

SOCIOTECHNICAL ARCHITECTURE PATTERNS

Nick Tune - @ntcoding



I **forget** my
keys, passport,
clothes why!!??

KANDDD

Pilots suspended after their aircraft nearly ran out of fuel because they'd forgotten to bring up the landing gear

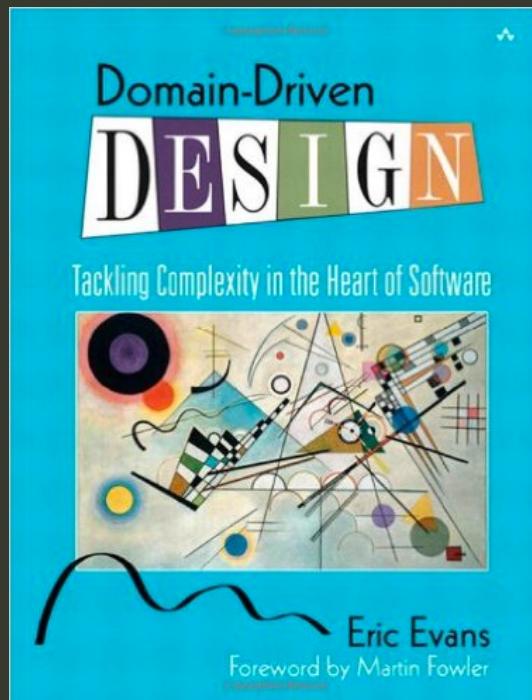
- The Airbus A320, with 99 on board, took off last Saturday from Kolkata
- But with the wheels affecting the aerodynamics it burned excessive fuel
- They reportedly only realised the gear was already down when they diverted

http://www.dailymail.co.uk/travel/travel_news/article-4739838/Air-India-pilots-forget-raise-landing-gear.html

*Have we forgotten a
fundamental motivation of
strategic DDD?*

Use Strategic DDD to enable
multiple teams to thrive in
large, complex domains.

“
[Strategic design] enables the modeling process to scale up to very complicated domains. Most such decisions must be made at team level.

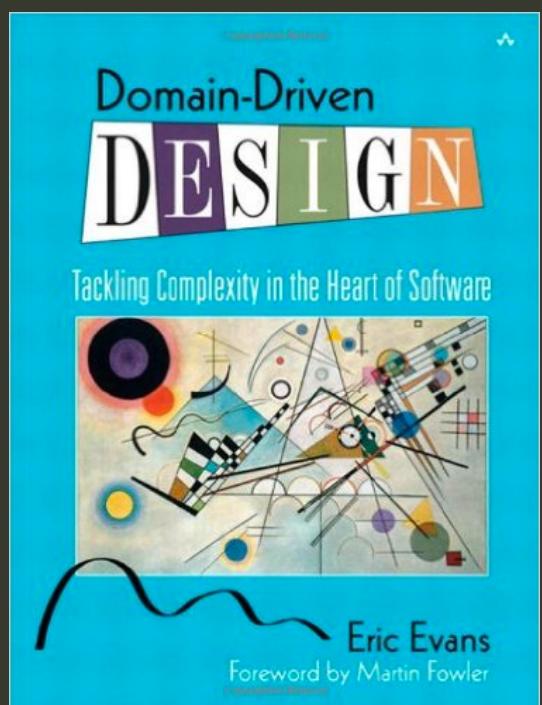


— Eric Evans (@ericevans0)

“

Generally speaking, there is a correspondence of one team per BOUNDED CONTEXT..

– Eric Evans (@ericevans0)

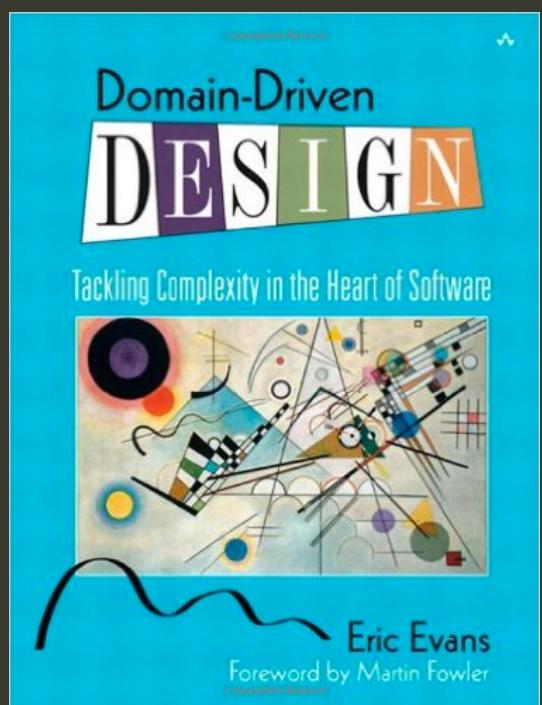


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“

Strategic design principles must guide design decisions to reduce the interdependence of parts

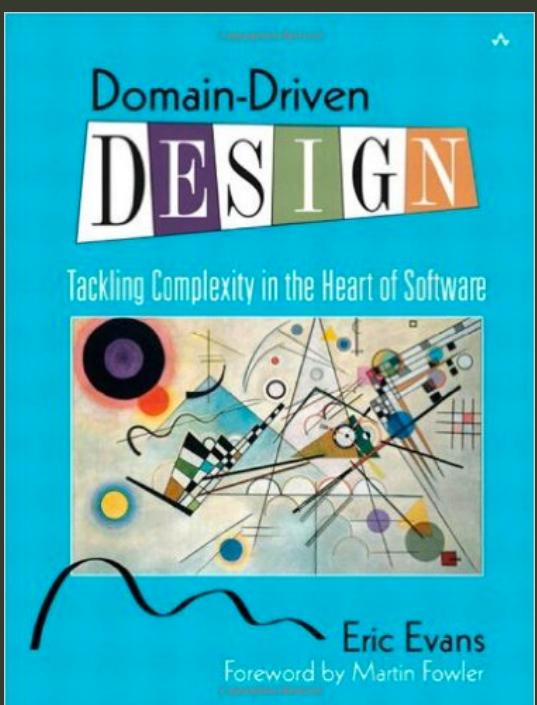
– Eric Evans (@ericevans0)



”

“
*the specific structures discussed
are only examples; they are not a
comprehensive catalog. New ones
should be invented as needed...*

— Eric Evans (@ericevans0)



Strategic design patterns are
sociotechnical patterns -
teams and software are
interdependent.

*What are the consequences if
we aren't aware of the
patterns and we choose the
wrong ones?*



