DELIVERING WITH MICROSERVICES

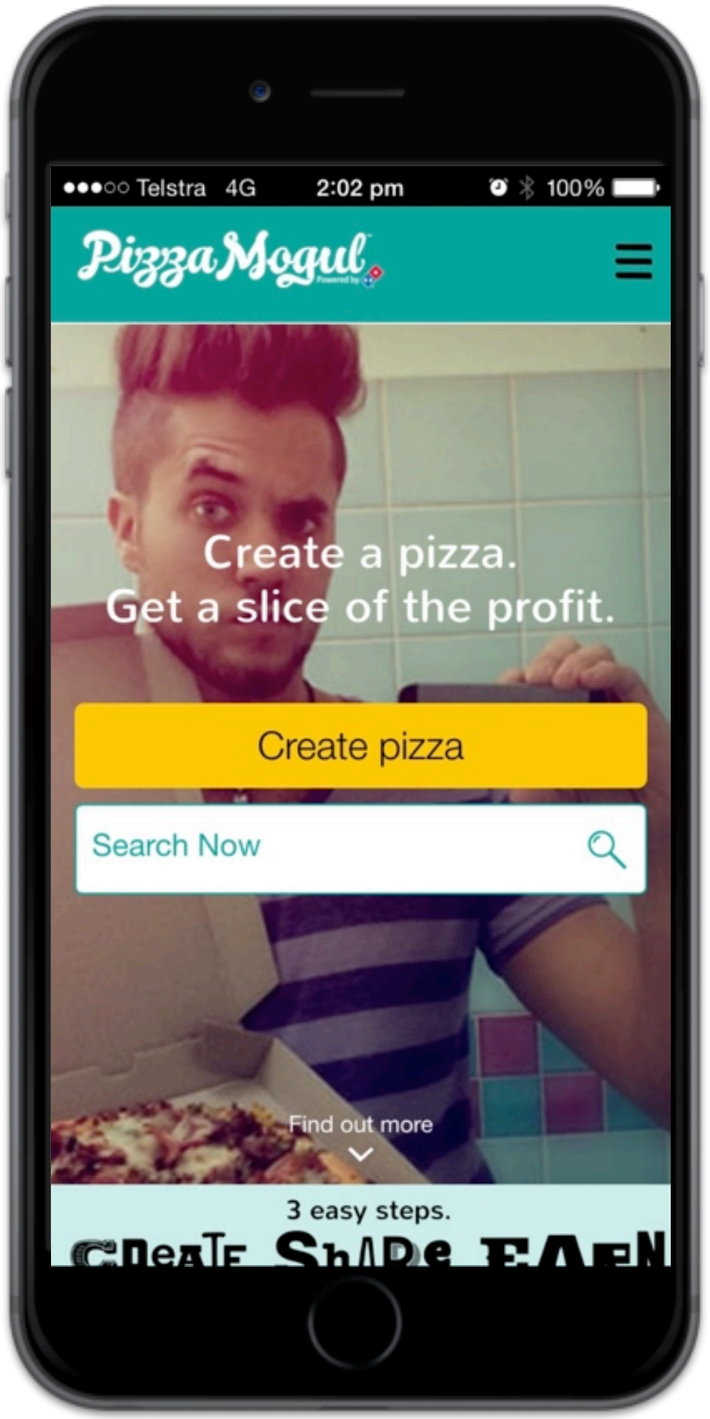
HOW TO ITERATE TOWARDS SOPHISTICATION

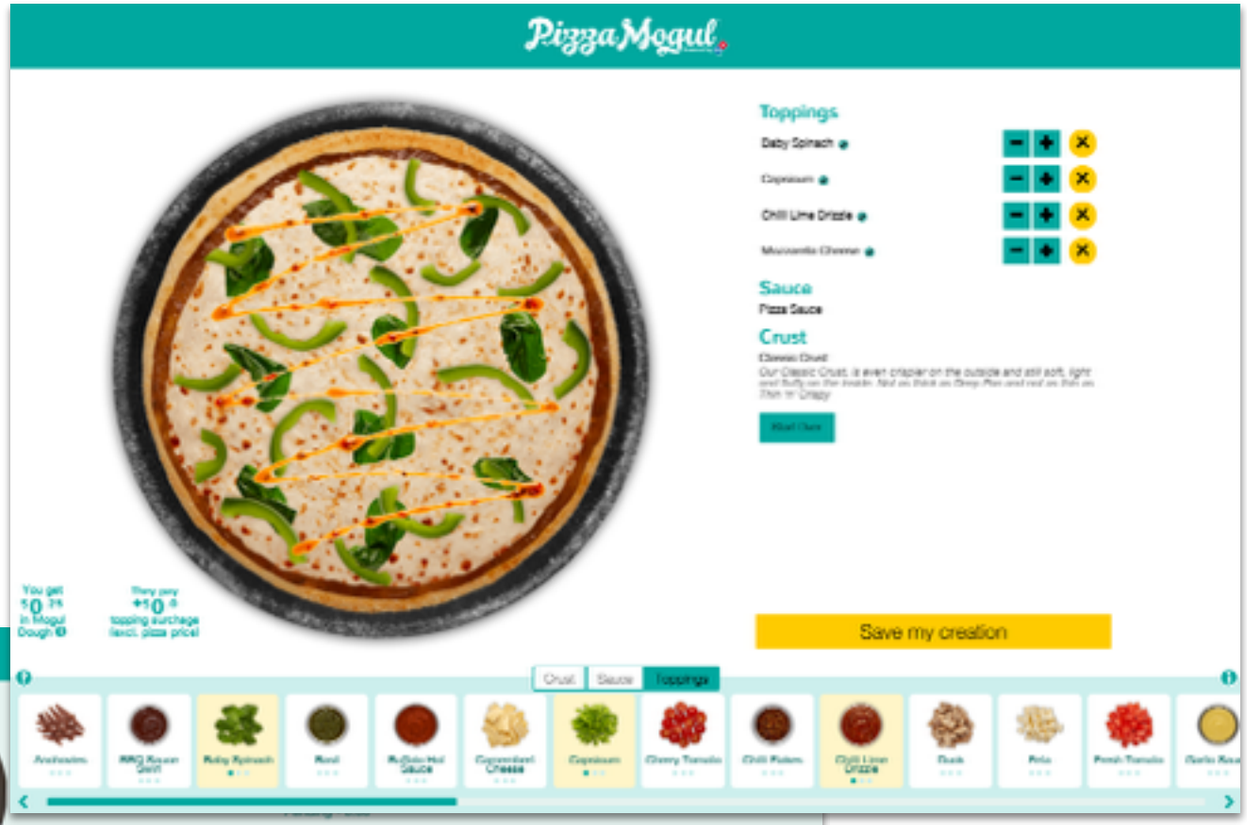
FROM THE TRENCHES

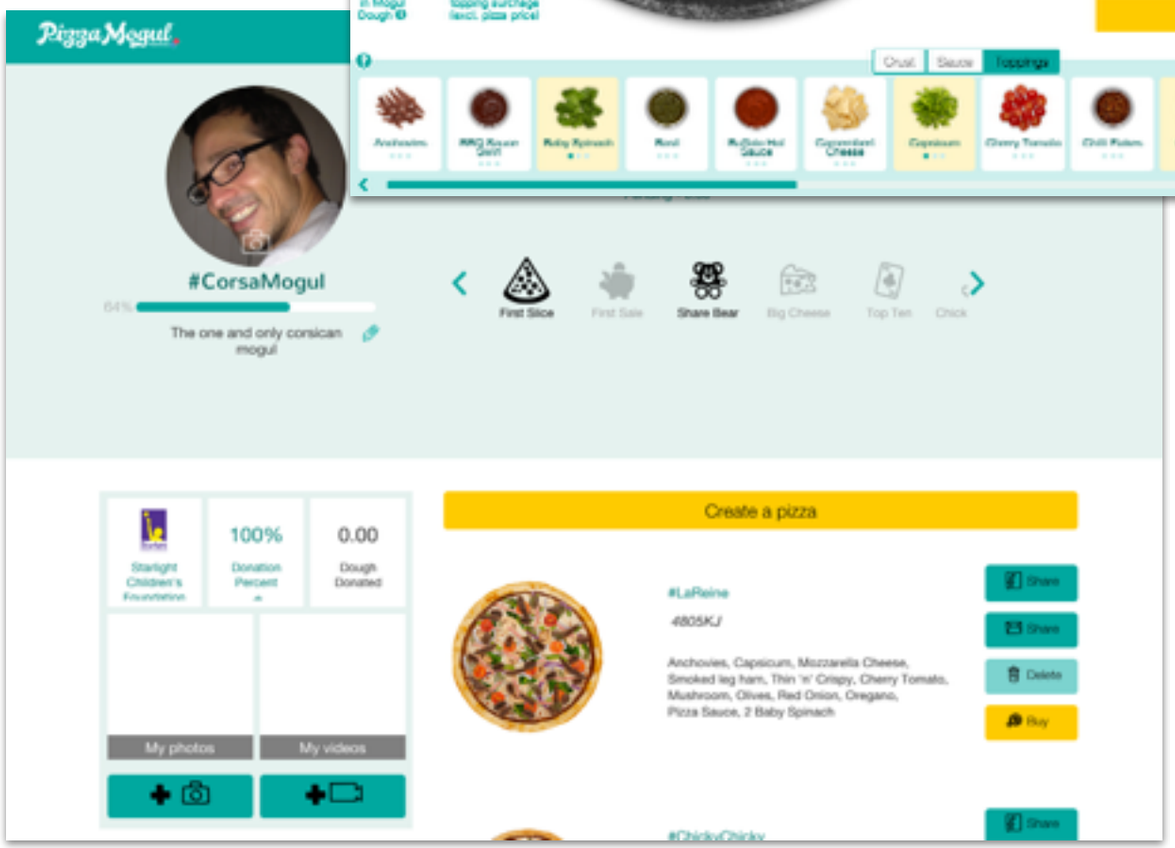
PIZZA MOGUL

FROM THE TRENCHES

PIZZA MOGUL

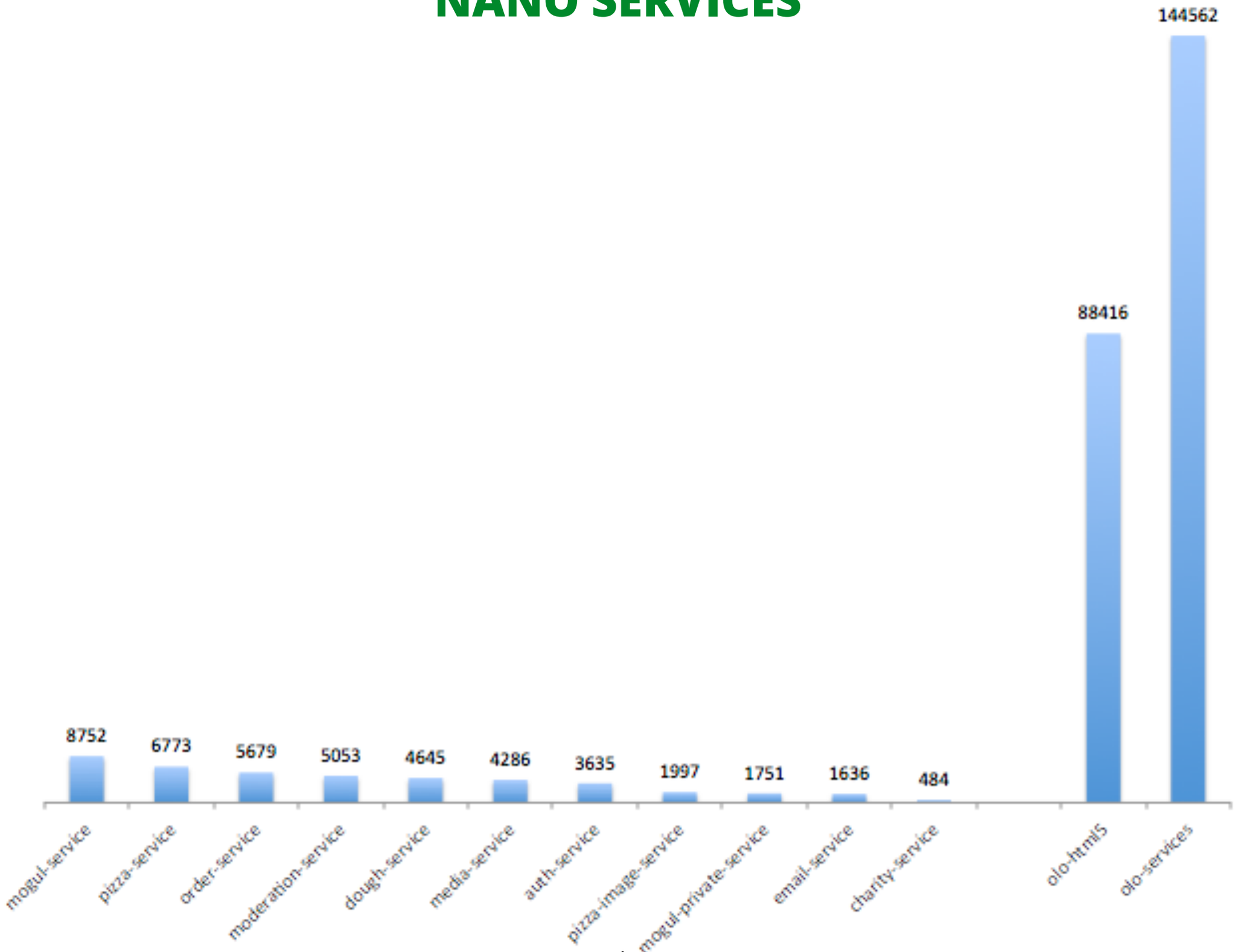






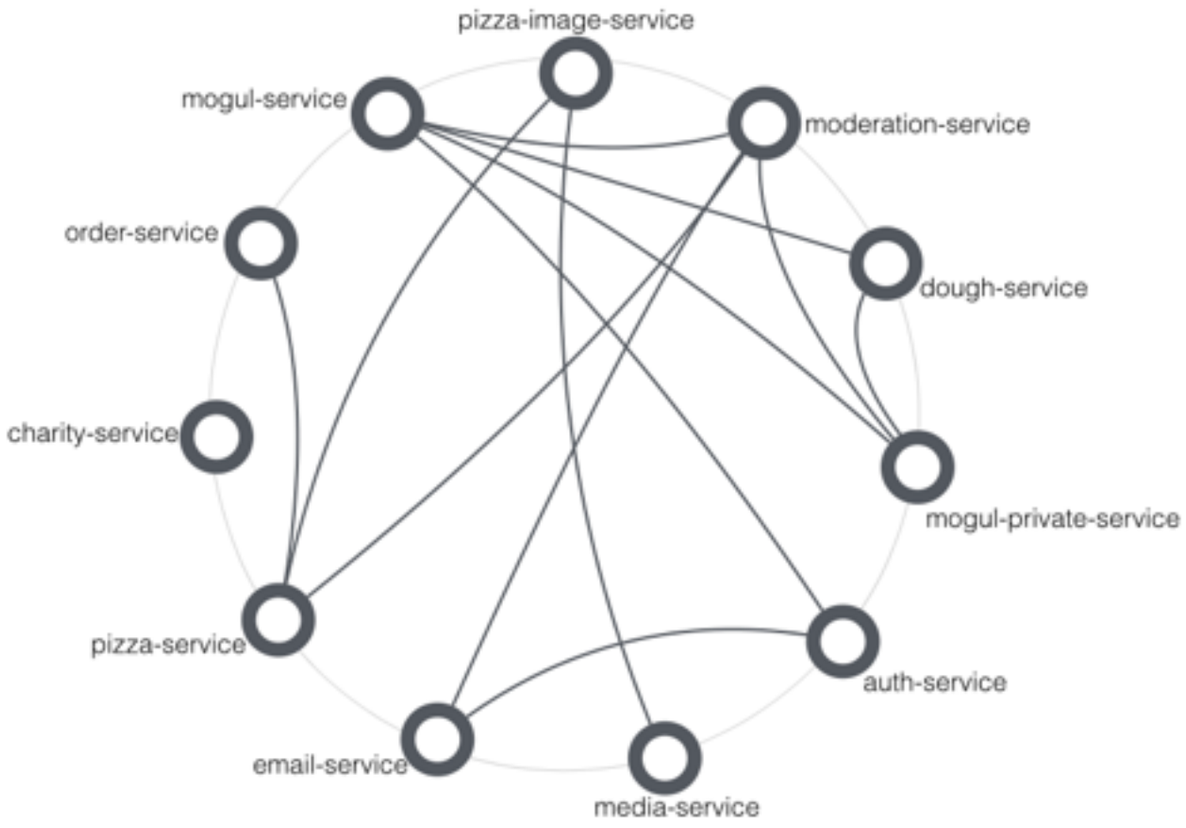
FROM THE TRENCHES

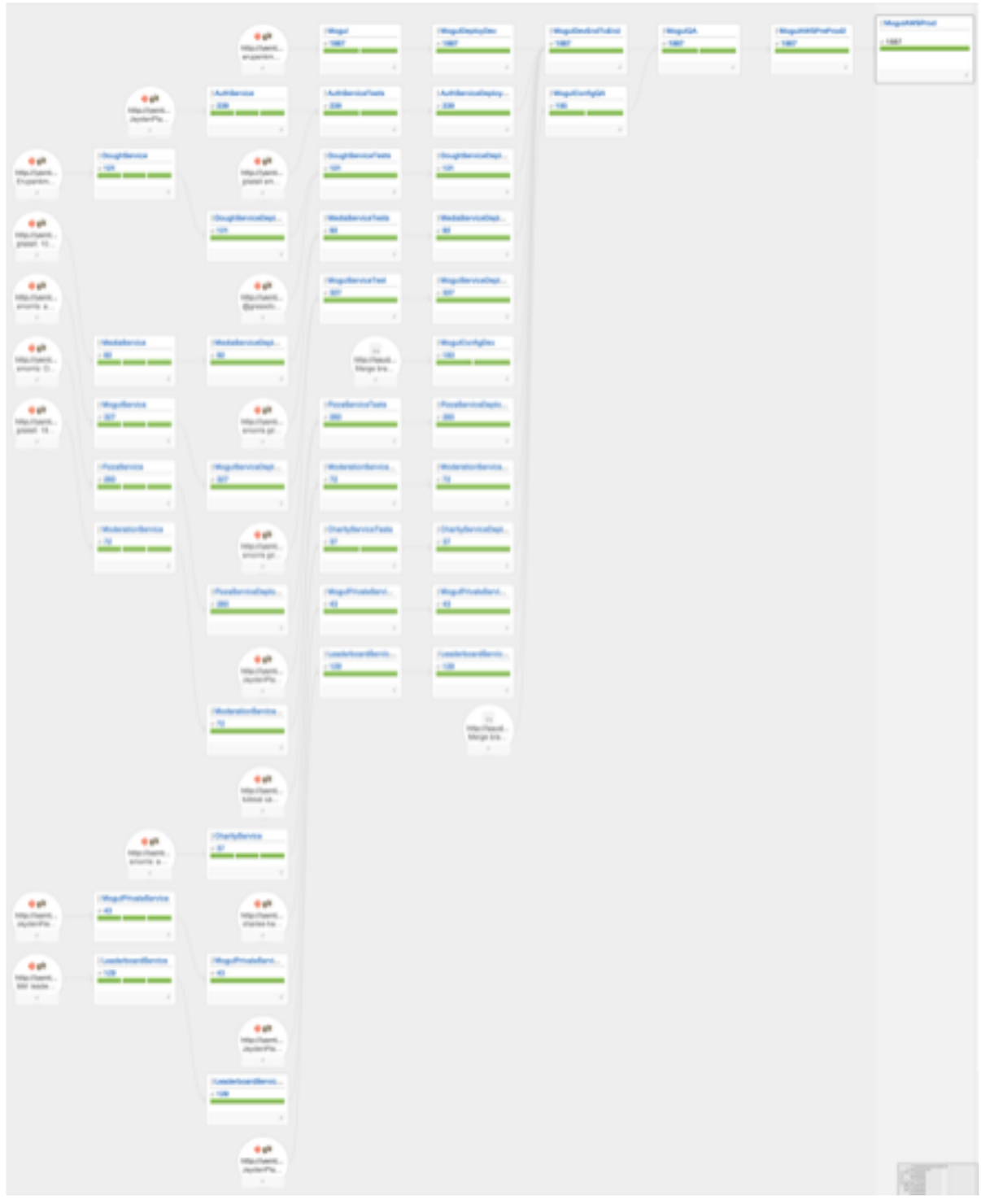
NANO SERVICES



FROM THE TRENCHES

COMPLEXITY





