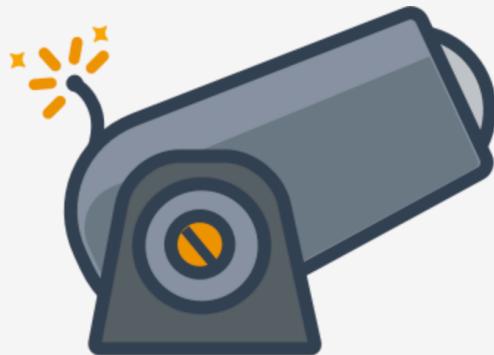


Capability Mapping

Partitioning Microservices

Who are you?

- Software Developer for more than 20 years
 - Worked mainly for ISVs
 - Reuters, SunGard, Misys, Huddle
 - Worked for a couple of MIS departments
 - DTI, Beazley
- Microsoft MVP for C#
 - Interested in architecture and design
 - Interested in Agile methodologies and practices
- No smart guys
 - Just the guys in this room



Welcome to Brighter

This project is a Command Processor & Dispatcher implementation with support for task queues that can be used as a lightweight library.

It can be used for implementing [Ports and Adapters](#) and [CQRS \(PDF\)](#) architectural styles in .NET.

It can also be used in microservices architectures for decoupled communication between the services

[GET STARTED](#)

Agenda

- Products not Projects
- Componentization via Services
- Organized Around Business Capabilities
- Independent Operability

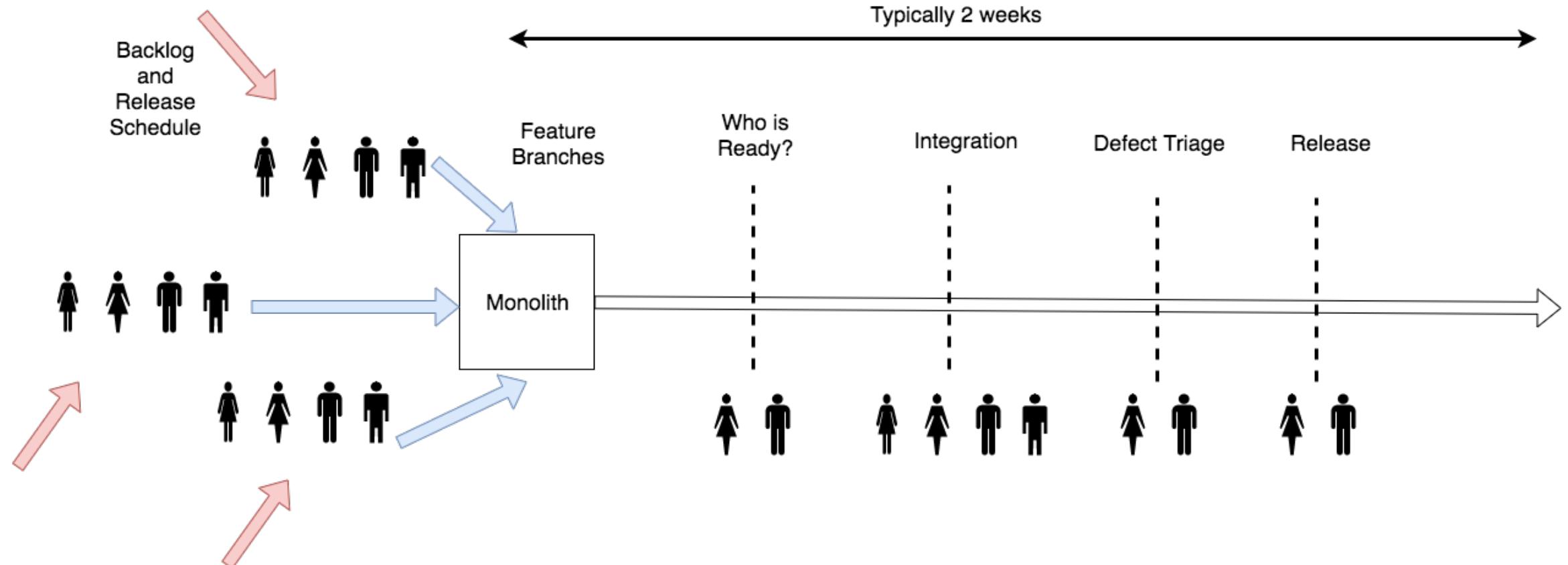
Products Not Projects

Why Microservices?

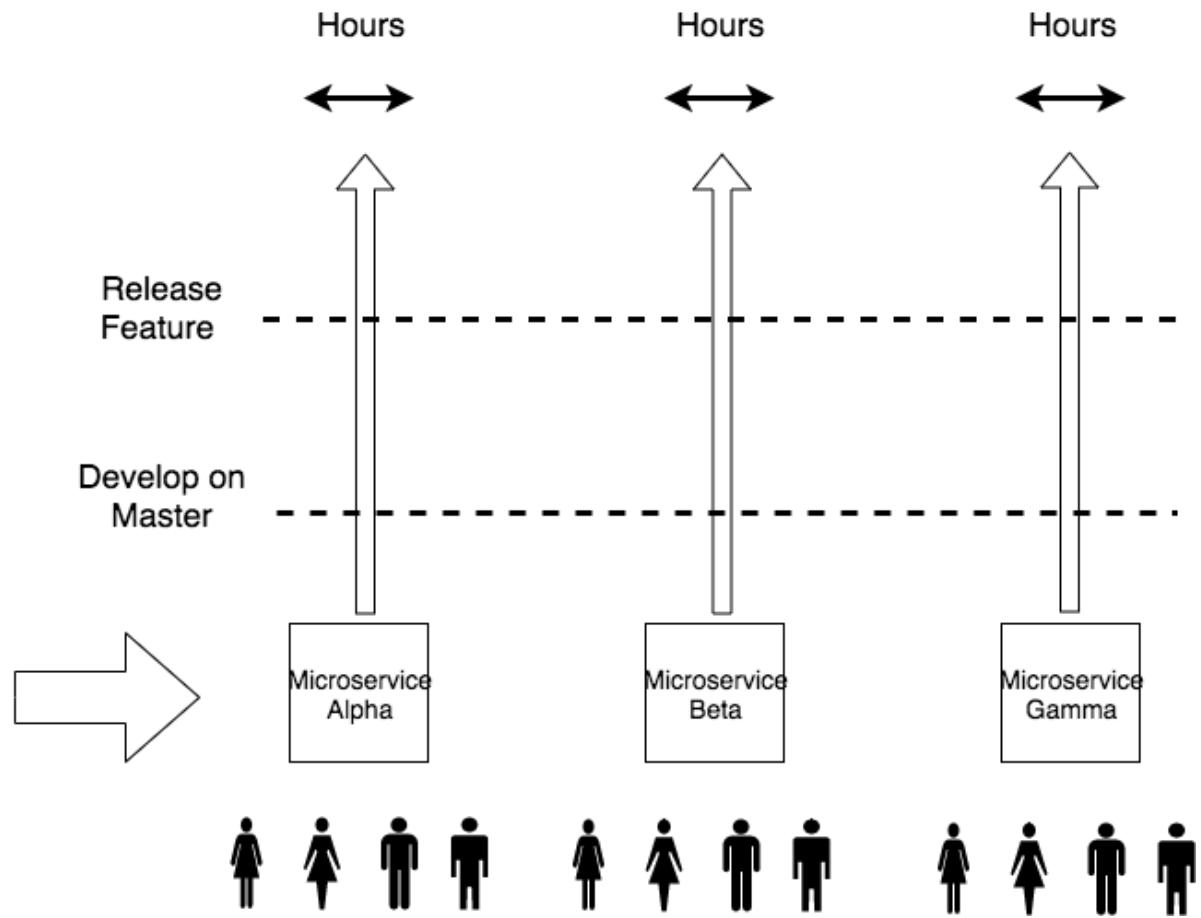
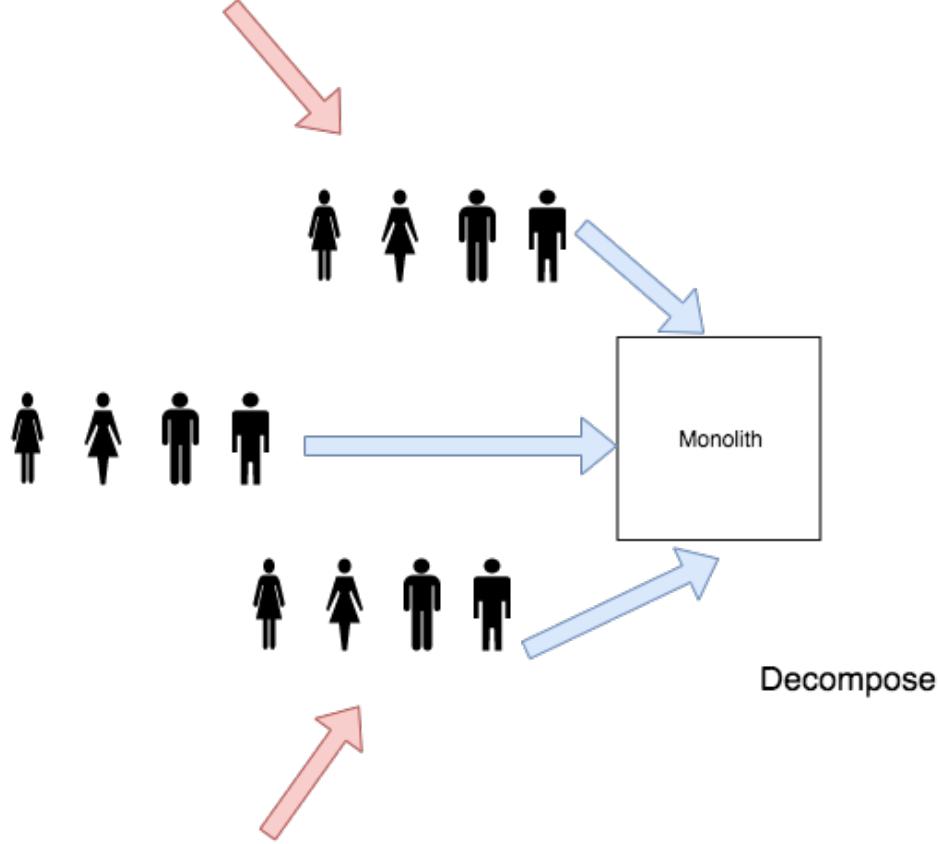
“Speed wins in the marketplace”

•Adrian Cockcroft, former lead architect at Netflix

Monoliths Do Not Scale To Many Teams!