ACTIVITY-ORIENTED ARCHITECTURE

FRONTEND TEAM



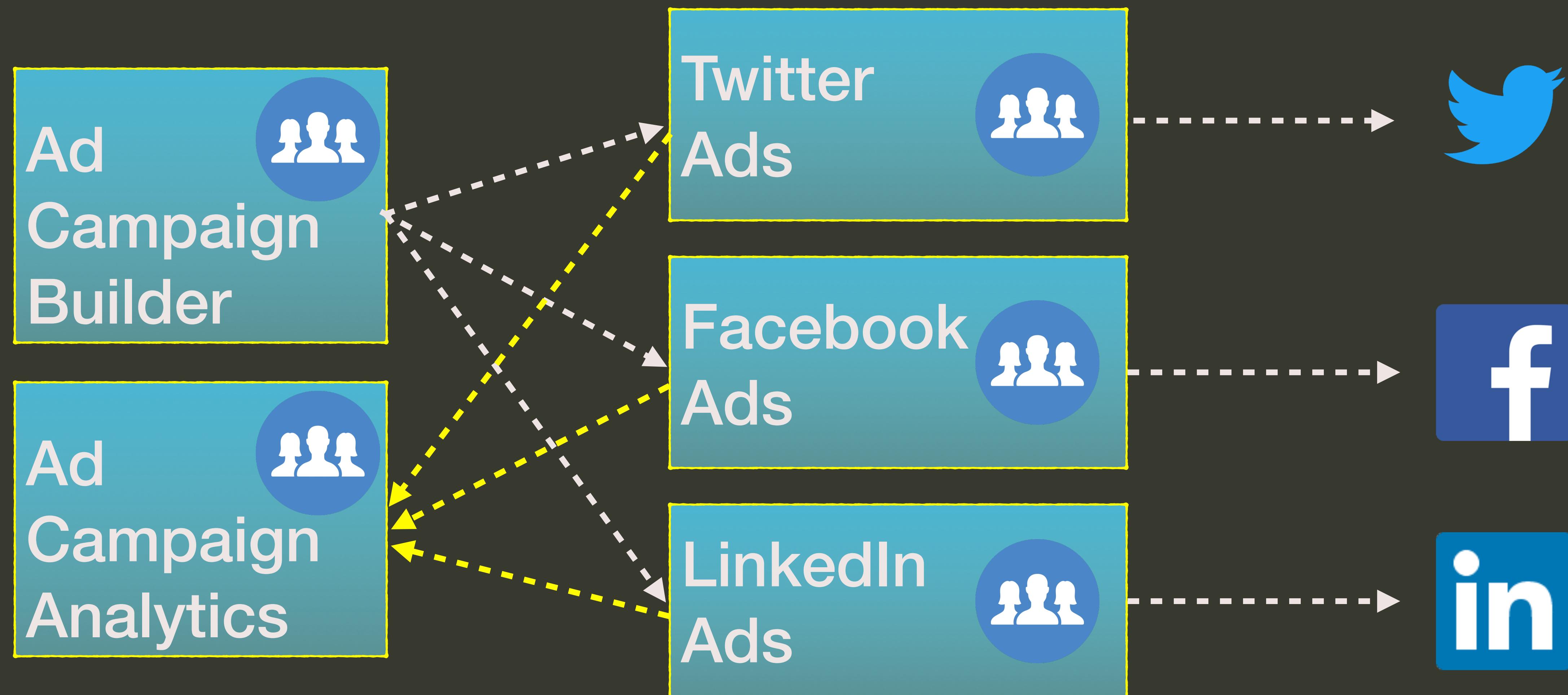
BACKEND TEAM



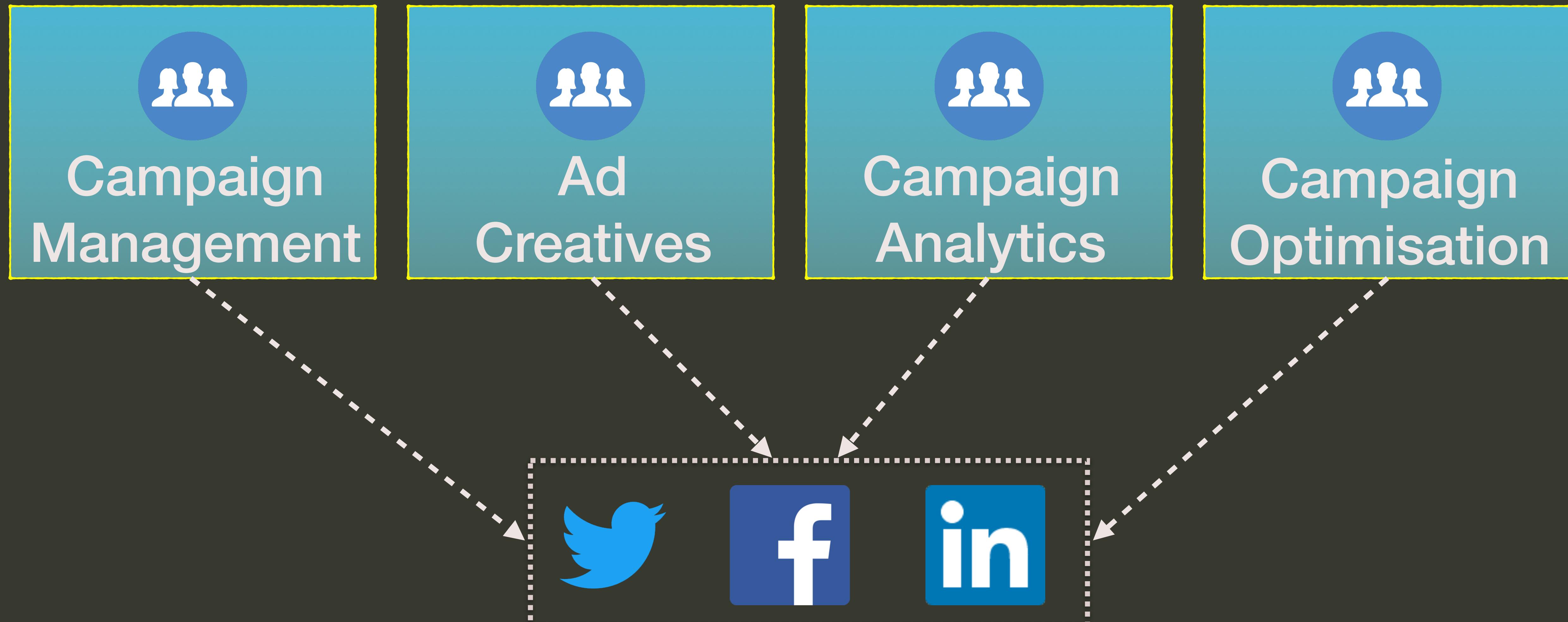
DBAs



PARTNER-ALIGNED ARCHITECTURE



CAPABILITY-ALIGNED ARCHITECTURE

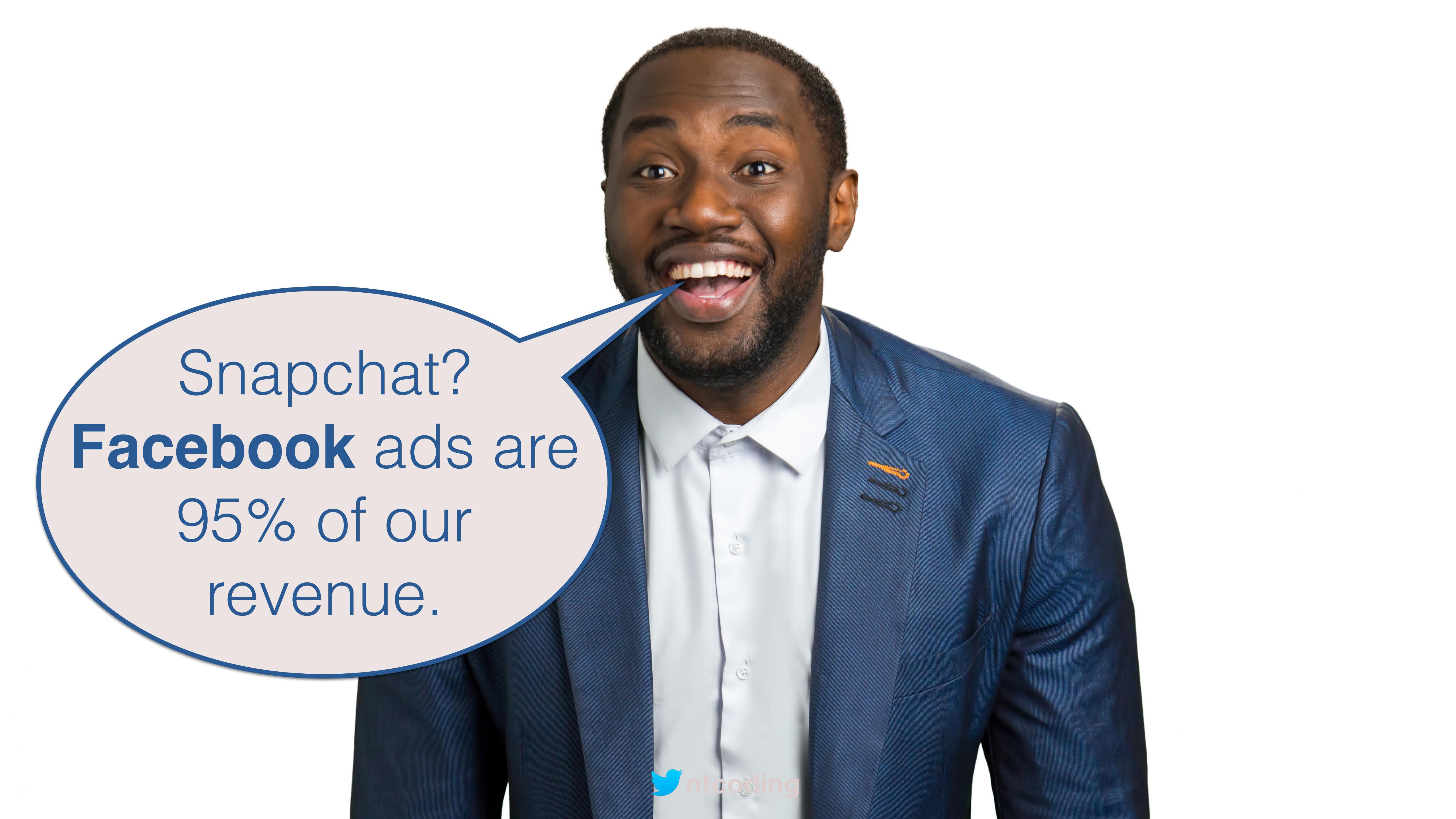


CHOOSE ONE





We need to
add **Snapchat** to
close a huge
deal!



Snapchat?
Facebook ads are
95% of our
revenue.





FLOW IS A COMPROMISE

“
[In our study at Thoughtworks we found] work takes an order of magnitude longer when it leaves a team.

— James Lewis (@boicy)
<https://t.co/2ElhXGVDHV>



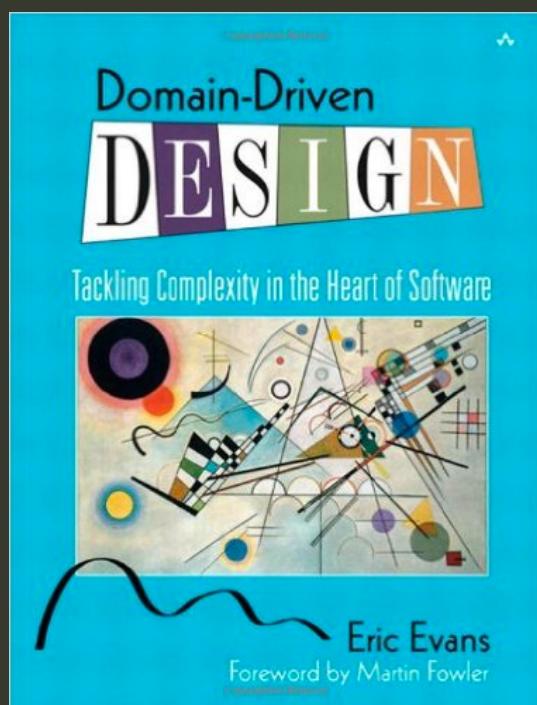
Strategic design is technical,
economical, and **political**...

So are the consequences of
poorly-designed **boundaries**.

“

[Strategic design] decisions are where design and politics often intersect.

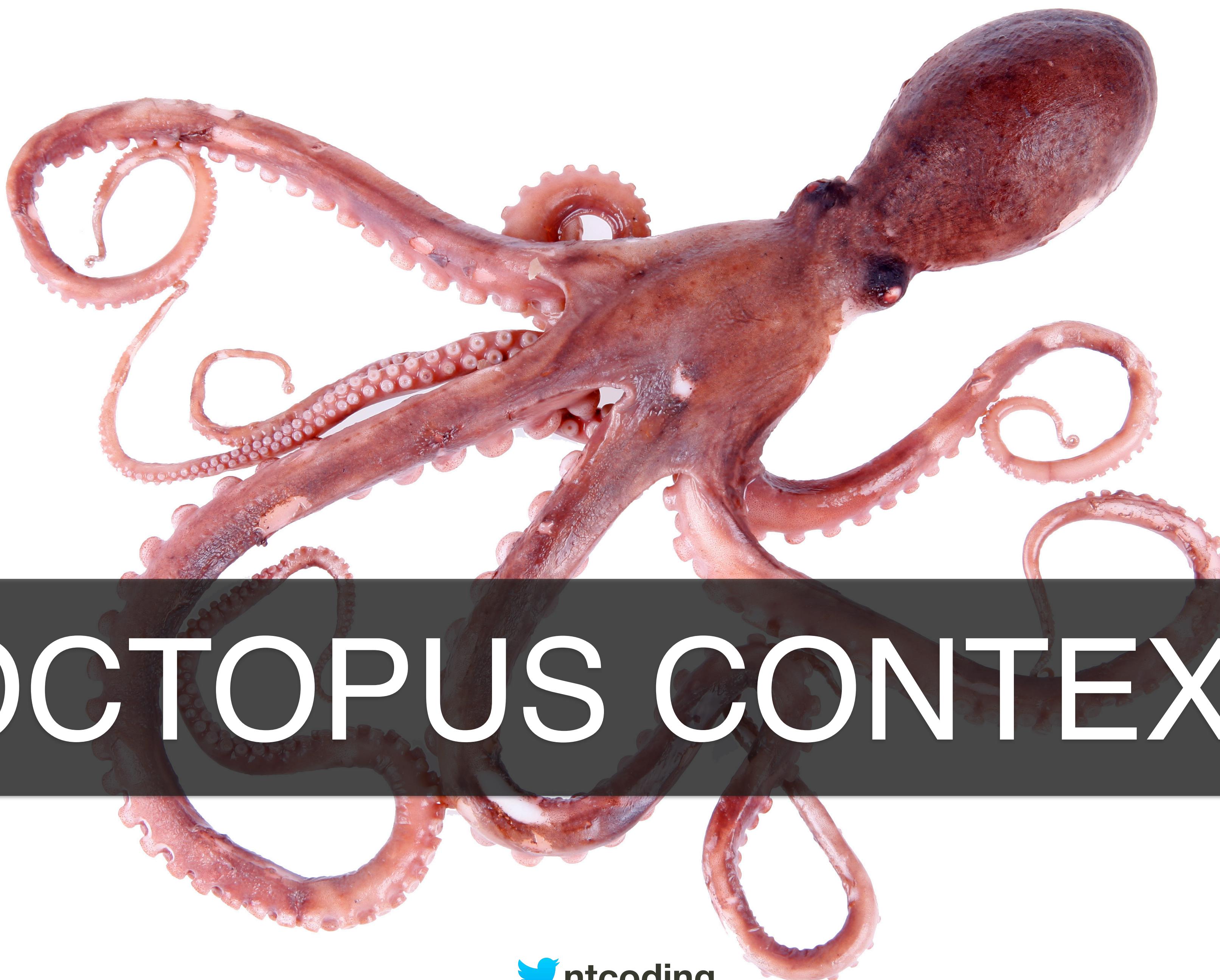
– Eric Evans (@ericevans0)



”

STRUCTURAL PATTERNS

#1



OCTOPUS CONTEXT

OCTOPUS CONTEXT



OCTOPUS ECONOMICS

- High levels of coordination can impact flow in many teams
- For compliance scenarios, it is about protecting rather than generating revenue

OCTOPUS POLITICS

- Nobody wants to slow down feature delivery for somebody else's roadmap
- High levels of synchronous alignment

OCTOPUS TECHNOLOGY

- Try to centralise complexity in the Octopus
- Technology standardisation can help
- A bit of integration design up front can save a lot of politics in the future

Be wary of patterns like the Octopus which introduce many **dependencies**. Can we avoid them instead?