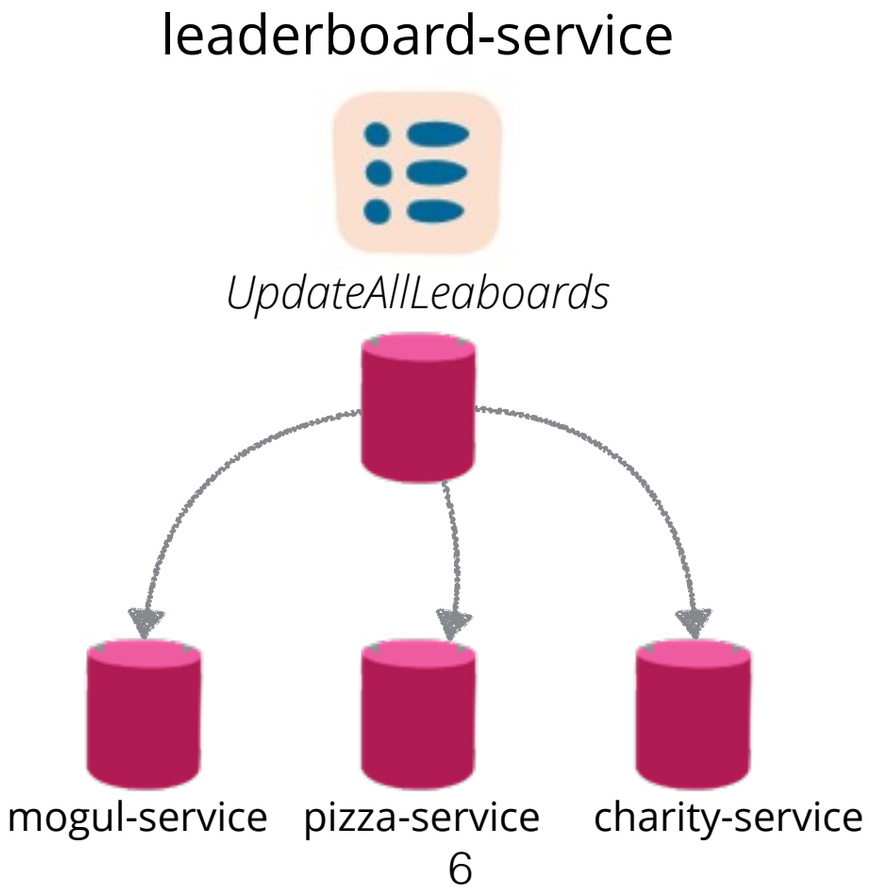
FROM THE TRENCHES

CROSS CUTTING CONCERNS

```
public void RefreshAllLeaderboards()
{
    […]

    WithConnection(
        connection =>
        connection.Execute(DbTable + "UpdateAllLeaderboards", CommandType.StoredProcedure));

    […]
}
```



FROM THE TRENCHES

REFLECTIONS

microservices?

need big upfront design?

DEFINE MICROSERVICES

WHEN AGILE MEET DISTRIBUTED SYSTEMS

DEFINE MICROSERVICES

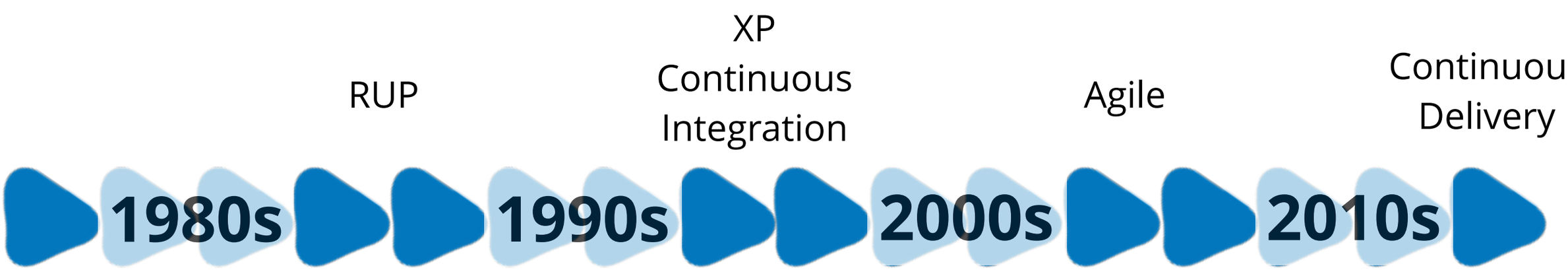