Microservices let us scale an organisation

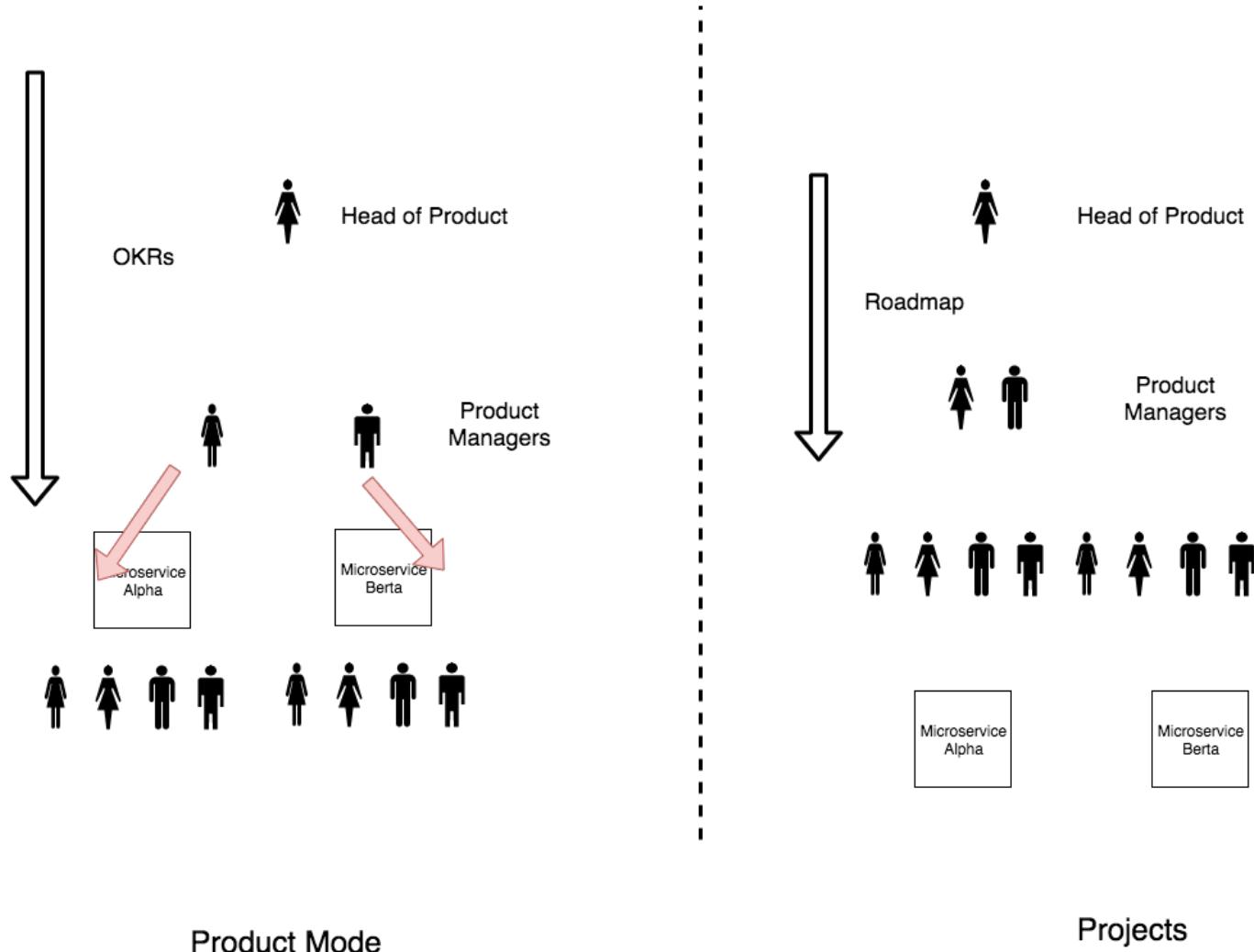


Independent Deployability

“Independent deployability is the idea that we can make a change to a microservice and deploy it into a production environment without having to utilize any other services.”

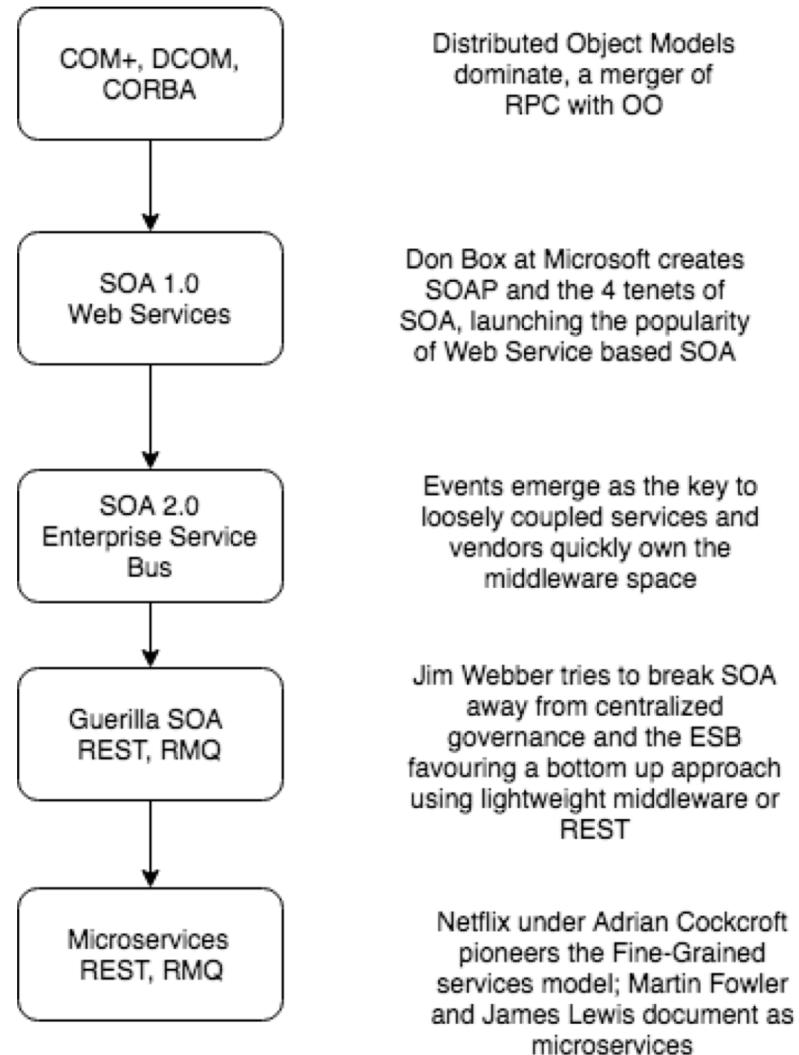
Newman, Sam. Monolith to Microservices.

Product Mode



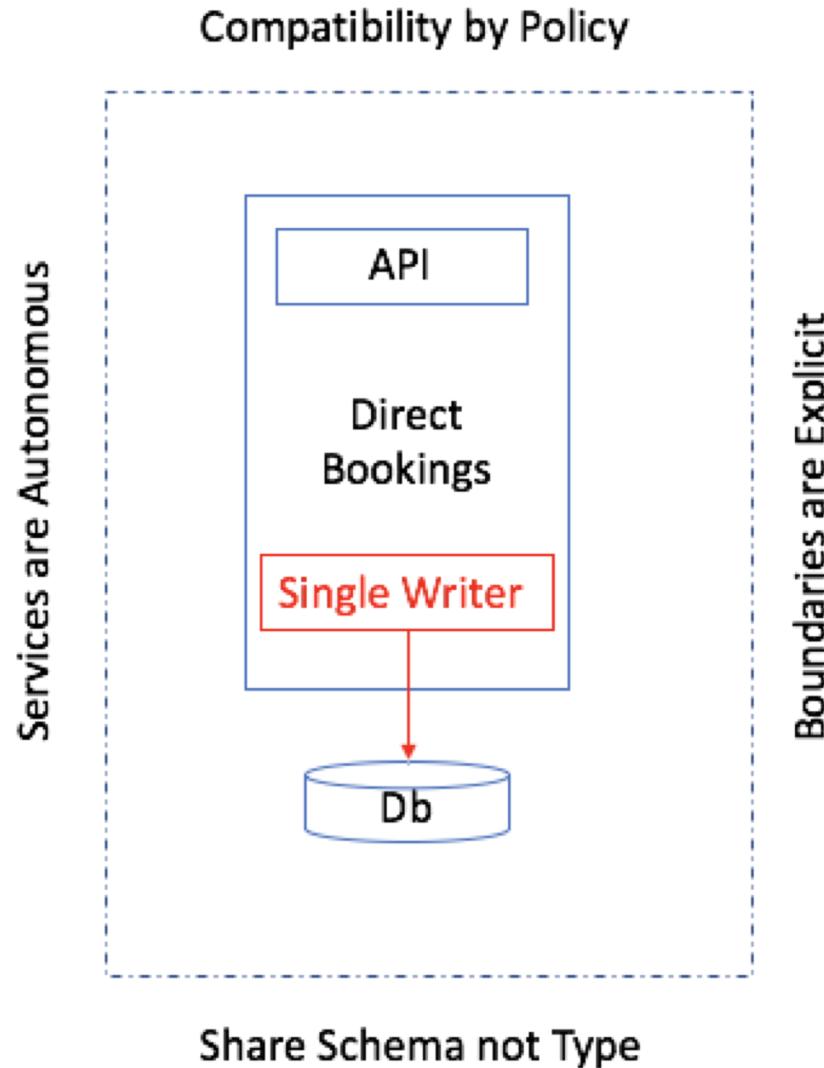
Componentization via Services

A Brief History of Microservices



The definition of [Microservices](#), we use comes from the paper by Martin Fowler and James Lewis