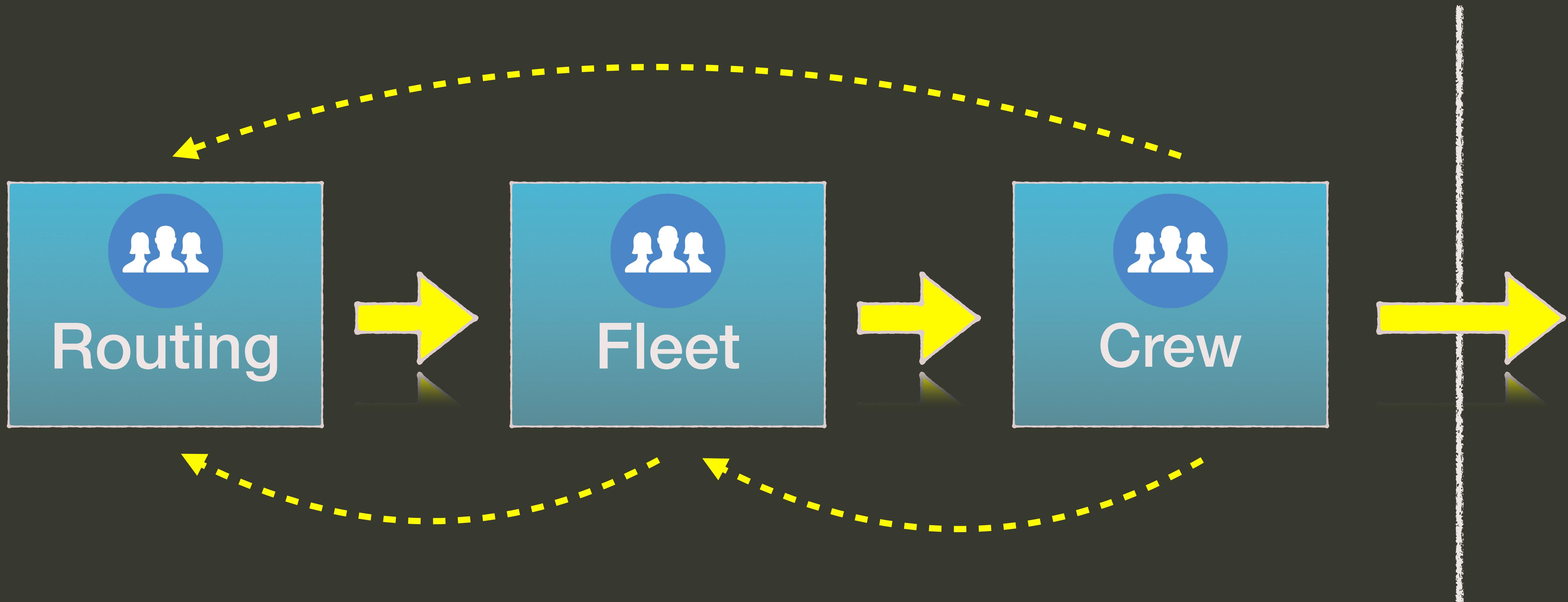
ENTITY LIFECYCLE PIPELINE



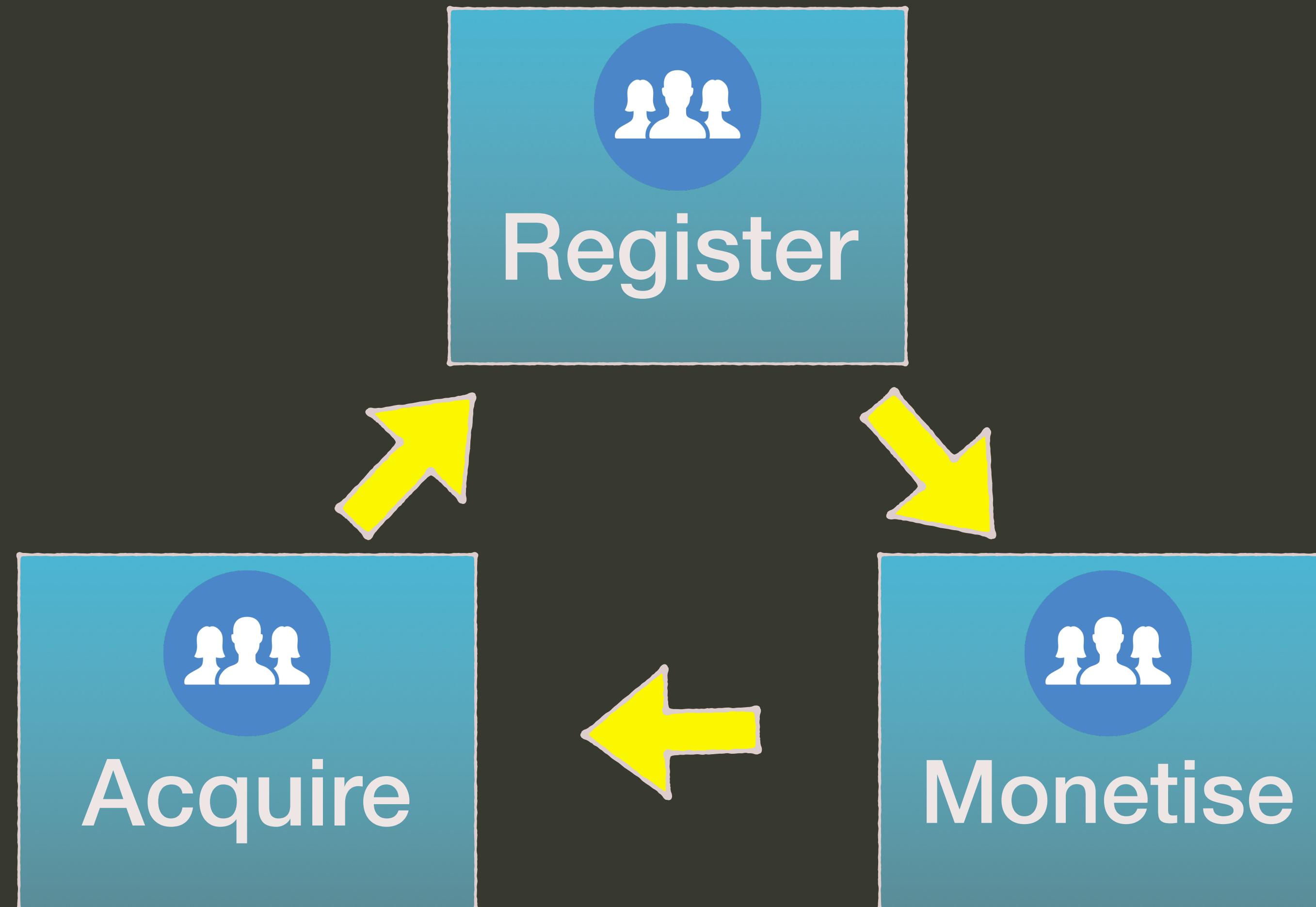
ENTITY LIFECYCLE PIPELINE

- If revenue is generated at the end, every team has to bring their A Game.
- Changes likely to cascade through many teams (maybe the boundaries are wrong)
- Consider UI composition to avoid frontend activity team

PROPOSAL PIPELINE



CIRCLE OF LIFE



#2

BUSINESS MODEL ALIGNMENT PATTERNS



DOG FOOD
CONTEXT!

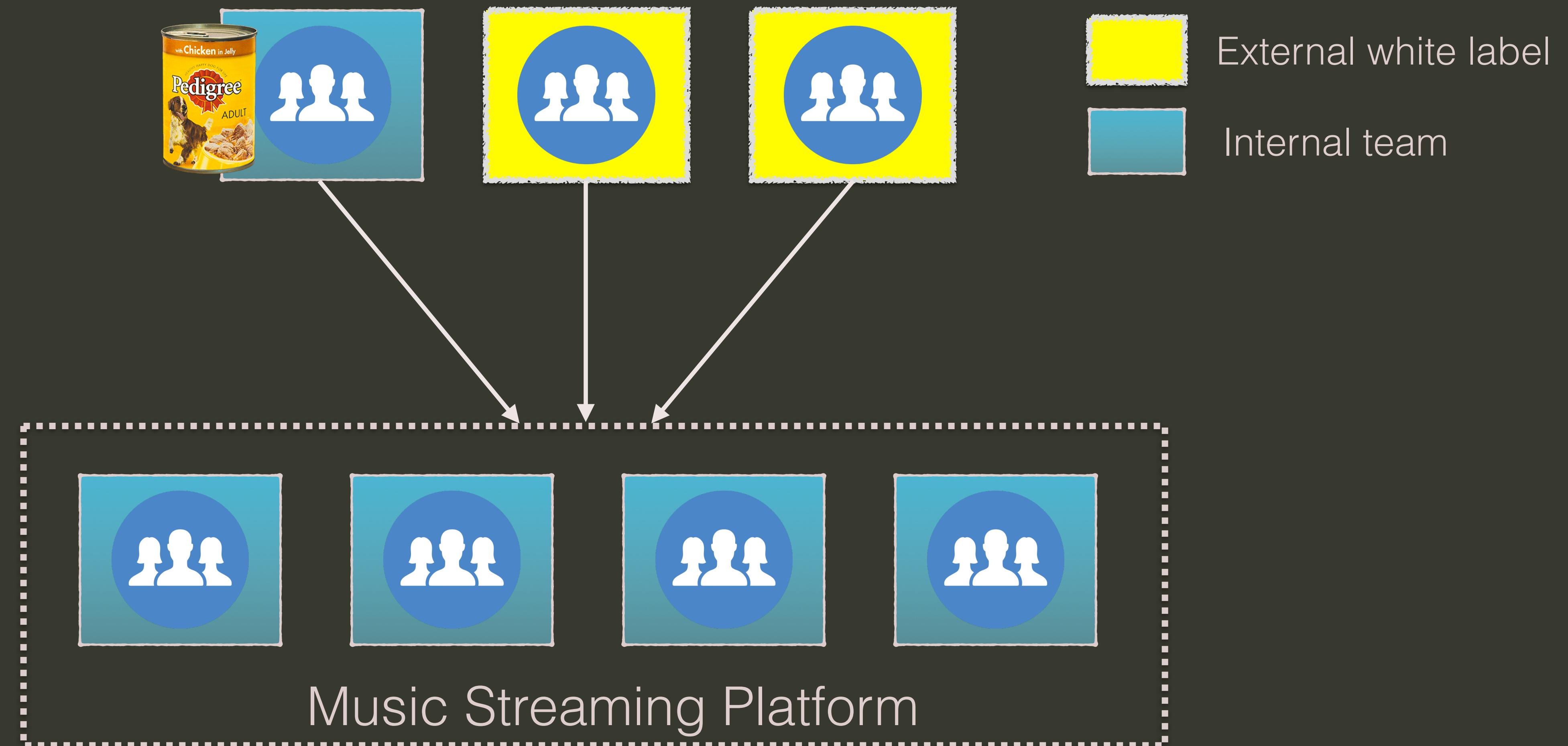


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DOG FOOD CONTEXT GOAL

We don't want to optimise our flow,
we want to have the same
experience as customers in order
to grow our strategic capabilities.

DOG FOOD CONTEXT



DOG FOOD ECONOMICS

- ROI is not the goal - making a loss may be acceptable
- Feedback to improve core products is the goal
- Dog food context can grow into a product

DOG FOOD POLITICS

- Every team wants to build the star product not a loss leader
(But it can evolve into a bona-fide product)
- Managers may use deceptive motivational techniques

DOG FOOD TECHNOLOGY

- Freedom to use any technology
(to simulate the customer experience)
- Try out new tech in production

ENTITY FUNNEL



ENTITY FUNNEL

- Goal is to lose customers (to next tier)
- Teams owning higher tiers may develop an arrogance
- How to share / store customer data as they progress through funnel?

