglot Media system.

**Everything in software
architecture is a trade-off.**

- First Law of Software Architecture

- Mark Richards & Neal Ford

Exercise

Narrative

tell your audience a story to get your message across

After nourishment, shelter and companionship, stories are the thing we need most in the world.

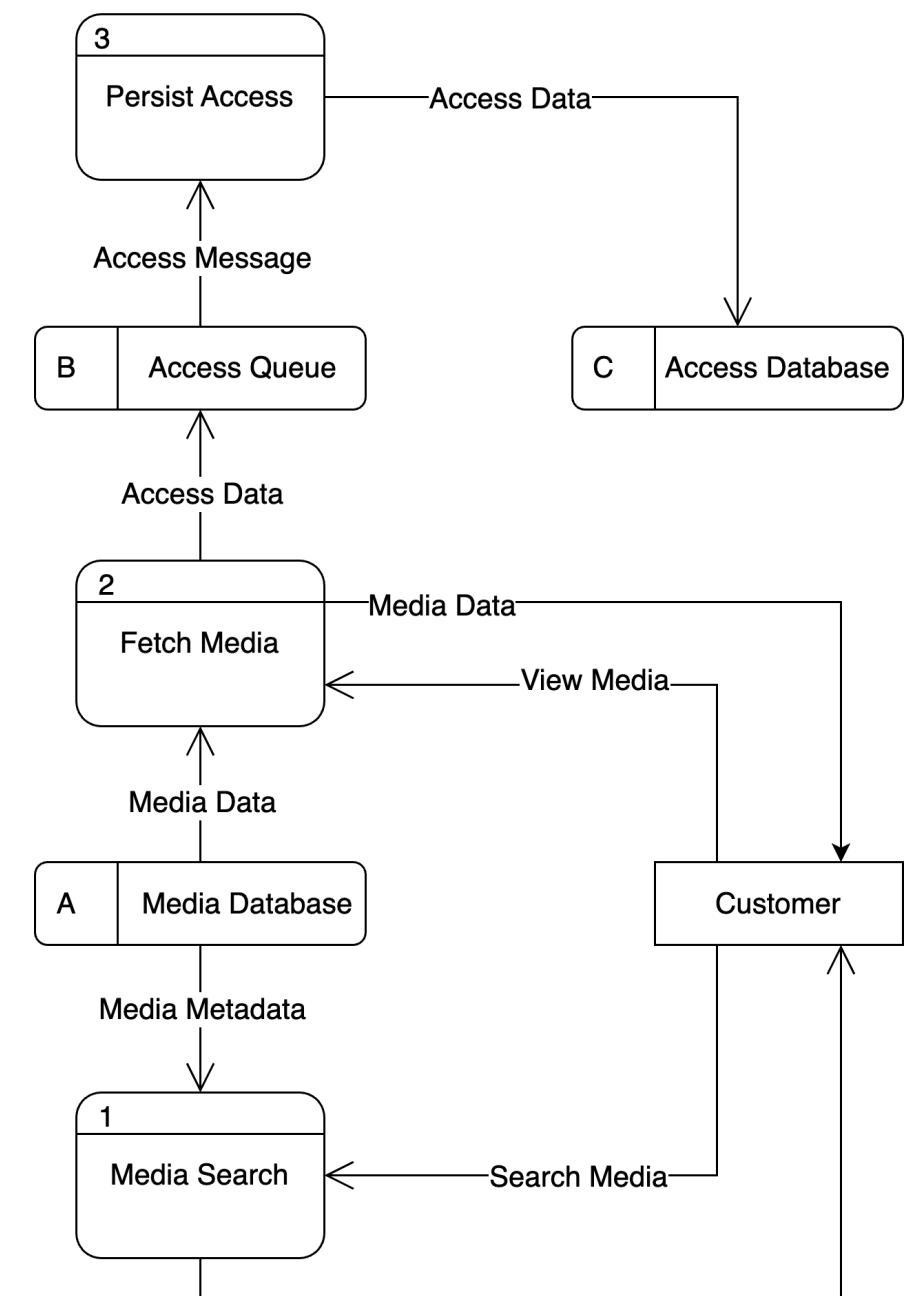
- Philip Pullman

Pattern

A push in the right direction

AKA: match the diagram flow to expectations

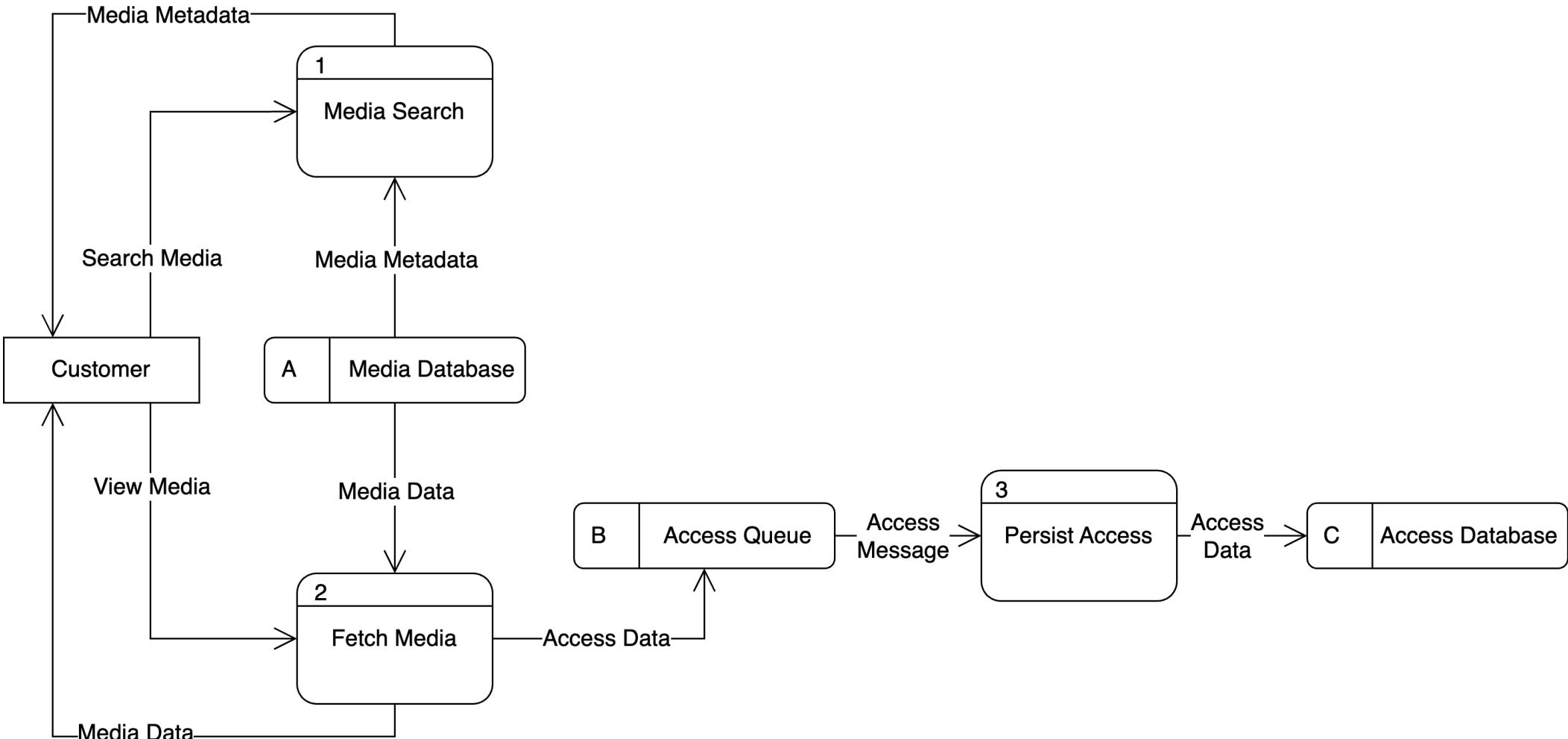




Polyglot Media

Data Flow Diagram: media search, view and access analytics

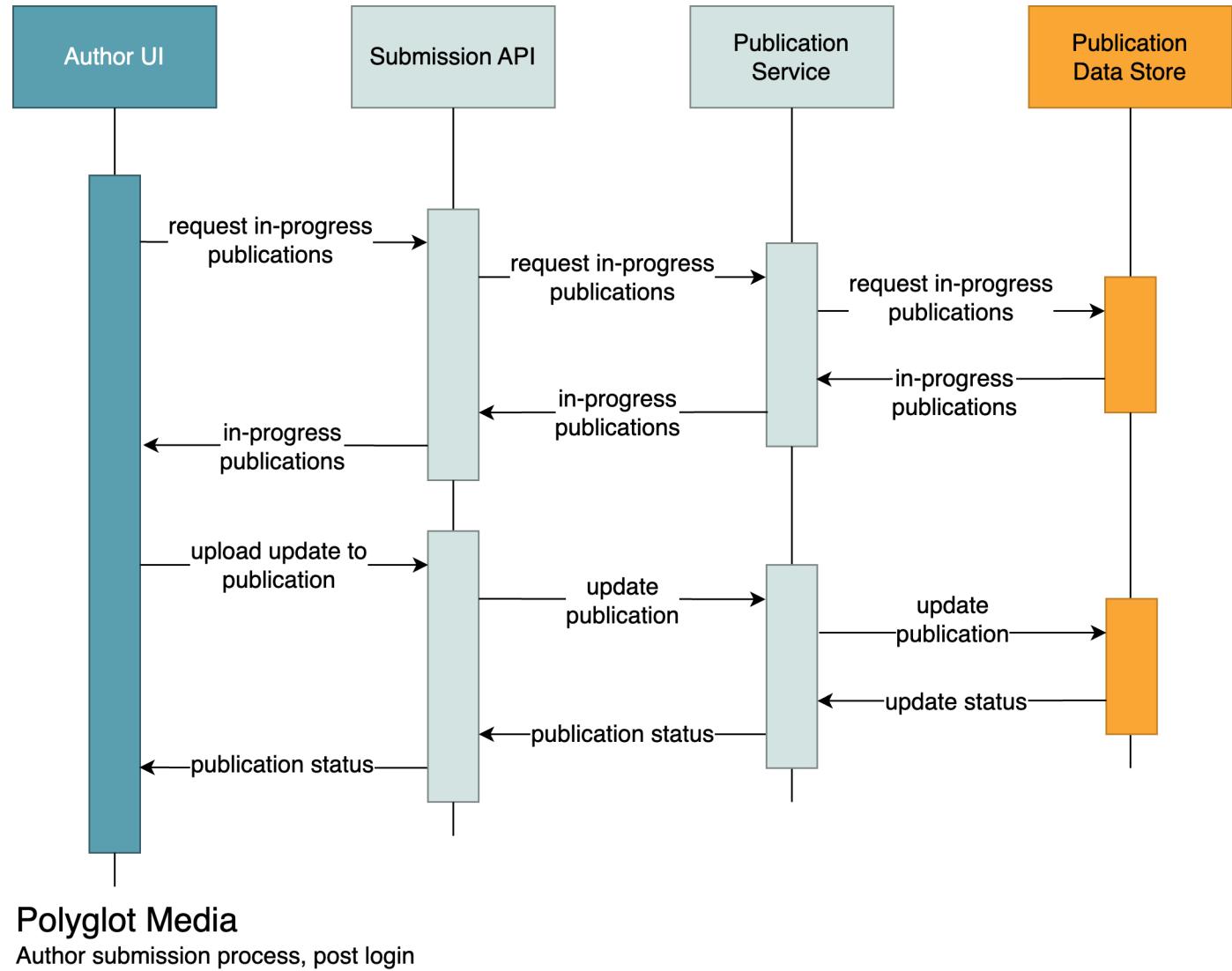
Let's match expectations



Polyglot Media

Data Flow Diagram: media search, view and access analytics

Inputs & Outputs



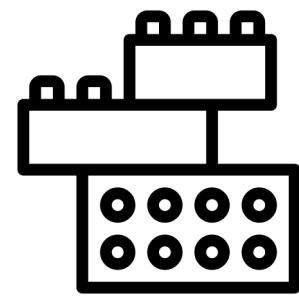
Pattern

Show them the pirate ship!

AKA: enthrall your audience with context



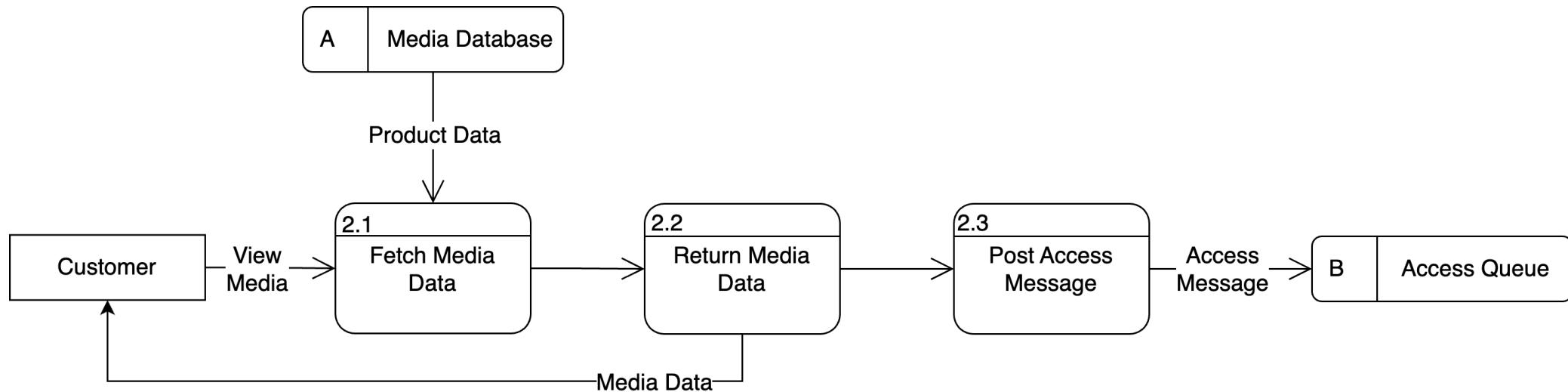




When you look at the cover of a box of LEGOs
you don't see a picture of each individual
brick that's inside. Instead, you see the
picture of an exciting, fully assembled model,
... positioned in a life-like pirate's bay with
cliffs and sharks.

Gregor Hohpe, The Software Architect Elevator

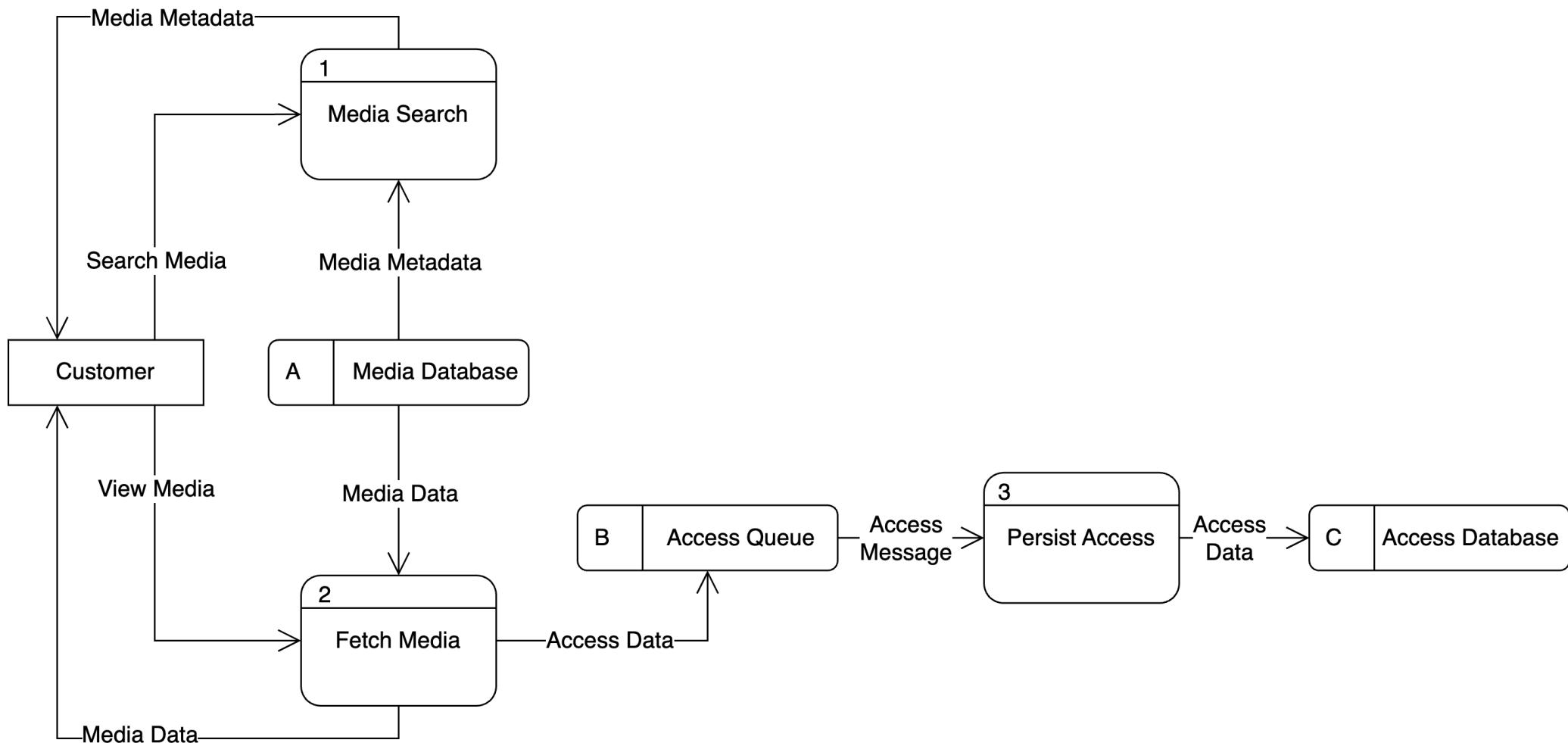
First impressions?