DISTRIBUTED AND WEB ARCHITECTURES

ANSI C C++ Java XML JavaScript

TCP/IP Client-Sever RPC CORBA RMI SOAP SOA JSON REST

DEFINE MICROSERVICES

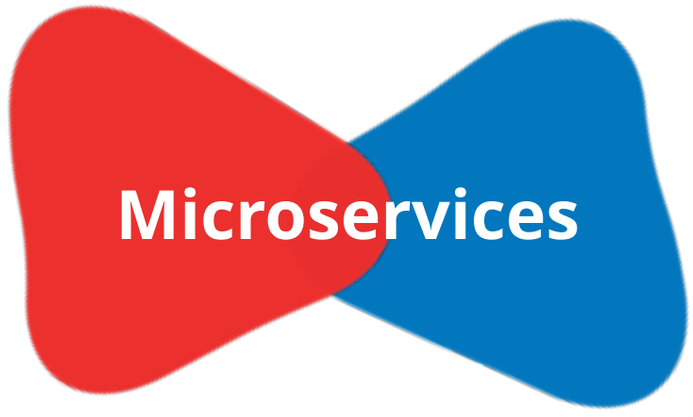
SOFTWARE DEVELOPMENT METHODOLOGIES



DEFINE MICROSERVICES

XXXXXXXXXXXXX

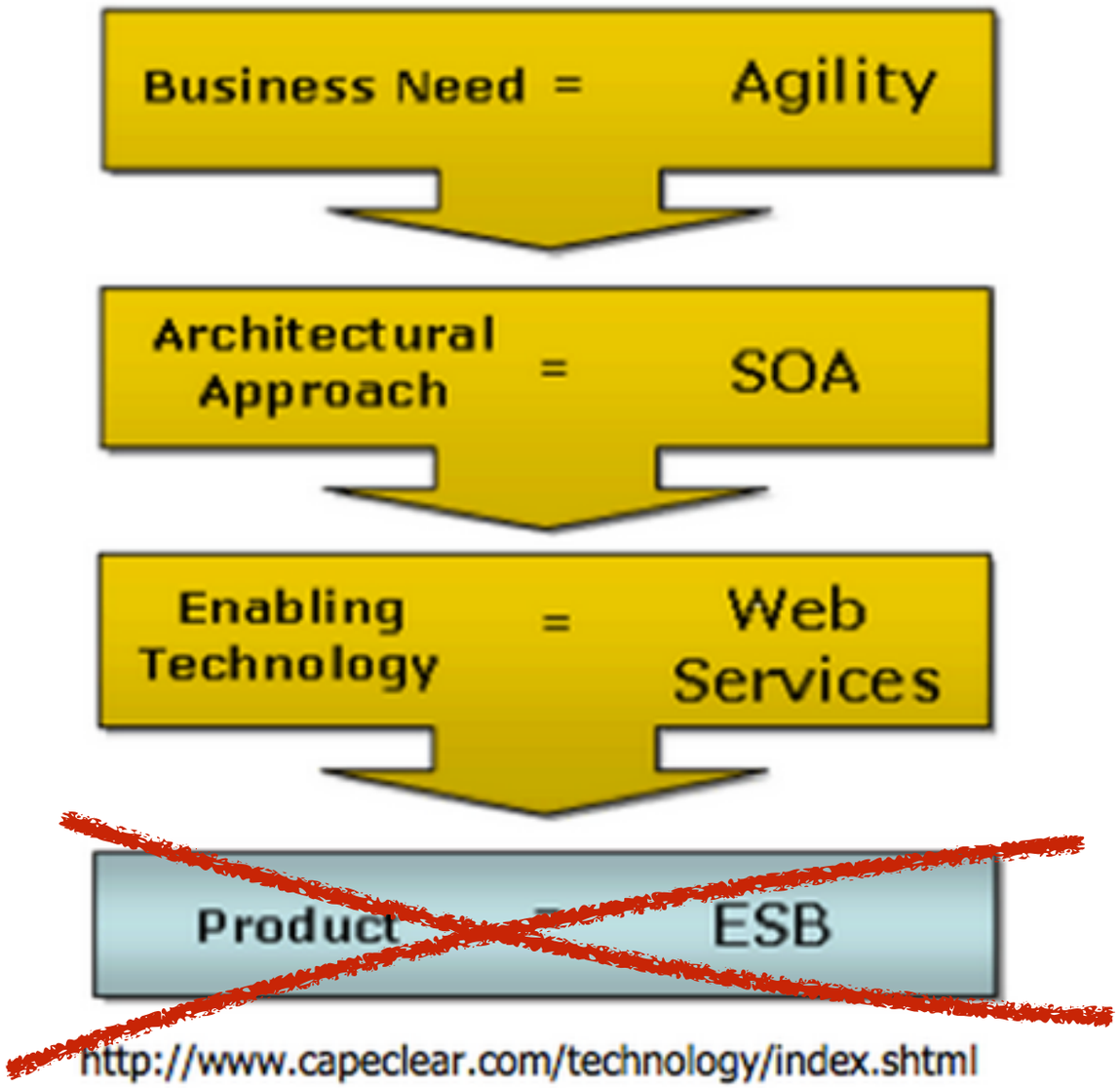
Distributed & Web Architecture



Agile & Continuous Delivery

DEFINE MICROSERVICES

AN ALTERNATIVE TO TRADITIONAL SOA



Microservices

DEFINE MICROSERVICES

REFLECTIONS

microservices?