Microservices are partitions of software

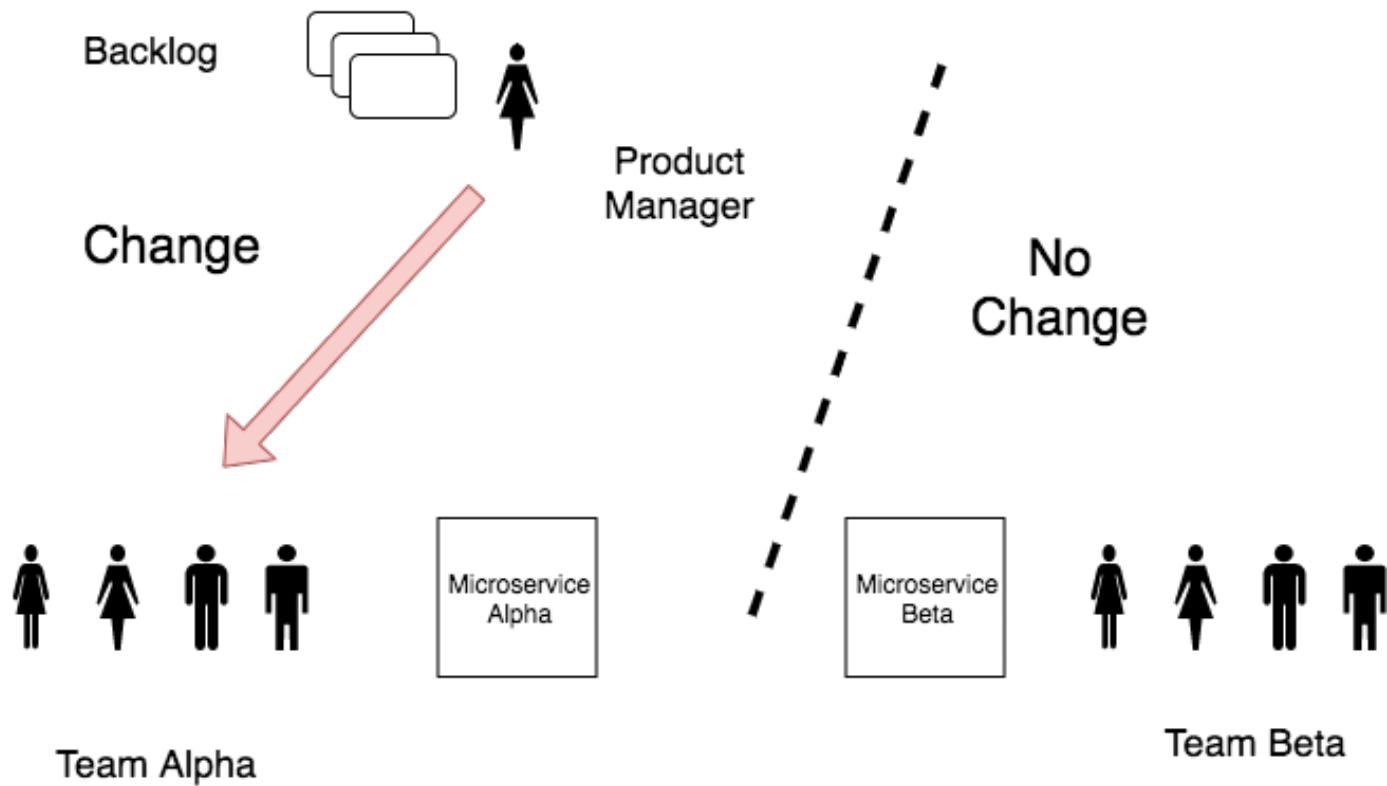


Cohesion and Coupling

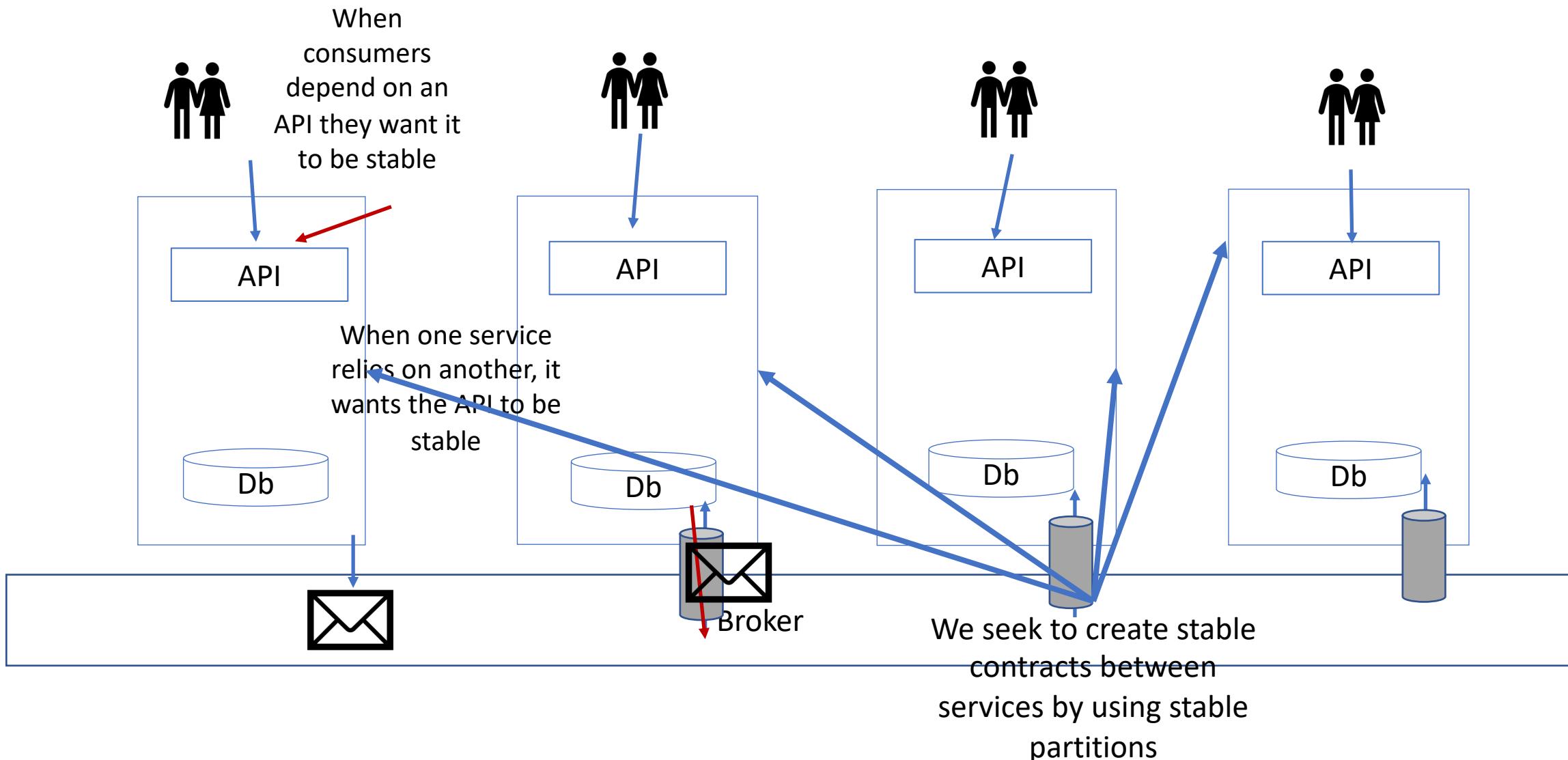
“A structure is *stable* if cohesion is strong and coupling is low.”

Larry Constantine

Microservices require Common Closure



Microservices need stable partitions



Organized Around Business Capabilities

Splitting Up Services

“The microservice approach to division is different, splitting up into services organized around **business capability**.”

Fowler, Martin & Lewis, James. [Microservices](#)

Capabilities

A capability is the ability of an entity (e.g., organization or department) to achieve its objectives.

process— series of interrelated activities that convert inputs into results (outputs)

delivery models—e.g., shared services, outsources, or distributed;

organizational structures—the arrangement of authority, responsibilities, and communications;

systems—automation of business processes; **tools**—assets that enable the process;

knowledge—information as well as business rules and decision models;

and **people**—the training and skills of individuals involved.

SOA is Aligned to Processes

Processes are performed in different steps (also called *activities* or *tasks*) on different systems. ... **a service should represent a self-contained functionality that corresponds to a real-world business activity.**

Josuttis, Nicolai M.. SOA in Practice: The Art of Distributed System Design . O'Reilly Media. Kindle Edition.

Process vs. Capability

A process is usually a verb + noun: [Make Lunch, Prepare Bill](#)

A capability is usually a noun: [Catering, Accounting](#)

A capability is how we deliver a process, including the use of technology.

Finding Processes

So how do we find processes?

Value Stream Mapping

A value stream is the sequence of activities required to design, produce, and deliver a good or service to a customer...

Martin, Karen. Value Stream Mapping: How to Visualize Work and Align Leadership for Organizational Transformation.



Kickoff

Agree the scope to be mapped. We want to map how we create value for a customer i.e. Procure to Pay, or Order to Delivery; or we want to map how we support that, for example Analysis to Recommendation



Agree the scope to be mapped. We want to map how we create value for a customer i.e. Procure to Pay, or Order to Delivery; or we want to map how we support that, for example Analysis to Recommendation

Walk the value stream from end-to-end, identifying the processes.

As a rule, a new process is started when there is a delay between steps.

Look for 5-15 processes

Kickoff

Agree the scope to be mapped. We want to map how we create value for a customer i.e. Procure to Pay, or Order to Delivery; or we want to map how we support that, for example Analysis to Recommendation

First Walk

Walk the value stream from end-to-end, identifying the processes.

As a rule, a new process is started when there is a delay between steps.

Look for 5-15 processes

Place a customer Post-It note at the top.

Below that, horizontally, and left-to-right add Post-Its to represent the processes in the value stream.

Avoid forks, map the most common path to create value for the customer.

Number the process blocks.