Polyglot Media

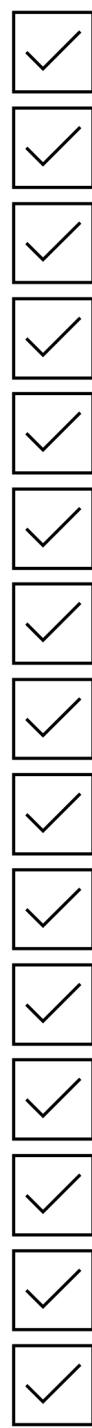
Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

Top Level DFD



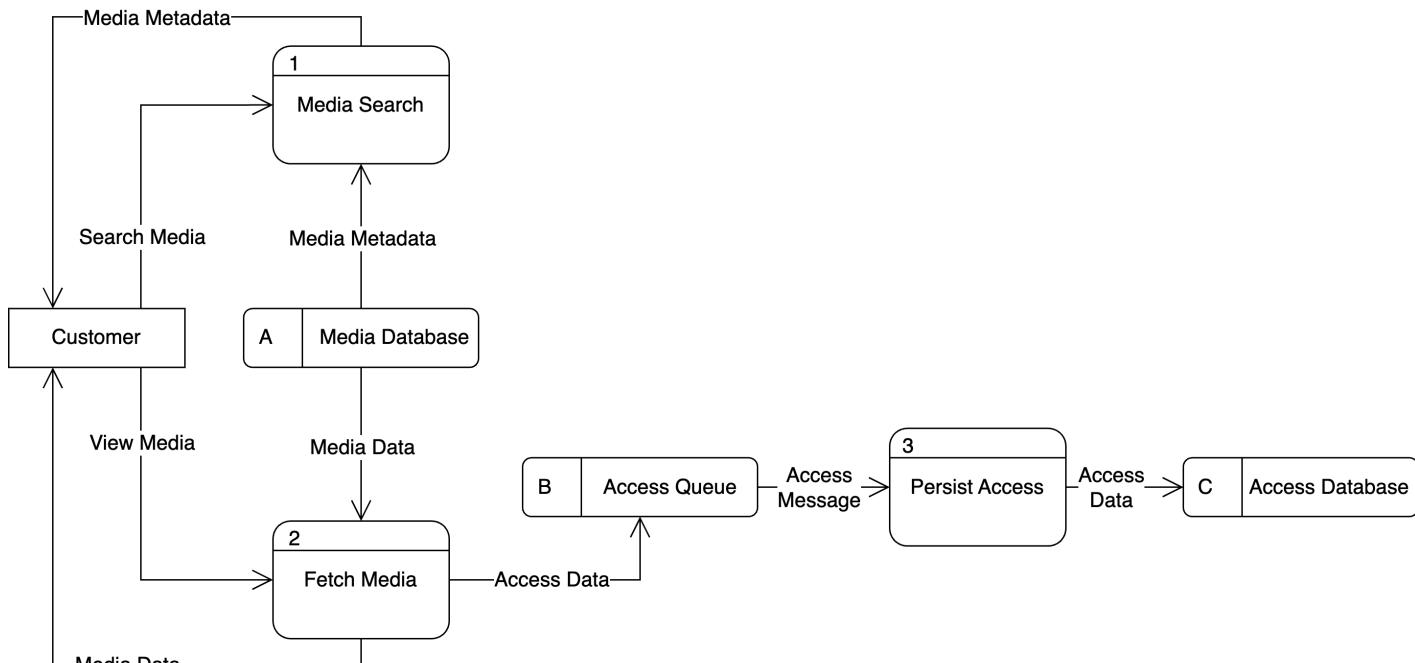
Polyglot Media

Data Flow Diagram: media search, view and access analytics

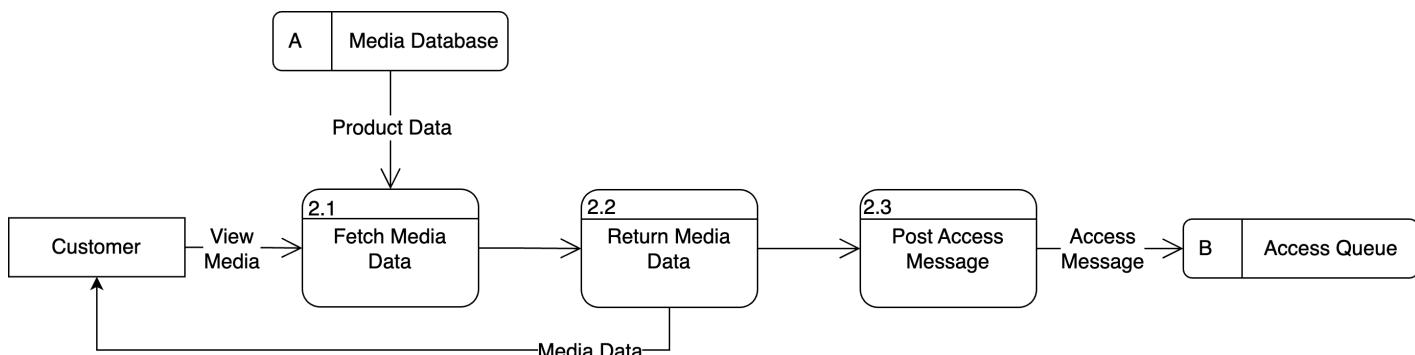


DFD Order

1

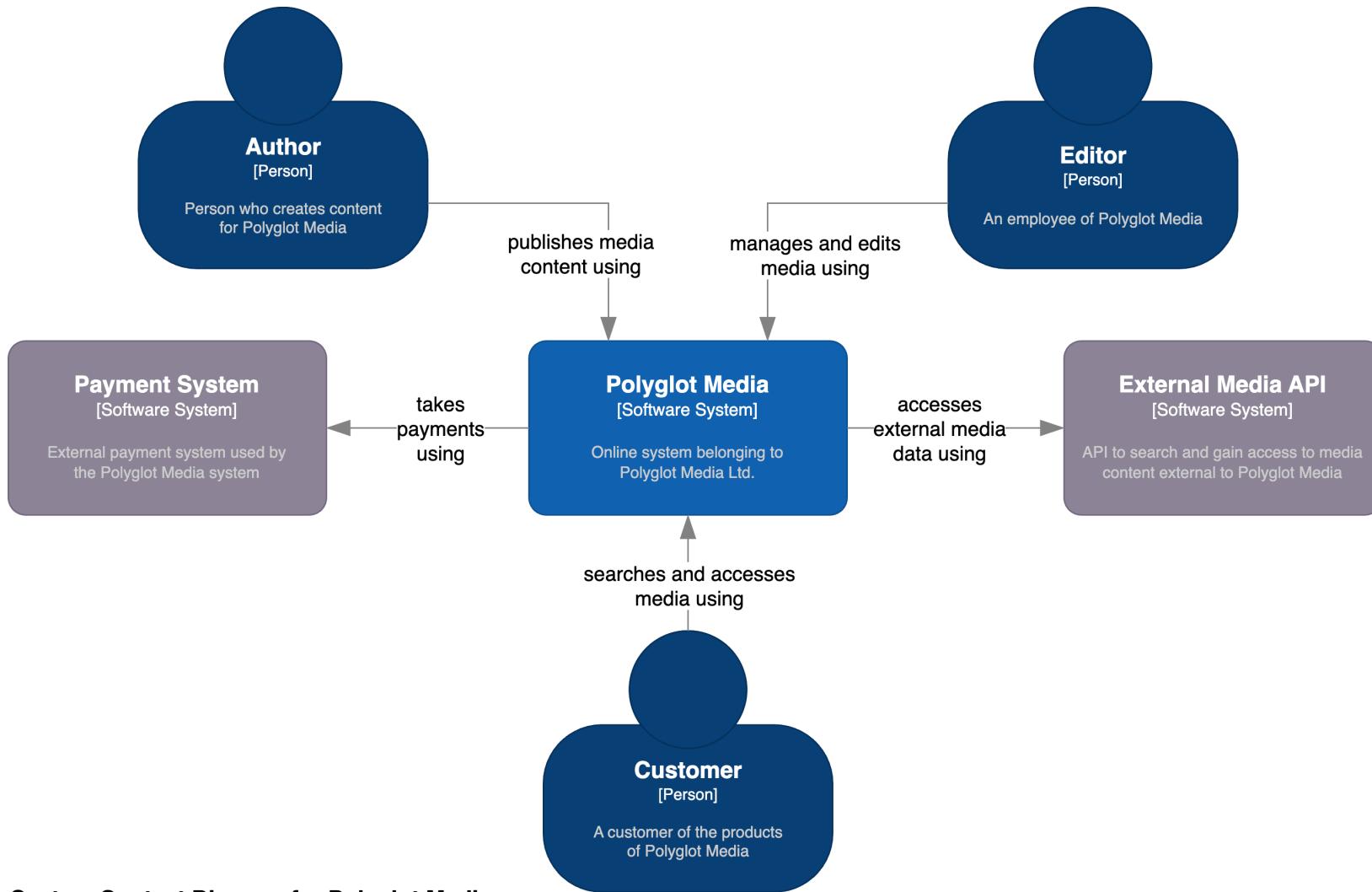


2

**Polyglot Media**

Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

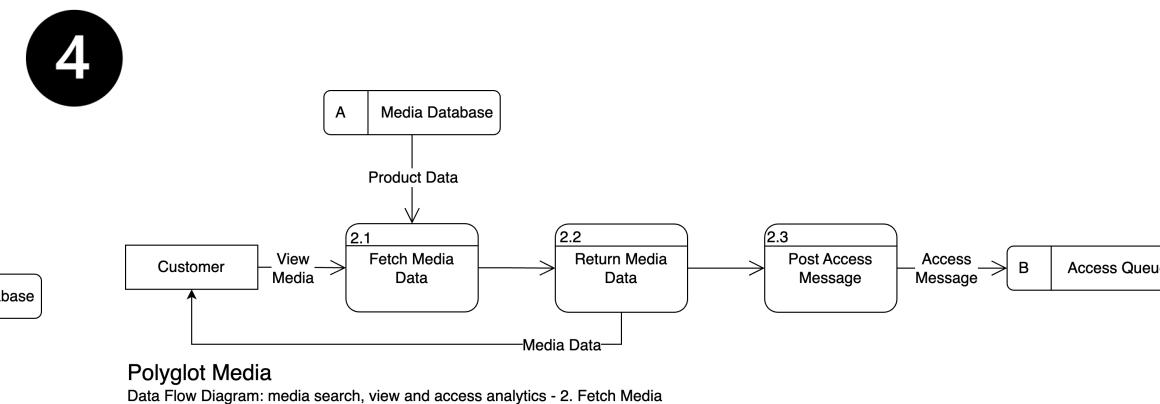
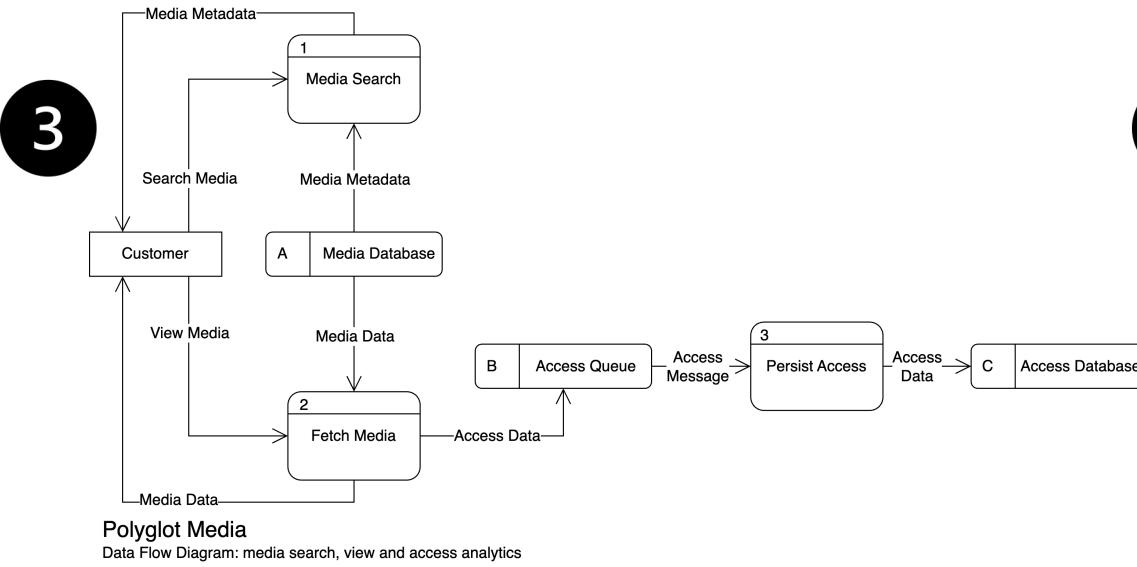
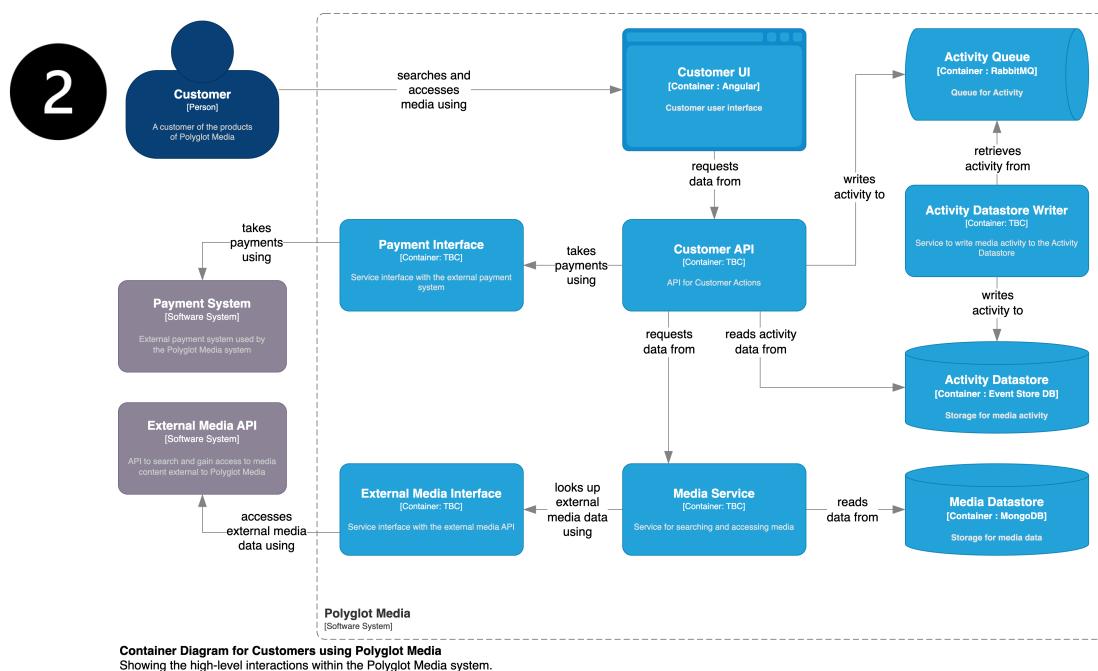
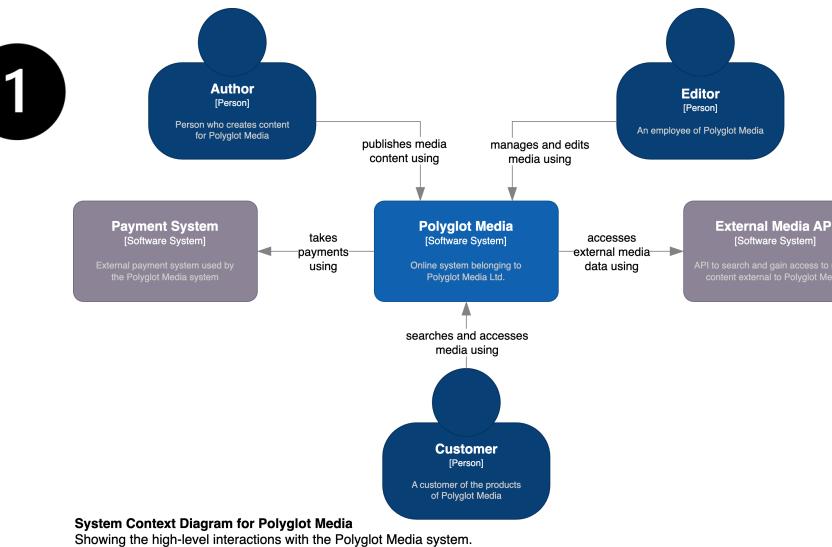
Context? Go for C4!



System Context Diagram for Polyglot Media

Showing the high-level interactions with the Polyglot Media system.

Create Narrative



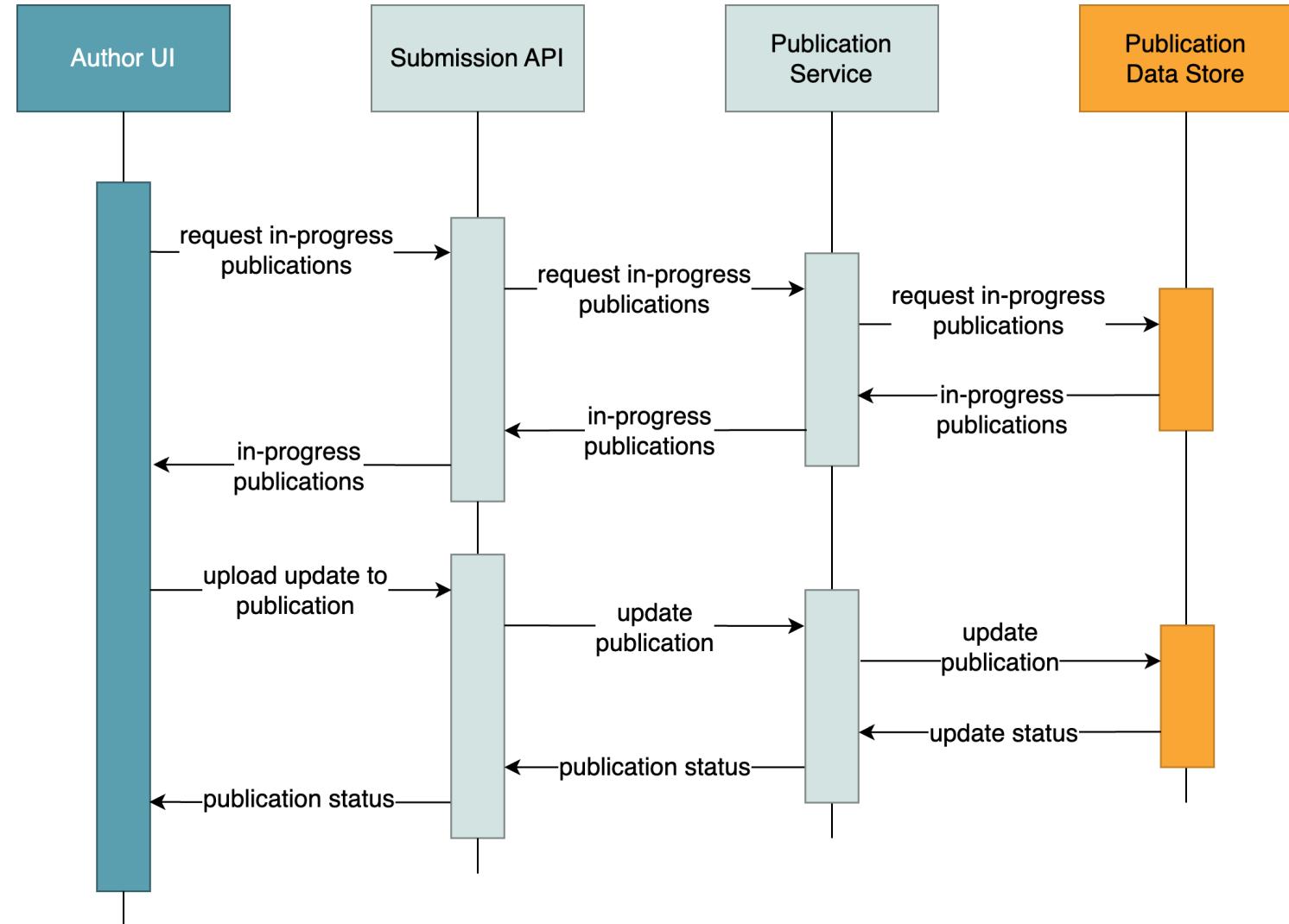
Pattern

Beside the Point

AKA: ensure relationships are clear



Uni-Directional

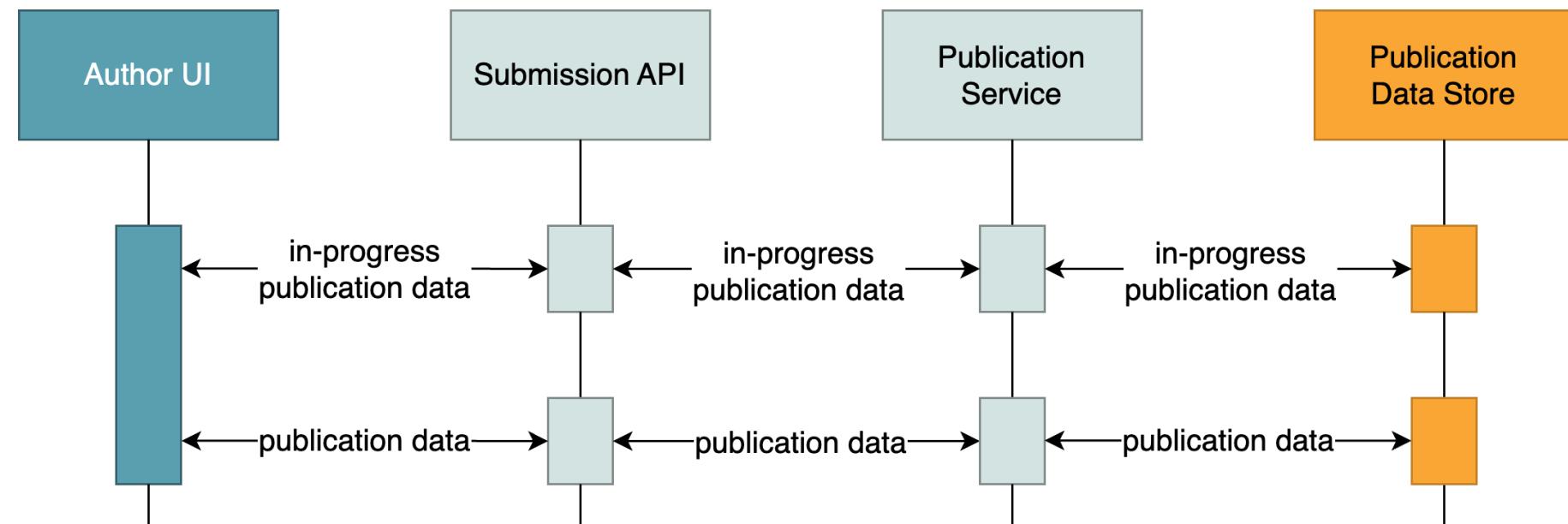


Polyglot Media

Author submission process, post login

Don't

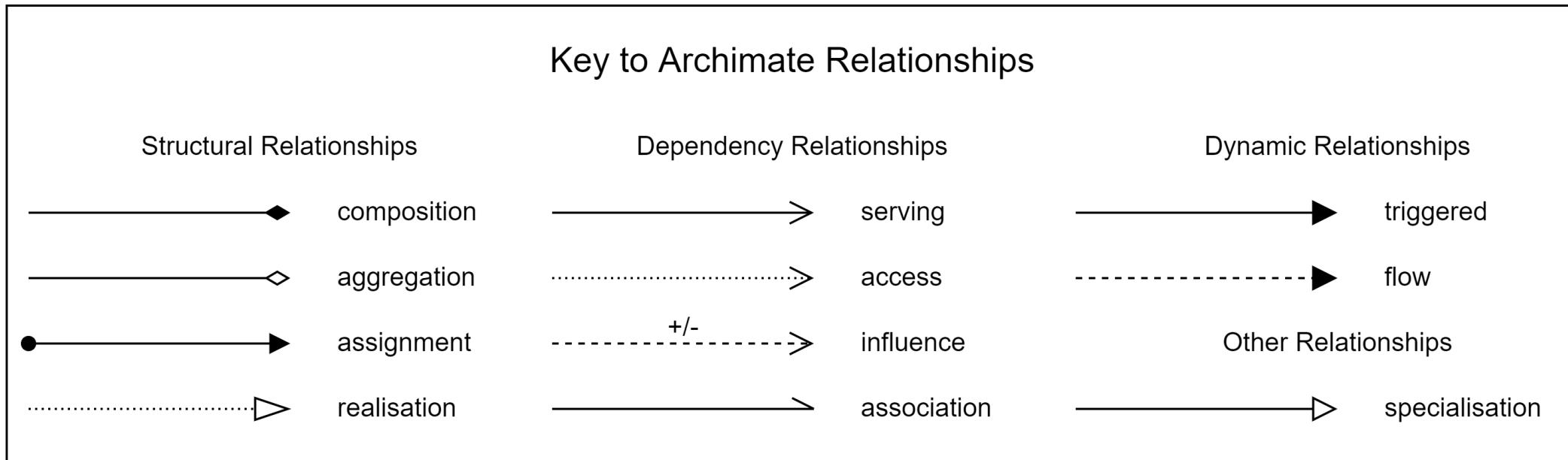
be tempted to combine arrows which do not have the same meaning