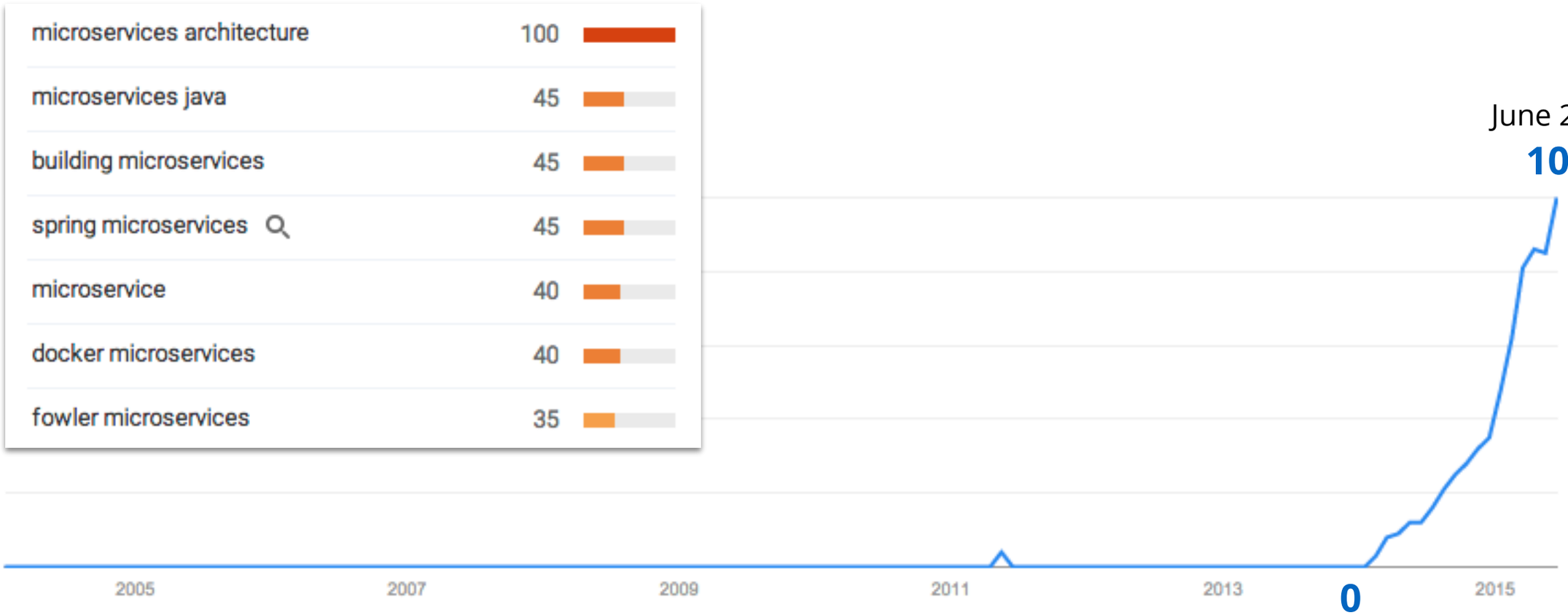
need big upfront design?

MICROSERVICES RUSH

WHAT MAKE THEM SO POPULAR?

MICROSERVICES RUSH

INTEREST



"*microservices*" searches

Google Trends Data

MICROSERVICES RUSH

SCALE

NETFLIX

"*In order to scale to the next order of magnitude, we're rethinking the fundamentals of our architecture*"

"*We created the viewing service to encapsulate the domain of viewing data collection, processing, and providing* "

"*These components would be easier to develop, test, debug, deploy, and operate if they were extracted into their own services.*"

Philip Fisher-Ogden, Director of Engineering

http://www.techrepublic.com/article/netflix-on-how-to-build-services-that-scale-beyond-millions-of-users/

MICROSERVICES RUSH

BREAK THE MONOLITH

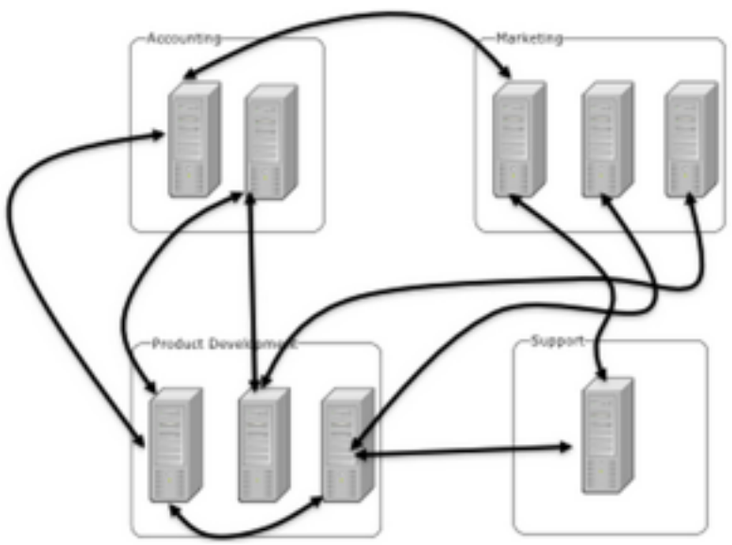
Monolithic Rails —> JS / Rails / Scala —> microservices

Monolithic Perl —> Monolithic C++ —> Java —> microservices

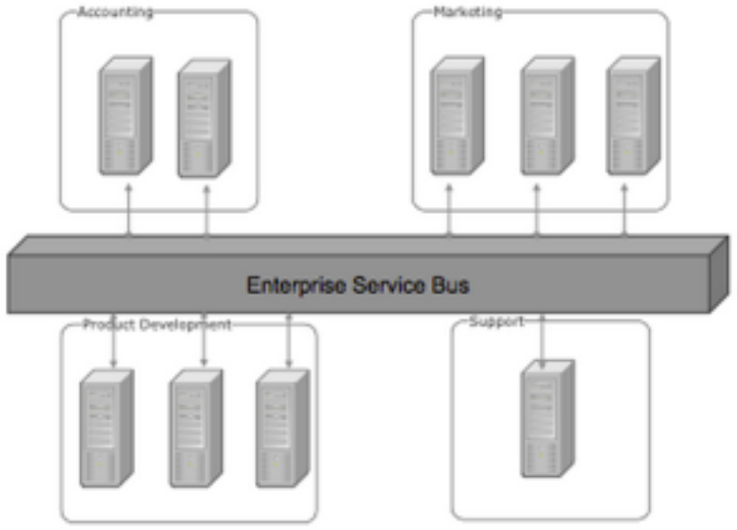
Monolithic C++ —> Perl / C++ —> Java / Scala -> microservices

MICROSERVICES RUSH

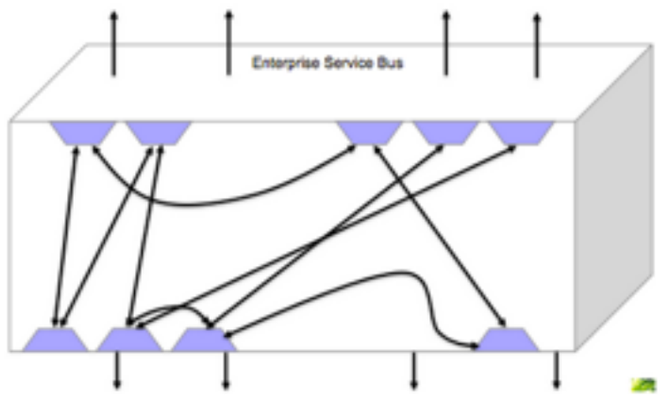
ENDPOINTS AS FIRST CLASS CITIZEN



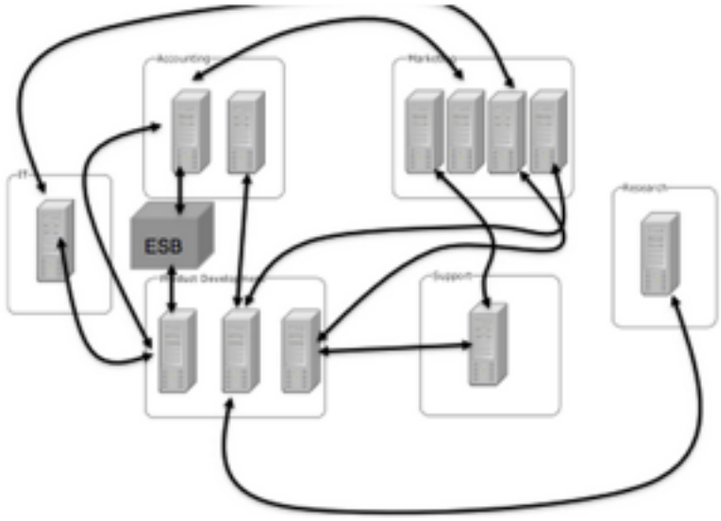
THE PROBLEM



THE SOLUTION?