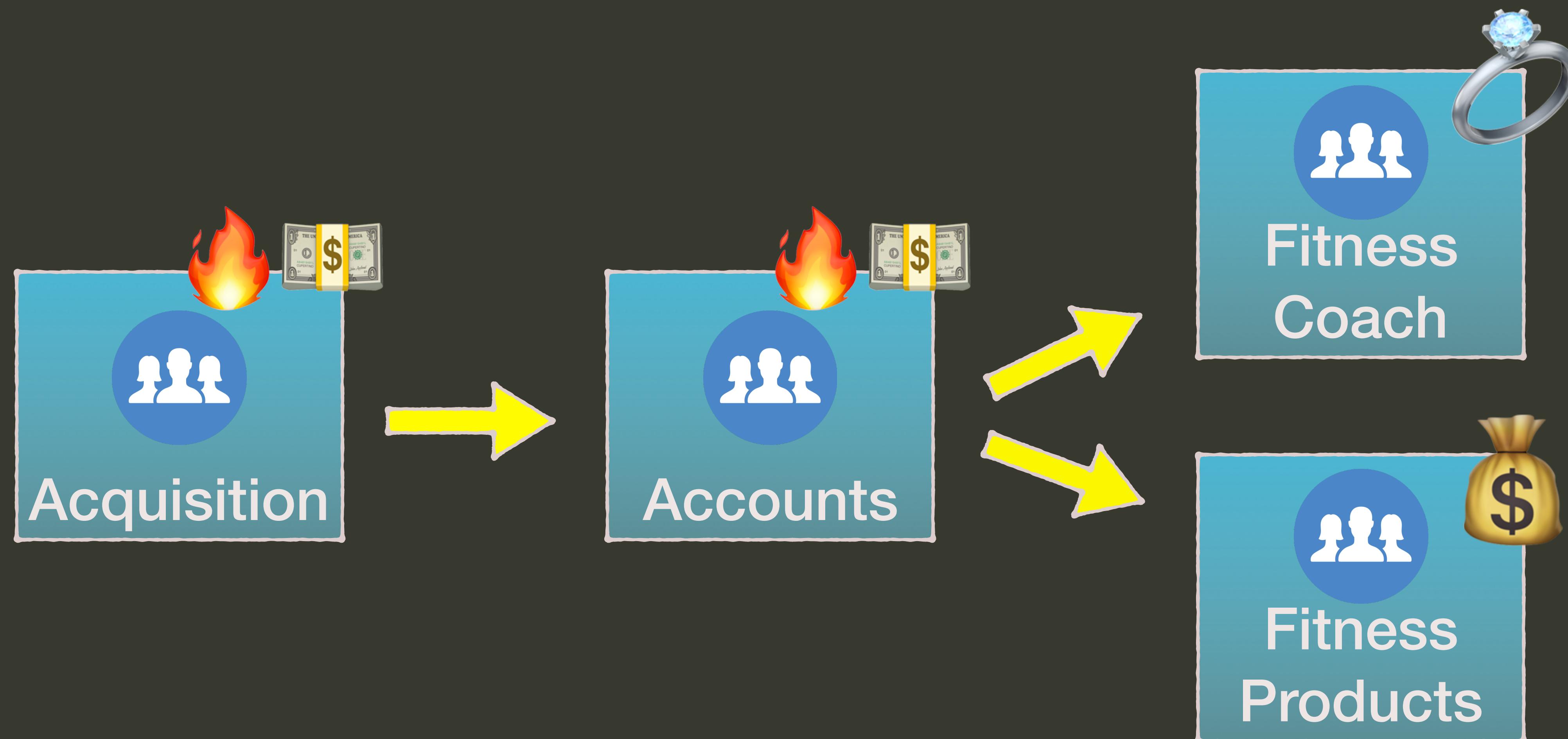
ENGAGEMENT CONTEXT



ENGAGEMENT CONTEXT

Provides non-revenue generating capabilities that keep customers engaged with your product leading to conversions / sales.

ENGAGEMENT VS REVENUE CONTEXTS

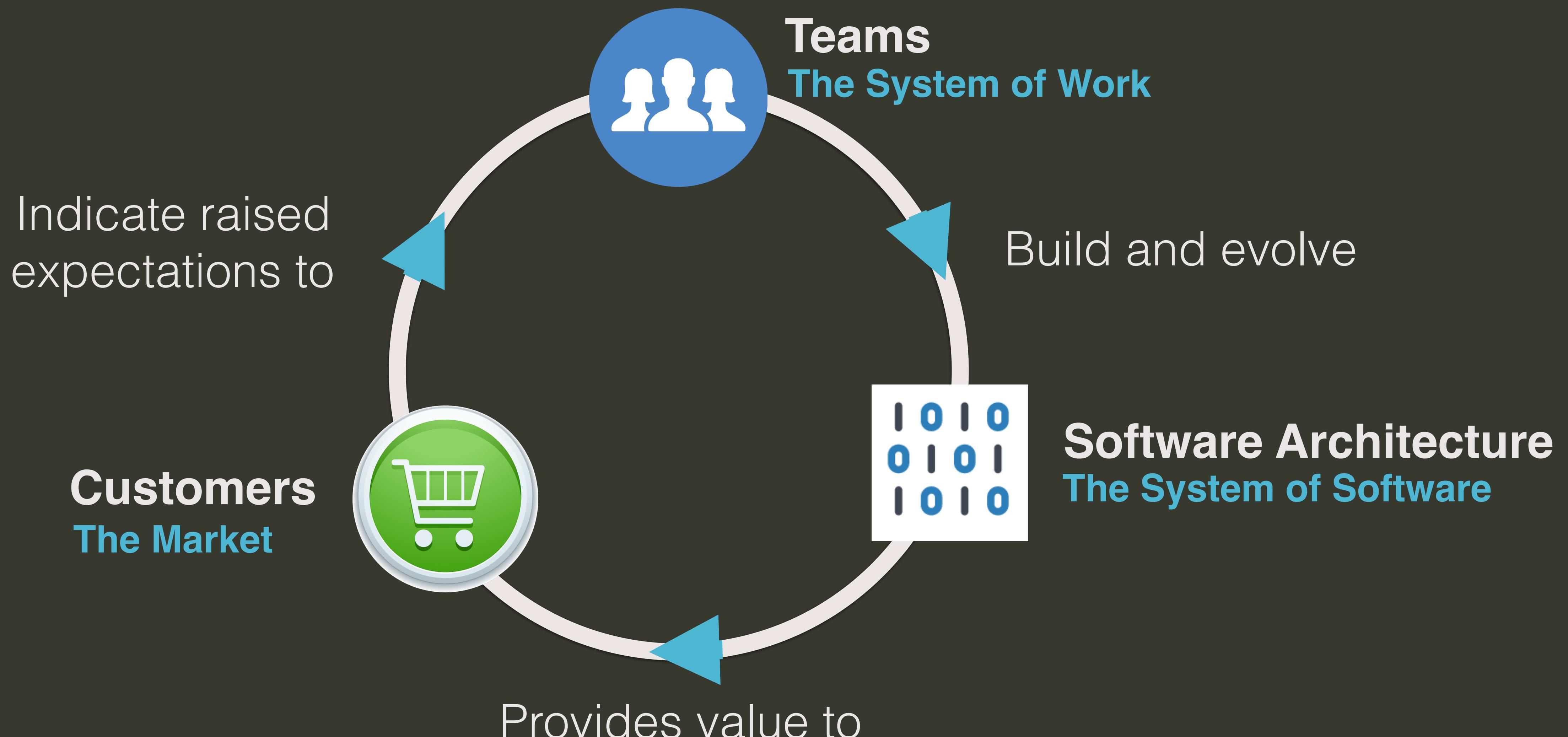


*What are the economical,
technical, and political
considerations of this
pattern?*

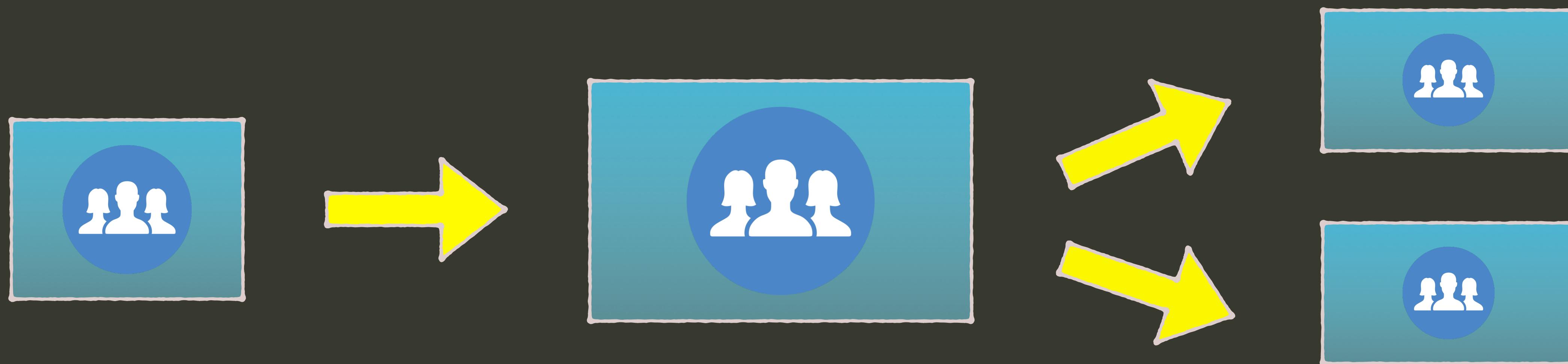
#3

EVOLUTIONARY PATTERNS

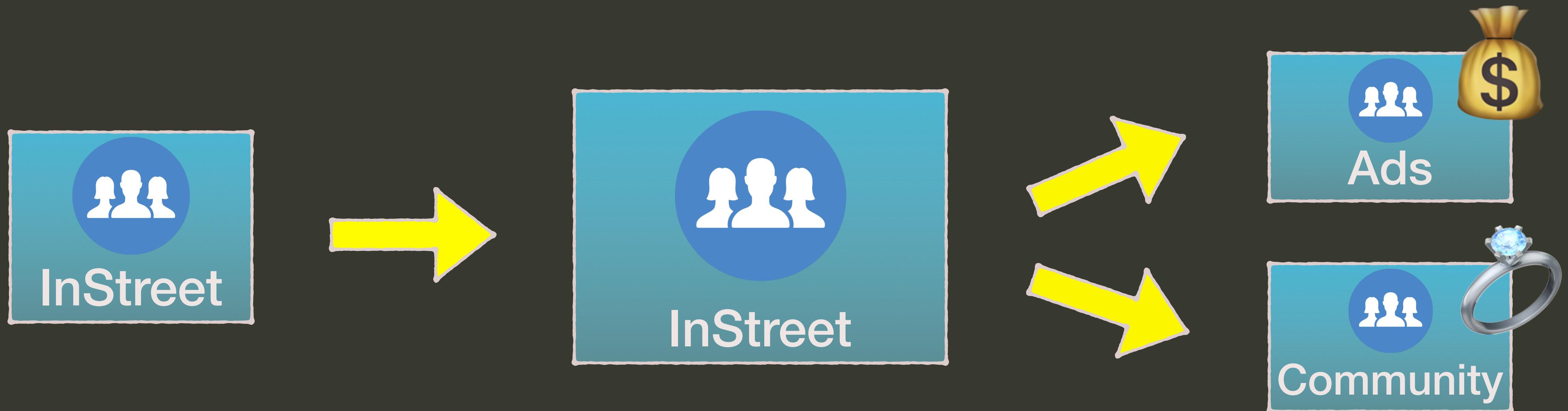
SOCIOTECHNICAL EVOLUTION



MITOSIS / GROW AND SPLIT



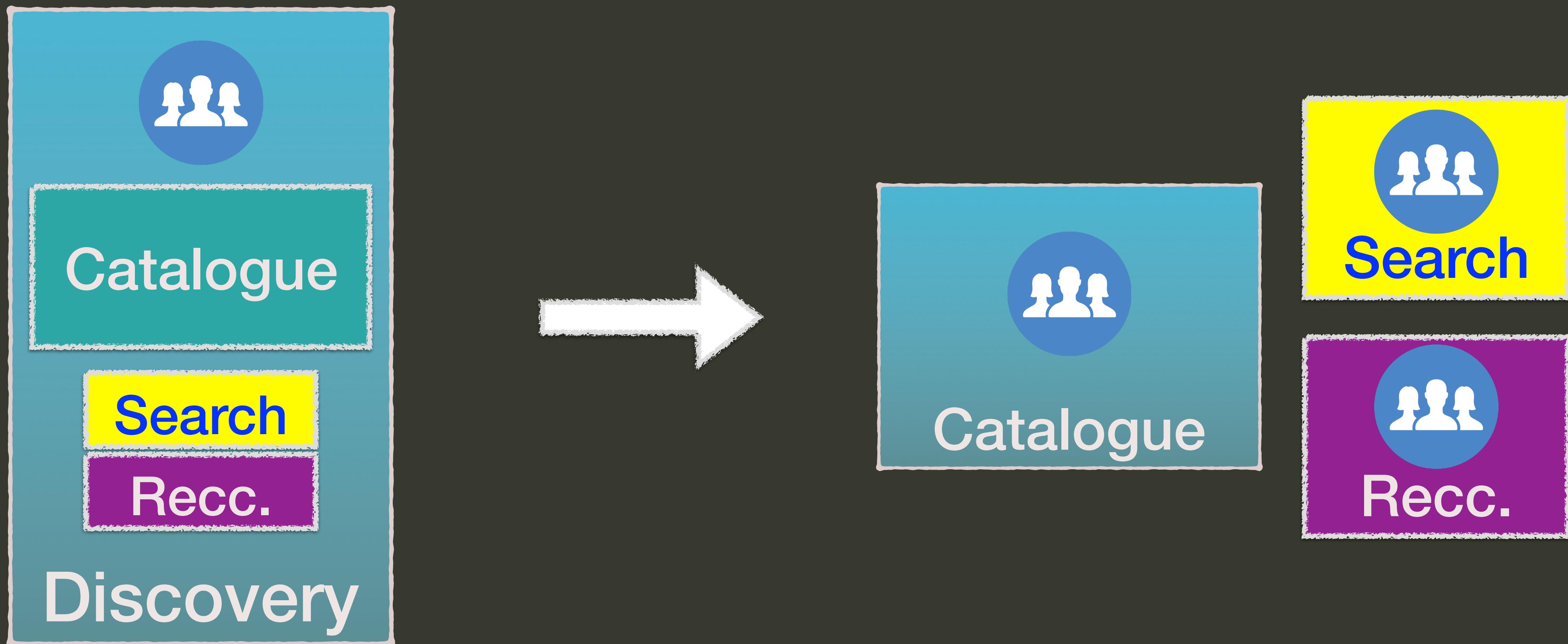
SPLIT BY REVENUE / ENGAGEMENT



GROW AND SPLIT SYMPTOMS...