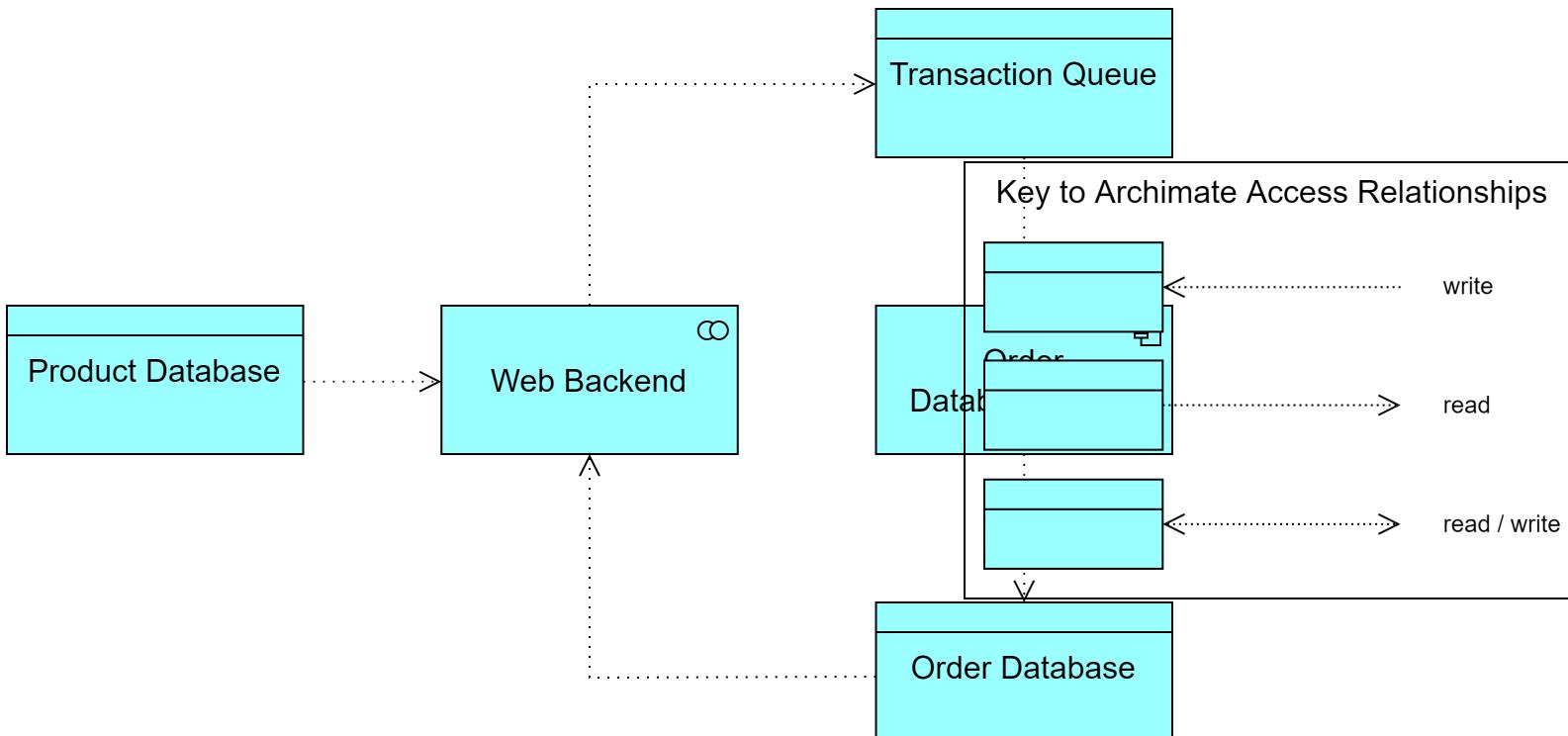
Polyglot Media

Author submission process, post login

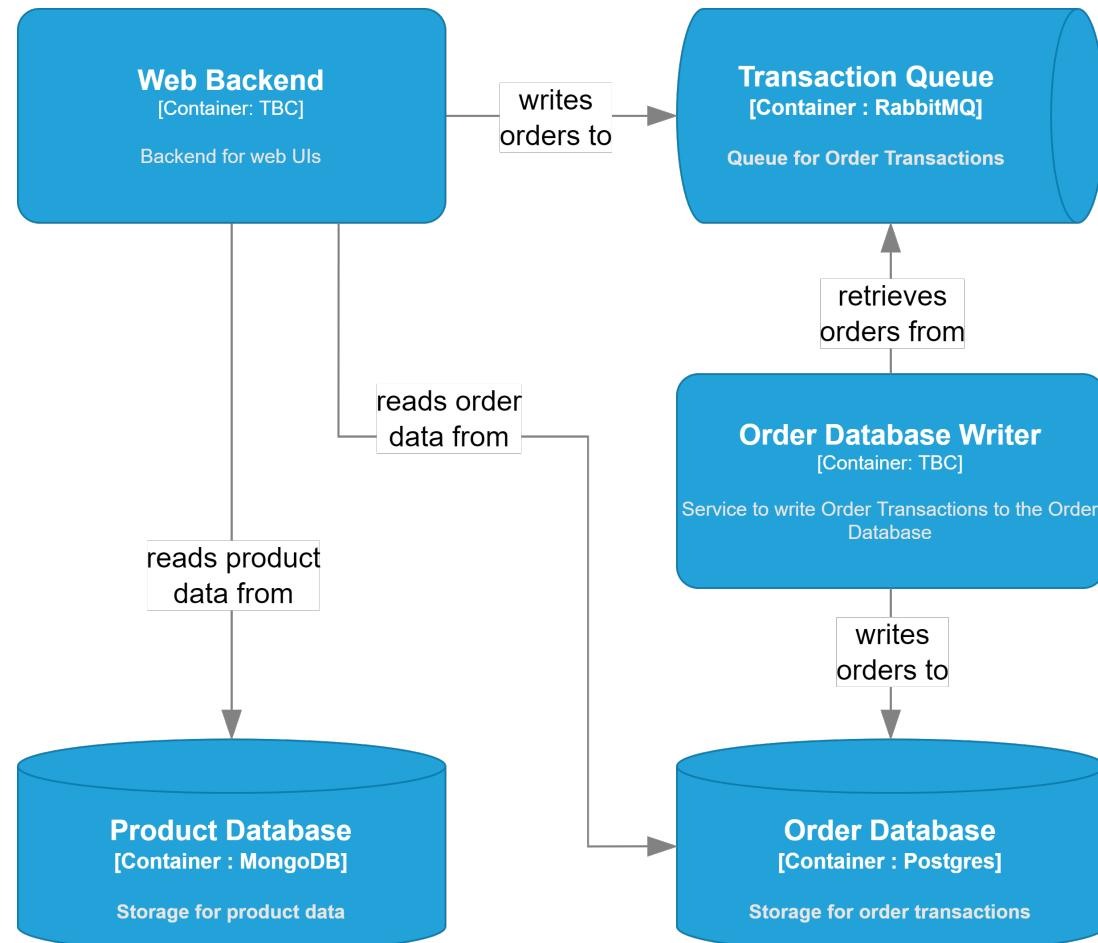
Archimate Relationships



Archimate Data Access



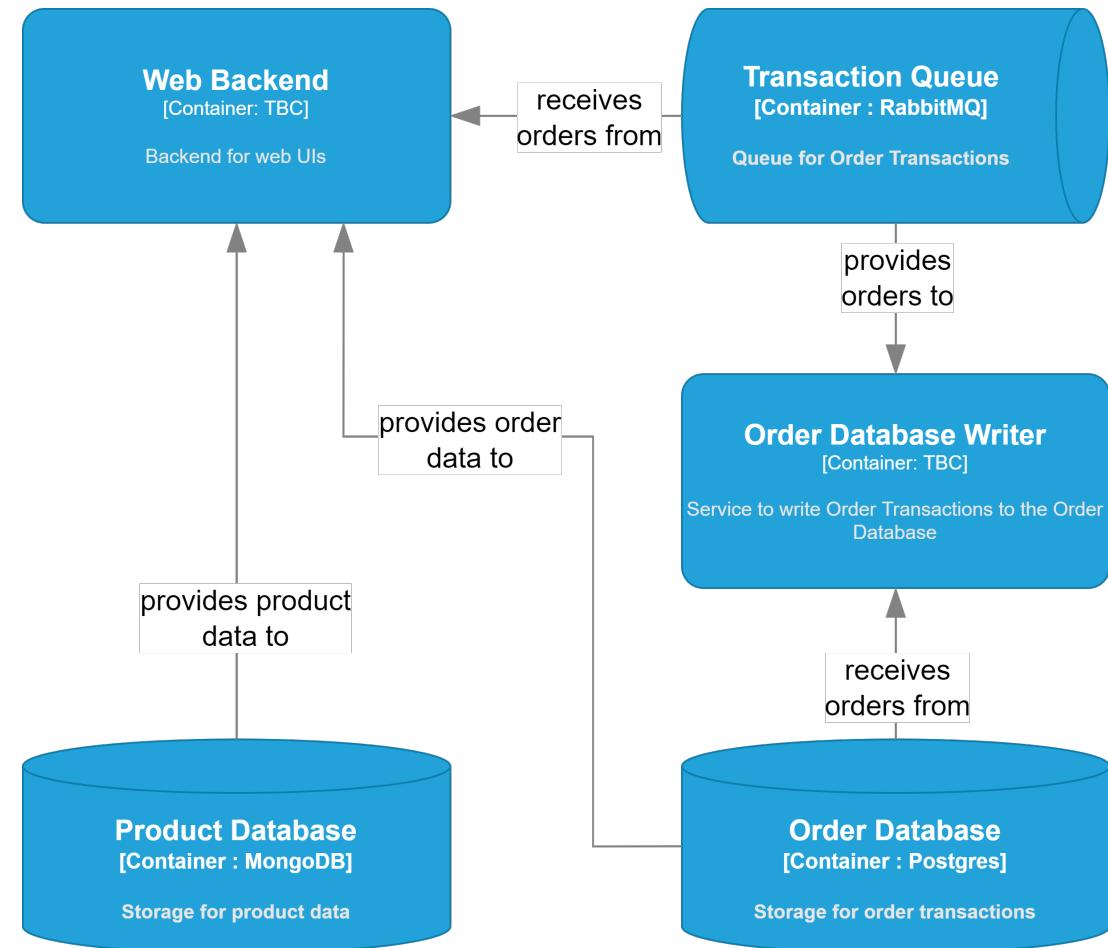
What does your audience need?



Container Data Access for Online Shop

Showing data access for the Web Backend in the Online Shop system

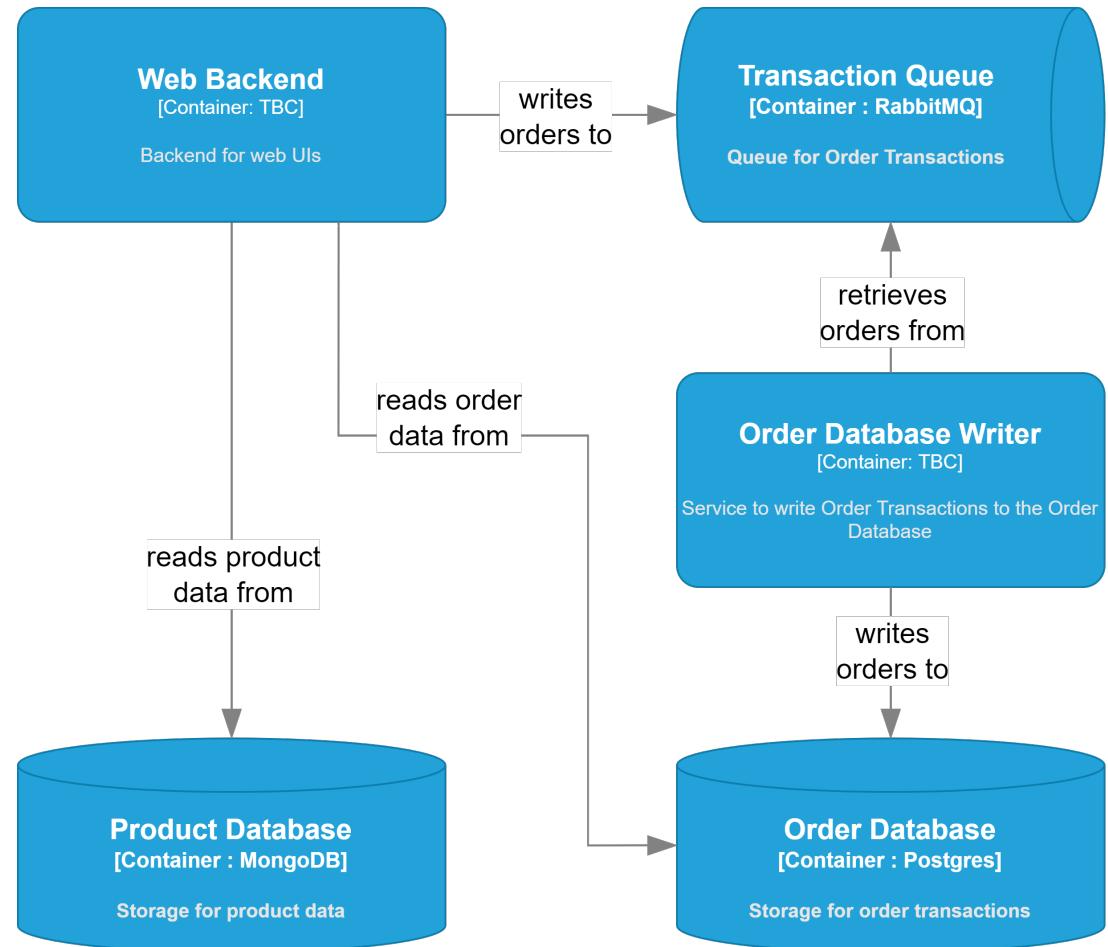
Reverse!