THE PROBLEM (AGAIN)



THE FUTURE

http://www.infoq.com/presentations/webber-guerilla-soa

MICROSERVICES RUSH

BUSINESS VALUE FIRST

Where is Strategic Value?

https://yow.eventer.com/yow-2011-1004/domain-driven-design-strategies-for-dealing-with-legacy-systems-by-eric-evans-1033

MICROSERVICES RUSH

A NEW ORGANISATION

"*Any organization that designs a system (defined more broadly here than just information systems) will inevitably produce a design whose structure is a copy of the organization's communication structure.*"

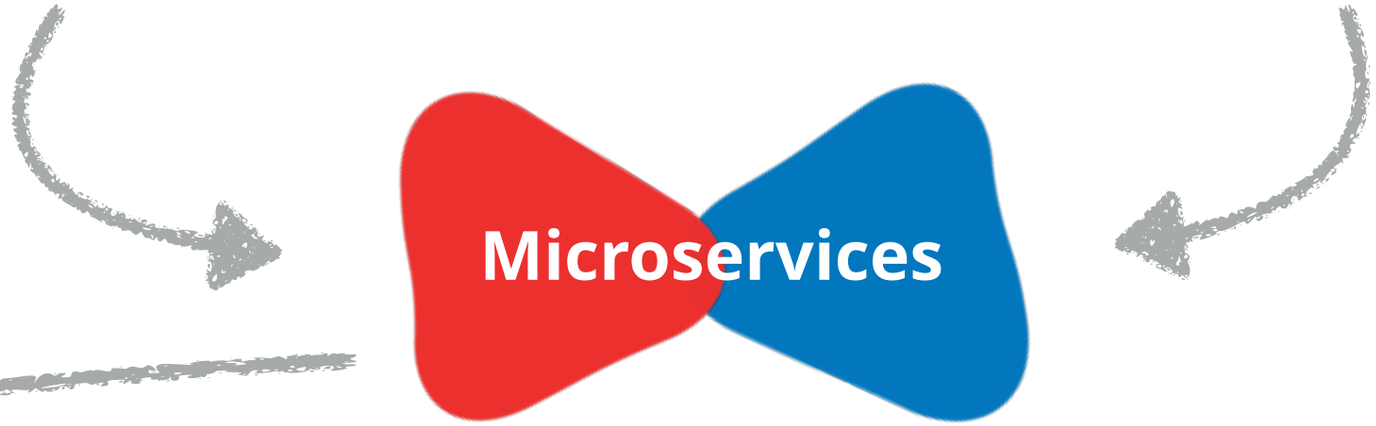
Melvin Conway, *How Do Committees Invent* - 1968

MICROSERVICES RUSH

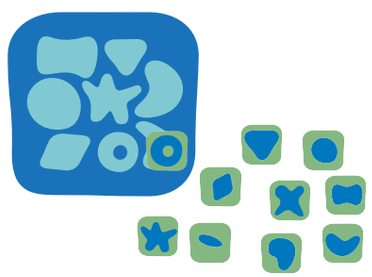
REFLECTIONS

microservices?

need big upfront design?