- Lack of focus / excessive context switching
- Nobody sure what others in team are working on
- Standups are long and boring
(Even longer and even more boring than usual)

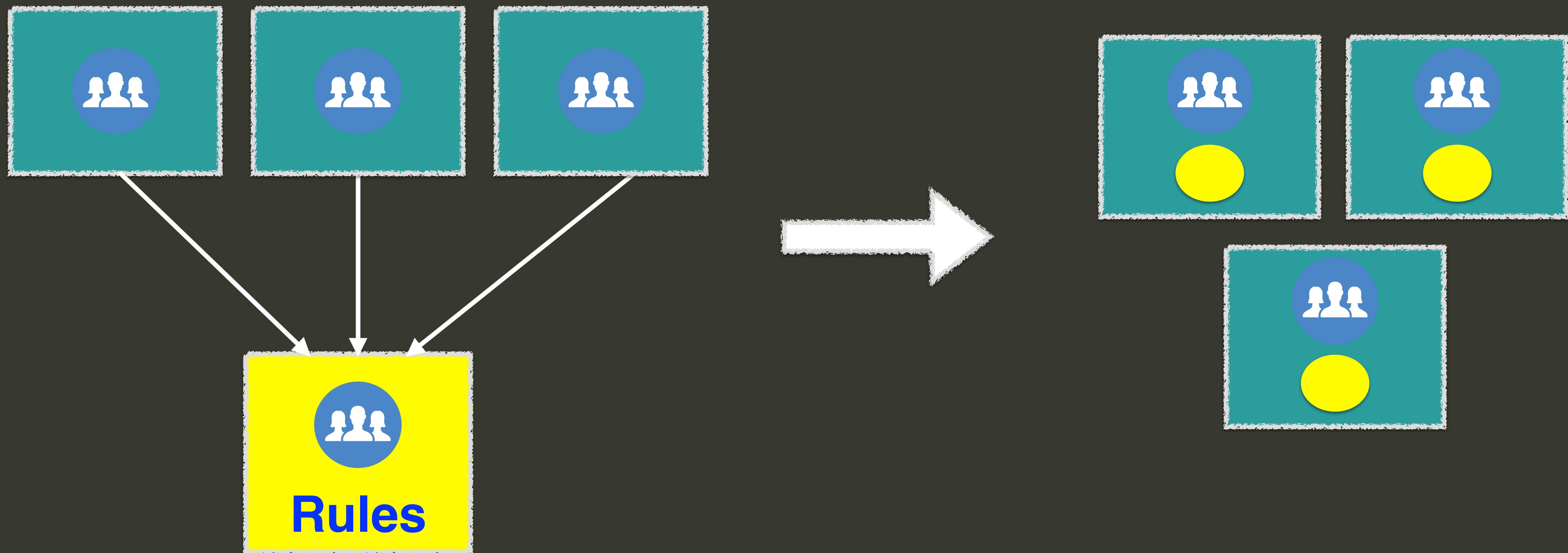
SLICE AND SCALE



SLICE AND SCALE

- Adapt to changing consumer expectation
- Team may not want to lose responsibility
- A tight technical coupling may be hard to break - analyse market and anticipate evolution (see Wardley Maps)

SLICE AND SCATTER



SLICE AND SCATTER

- Expensive change - be sure it's worth it
- Breaking up a team is not easy
- Software may be hard to decompose - a rewrite may be necessary

SLICE AND MERGE



SLICE AND MERGE

- Ensure rate of co-change justifies change
- Warning: Now there are 3 teams to coordinate
- Technical separation may be painful

#4

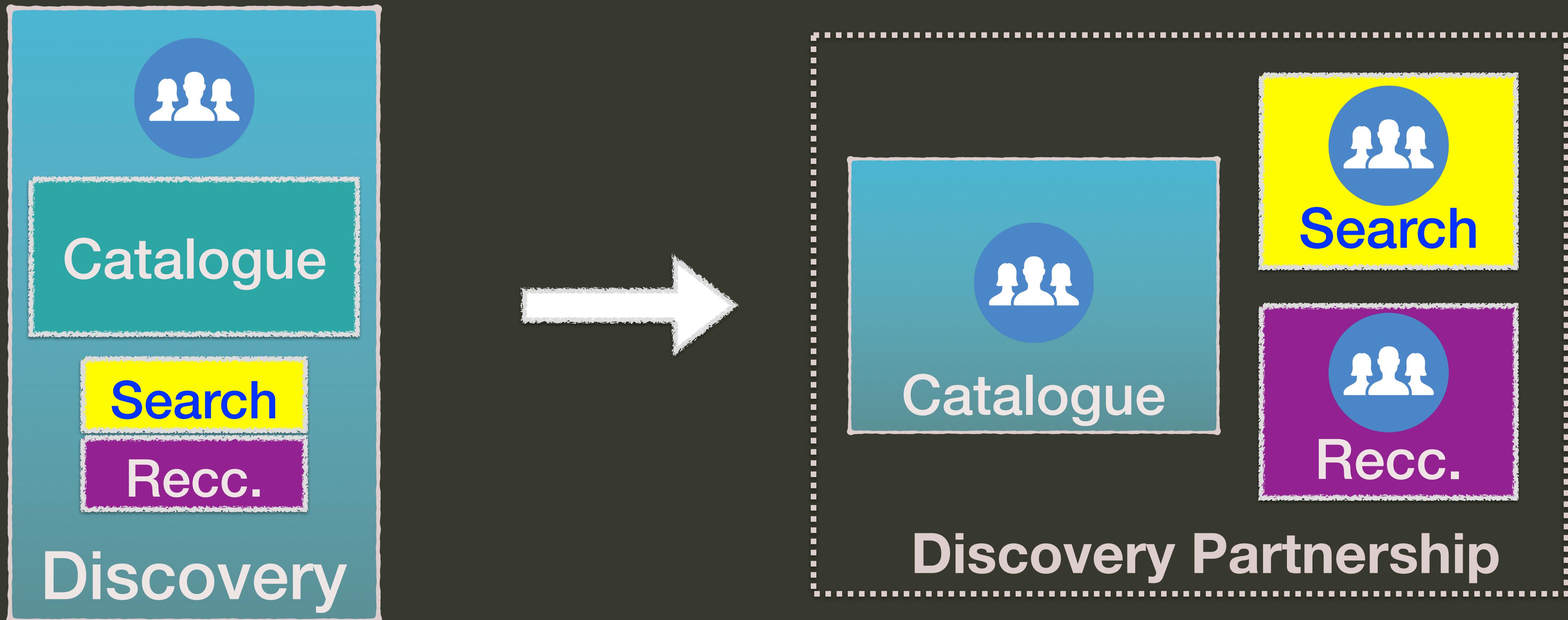
COOPERATIVE PATTERNS



Organisation design &
capabilities are **fractal**.

Cohesion applies at every
level (with many caveats).

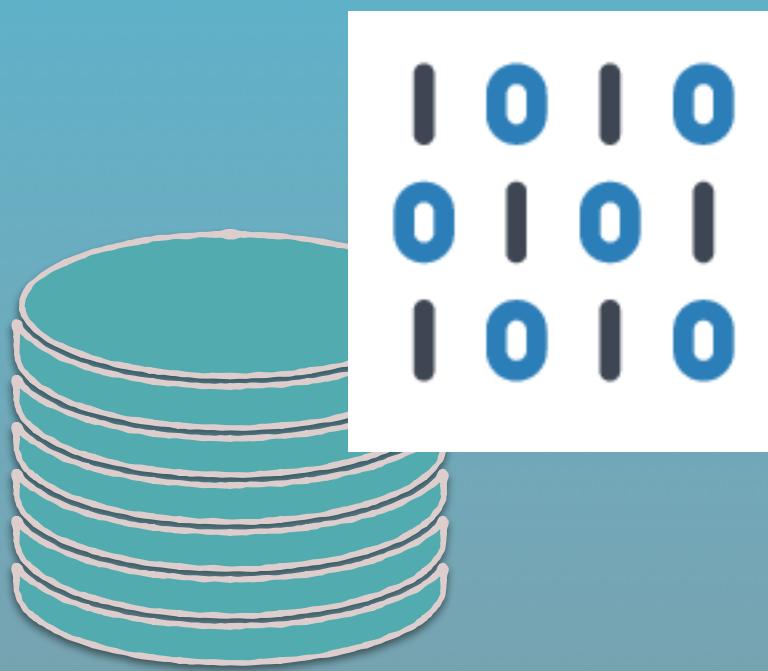
LAYER 2 CAPABILITY (AKA TRIBE)



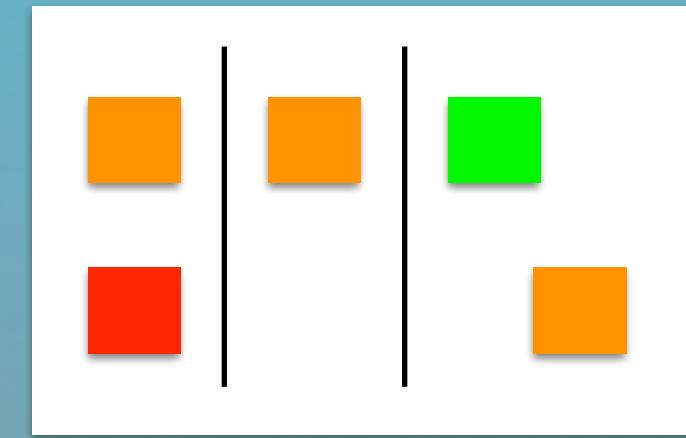
LAYER 1 CAPABILITY



Organisational Unit
(the team)



Technology
(code, DBs...)