Container Data Access for Online Shop

Showing data access for the Web Backend in the Online Shop system

Sensical



Container Data Access for Online Shop

Showing data access for the Web Backend in the Online Shop system

Exercise

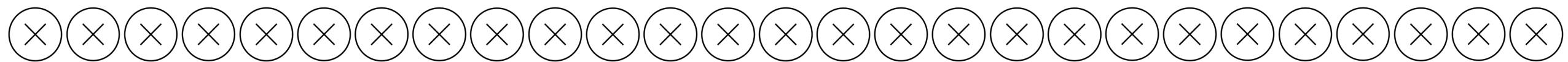
Notation

select the best standard to communicate successfully

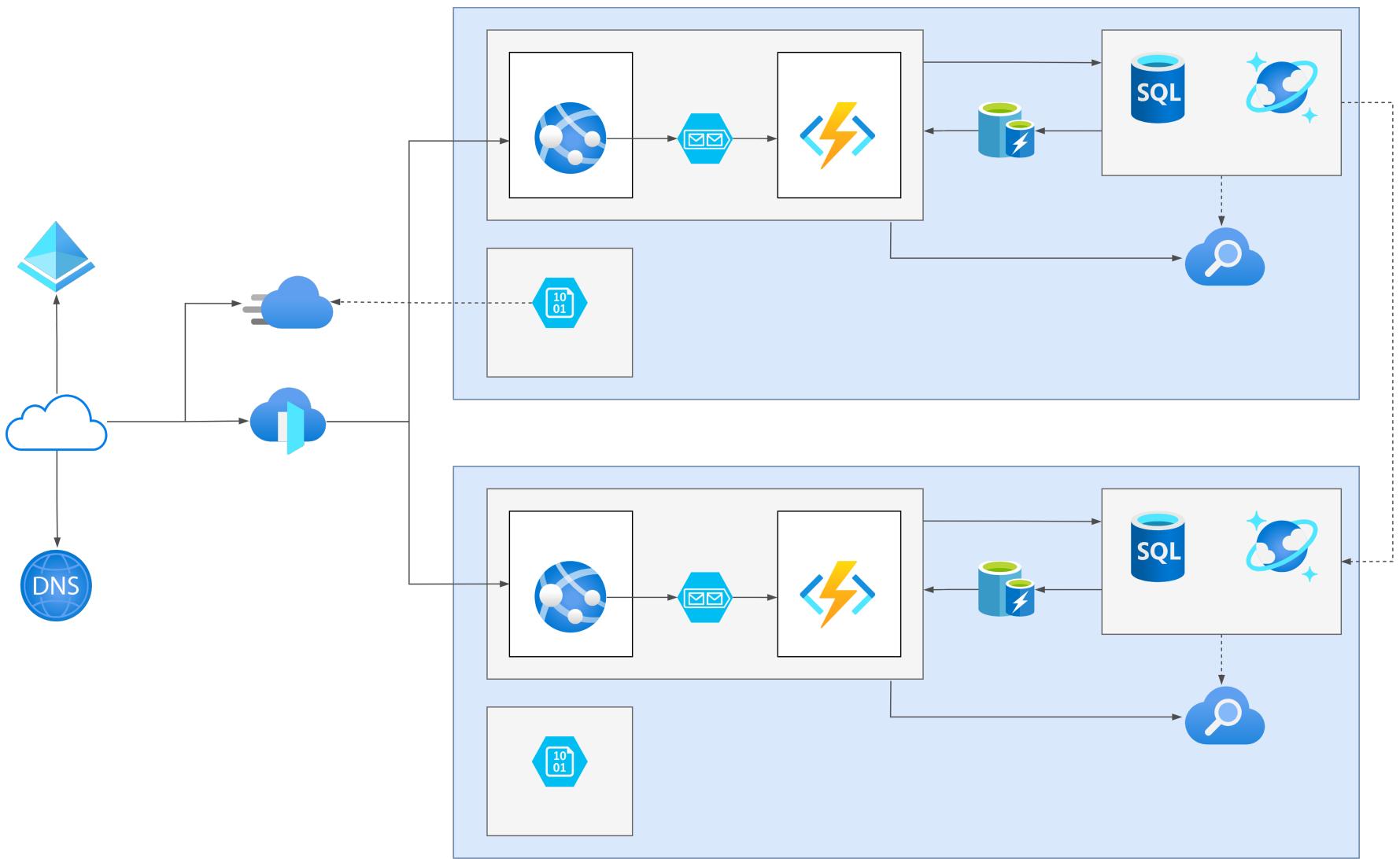
Antipattern

Iconic

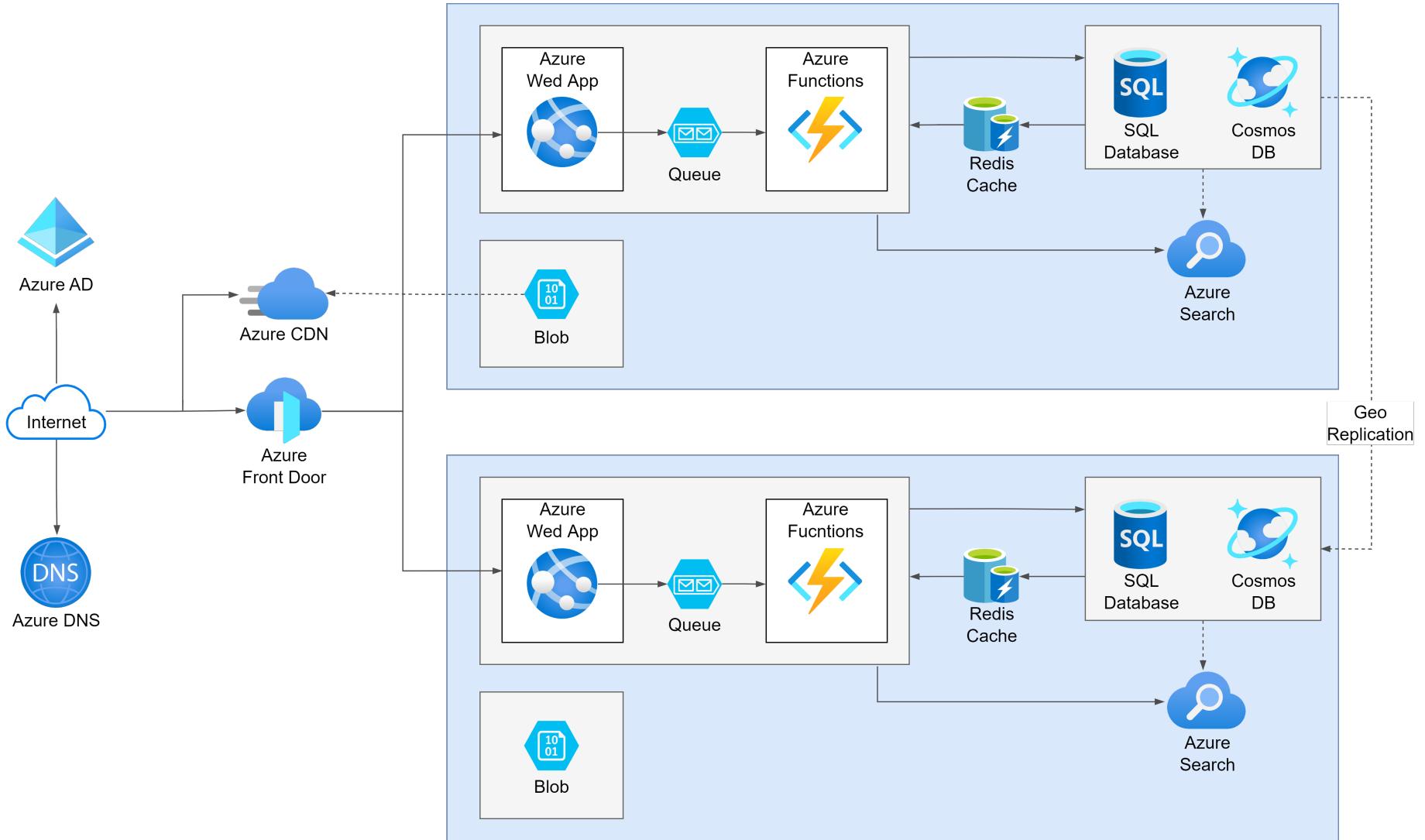
AKA: Using icons to convey meaning



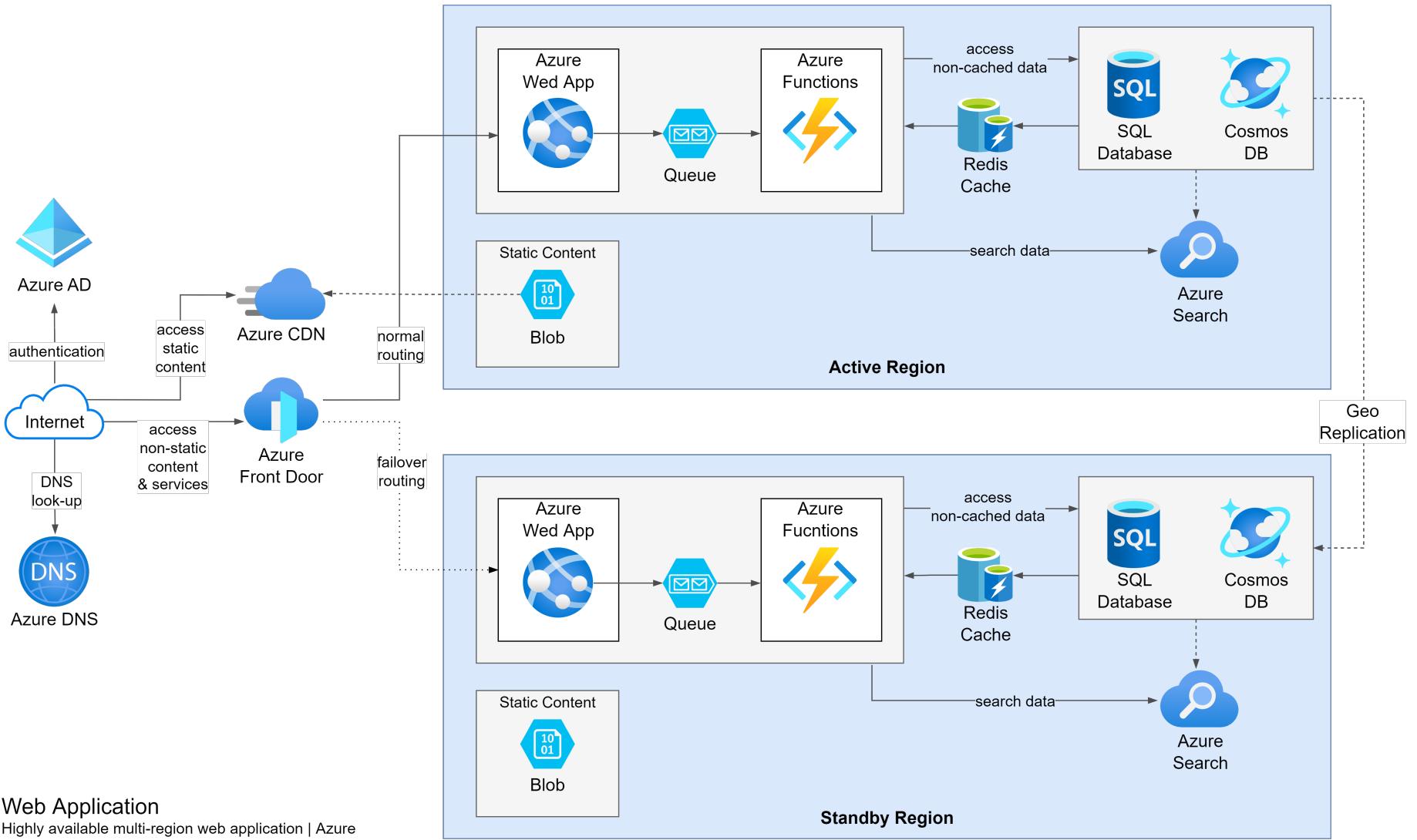
Just icons!



Some labels



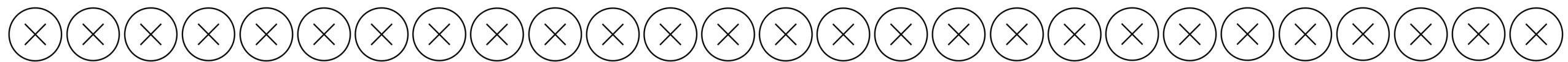
Communication!



Antipattern

Not-So-Unified Modelling Language

AKA: using UML when it's not useful



UML is useful

UML Diagram Types

Structural

Behavioural

Profile

Class

State Machine

Timing

Deployment

Object

Communication

Sequence

Package

Component

Usecase

Activity

Composite
Structure

Interaction
Overview

UML Diagram Types

Structural

Behavioural

Profile

Class

State Machine

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Object

Communication

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Package

Component

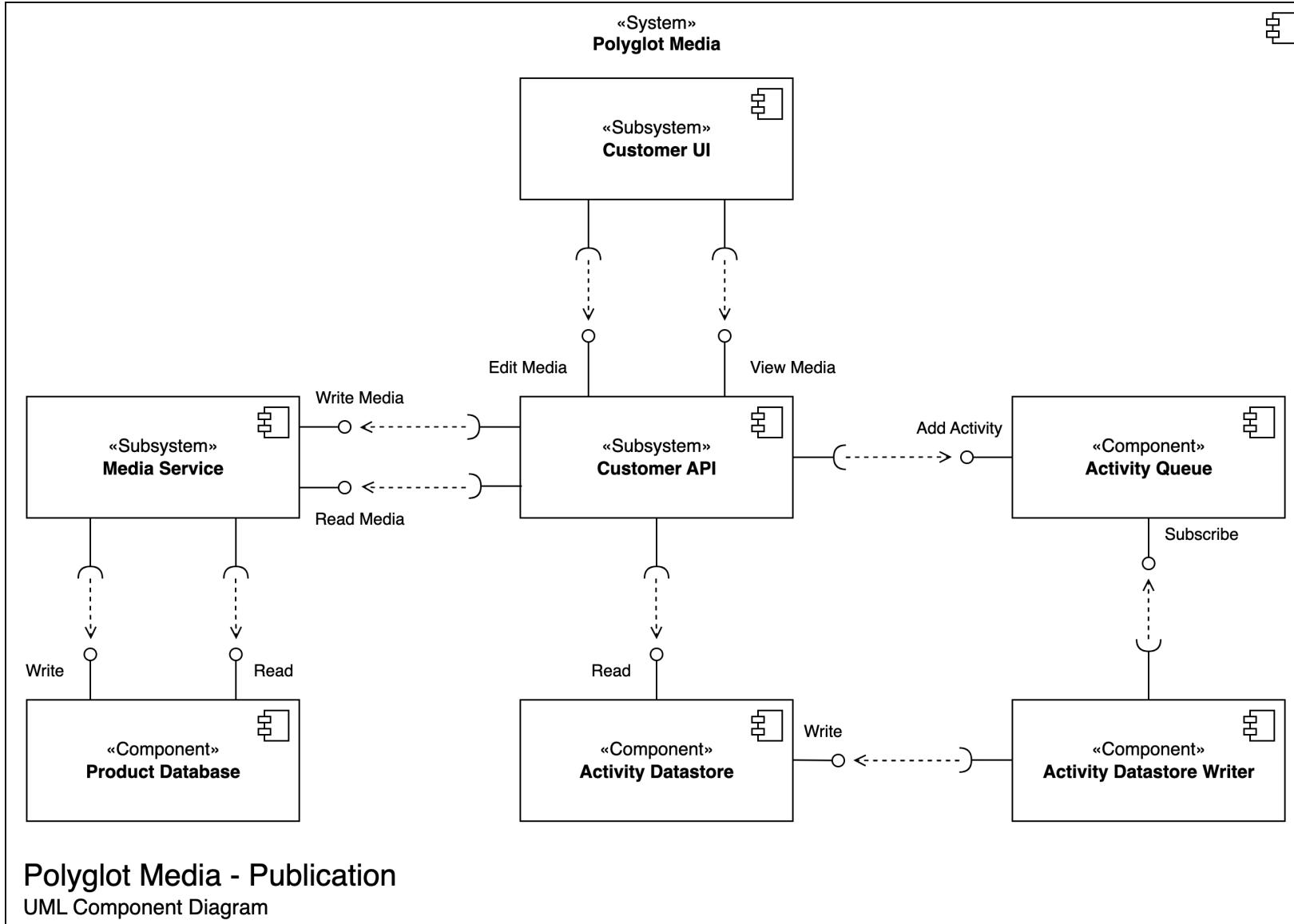
Usecase

Activity

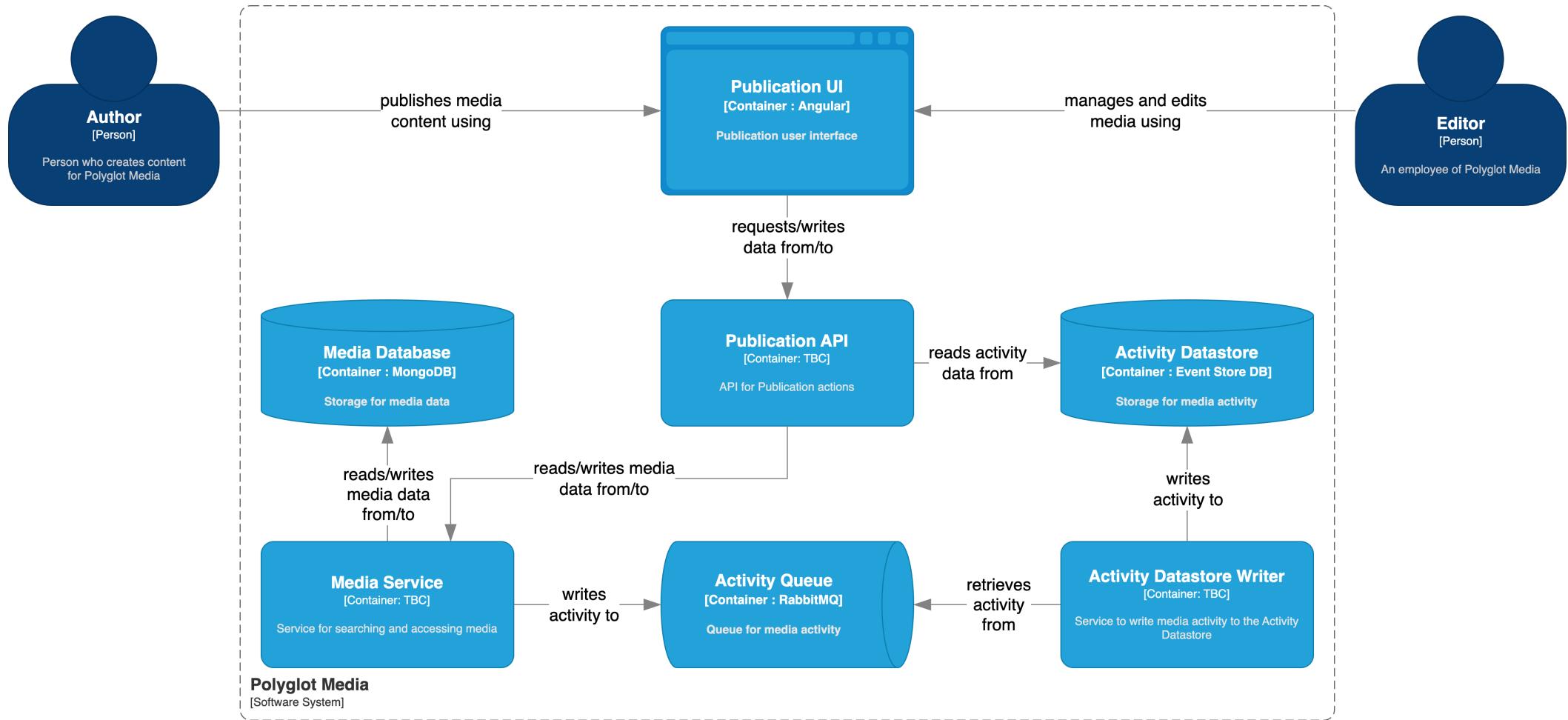
Composite
Structure

Interaction
Overview

UML Component

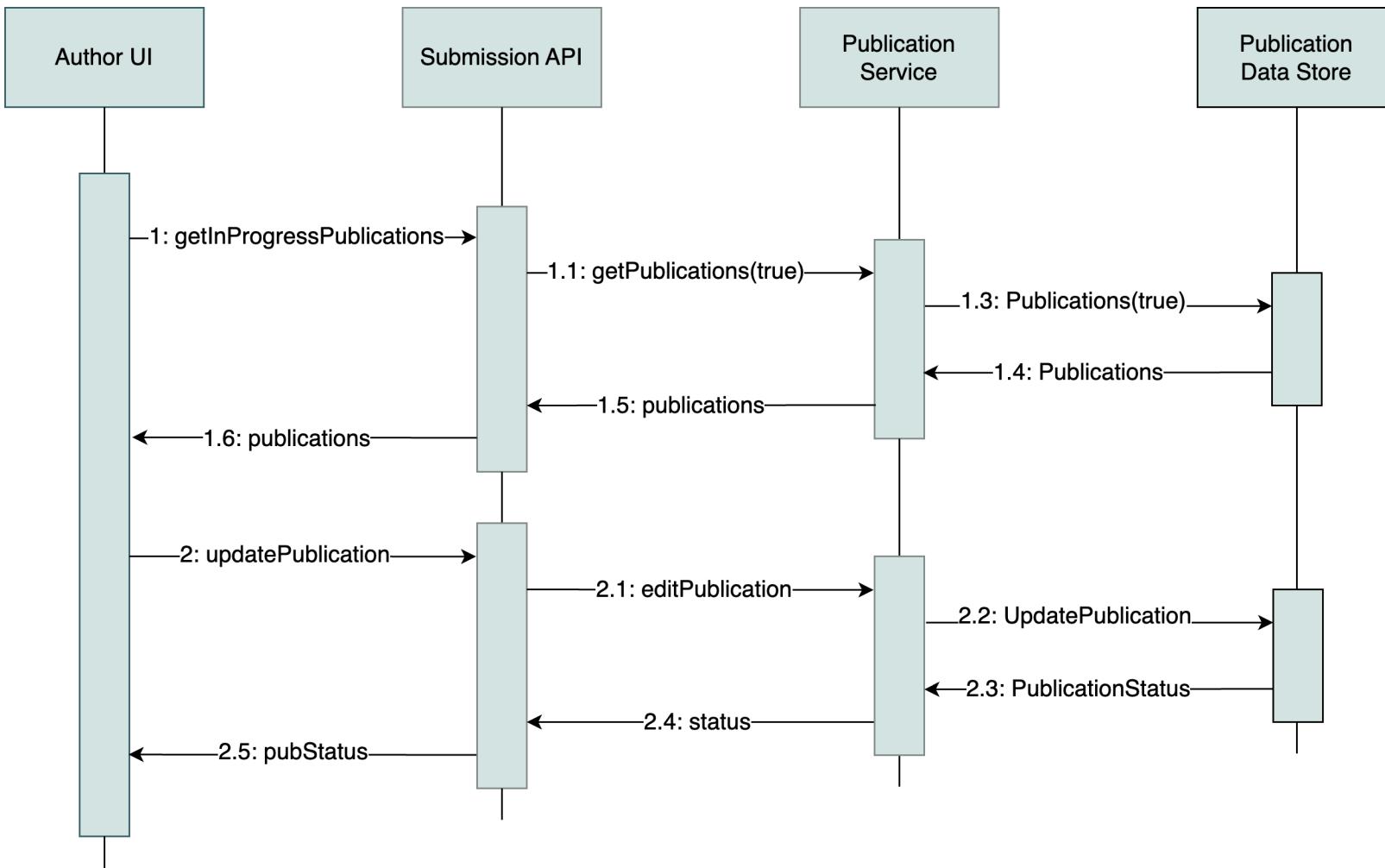


C4 Container Diagram



Container Diagram for Publications in Polyglot Media
Showing the high-level interactions within the Polyglot Media system.