strategic value



break the monolith

scale

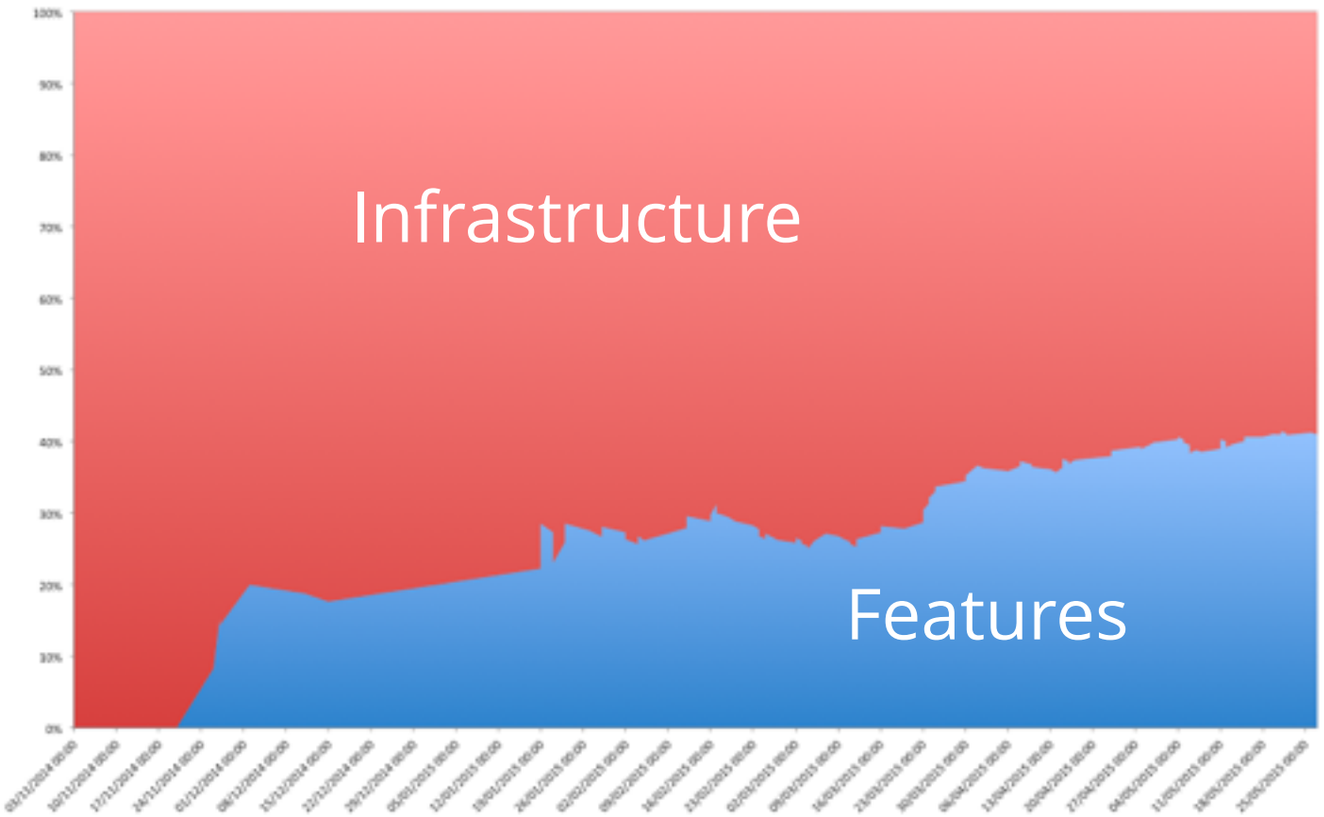
re-org

DELIVERING MICROSERVICES

IN AN AGILE WAY

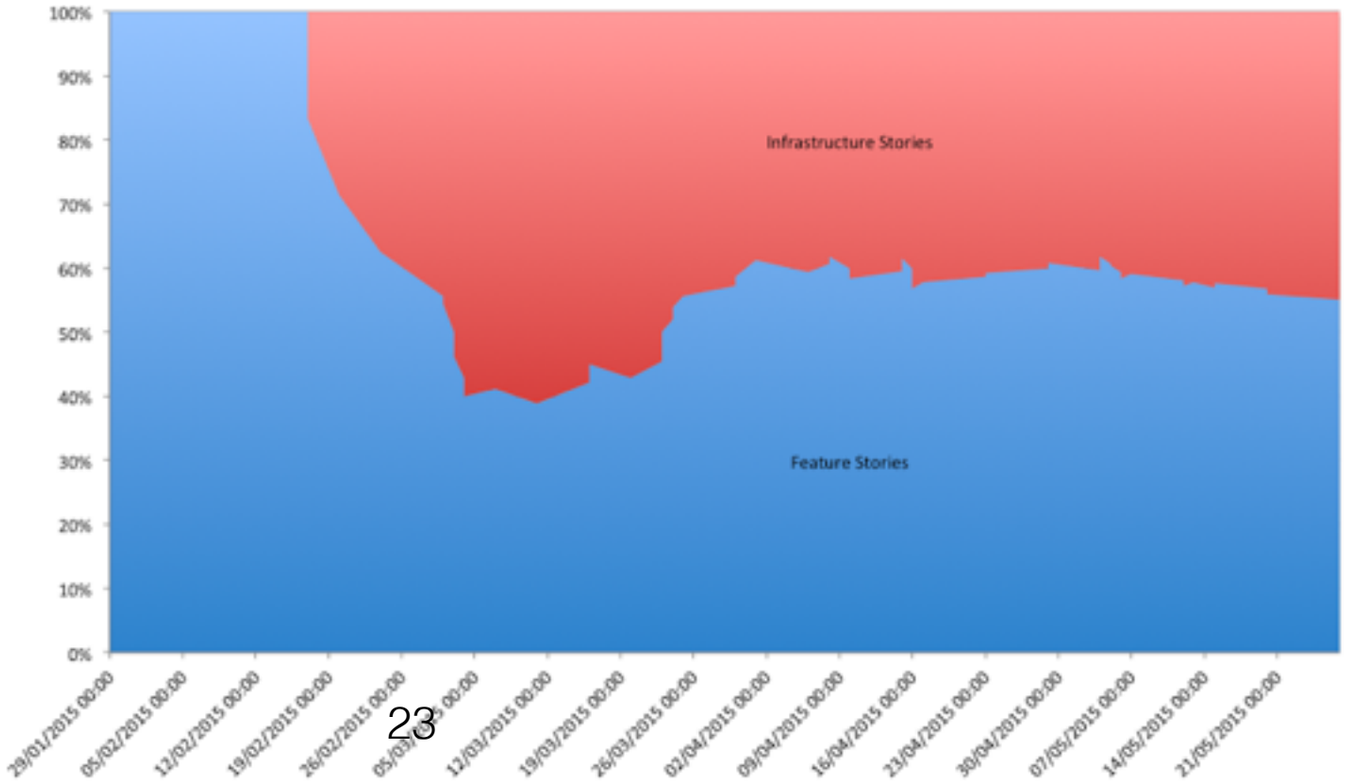
DELIVERING MICROSERVICES

THE PROBLEM



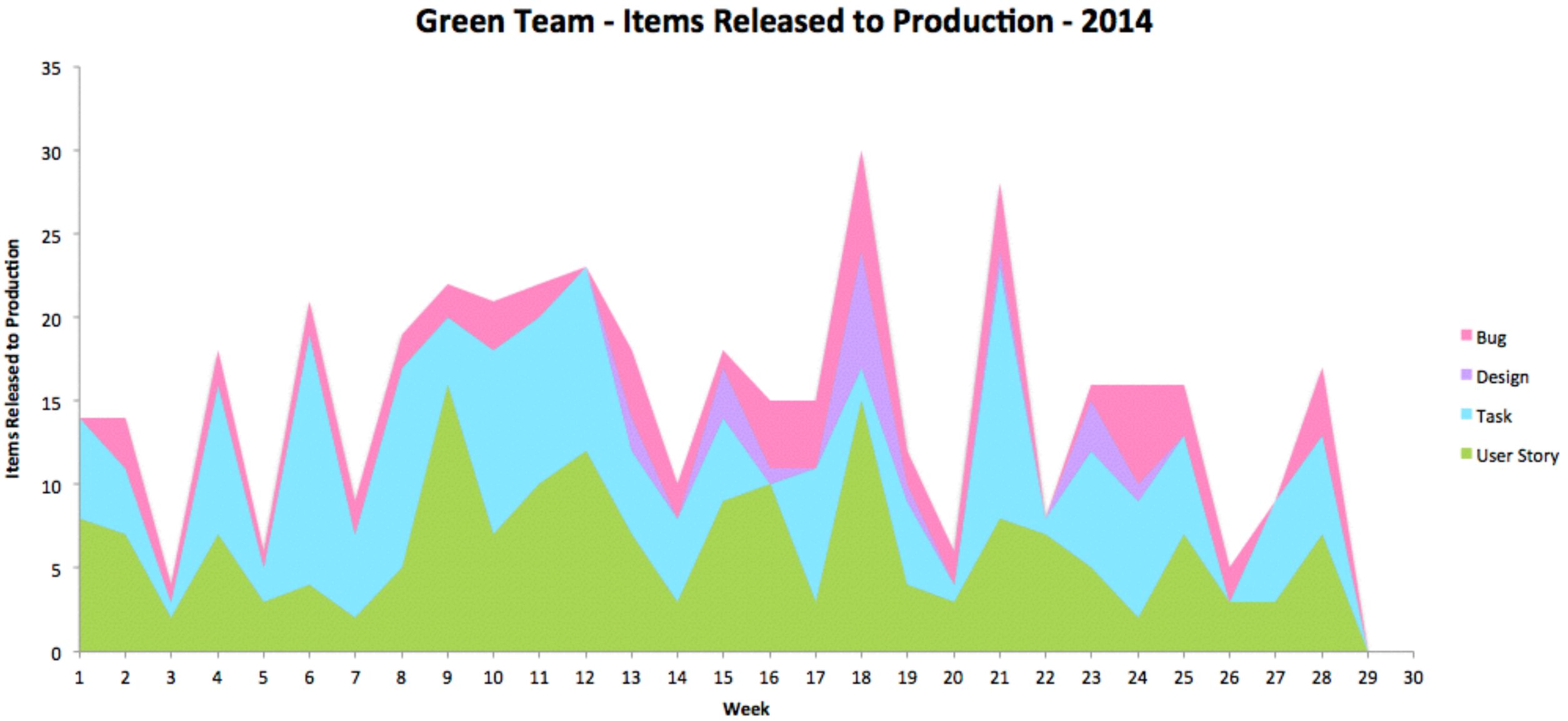
WatchlistService

PriceEstimationService



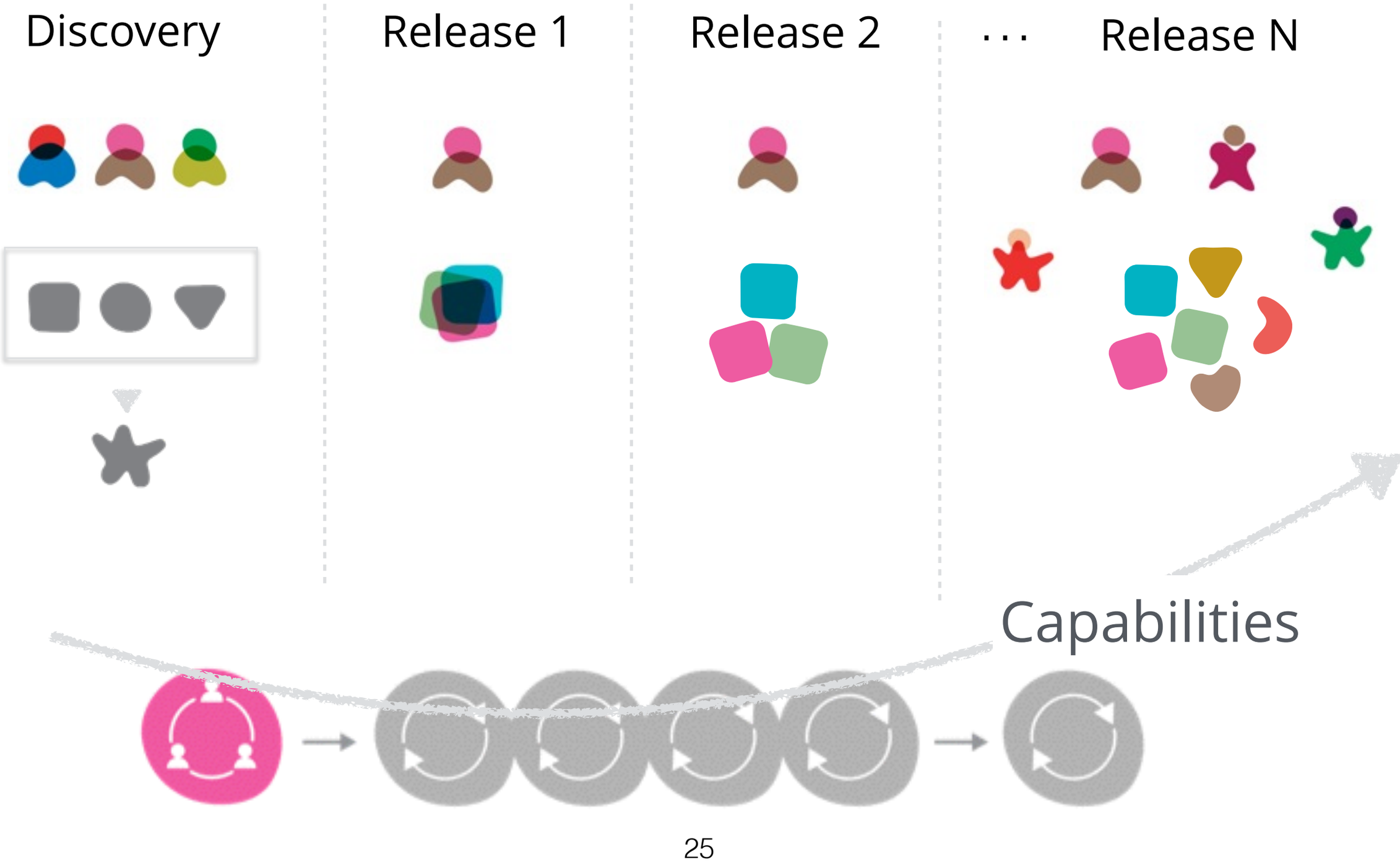
DELIVERING MICROSERVICES

THE GOAL



DELIVERING MICROSERVICES

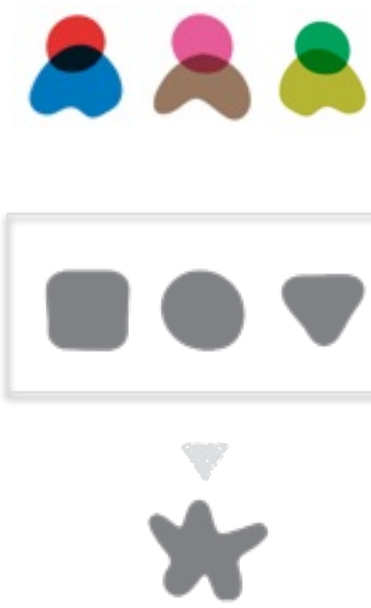
JOURNEY



DELIVERING MICROSERVICES

DISCOVERY - WHY MICROSERVICES

Discovery



Release 1

Release 2

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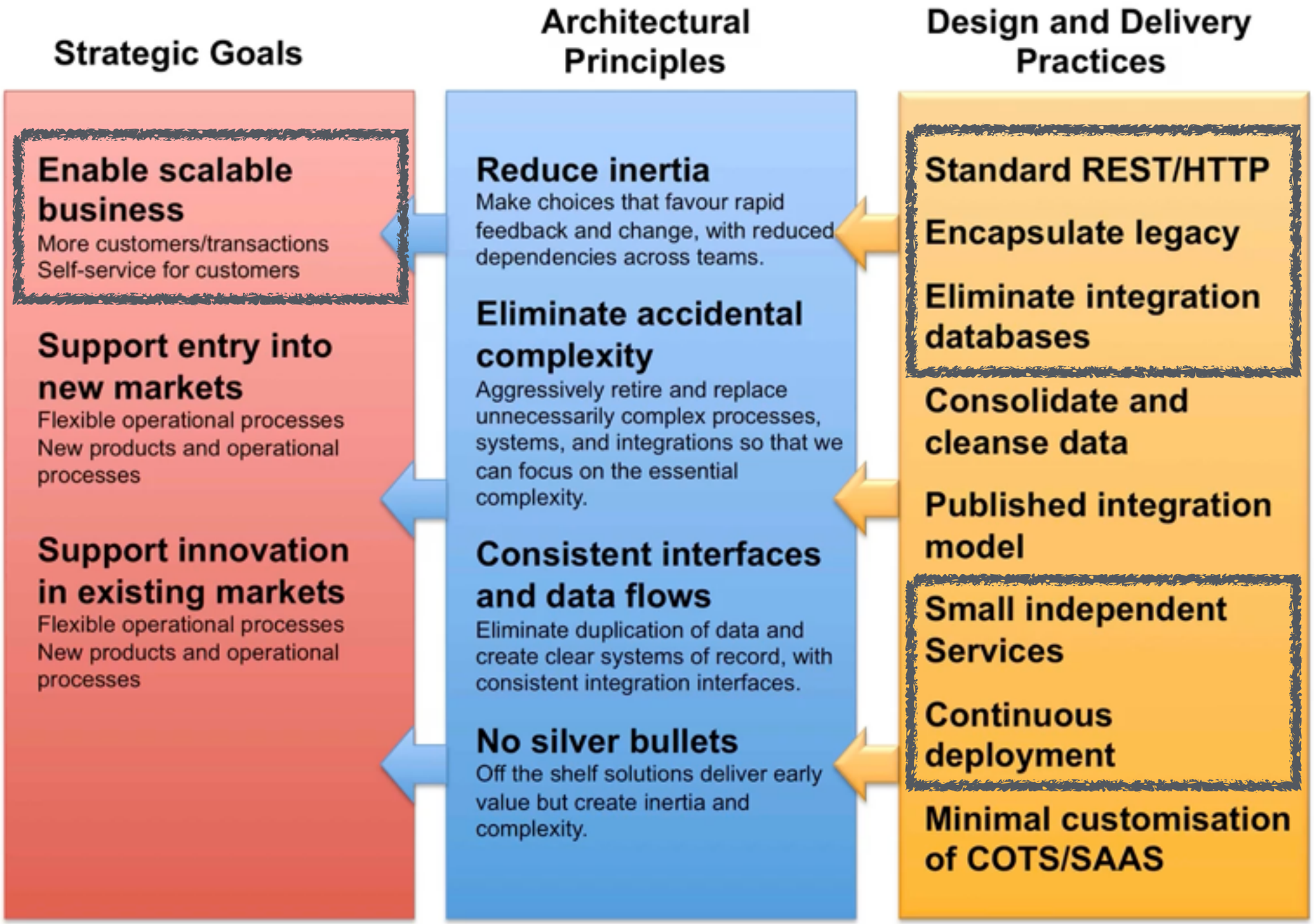
Release N