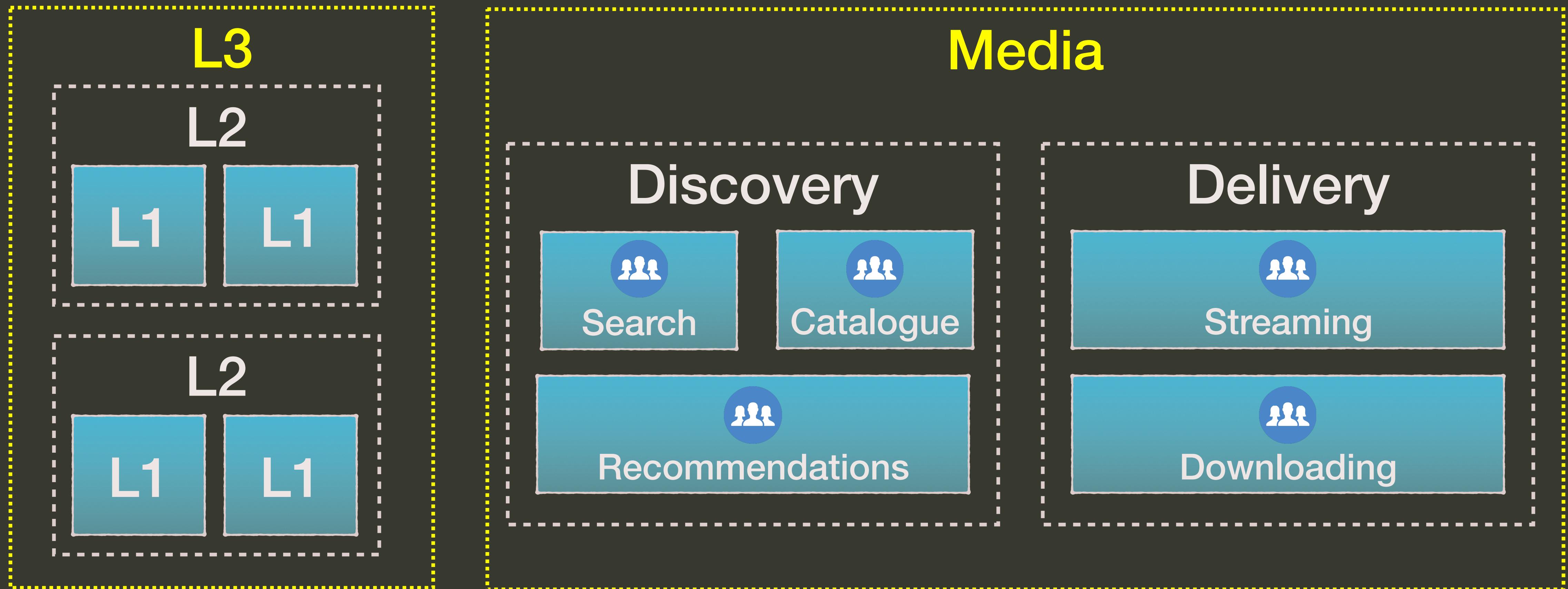


Process

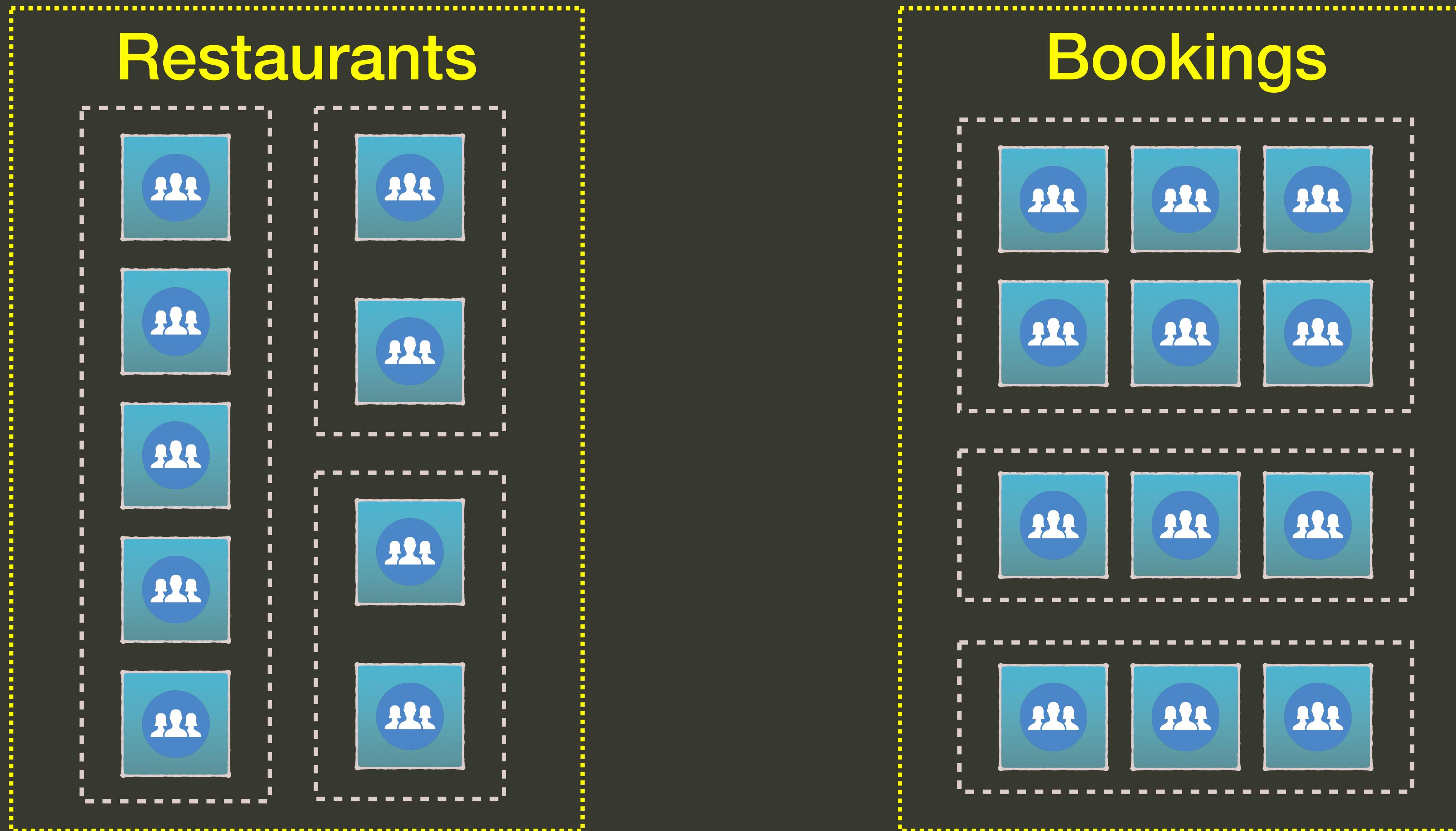


Culture

INFINITE CAPABILITY LAYERS

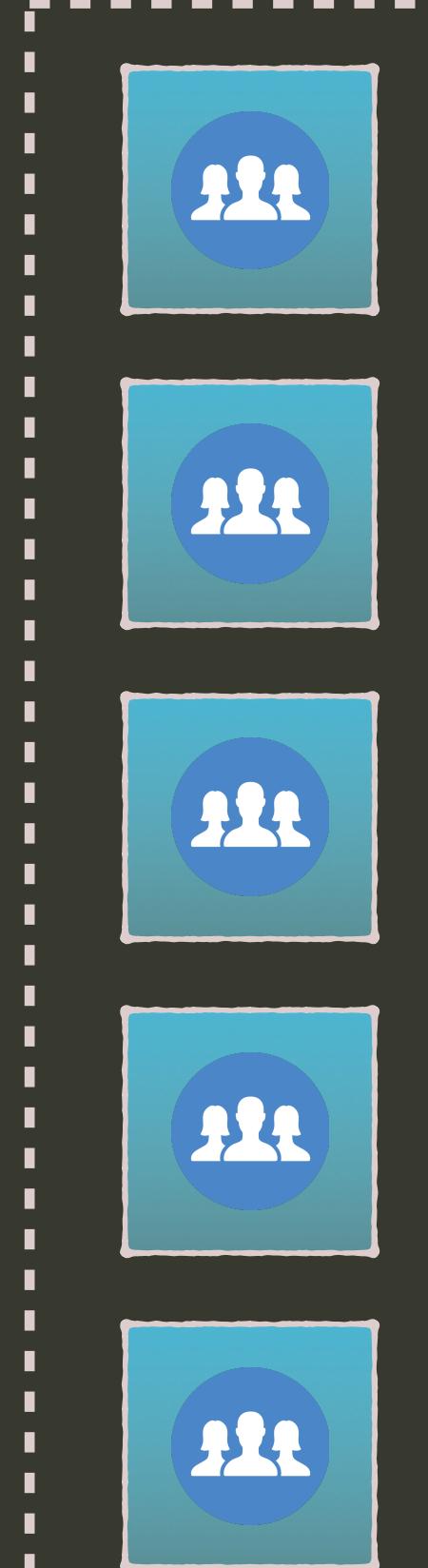


SUPPLY / DEMAND SPLIT



MARKET VERTICALS

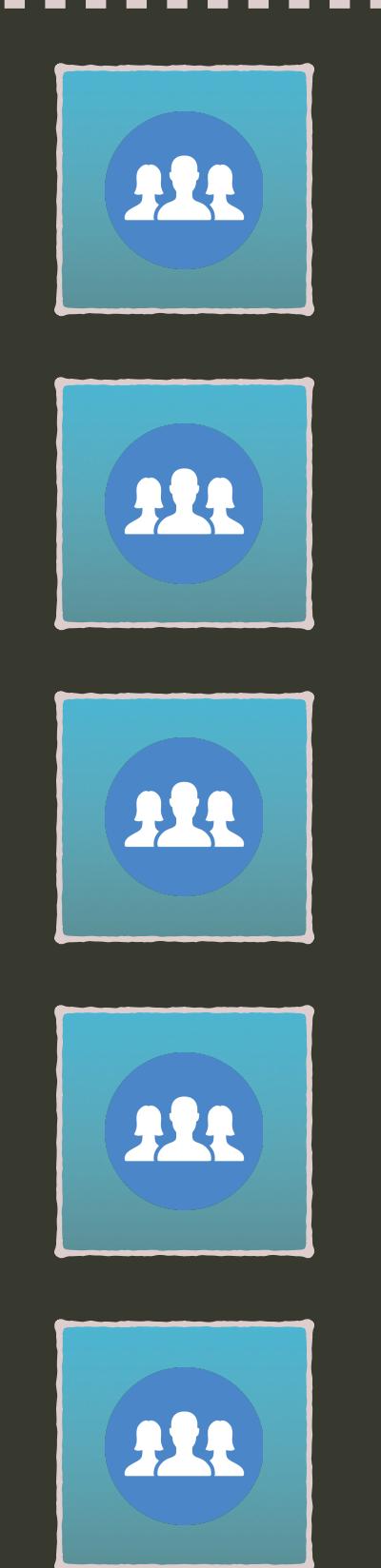