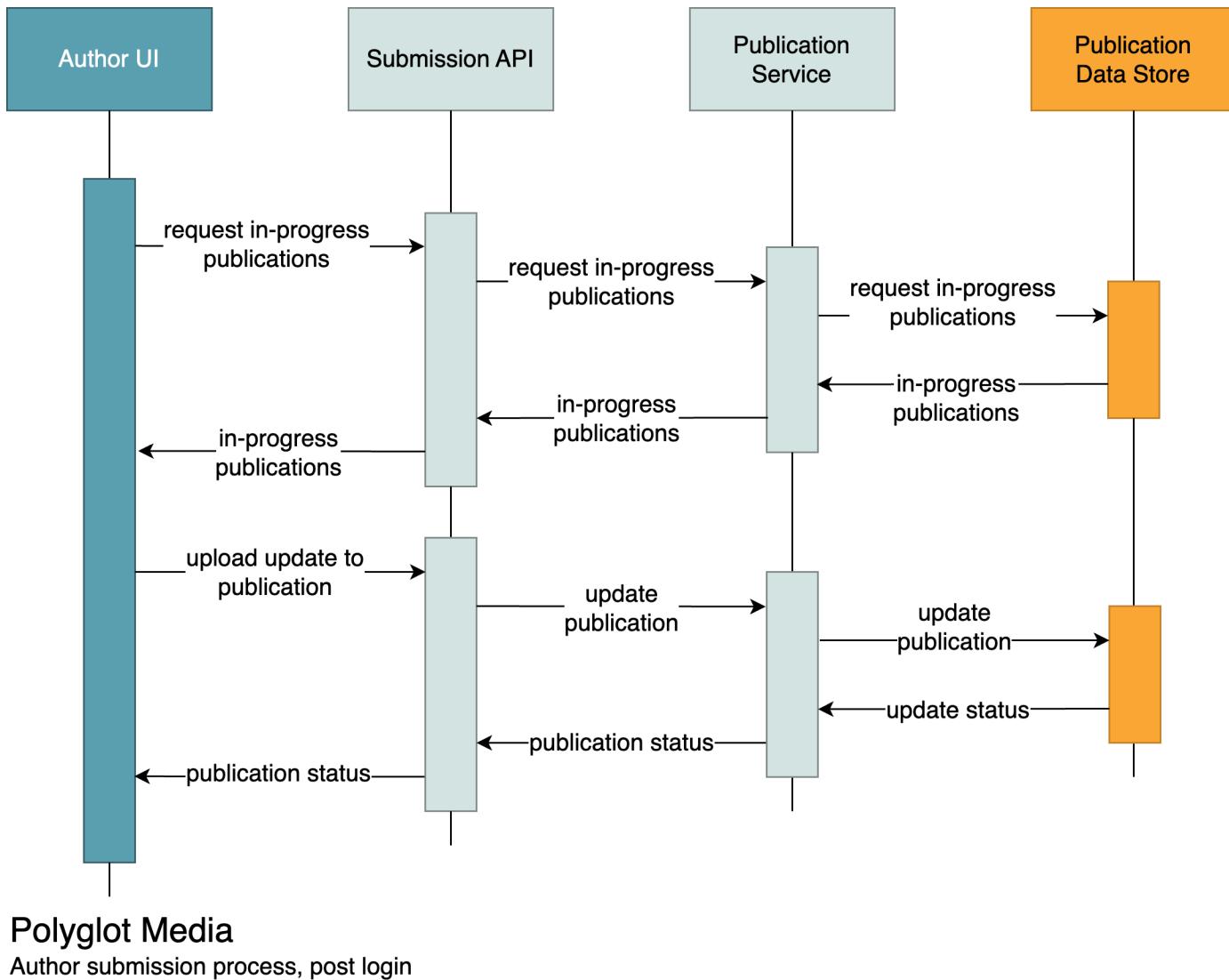
UML Sequence



Polyglot Media

Author submission process, post login

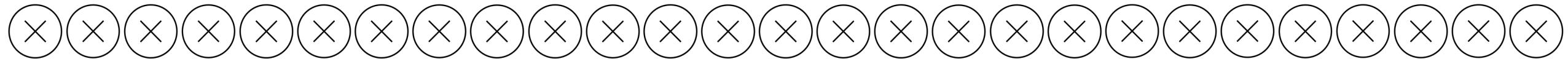
Simplified Sequence



Antipattern

Structures Behaving Badly

AKA: mixing structure and behaviour



UML Diagram Types

Structural

Behavioural

Profile

Class

State Machine

Timing

Deployment

Object

Communication

Sequence

Package

Component

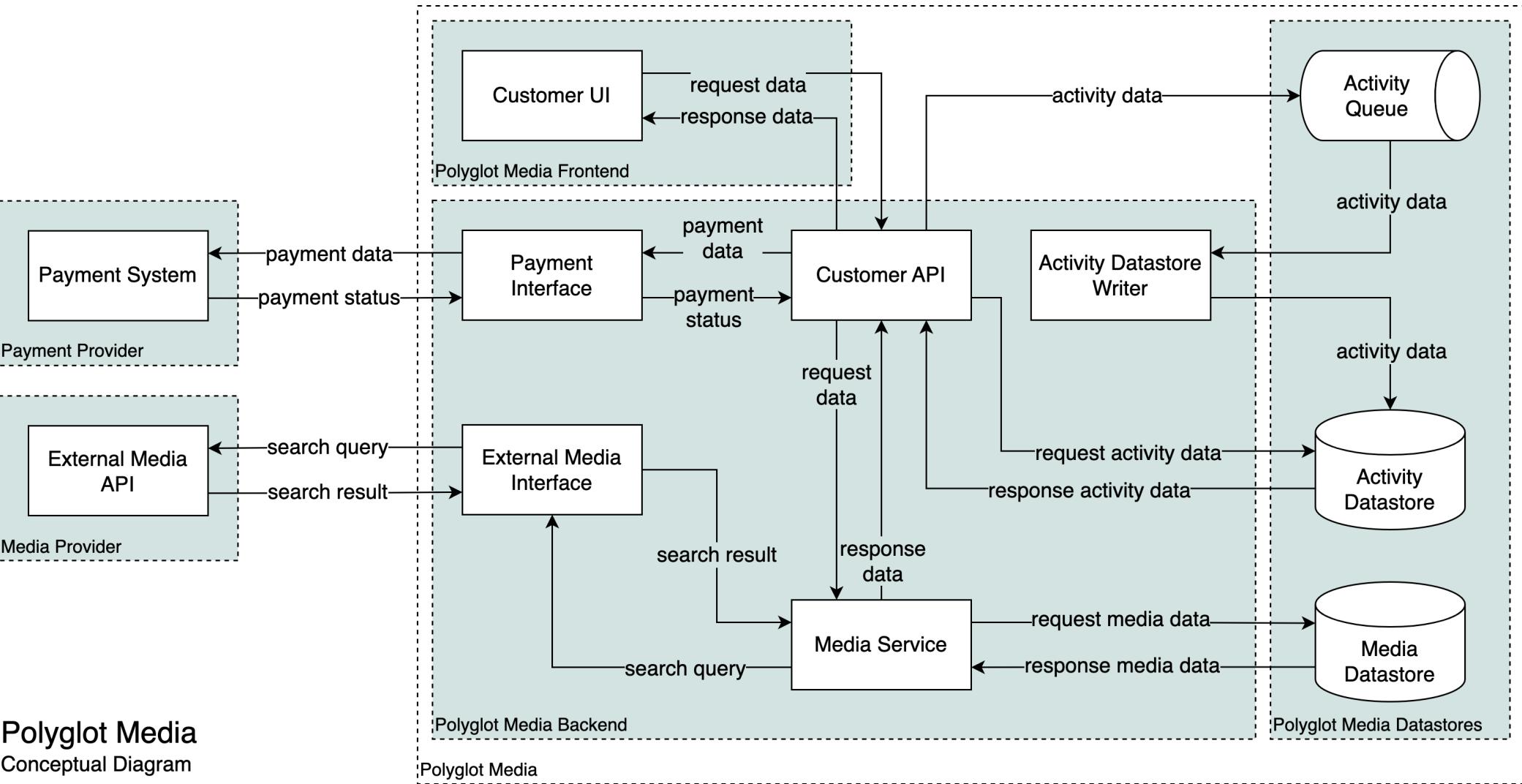
Usecase

Activity

Composite
Structure

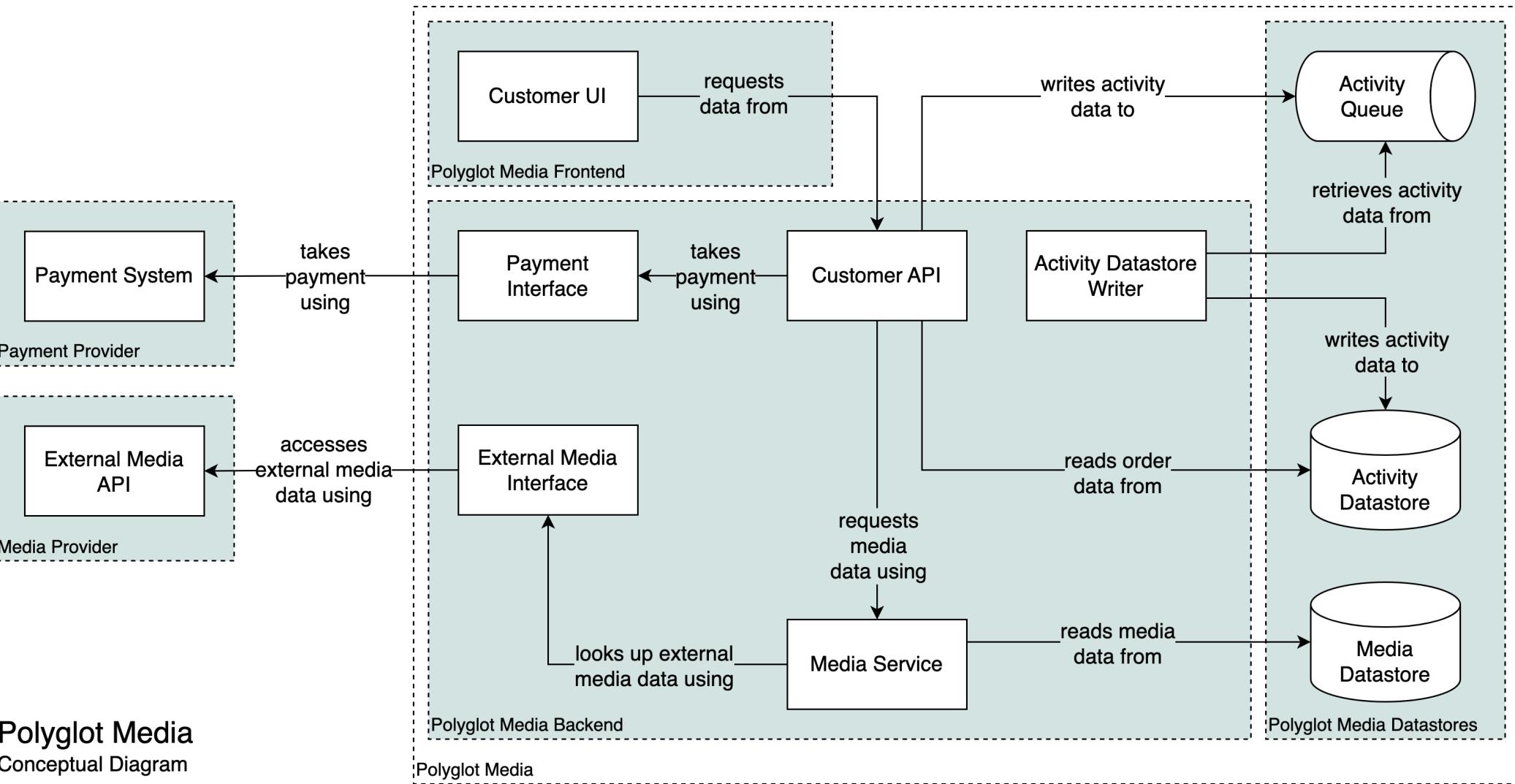
Interaction
Overview

Mixed Messages



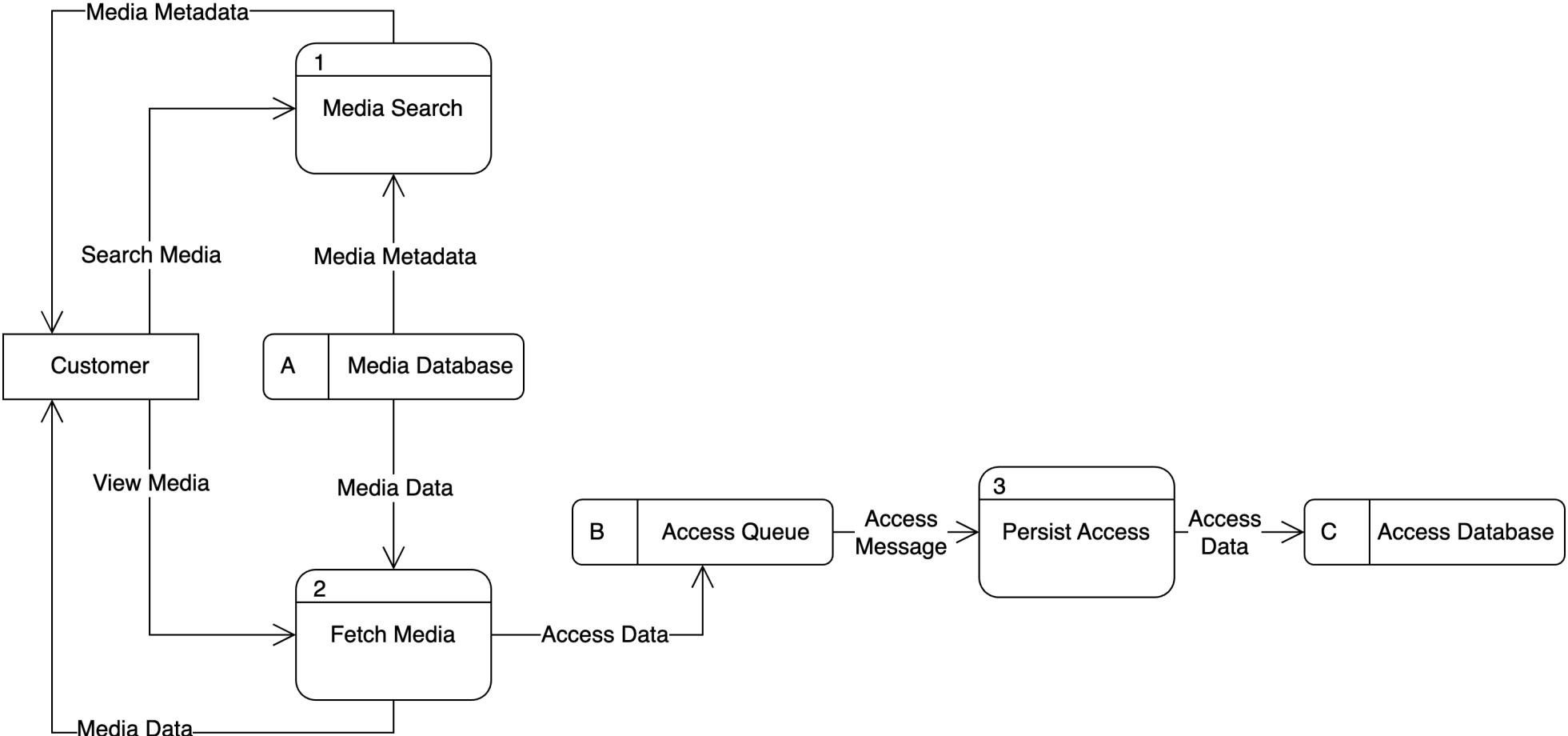
Polyglot Media
Conceptual Diagram

Structure





Behaviour



Polyglot Media

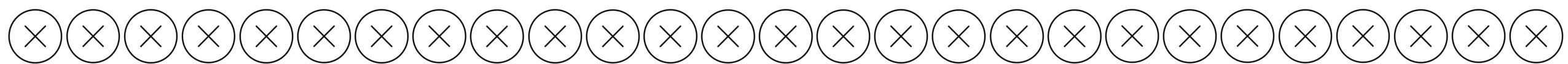
Data Flow Diagram: media search, view and access analytics