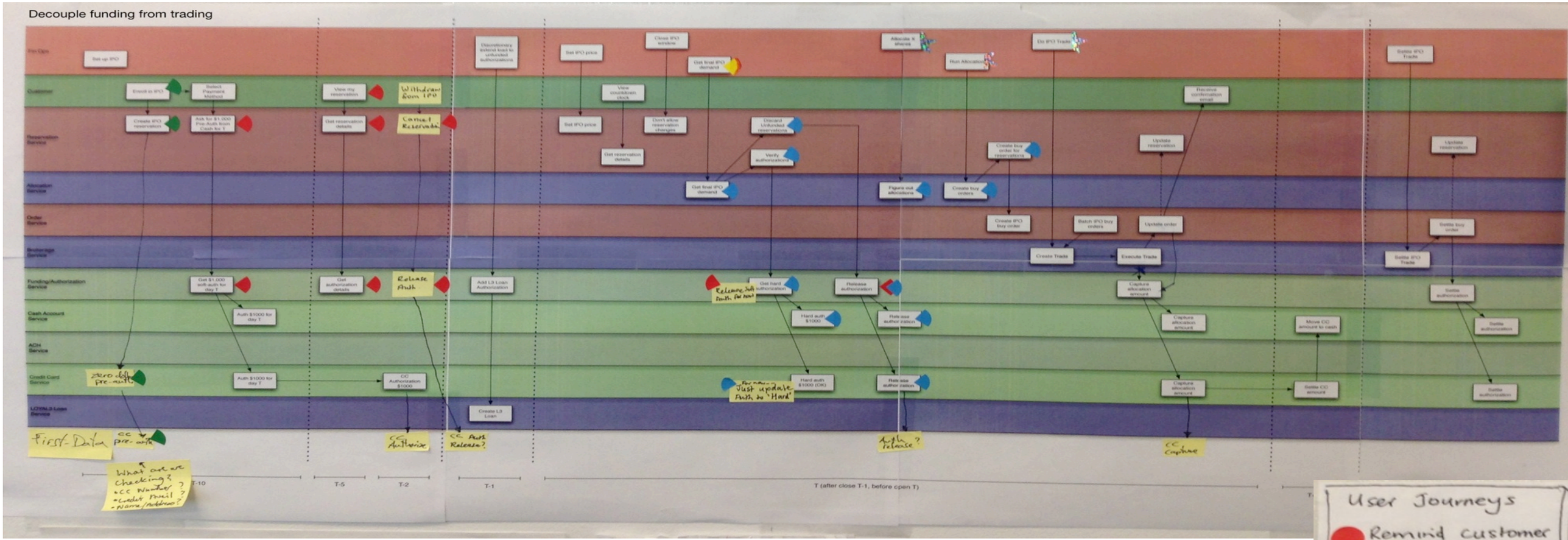
DELIVERING MICROSERVICES

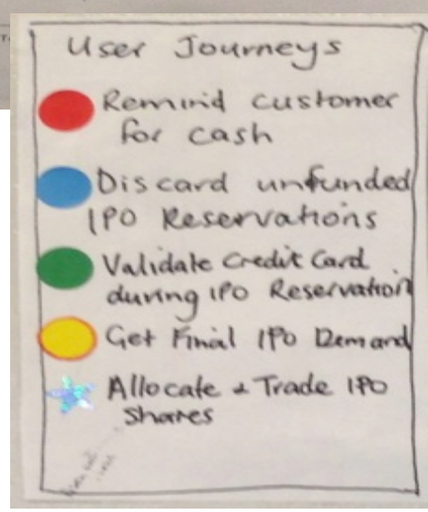
BUSINESS & ARCHITECTURE CONTRACT



DELIVERING MICROSERVICES

USER JOURNEYS ACROSS SERVICES





DELIVERING MICROSERVICES

RELEASE 1 - BUILD A MINILITH

Discovery

Release 1

Release 2

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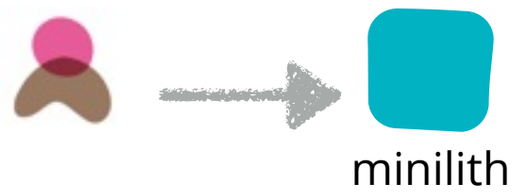
Release N