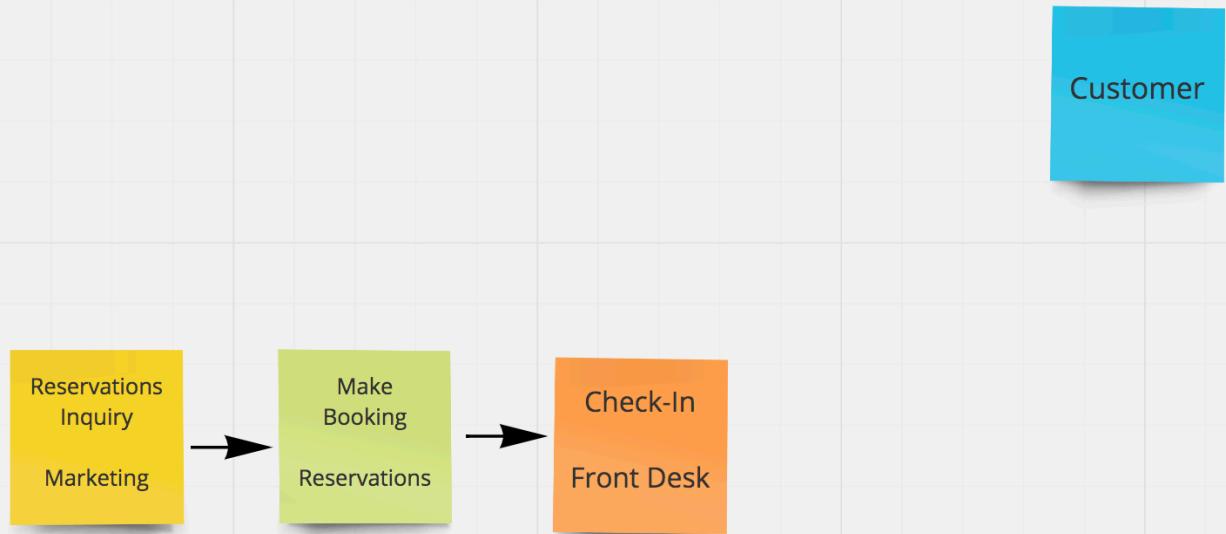
Map Layout

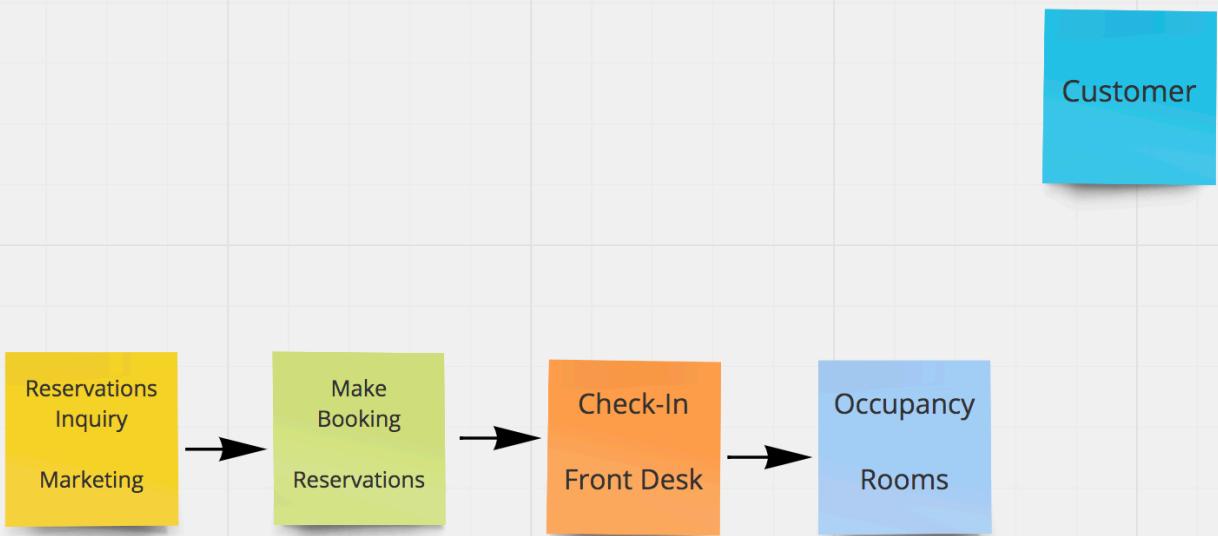
Reservations
Inquiry
Marketing

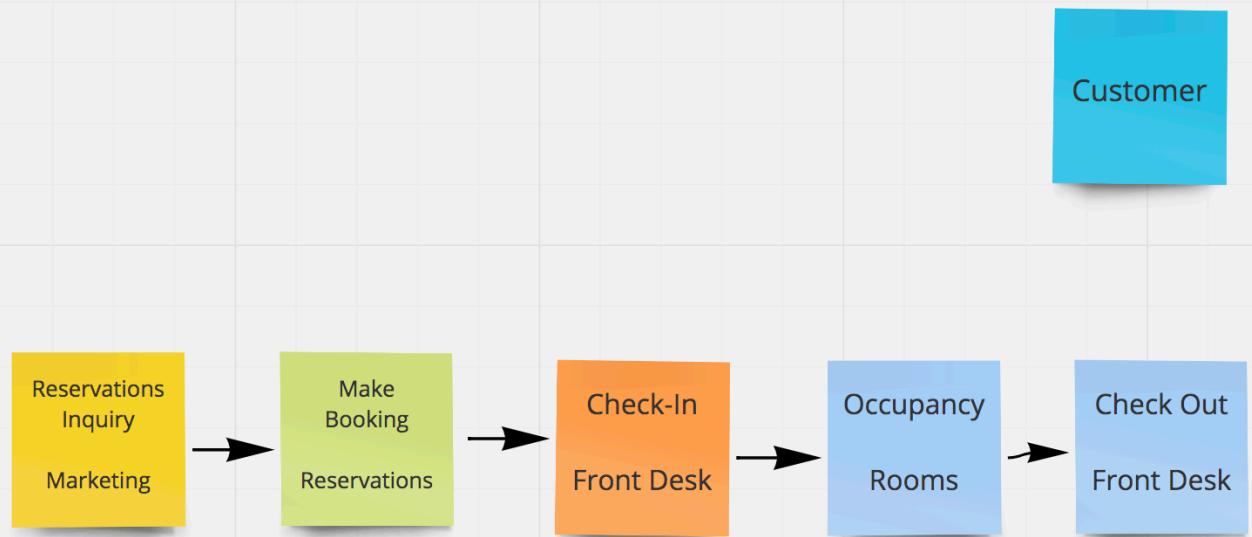
Customer



Customer







Kickoff

Agree the scope to be mapped. We want to map how we create value for a customer i.e. Procure to Pay, or Order to Delivery; or we want to map how we support that, for example Analysis to Recommendation

1st Walk

Walk the value stream from end-to-end, identifying the processes.

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Number the process blocks.

Map Layout

2nd Walk

Walk the value stream from backwards, looking for processes that the initial walk through missed..

Track key metrics (Process Time, Lead Time, % complete and accurate)

Hold a census of the number of people

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Hold a census of the number of people

Map Details

Add the details from the second walk to the map.