Antipattern

Unconventional

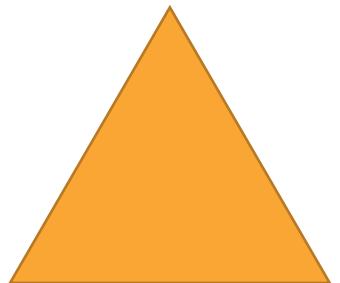
AKA: going against common expectations



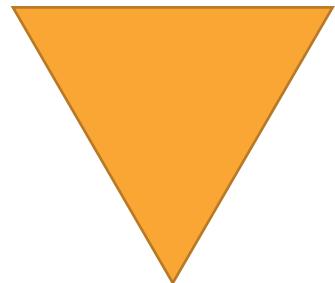


https://commons.wikimedia.org/wiki/File:Steve_Jobs_WWDC07.jpg





stability



instability



order



formality

Exercise

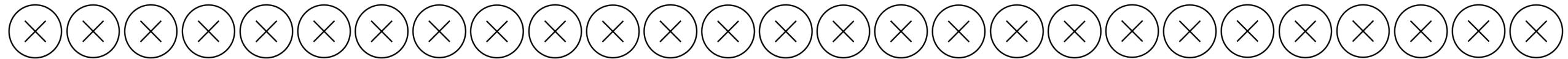
Composition

arrange your visuals for ultimate clarity

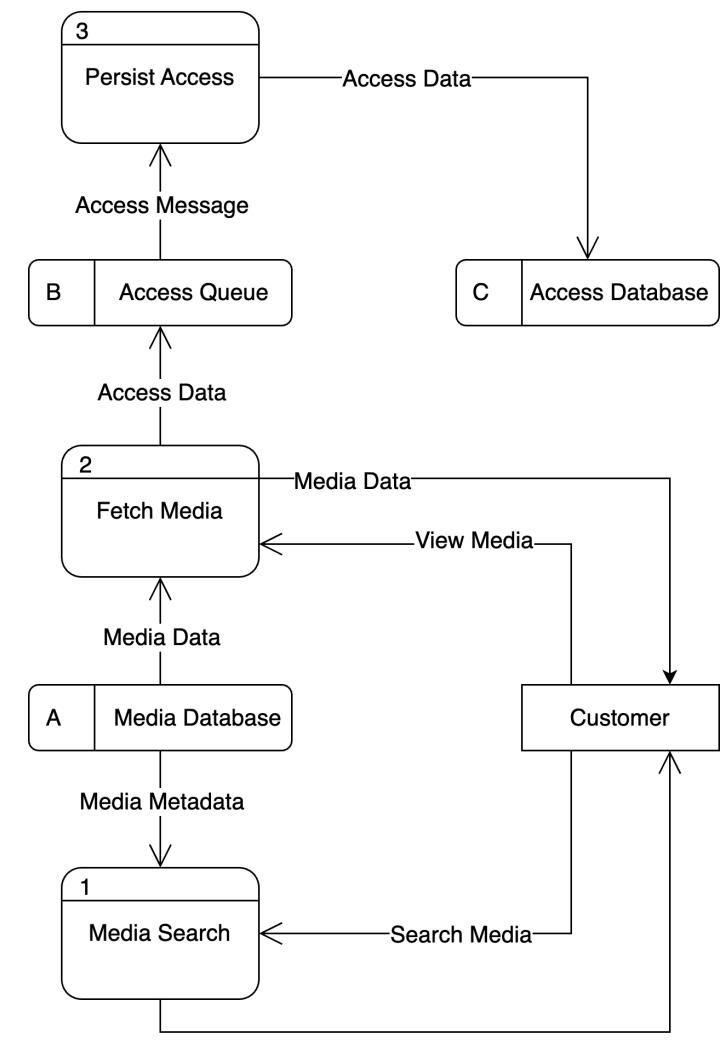
Antipattern

Portrait Gallery

AKA: using the wrong orientation for your format



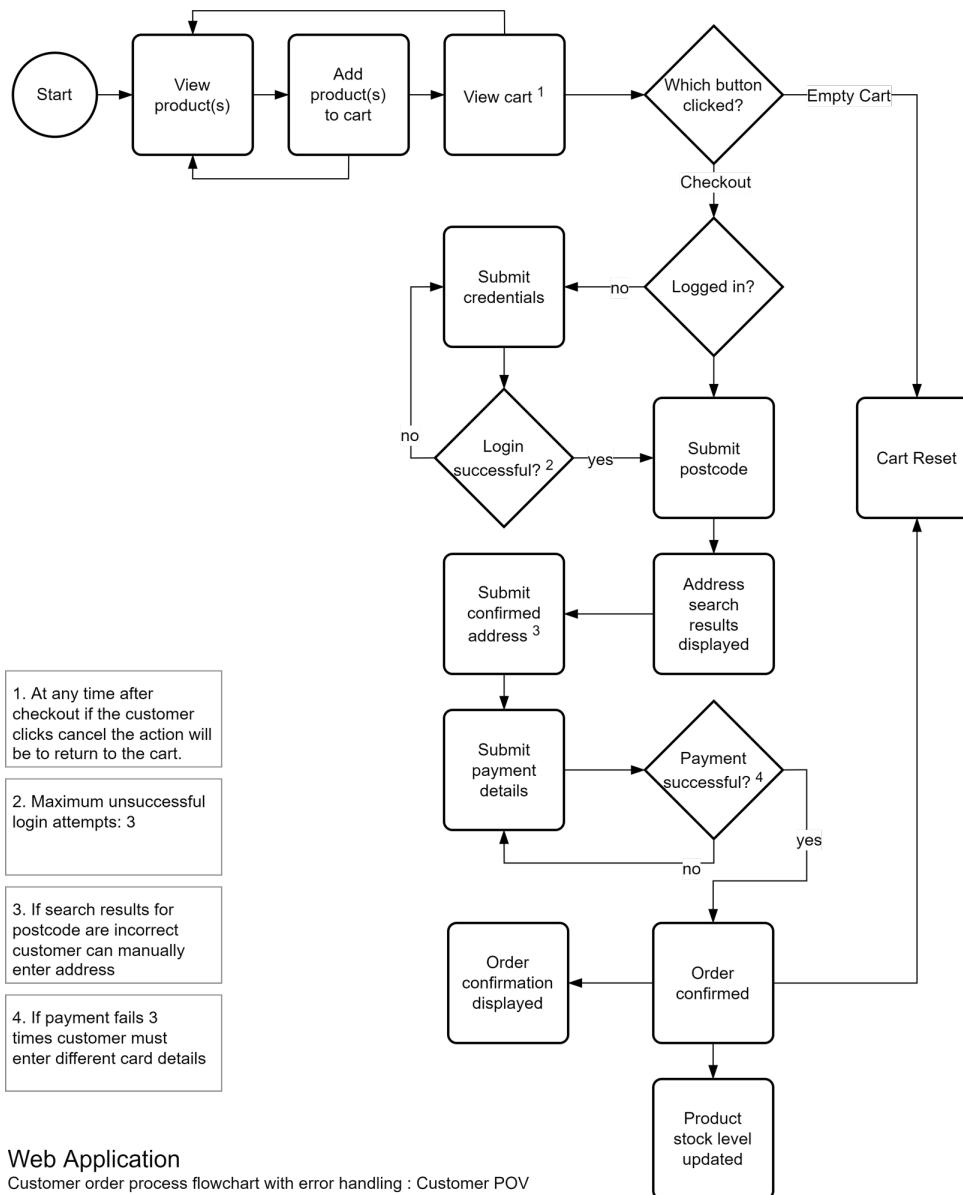
Wrong Orientation



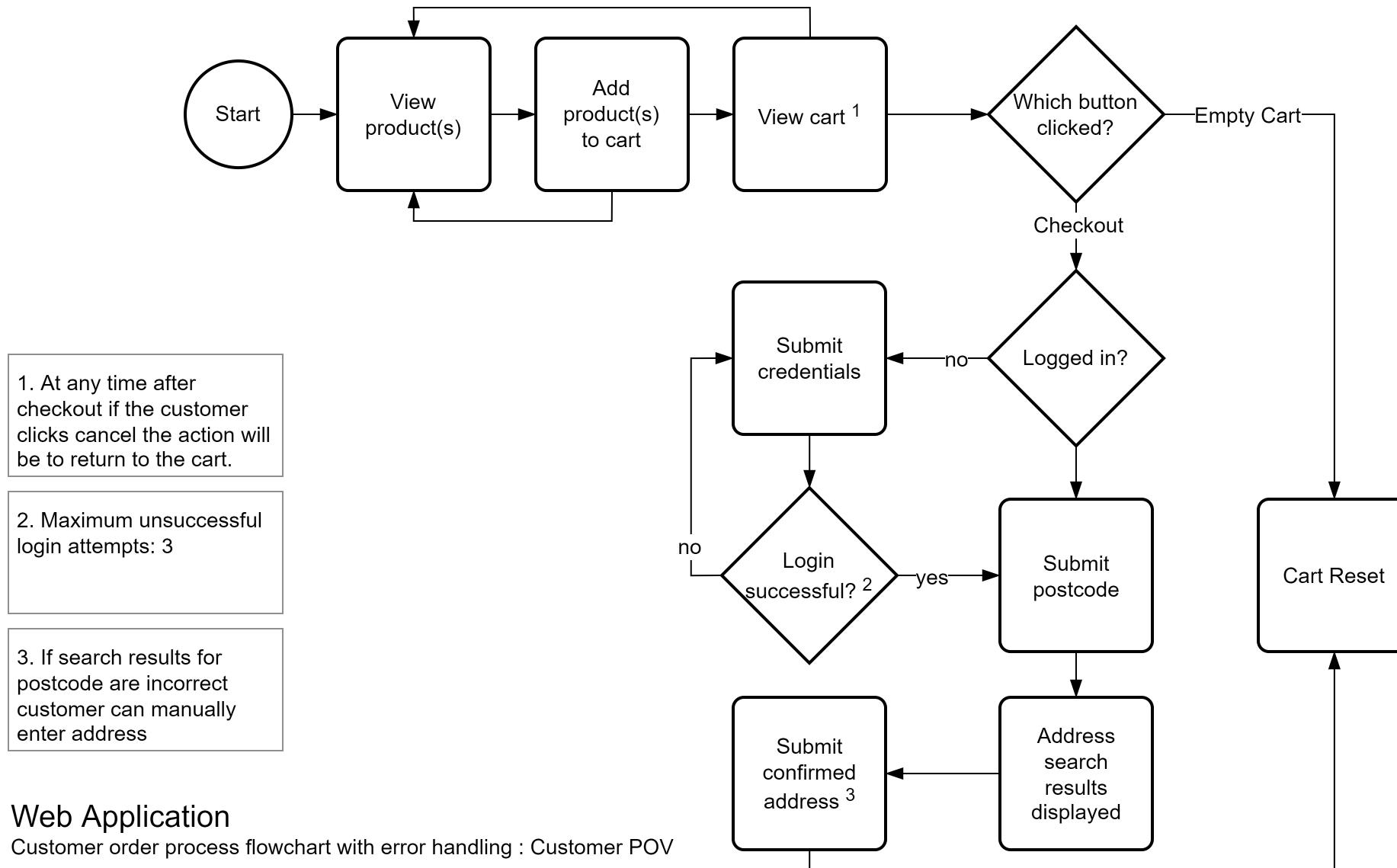
Polyglot Media

Data Flow Diagram: media search, view and access analytics

Start with the overview...

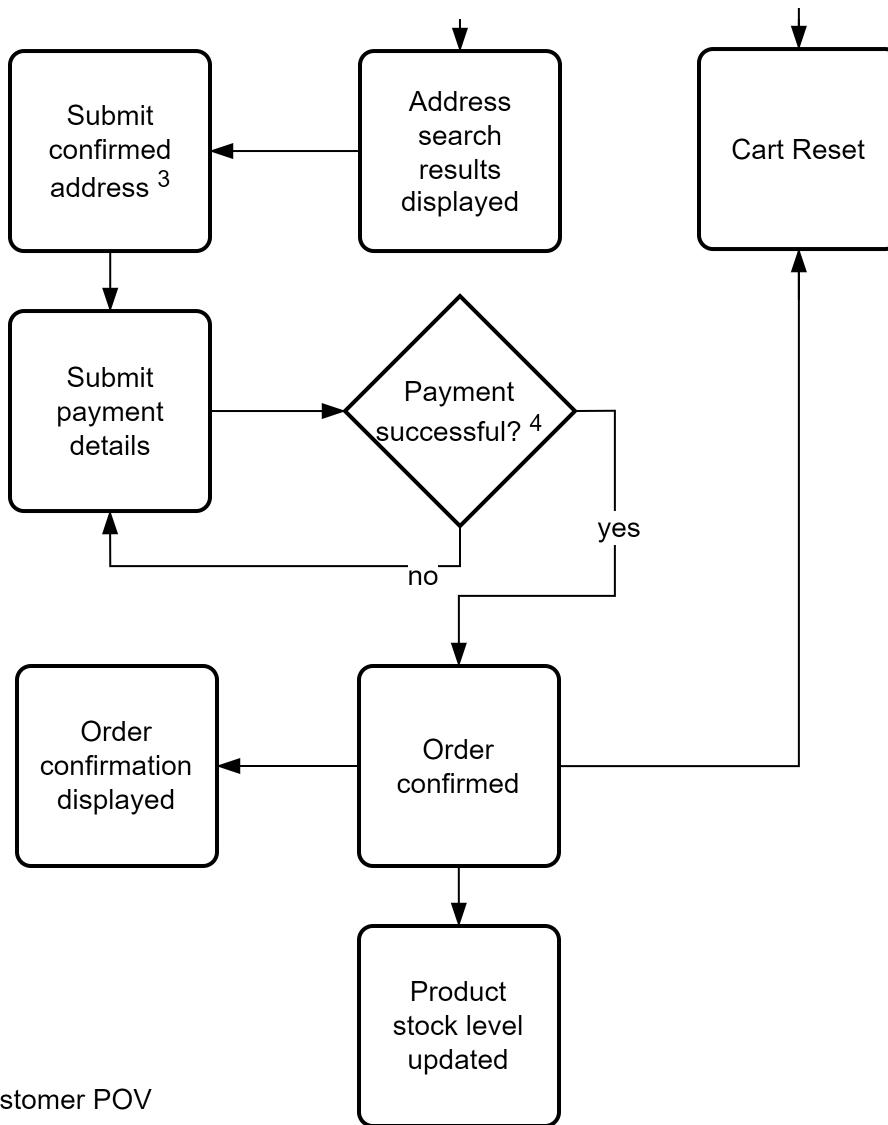


Legible



Move on...

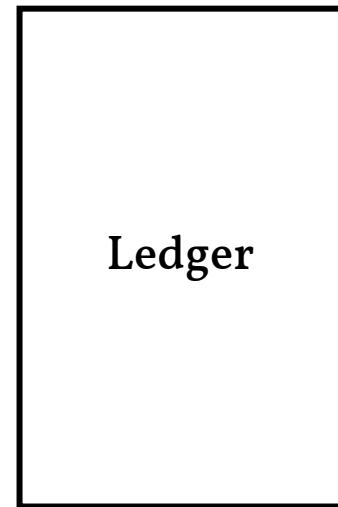
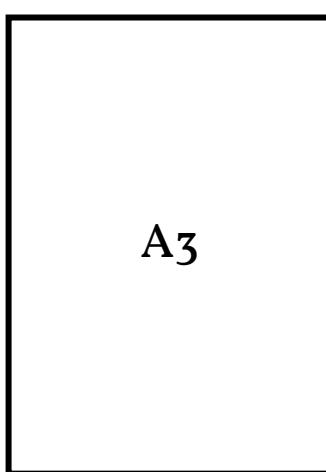
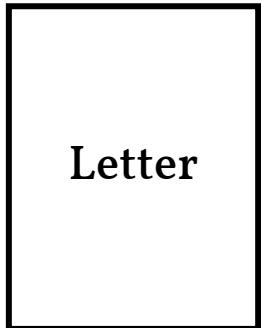
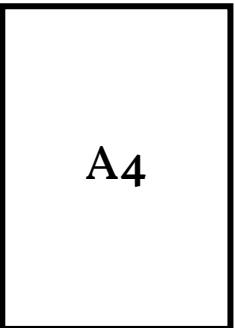
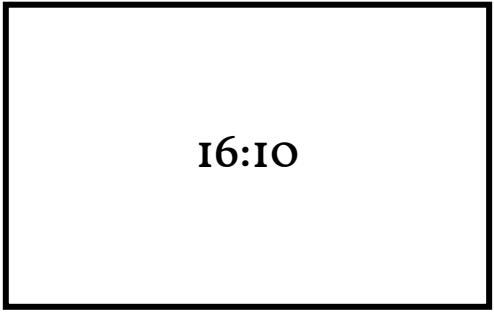
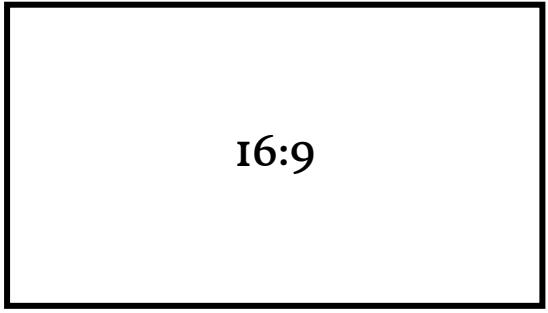
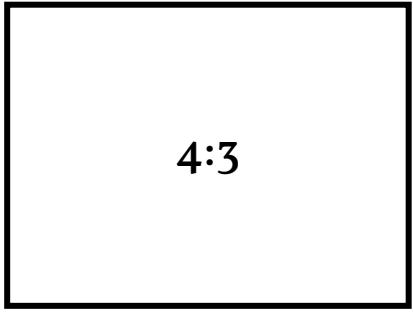
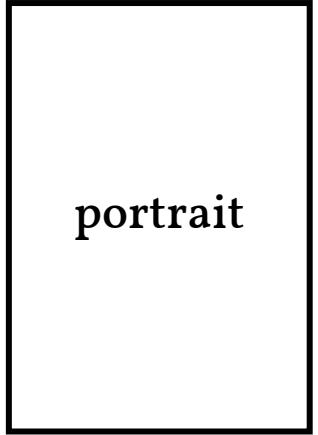
1. At any time after checkout if the customer clicks cancel the action will be to return to the cart.
2. Maximum unsuccessful login attempts: 3
3. If search results for postcode are incorrect customer can manually enter address
4. If payment fails 3 times customer must enter different card details



Web Application

Customer order process flowchart with error handling : Customer POV

Orientation & Ratio



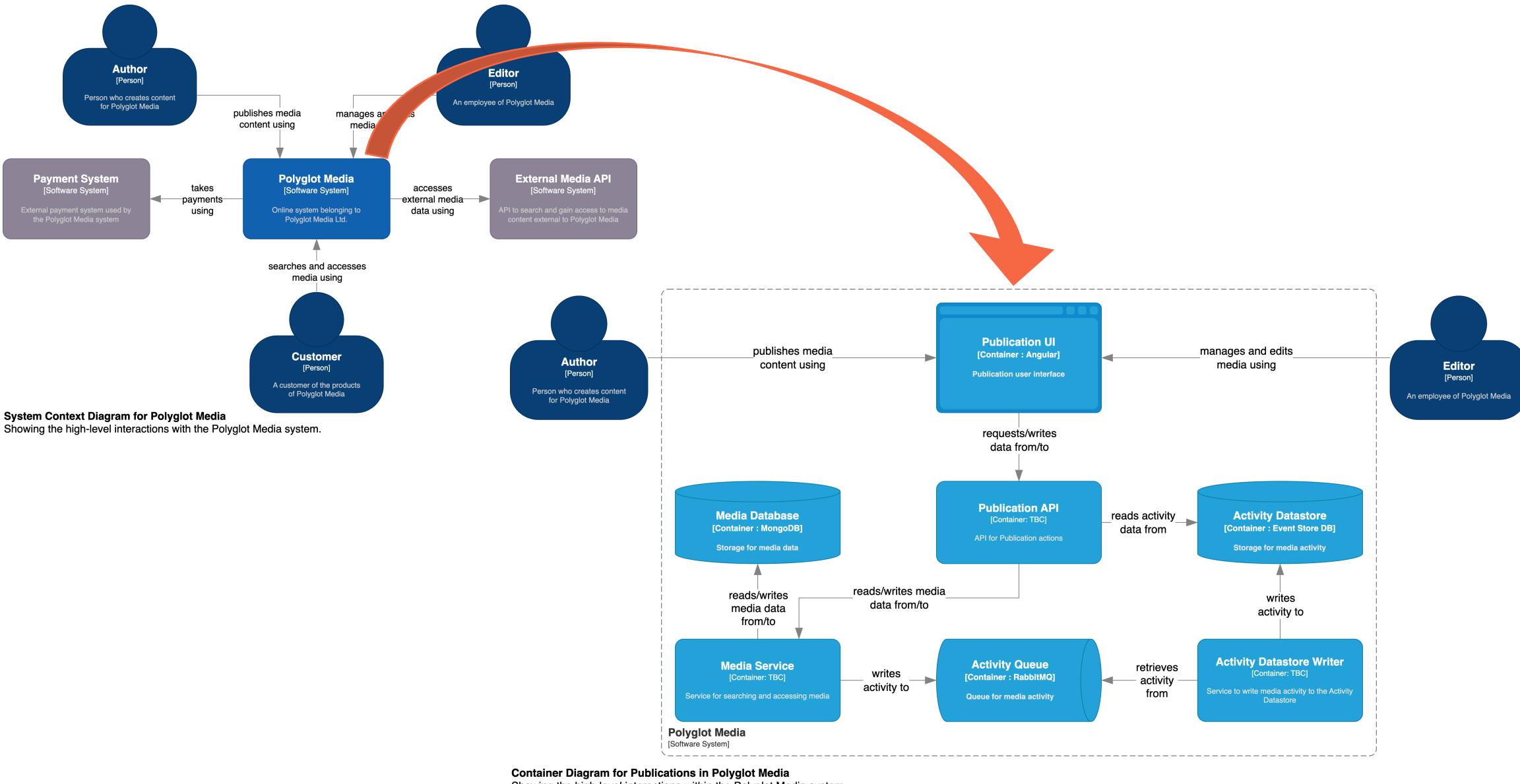
Pattern

Connect the Dots

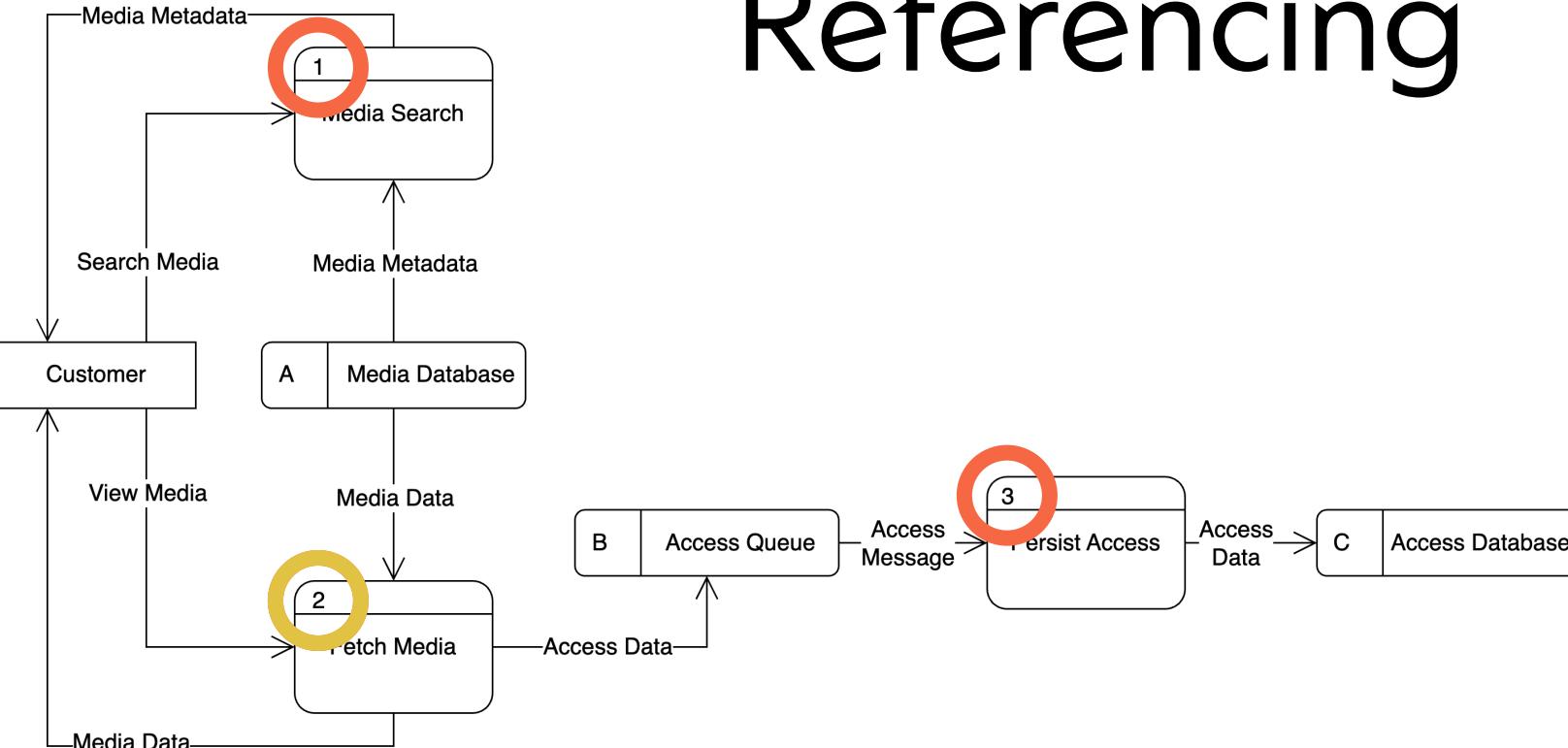
AKA: Representational Consistency
– connecting levels of abstraction