Healthcare



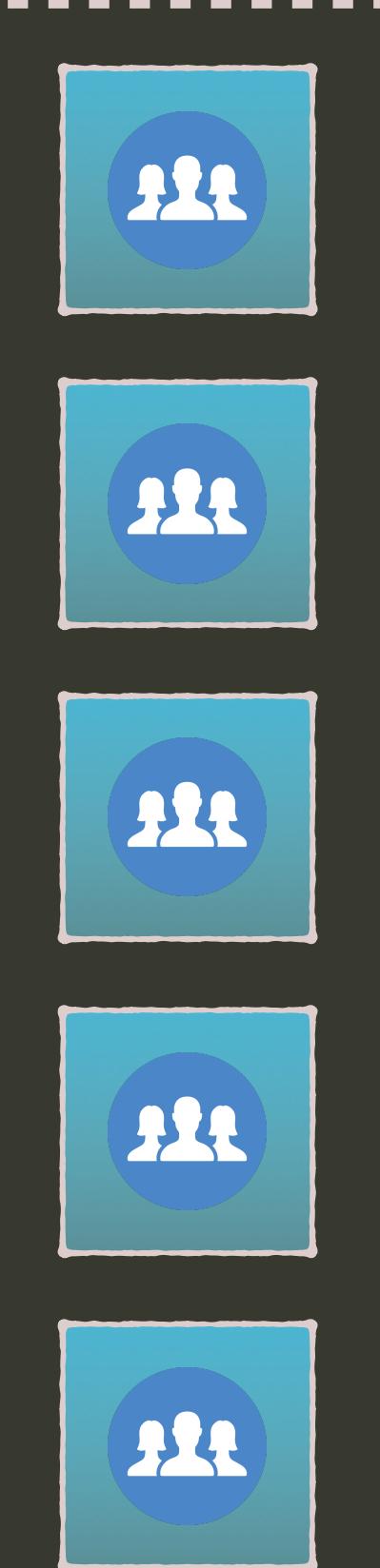
Transport



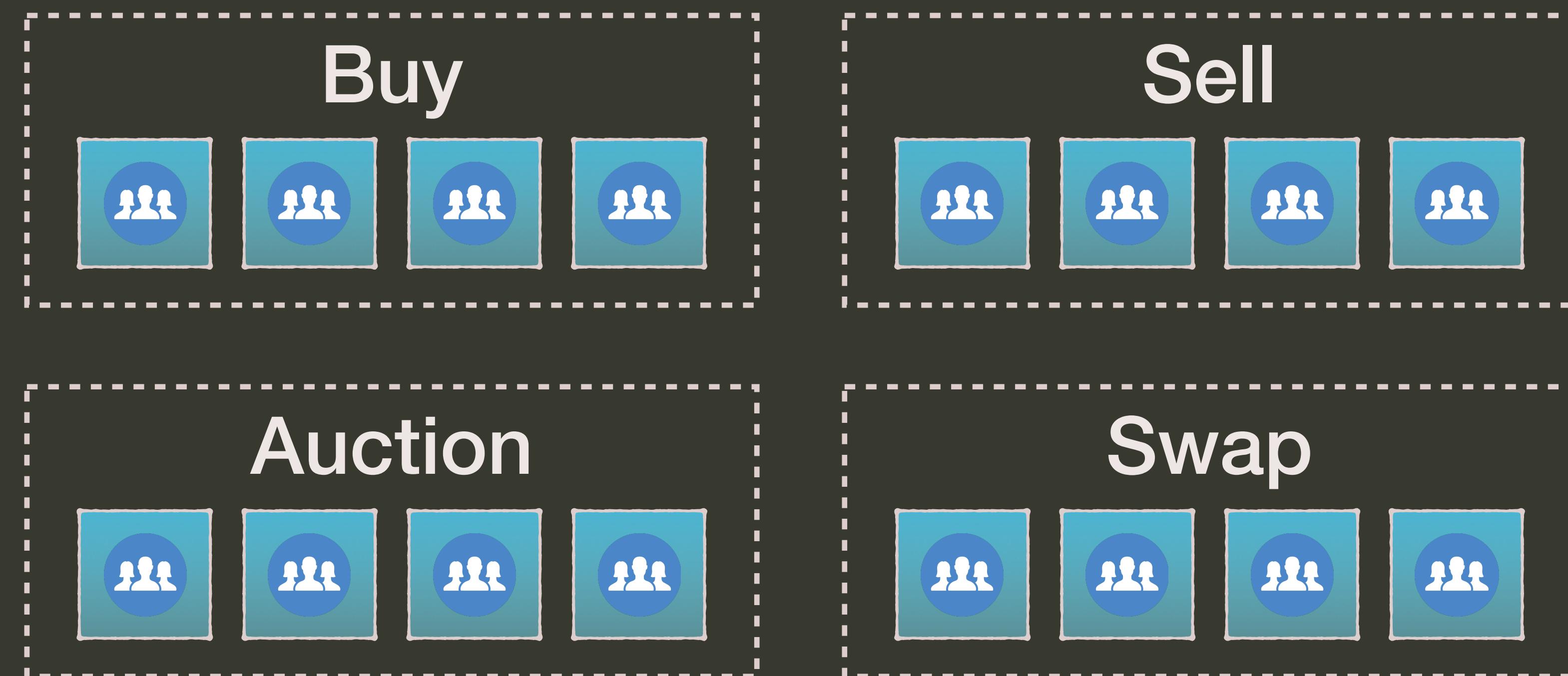
Government



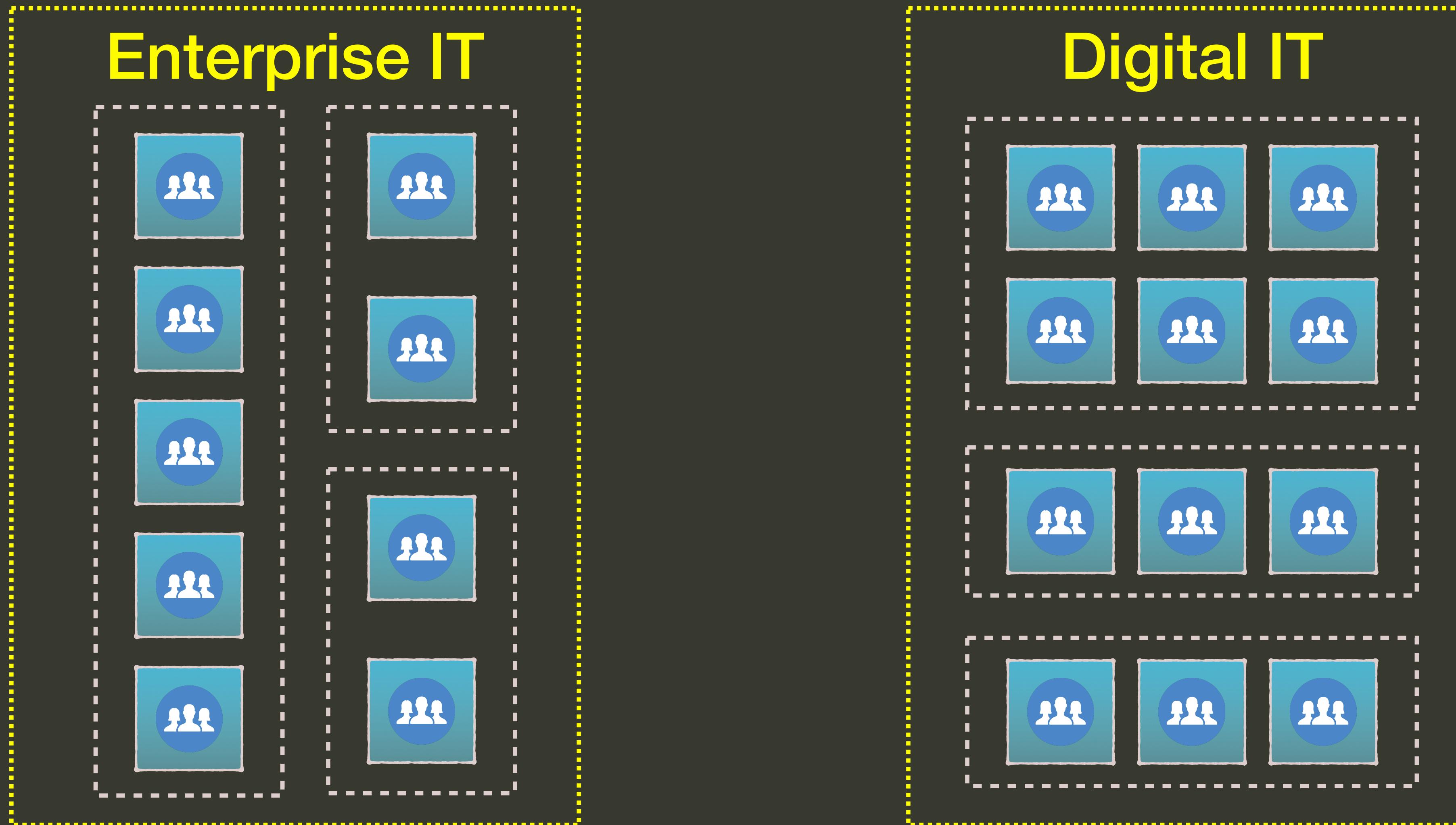
Telcos



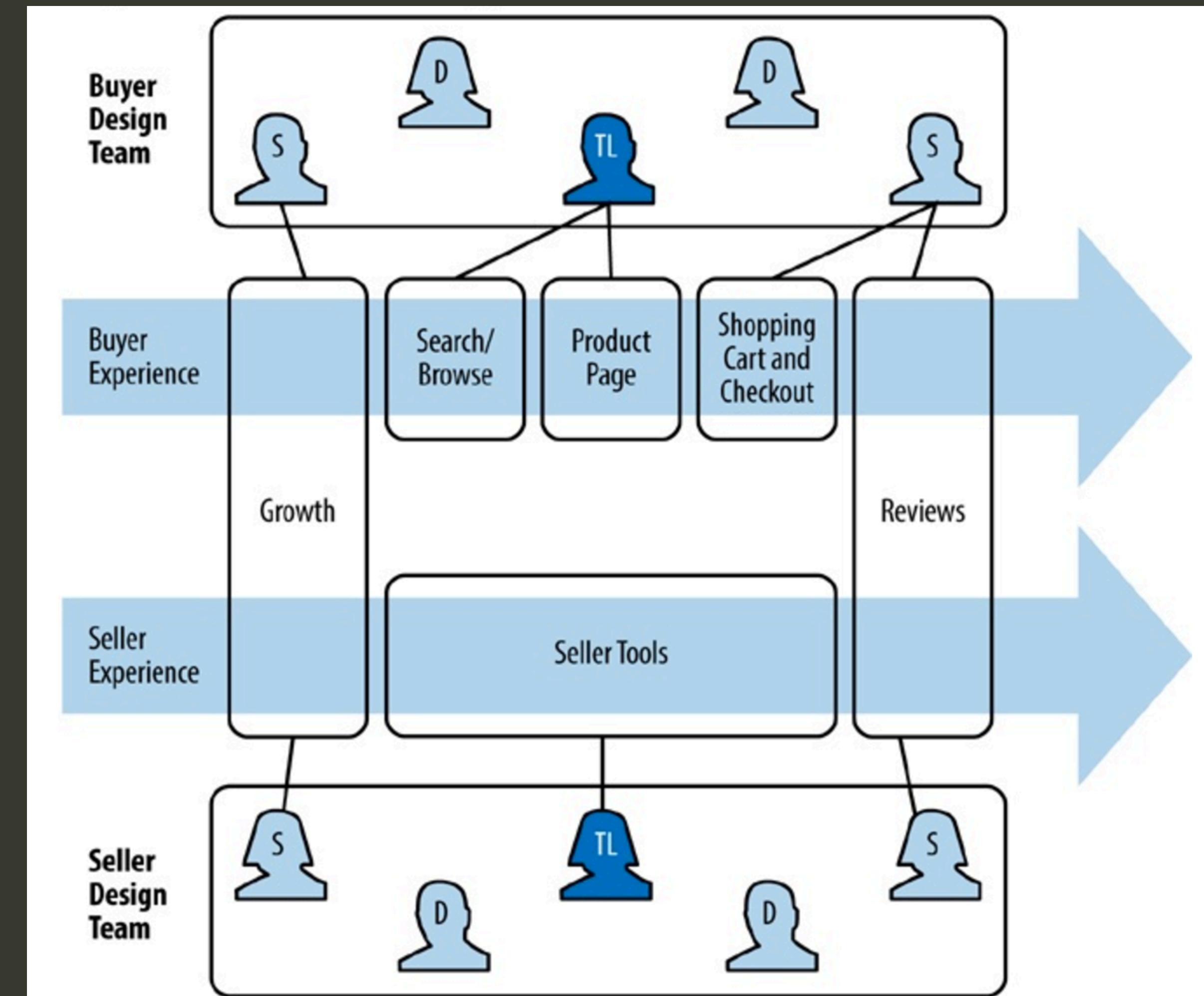
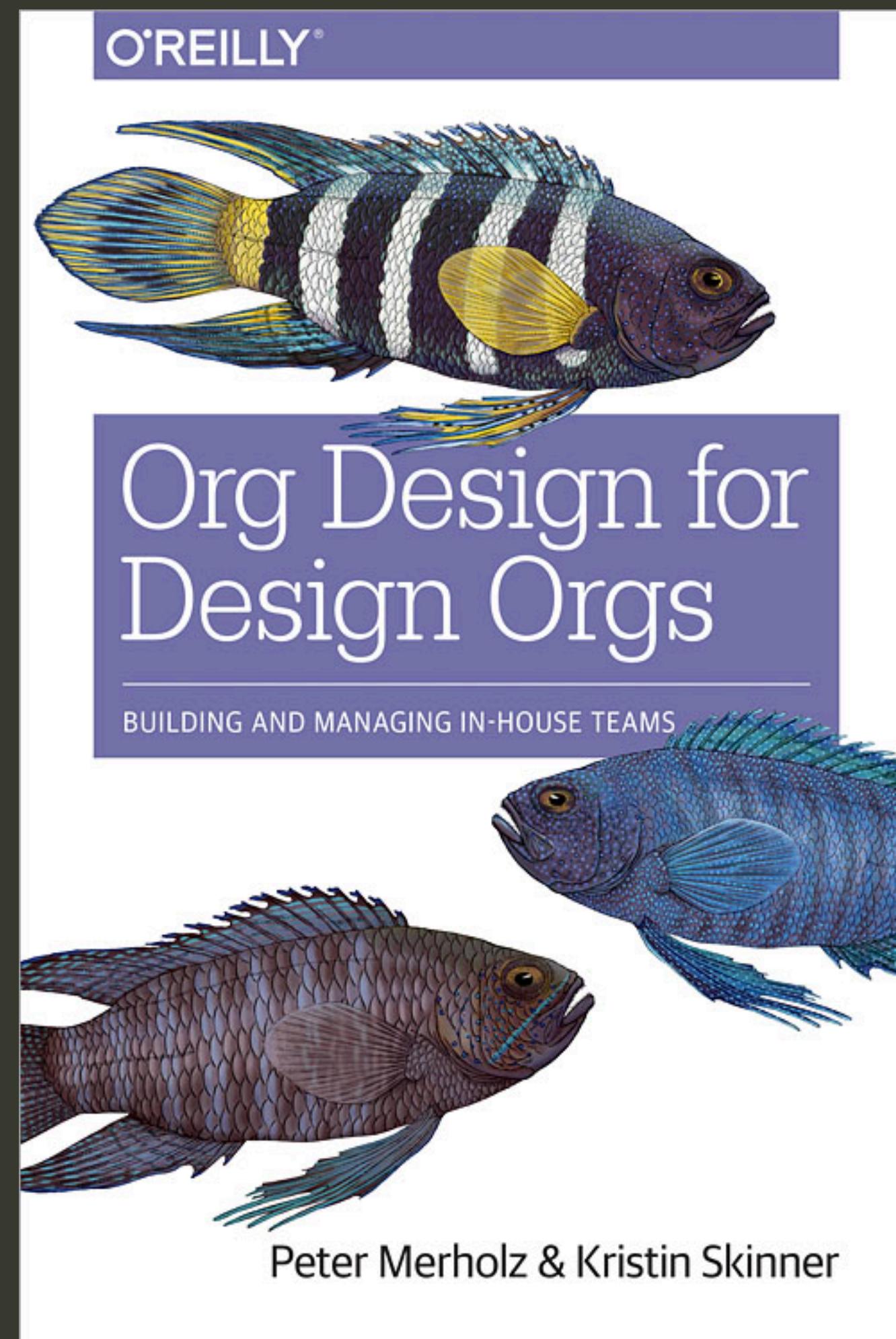
USER JOURNEYS