Add A timeline and map summary to the bottom axis of the map



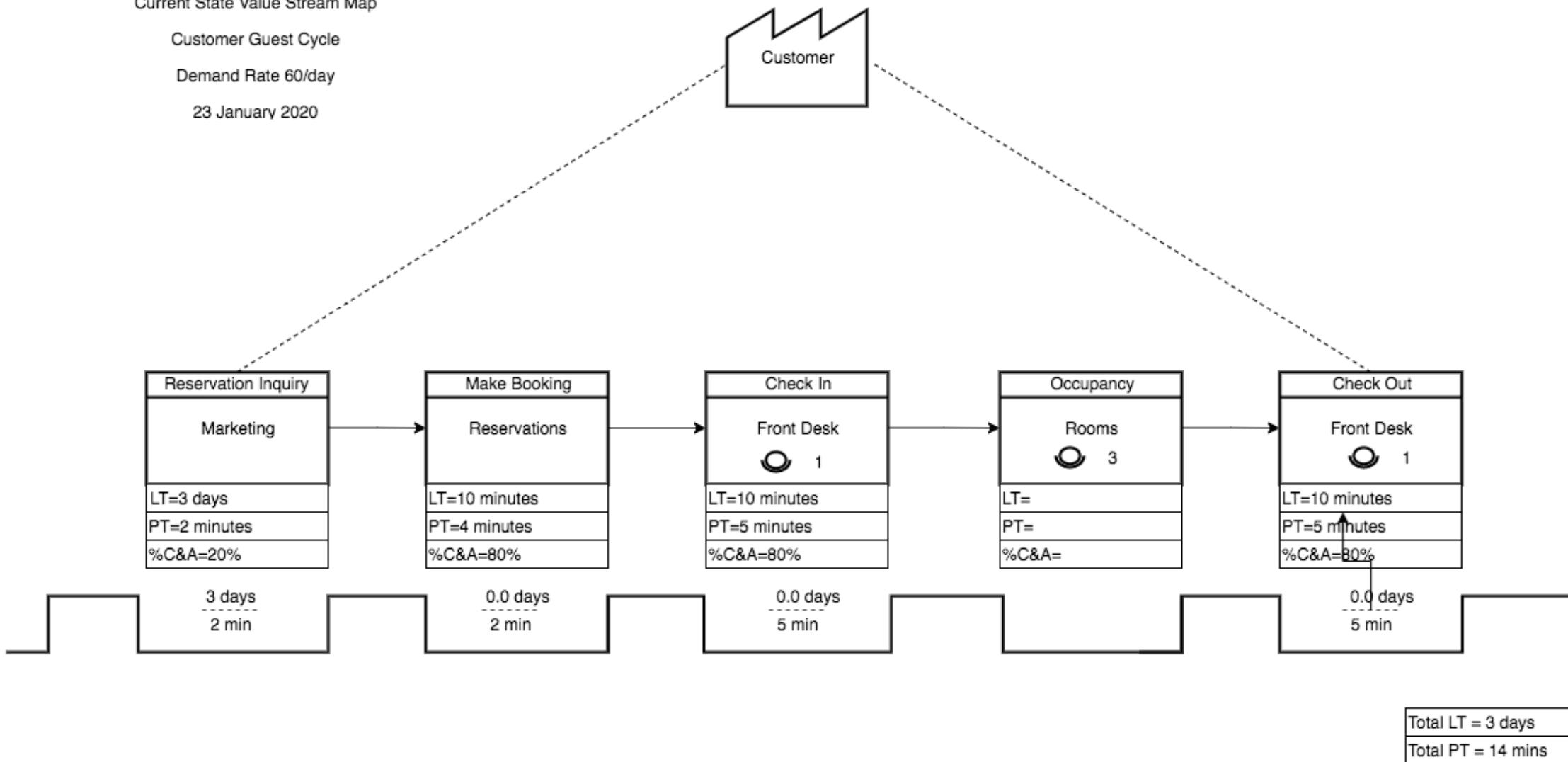
ABC Hotel Software

Current State Value Stream Map

Customer Guest Cycle

Demand Rate 60/day

23 January 2020



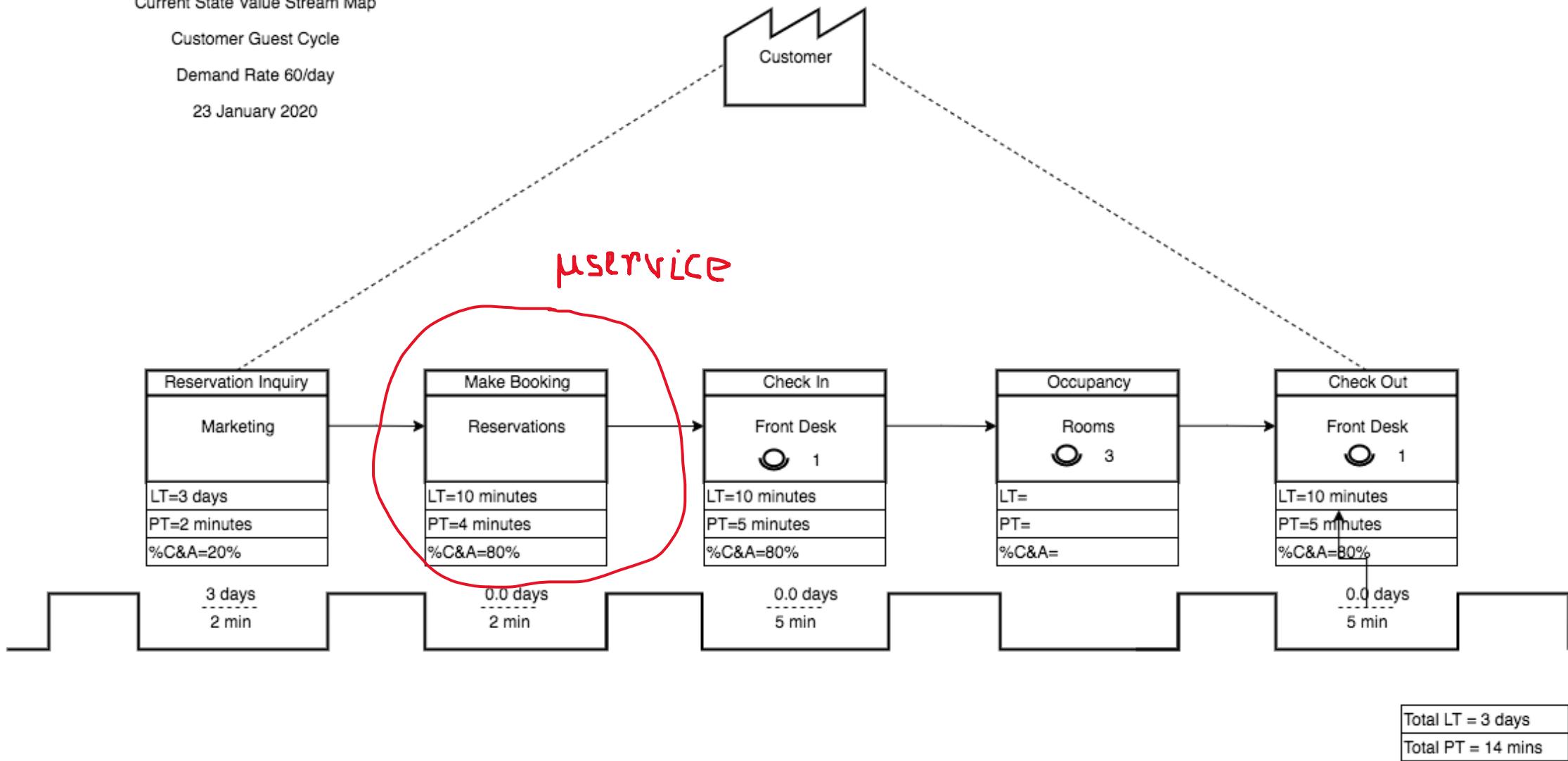
ABC Hotel Software

Current State Value Stream Map

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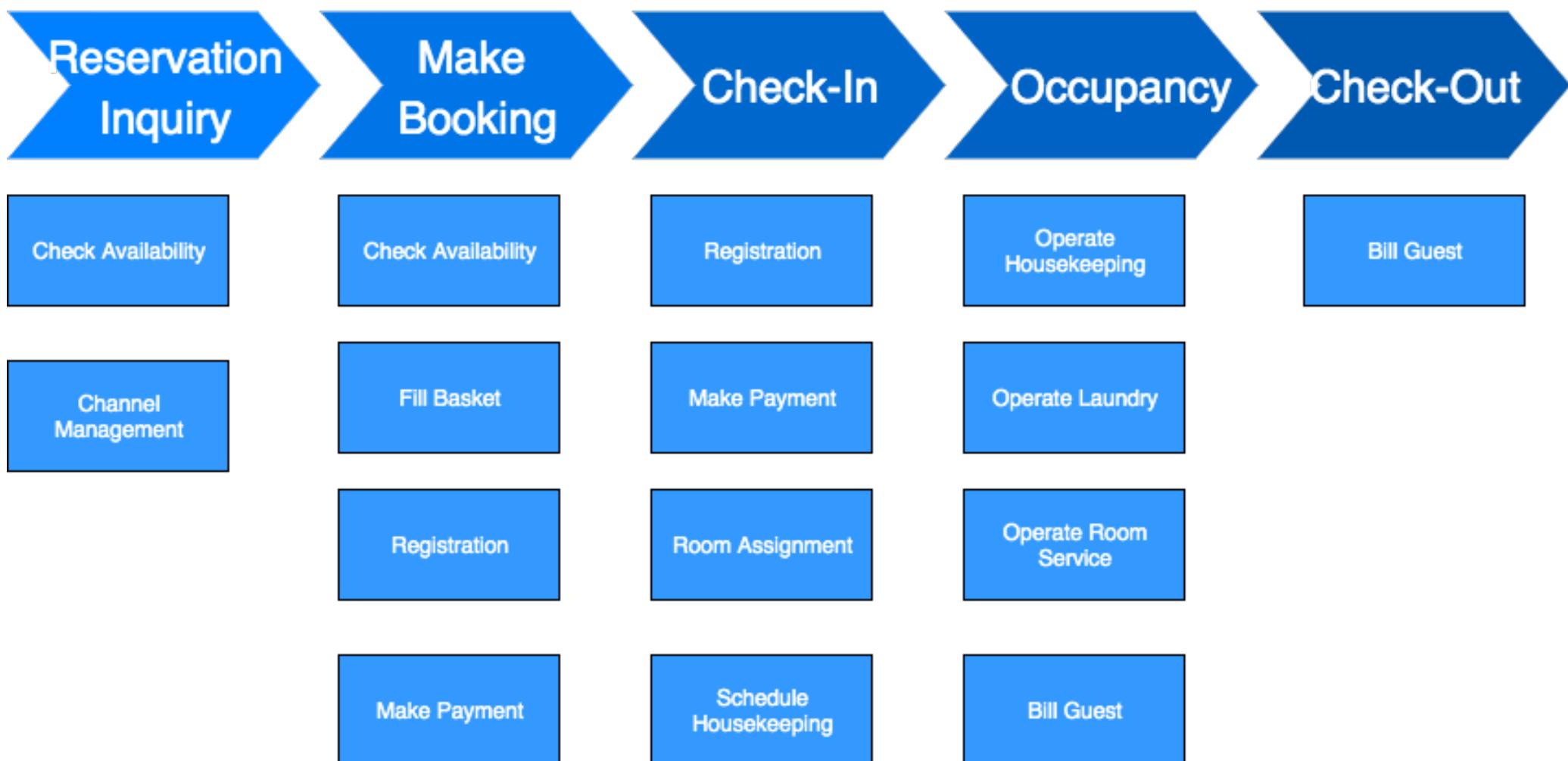
23 January 2020