C4 Levels

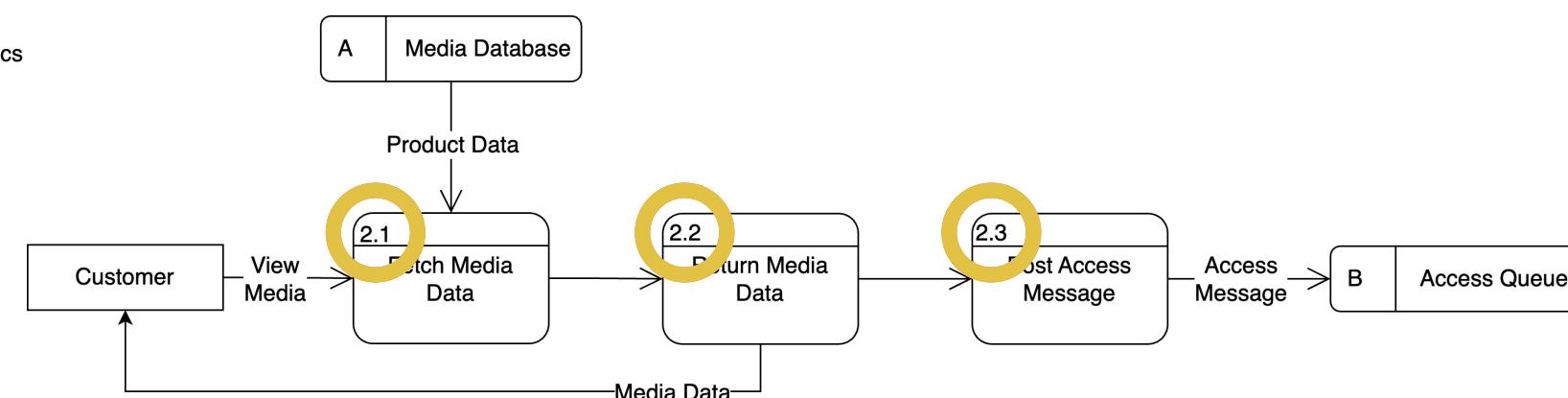


Referencing



Polyglot Media

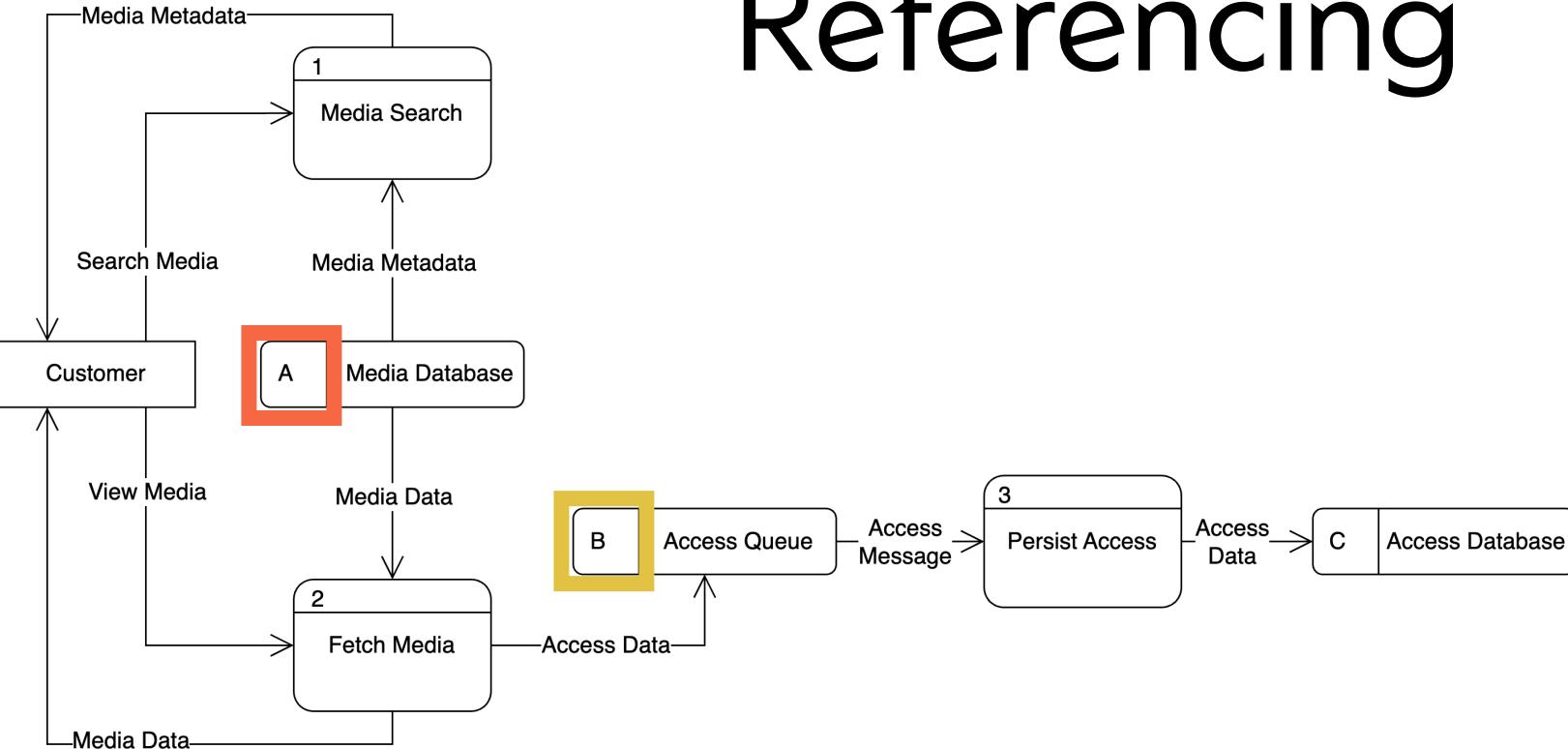
Data Flow Diagram: media search, view and access analytics



Polyglot Media

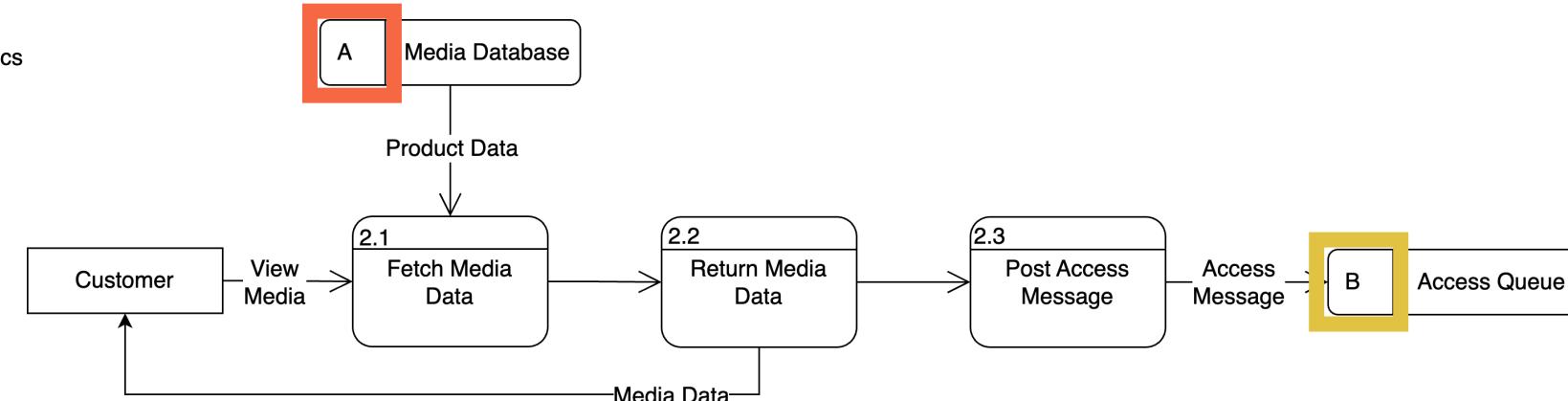
Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

Referencing



Polyglot Media

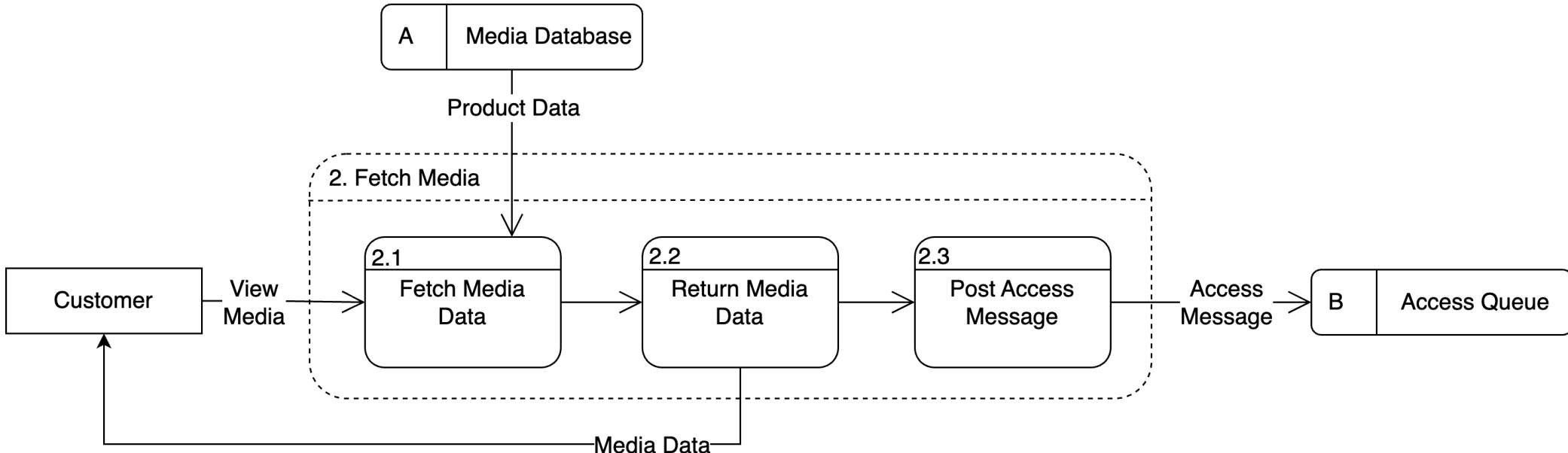
Data Flow Diagram: media search, view and access analytics



Polyglot Media

Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

C4-like Reference



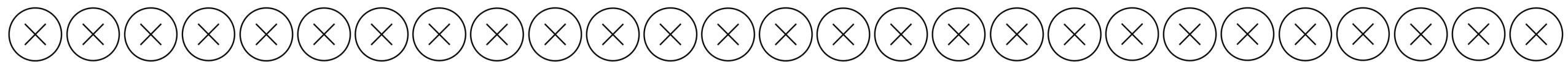
Polyglot Media

Data Flow Diagram: media search, view and access analytics - 2. Fetch Media

Antipattern

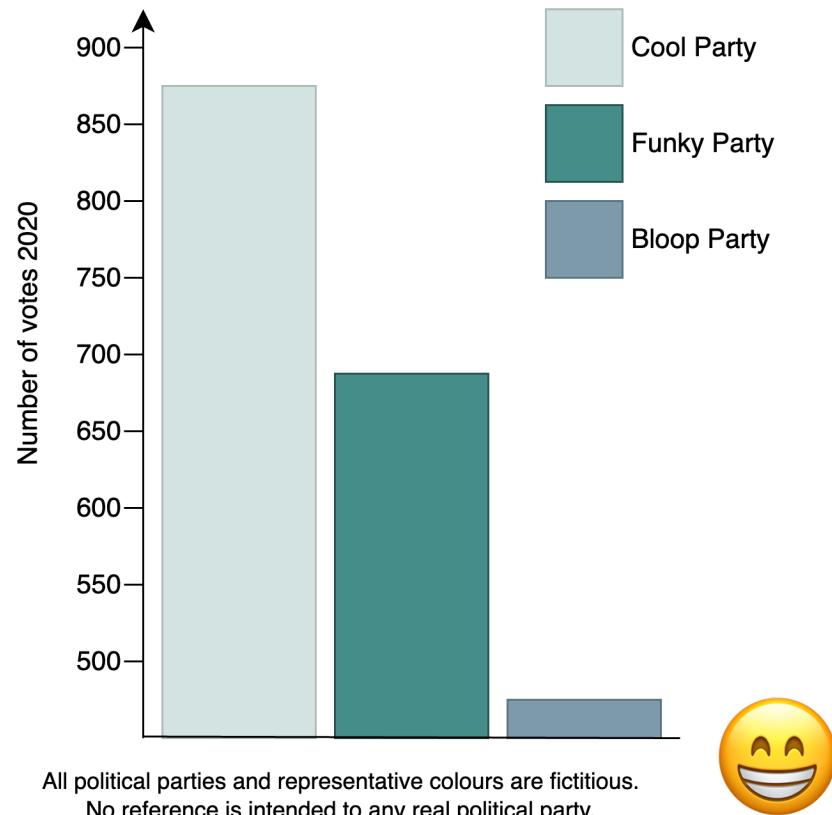
Misleading the Court

AKA: distorted composition

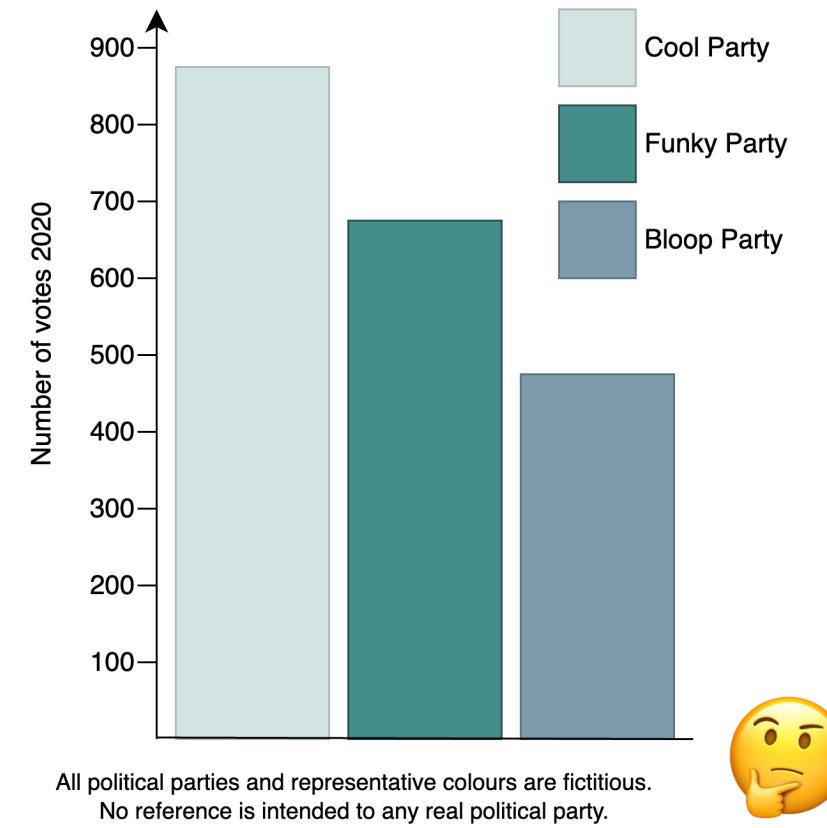


Baseline Tweaks

Cool Party can win AGAIN at the local elections!

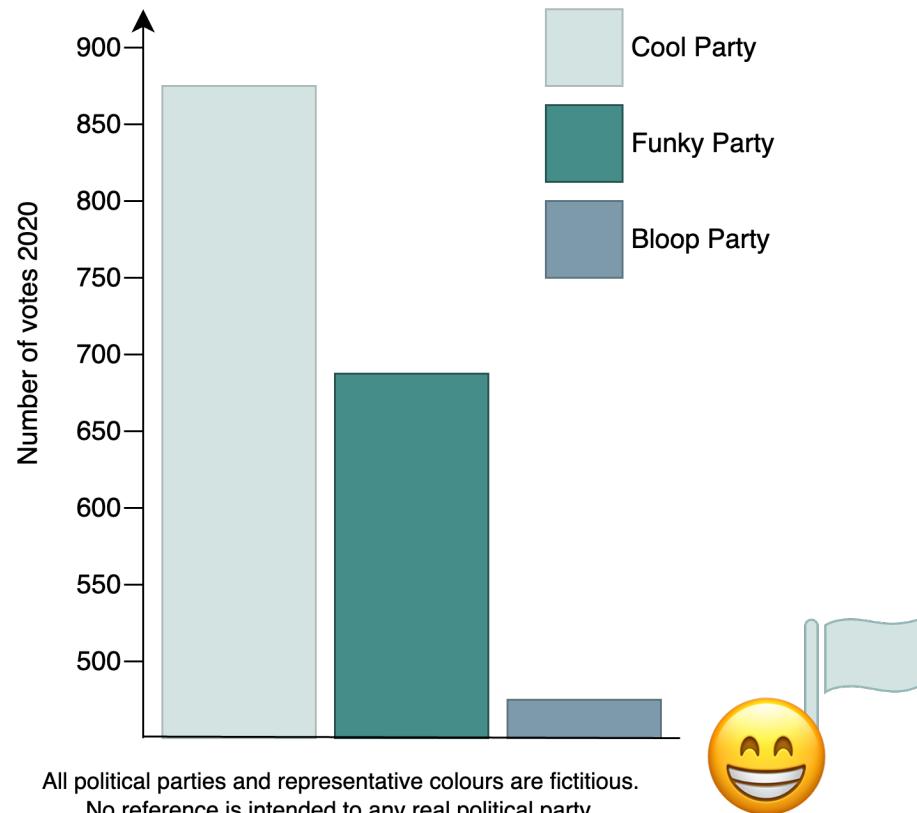


Cool Party can win AGAIN at the local elections!

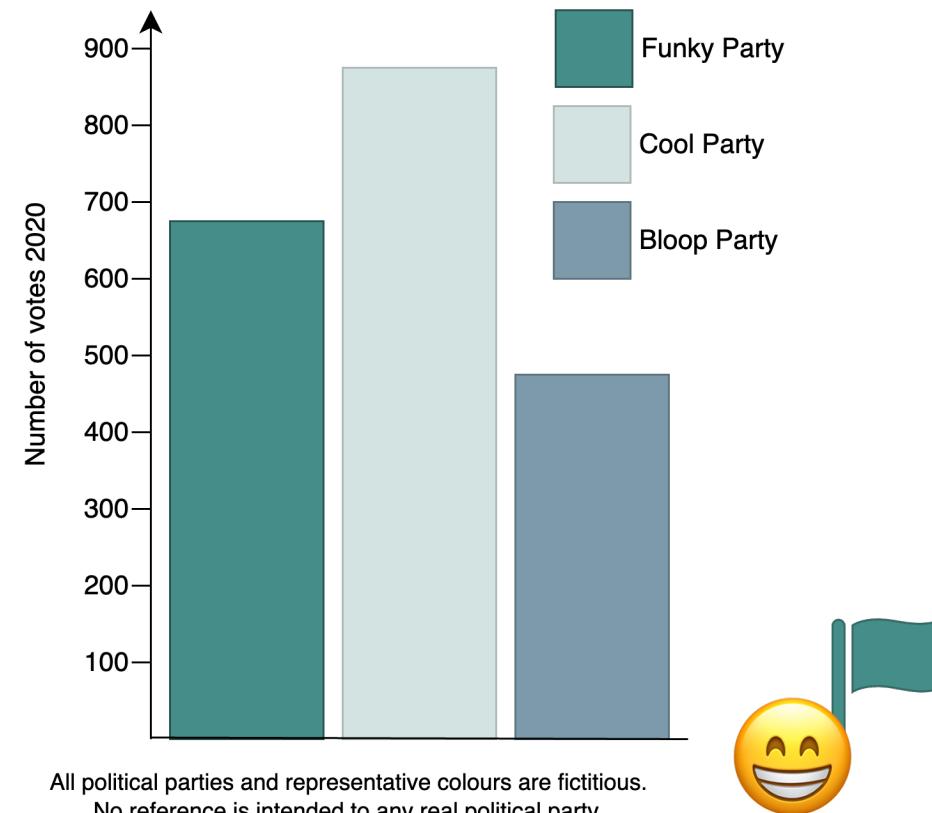


Baseline Tweaks

Cool Party can win AGAIN at the local elections!

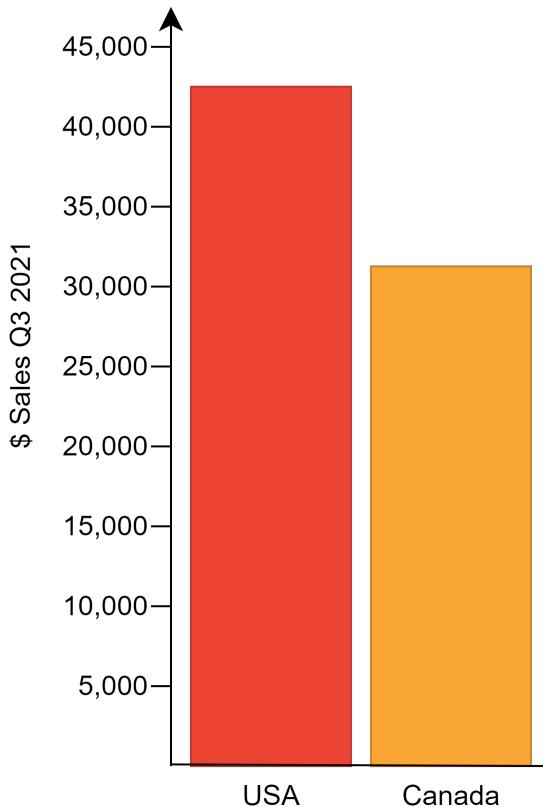


Funky Party can win the local elections!