POLITICAL BOUNDARIES



CENTRALIZED PARTNERSHIP



#5

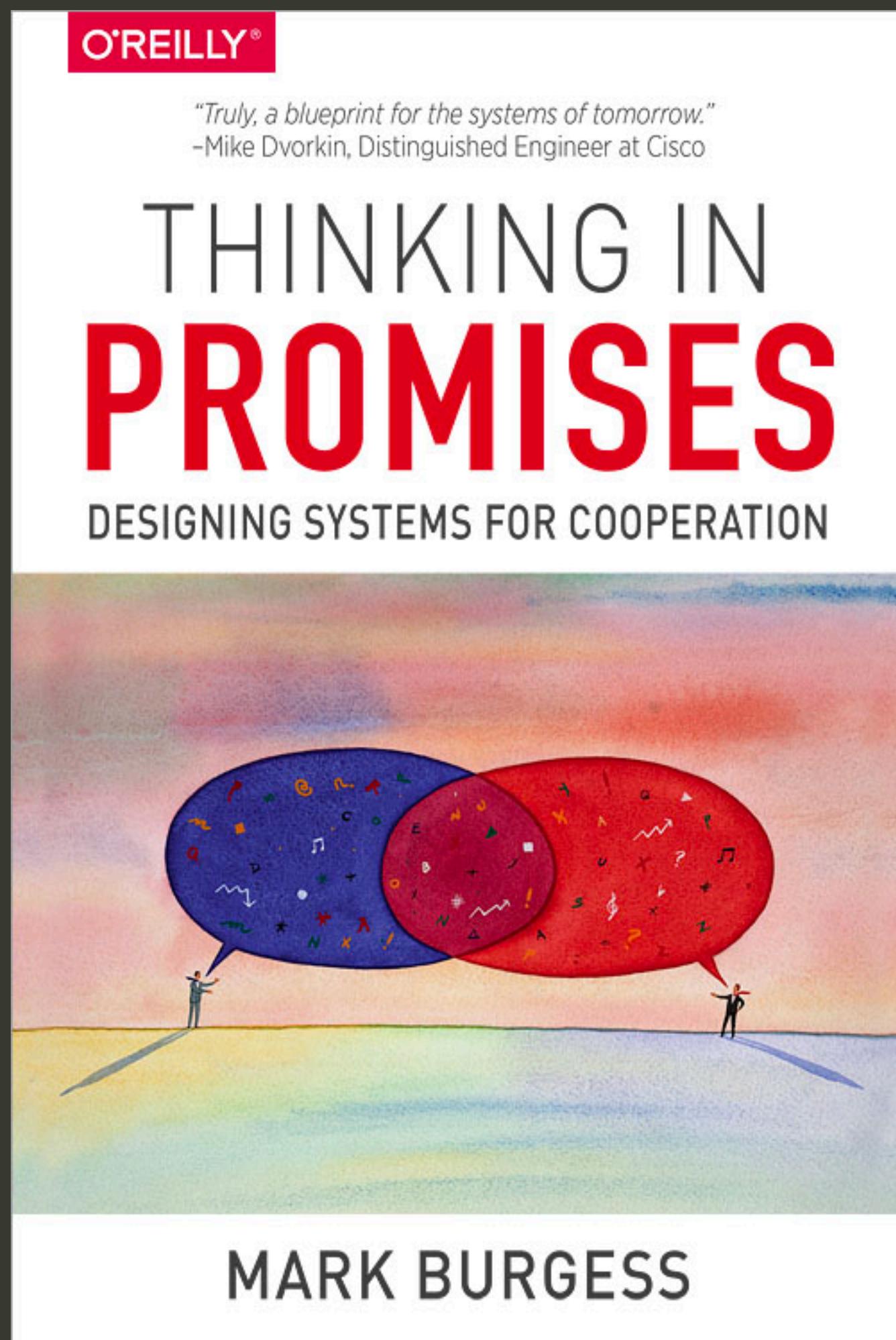
MODELLING HEURISTICS AND TECHNIQUES

*Should we model top down
or bottom up?*

“
...multiple teams are unavoidable and it reduces effectiveness. How can we design teams so that the most important outcomes are affected the least?

— **Sriram Narayan** (@sriramnarayan)

PROMISE THEORY



“Promised collaboration has to be constructed from the bottom-up, i.e. from the promises we know agents on the ground can keep”

DESIGN HEURISTICS

- Money heuristic (economic)
- Theory of Constraints heuristic (economic)
- Dan Pink heuristic (social)
- Erlang heuristic (technical)
- DDD heuristics

GAME OF THRONES HEURISTIC



EVENT STORMING

T
ER

VAT
REFUNDED

RECEIPT
SENT

EB

RECEIPT
RECEIVED

SQL
NICOLLE

Whenever Receipt
sent → Invoice
needs to be
created

CREATE
INVOICE

BILLING

INVOICE
SENT

INVOICE
RECEIVED

Customer

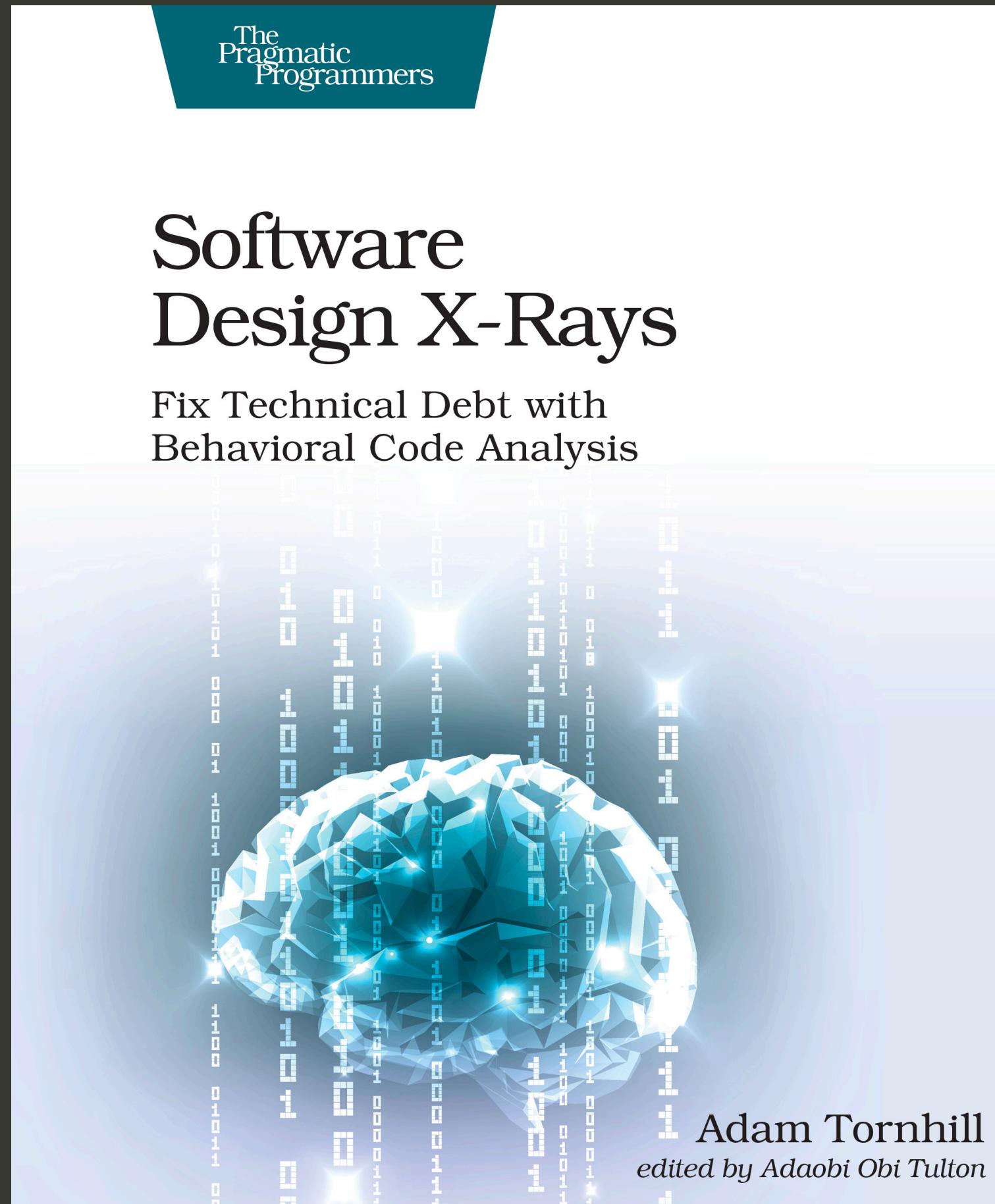
Whenever an
invoice sent →
TICKET is
issued

SEND
TICKET

TRA
CREATED/
PUBLISHED

VAT
de
ca

FORENSIC ANALYSIS



Analyse source control history to identify dependencies in sociotechnical systems

#6

CROSS-POLLINATION PATTERNS

“
silos are a case of misplaced or runaway autonomy.

– Sriram Narayan (@sriramnarayan)

100% autonomy is not the goal. Valuable interactions and resilience are vital too.

CROSS-POLLINATION PATTERNS

- Nomad Pattern
- Rotate Regularly:
 - Knowledge-sharing rotation
 - Relationship-building rotation
 - Personal-growth rotation



Inner sourcing enables us to
take the people to the work
to improve resilience.

NEXT STEPS...

#7

You are already skilled
modellers. Now it's time to
start thinking about the
social and technical.

FURTHER READING

- Agile Org Design, Sriram Narayan
- Dynamic Reteaming, Heidi Helfand
- Capability Mapping - bit.ly/biz-cap-map
- Sociotechnical Patterns - bit.ly/sociotech-arch

SPEAK SOON?

ntcoding.co.uk/workshops

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OrgDesignPlaybook.com



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O'REILLY®

Designing
Autonomous Teams
and Services

Deliver Continuous Business Value
through Organizational Alignment



Nick Tune & Scott Millett