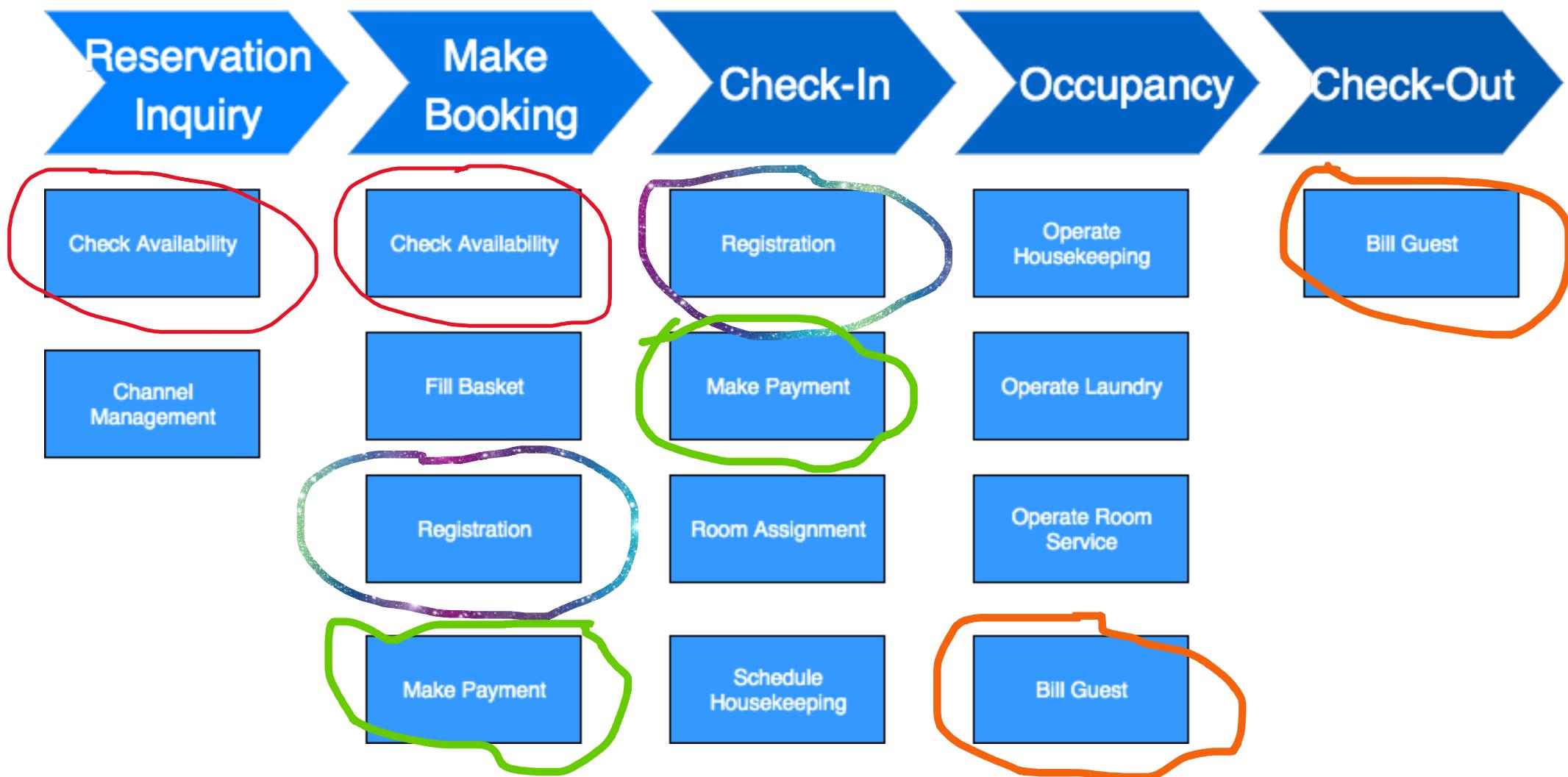
Guest Cycle



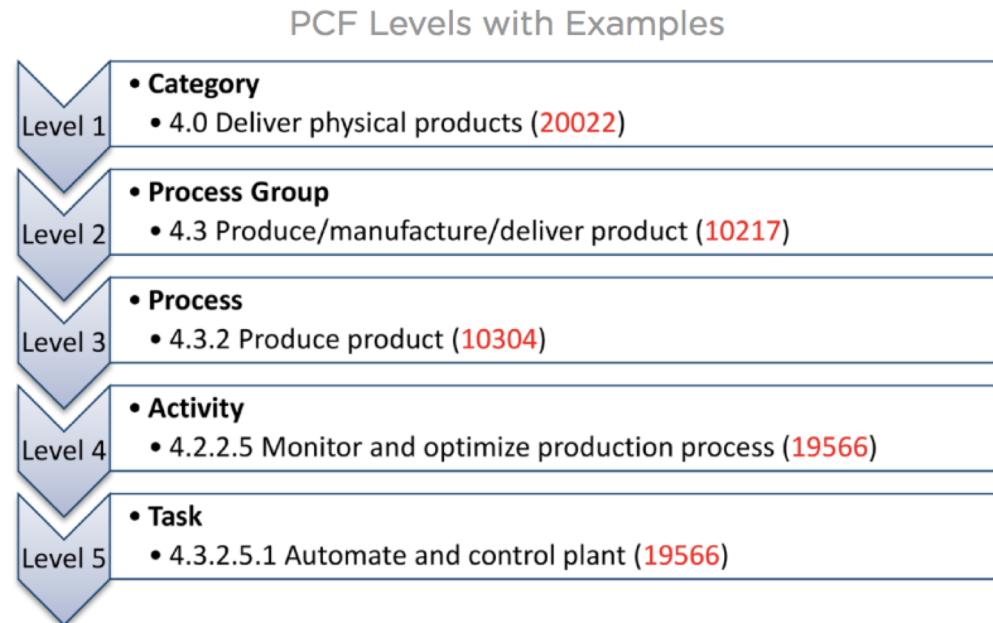
Guest Cycle



Guest Cycle

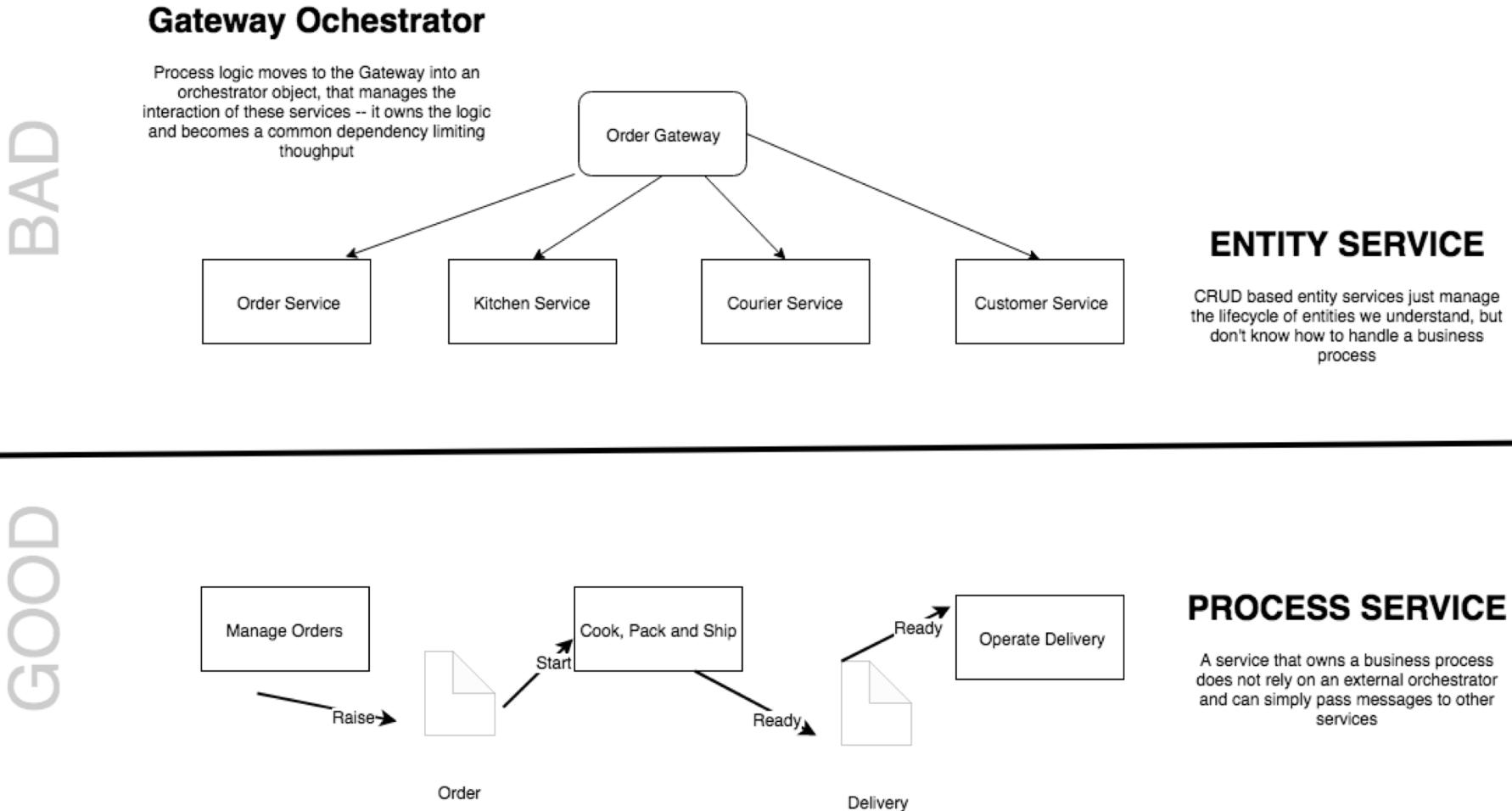


Process Classification



(Figure 1)

Smart Endpoints and Dumb Pipes



Multitudes, Multitudes

This is just one stream in our hotel. Other streams will uncover further processes. The value stream around customers purchasing food or drink, for example, will want value stream mapping.

Industry-Specific Process Classification Frameworks

The below images and links default to the most recent PDF version. There, you may also find additional versions of the framework in available.

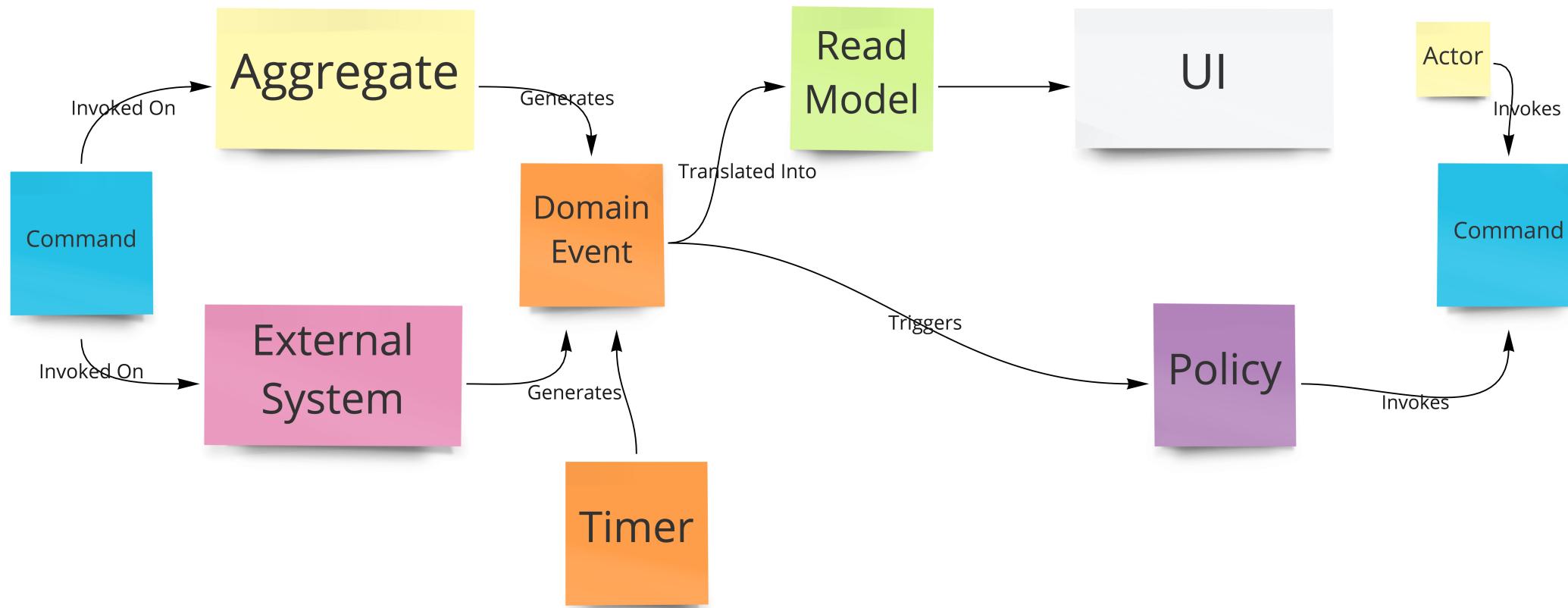
If you're looking for the cross-industry PCF, you can download it [here](#).

Industry-Specific Versions

PCF ID	Hierarchy ID	Name
16679	5.0	Deliver Products
16680	5.1	Operate warehouse
16681	5.1.1	Plan warehouse layout and operations
10226	5.1.1.1	Establish distribution planning constraints
10267	5.1.1.1.1	Establish distribution center layout constraints
10268	5.1.1.1.2	Establish inventory management constraints
10269	5.1.1.1.3	Establish transportation management constraints
10253	5.1.1.2	Determine product inventory requirements at destination
10349	5.1.1.3	Plan inbound material receipts
16682	5.1.1.4	Plan outbound product flow
16683	5.1.2	Manage inventory
16684	5.1.2.1	Plan inventory and replenishment levels
16685	5.1.2.2	Track quantity and location of items
10376	5.1.2.3	Determine lot numbering system
10377	5.1.2.4	Determine lot usage

A	B	C	D	E	F
PCF ID	Hierarchy ID	Name	Difference Index	Change details	Metrics available?
16610	3.0	Market Products and Services	I		N
16611	3.1	Perform customer and market analysis	0		N
10106	3.1.1	Perform analysis	0		Y
10108	3.1.1.1	Conduct customer and market research	0		N
10109	3.1.1.2	Identify market segments	0		N
10110	3.1.1.3	Analyze market and industry trends	0		N
10111	3.1.1.4	Analyze competing organizations, competitive/substitute products	0		N
10112	3.1.1.5	Evaluate existing products/brands	0		N
10113	3.1.1.6	Assess internal and external business environment	0		N
10107	3.1.2	Evaluate and prioritize market opportunities	PCF ID		Y
10116	3.1.2.1	Quantify market opportunities	0		N
10117	3.1.2.2	Determine target segments	0		N
10118	3.1.2.3	Prioritize opportunities consistent with capabilities and overall business strategy	0		N

Event Storming



Alberto Brandolini, Event Storming

Chaotic Exploration

Add post-it notes to the board that represent the events that occur in the flow you are modelling.