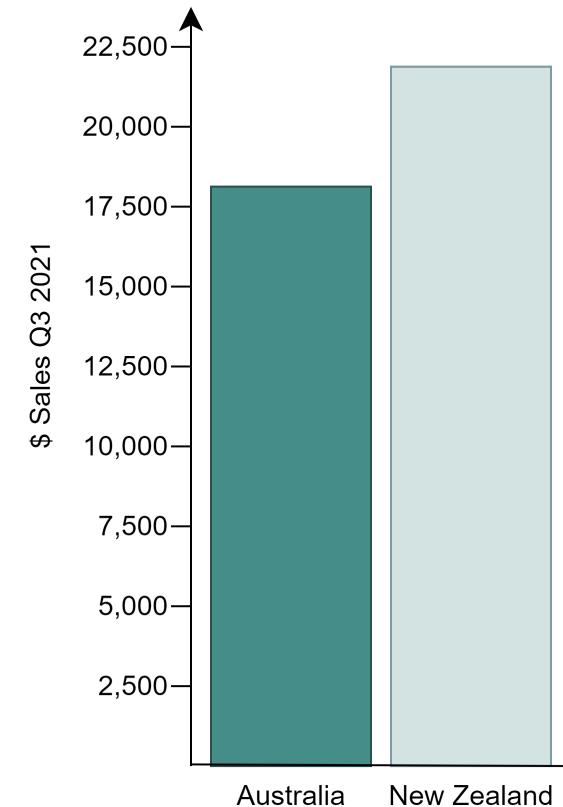


Misleading Comparison

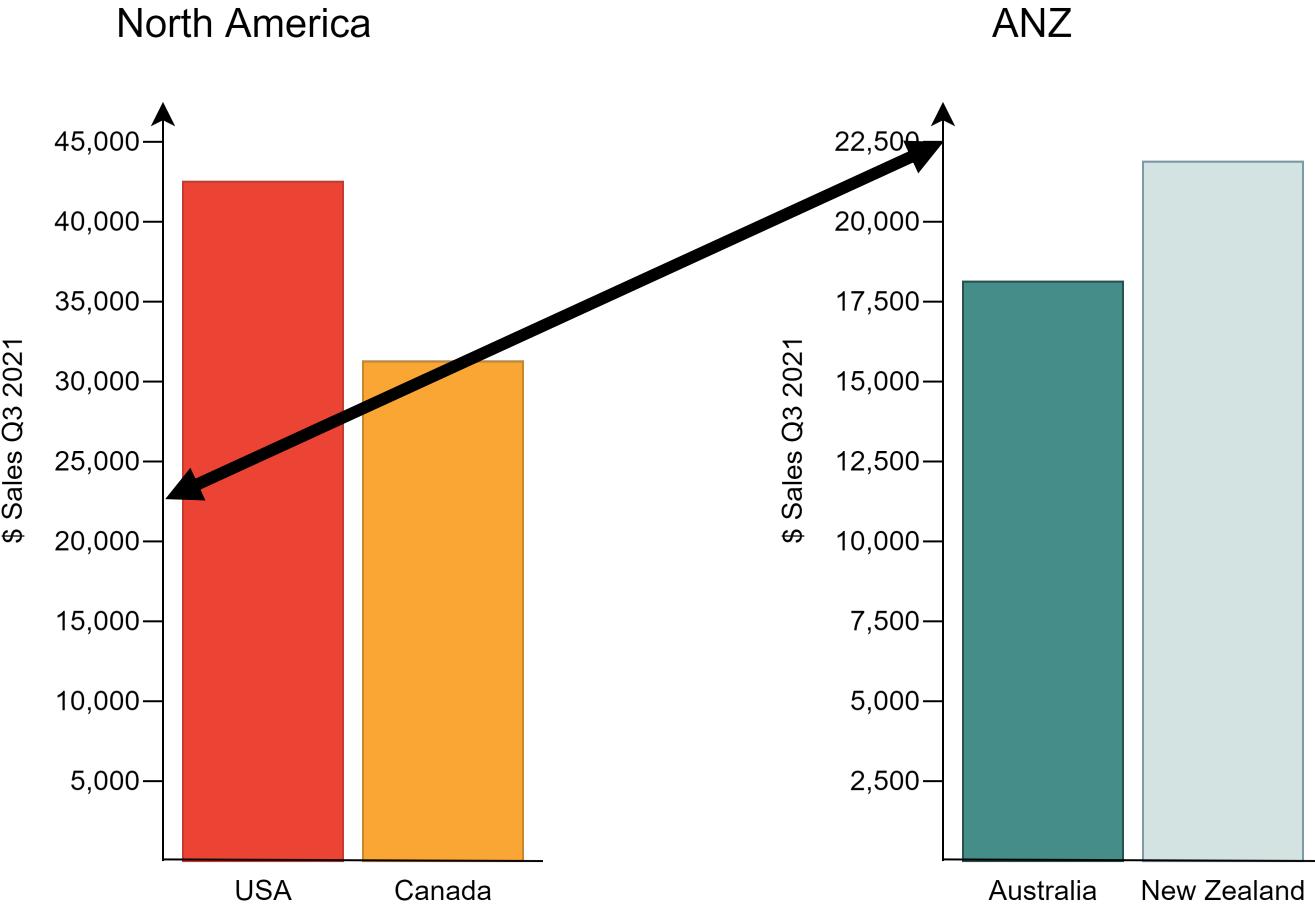
North America



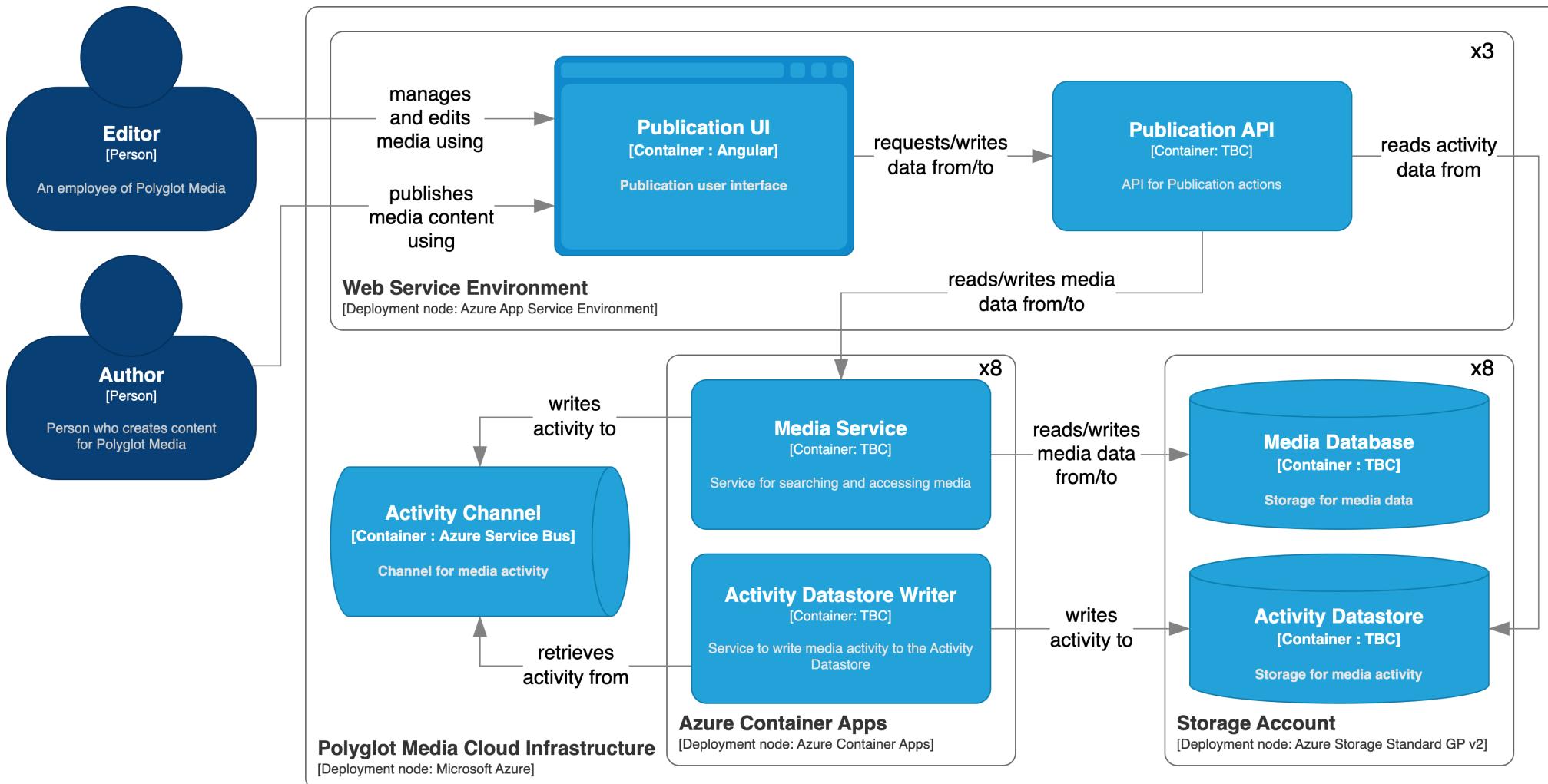
ANZ



Misleading Comparison

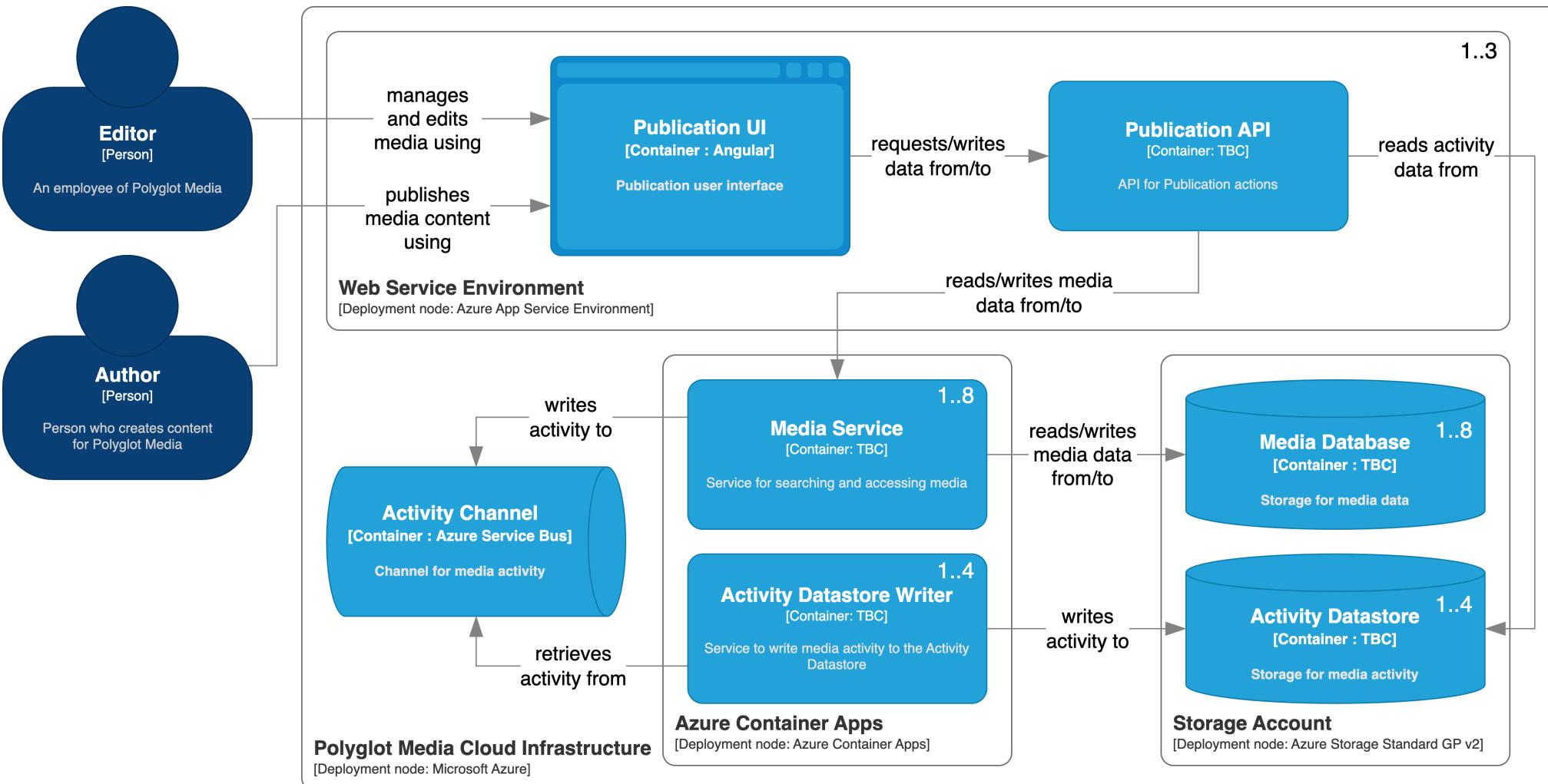


Scaled Deployment?



Deployment Diagram for Polyglot Media I Production I Publishing
Deployment scenario diagram for Polyglot Media Production environment

More realistic view



Deployment Diagram for Polyglot Media I Production I Publishing
Deployment scenario diagram for Polyglot Media Production environment

Pattern

Strike a Balance

AKA: create a visual balance

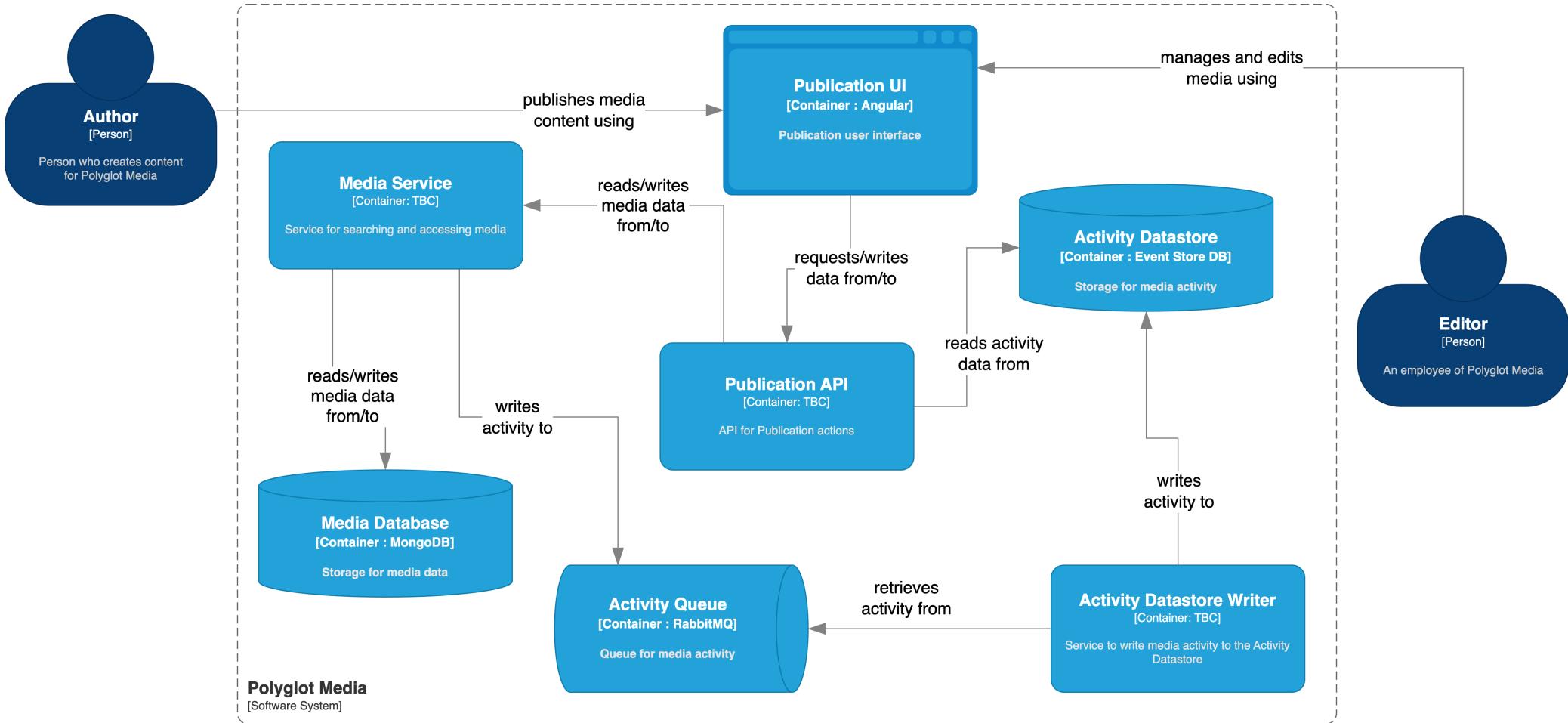




Balance is an innate,
fundamental human
expectation.

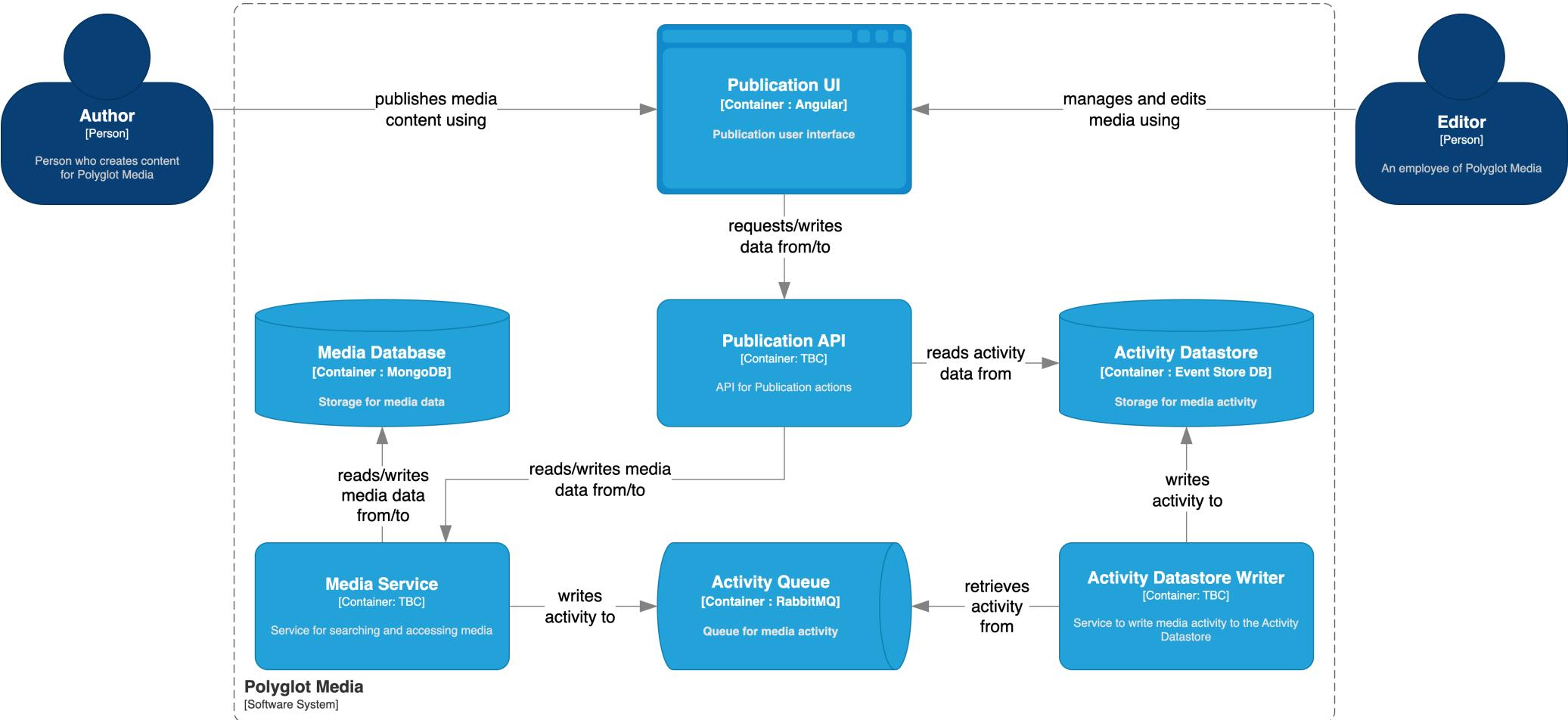
- Alvalyn Lundgren

Unbalanced C4



Container Diagram for Publications in Polyglot Media
Showing the high-level interactions within the Polyglot Media system.

Satisfying C4



Container Diagram for Publications in Polyglot Media
Showing the high-level interactions within the Polyglot Media system.

Exercise

Summary

You can now apply all these

- Meta Style
- Face in the Crowd
- Multi-Storey Diagram
- Explosion of Unicorns
- Boxed-In
- Spider's Web
- Notes on a Theme
- Colour is Key
- Written in Legend
- MLAH
- Pure and Simple
- Get a Handle on it
- A Push in the Right Direction
- Show Them the Pirate Ship
- Beside the Point
- Iconic
- Not-So-Unified Modelling Language
- Structures Behaving Badly
- Unconventional
- Portrait Gallery
- Connect the Dots
- Misleading the Court
- Strike a Balance

Exercise

Thank you



Jacqui Read

Consultant Software Architect
Founder @ Read The Architecture



fosstodon.org/@tekiegirl



@tekiegirl



JacquiRead.com