Room
Reserved

Payment
Completed

Booking
Confirmed

Guest
Registered

Room
Allocated

Card Pre-
Authorized

Keys
Issued

Bill
Raised

Payment
Completed

Guest
Checked
Out

Reservation
Timer

Booking
Failed

Room
Charged



Chaotic Exploration

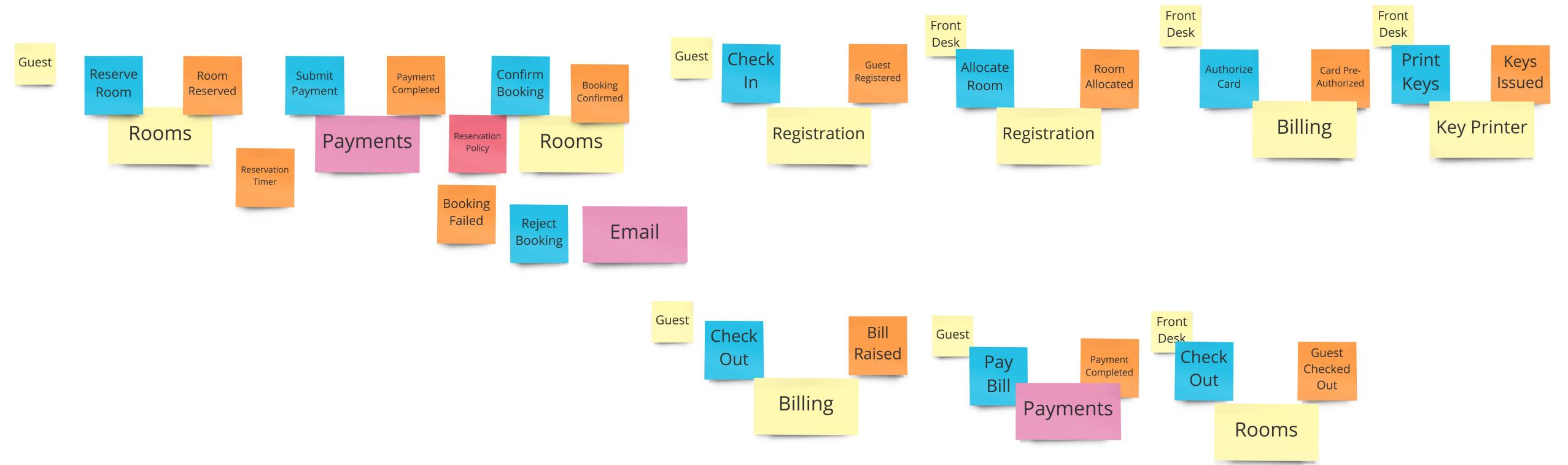
Enforce Timeline

Systems People

Add post-it notes to the board that represent the events that occur in the flow you are modelling.

Put the events into time order

Add systems and people to show how events are initiated by commands



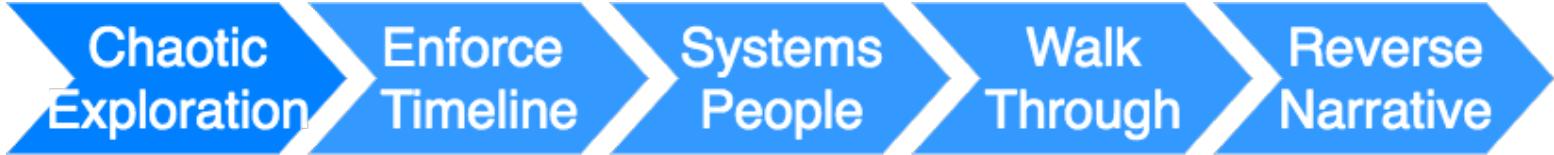


Add post-it notes to the board that represent the events that occur in the flow you are modelling.

Put the events into time order

Add systems and people to show how events are initiated by commands

Walk through the flow from an initiating actor to completion of a flow, looking for missing elements or issues



Chaotic Exploration **Enforce Timeline** **Systems People** **Walk Through** **Reverse Narrative**

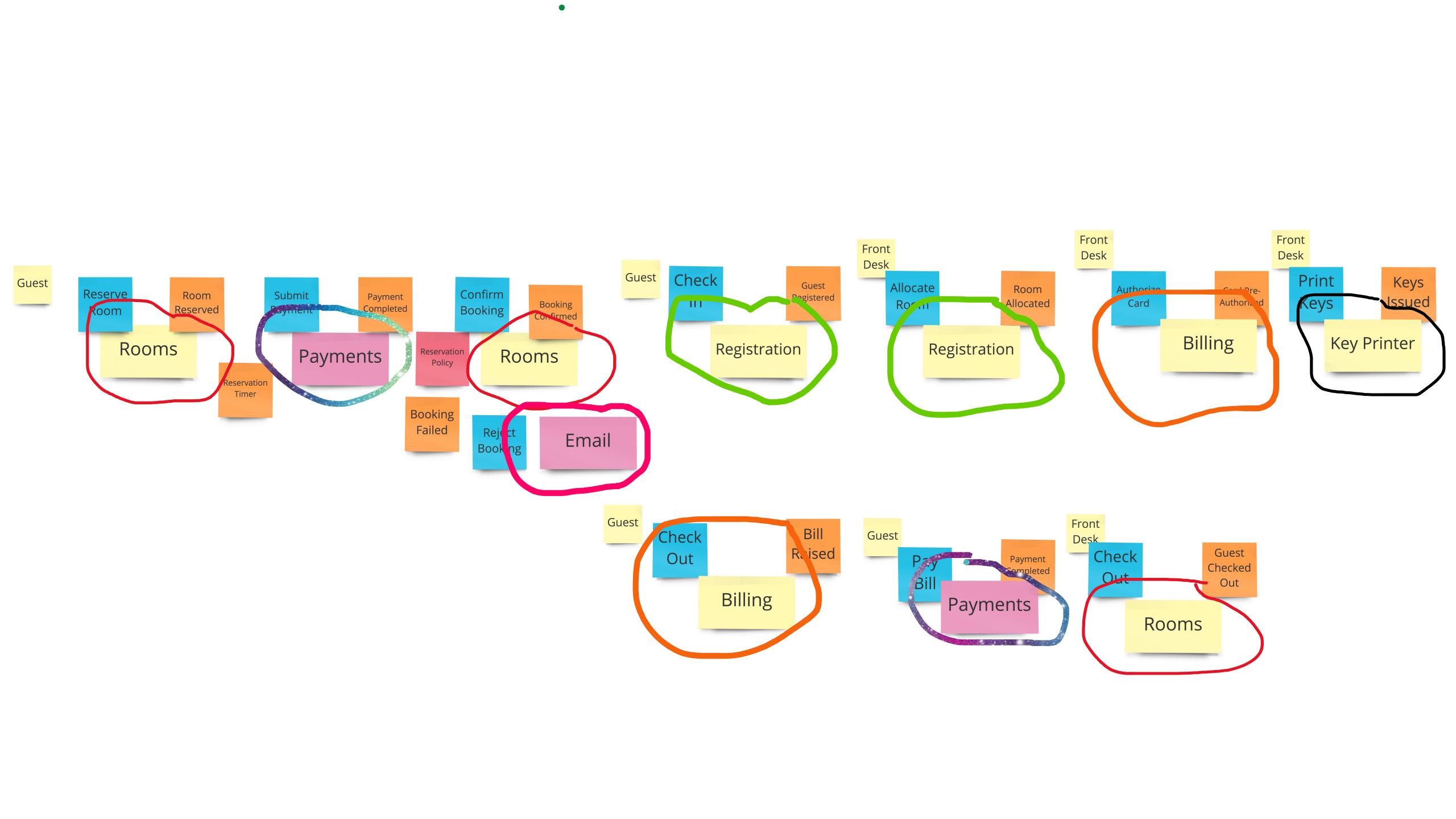
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Put the events into time order

Add systems and people to show how events are initiated by commands

Walk through the flow from an initiating actor to completion of a flow, looking for missing elements or issues

Do it backwards, which sometimes reveals new insights - what leads to this?

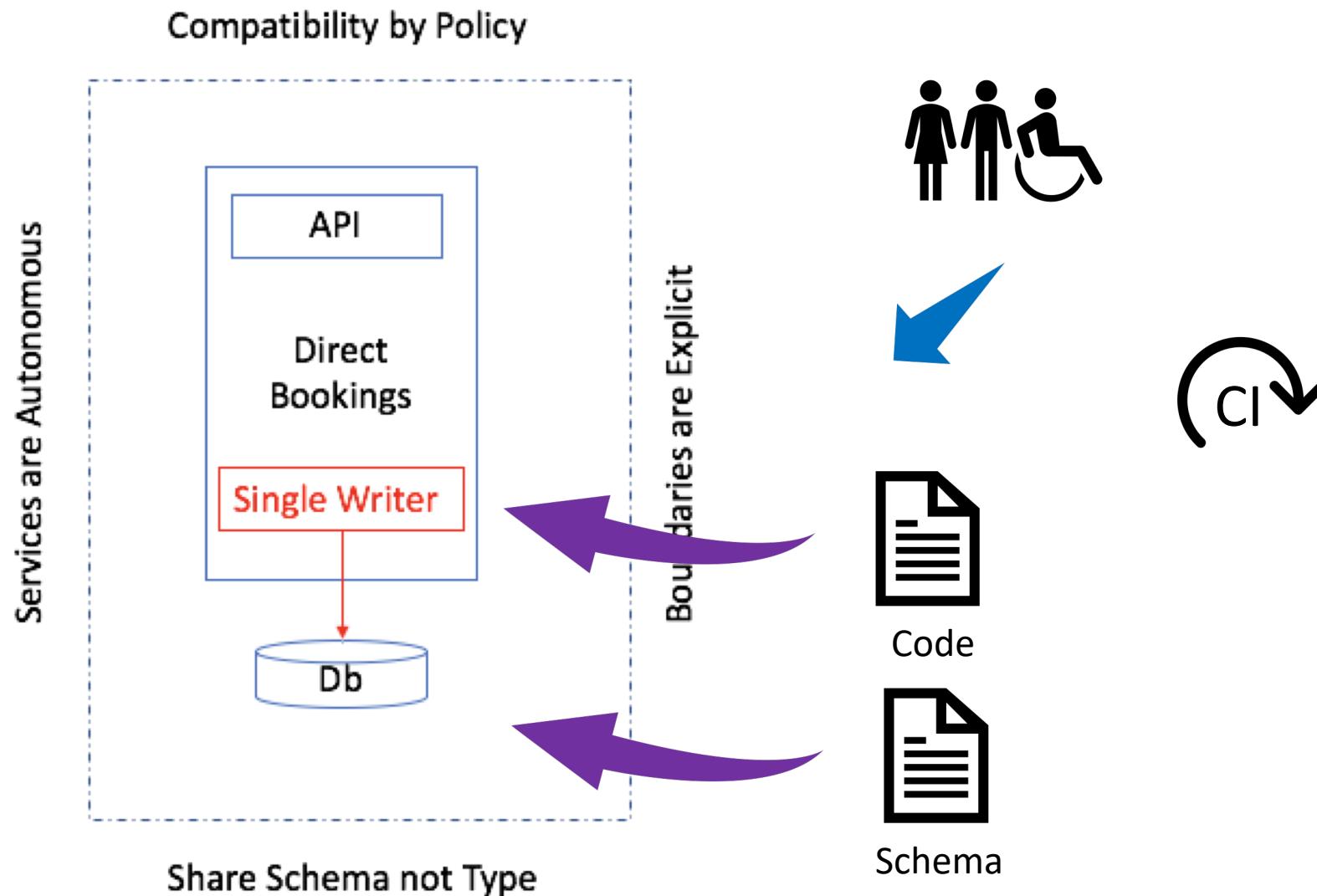


Bounded Contexts

... set boundaries in terms of team organization, ... code bases and database schemas.

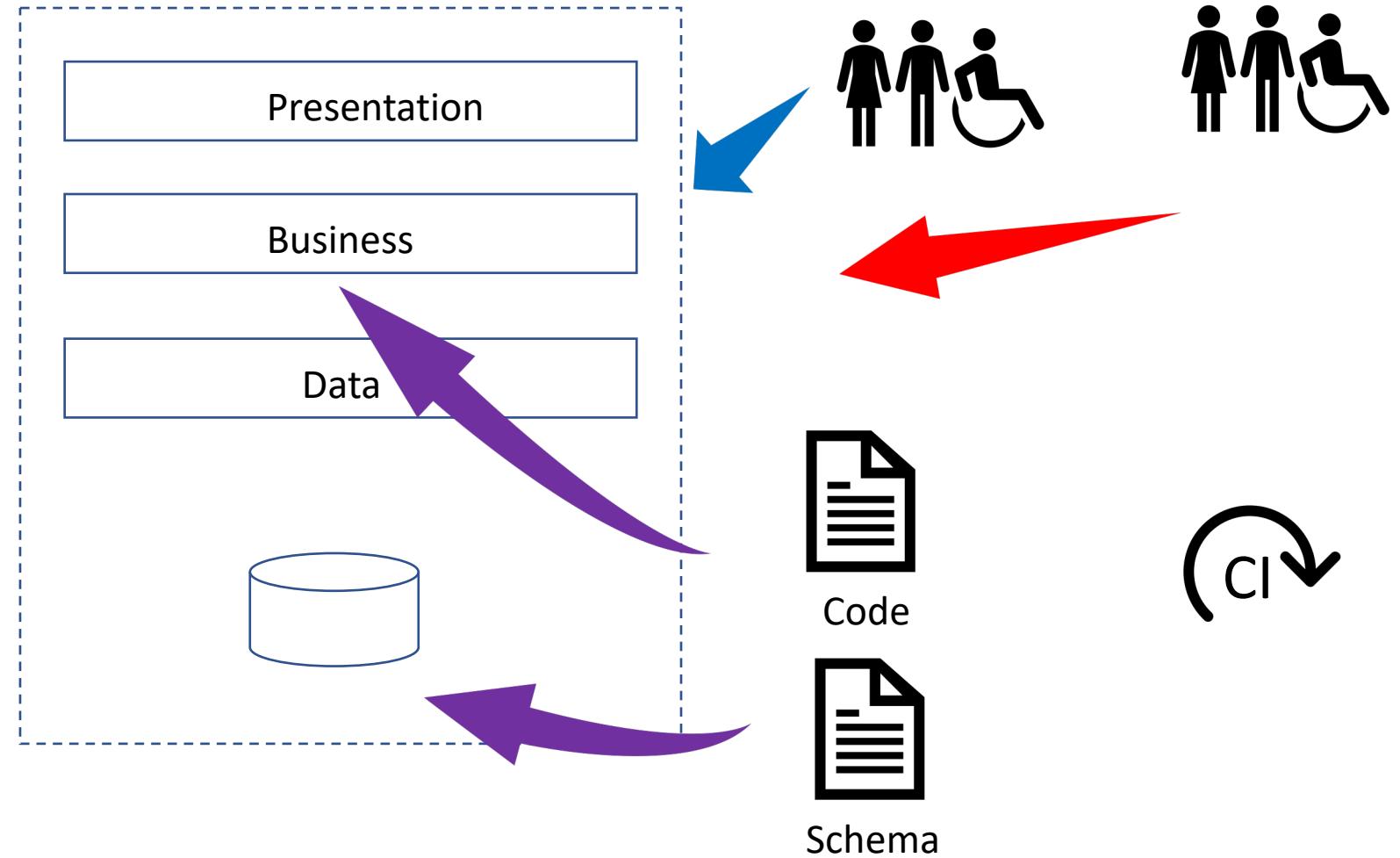
Evans, Eric, Domain Driven Design

Microservices are Bounded Contexts!



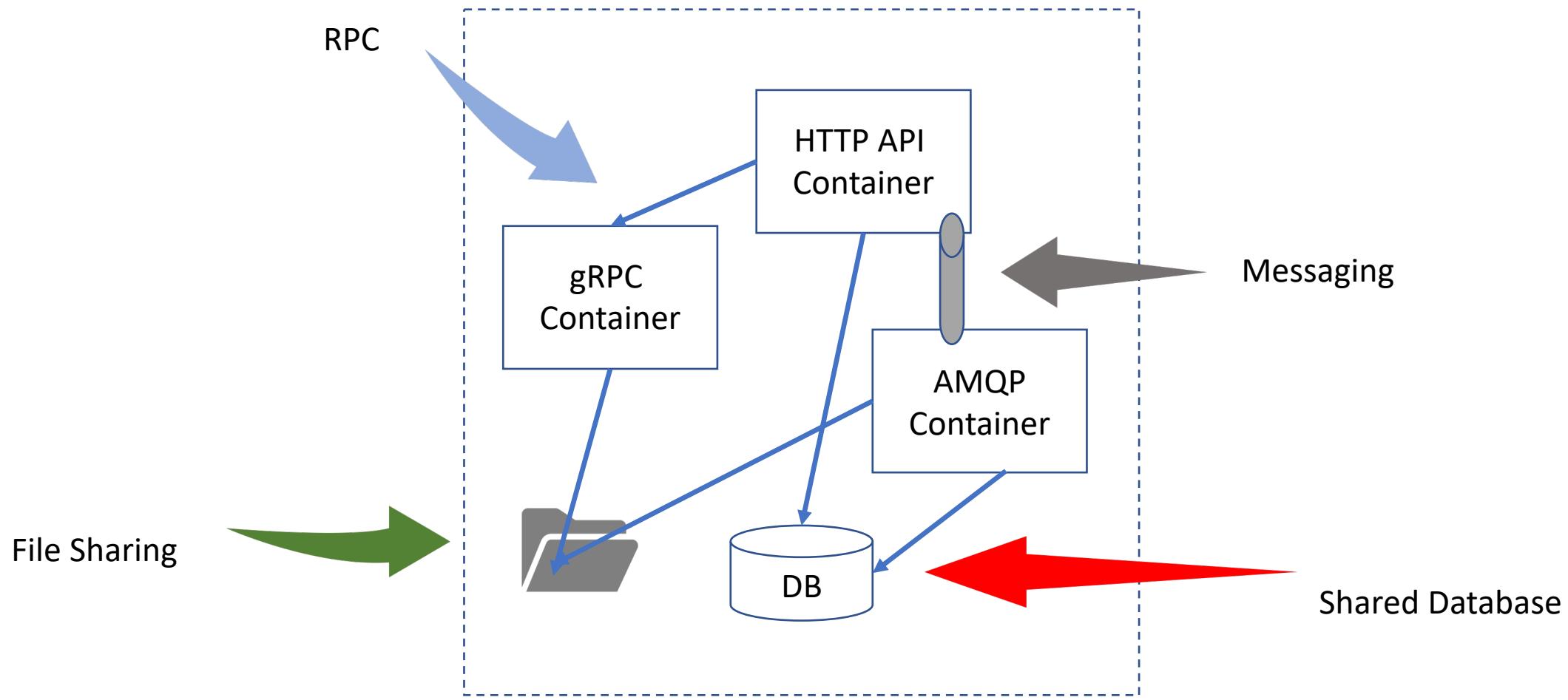
But Bounded Contexts are not Microservices!

Ubiquitous
Language

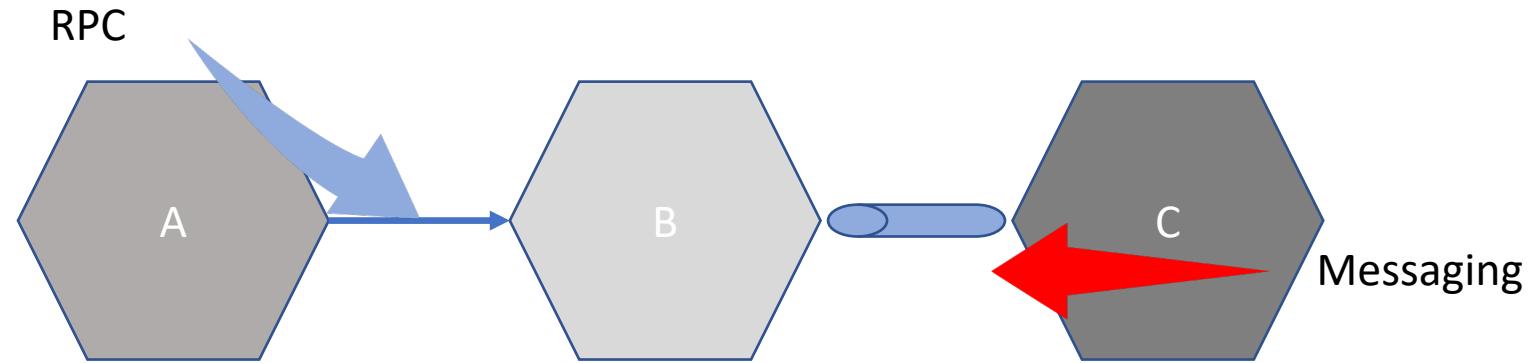


Independent Deployability

Inside the Microservice Boundary



Across Microservice Boundaries



Summary

That's All Folks!