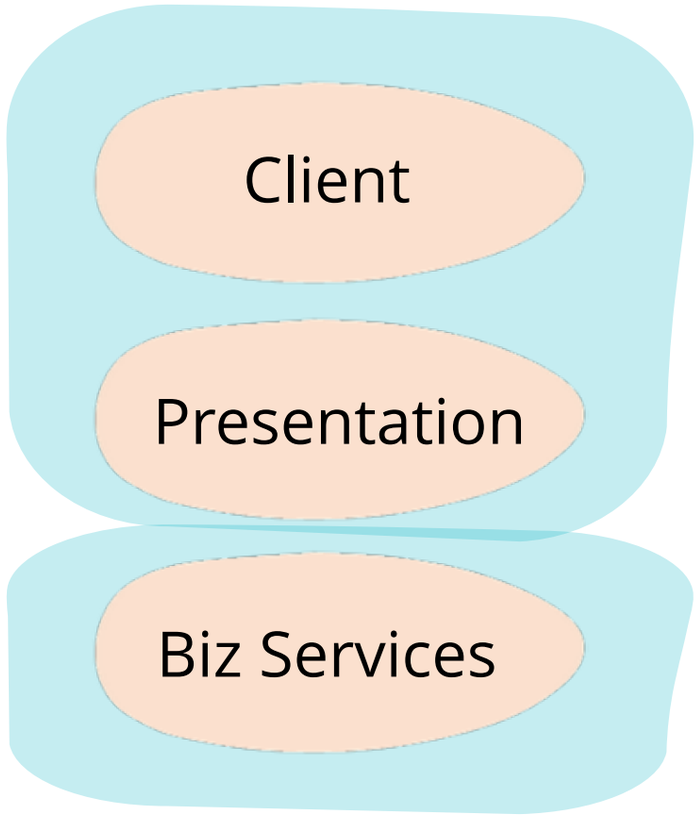
DELIVERING MICROSERVICES

RELEASE 1 - ARCHITECTURE

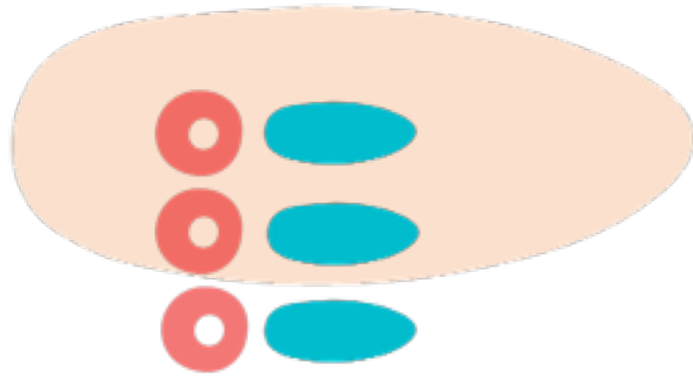
greenfield



brownfield



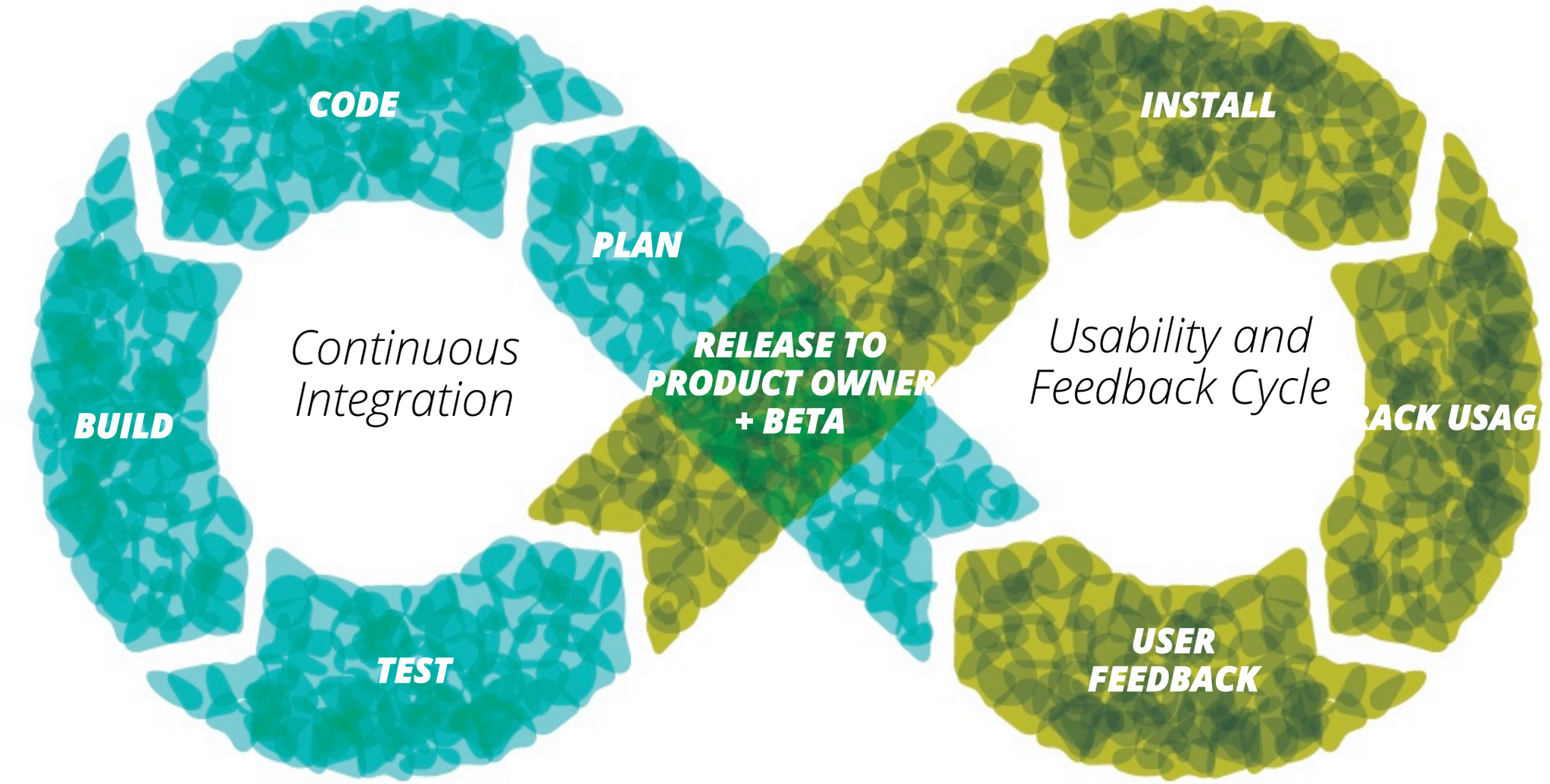
minilith



services

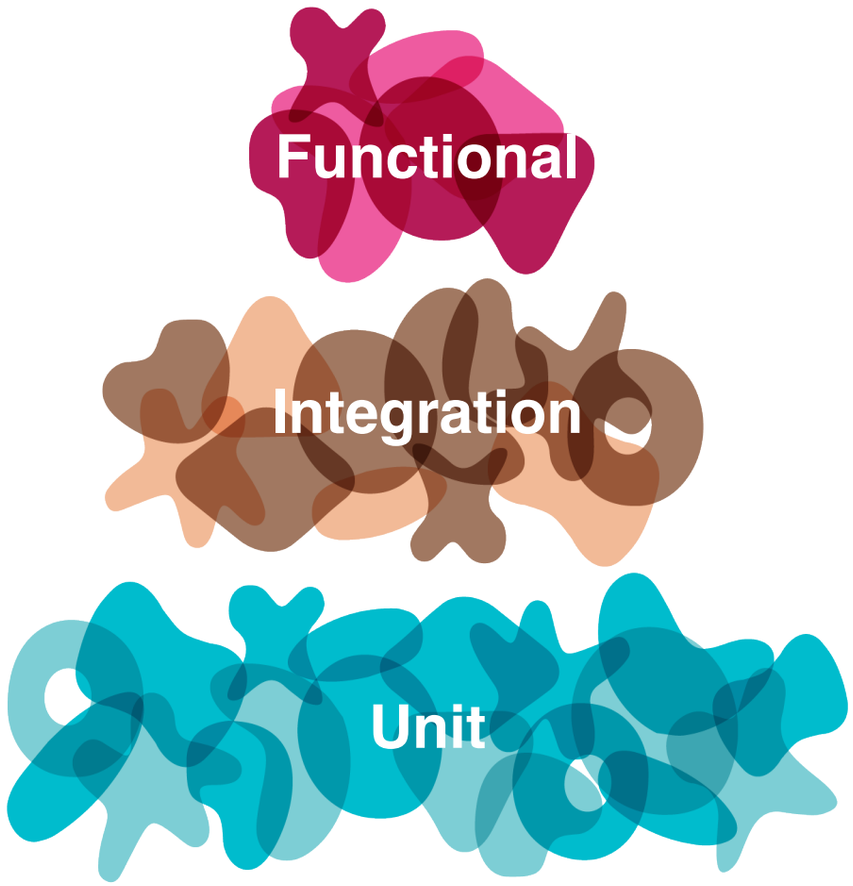
DELIVERING MICROSERVICES

RELEASE 1 - CONTINUOUS DELIVERY

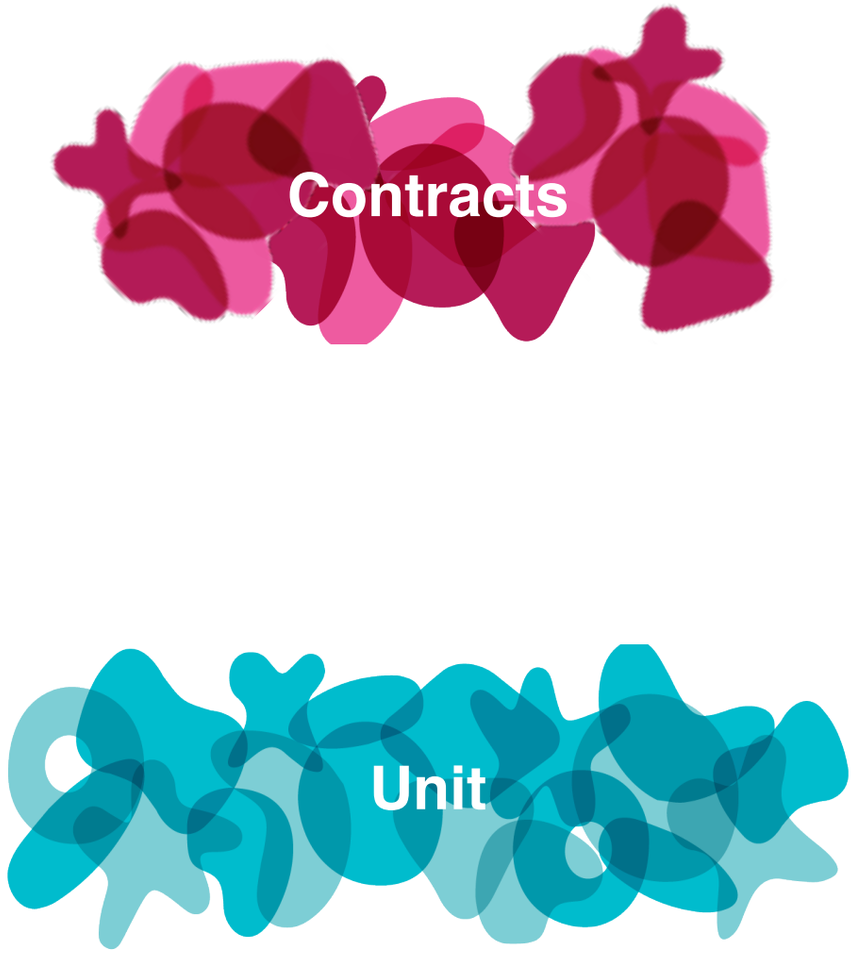


DELIVERING MICROSERVICES

RELEASE 1 - CONTRACT TESTING



Web Application



Web Services

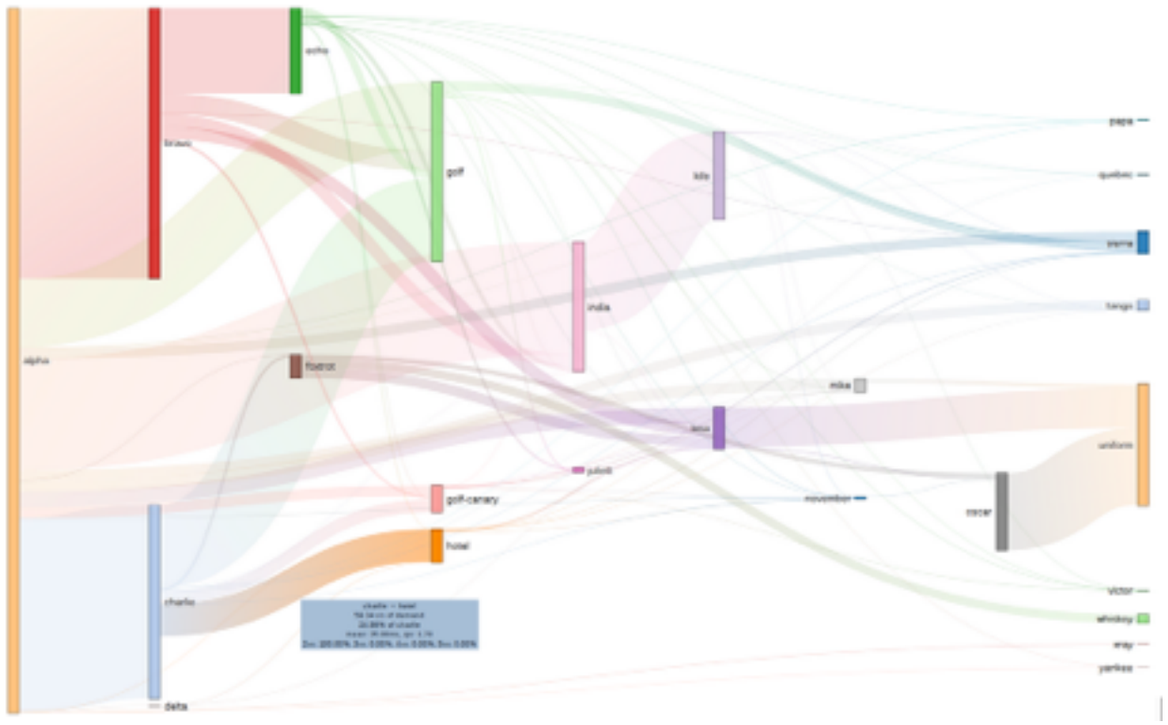
DELIVERING MICROSERVICES

RELEASE 1 - CONTRACT TEST EXAMPLE

```
describe('with an email created', function() {

   beforeEach(function(done) {
    var requestOptions = {
       url: config.serviceUrl + '/badge',
       method: 'POST',
       json: {
         'mogulid': '**********************************',
         'badgecode': 'FirstSlice',
         'name': 'First Slice',
         'description': 'Awarded when a Mogul creates their first pizza',
         'imageurl': '/images/badges/firstslice.png',
         'bonusamount': '0'
       }
     };
     request.get(requestOptions, function(err, response, body) {
       postResponse = response;
       postBody = body;
       getEmails(done);
     });
   });

   it('returns the email', function() {
     expect(postResponse.statusCode).toBe(201);
     var xml = new dom().parseFromString(getBody);
     expect(xpath.select('count(//*[local-name()=\'MogulEmail\'])', xml)).toBe(1);
     expect(xpath.select('count(//*[local-name()=\'Field\'])', xml)).toBe(9);
     expect(xpath.select('//*[local-name()=\'MogulEmail\']', xml)[0].namespaceURI)
             .toBe('http://PizzaMogul.Integration.Communication.Schemas.MogulEmail');
   });

});
```

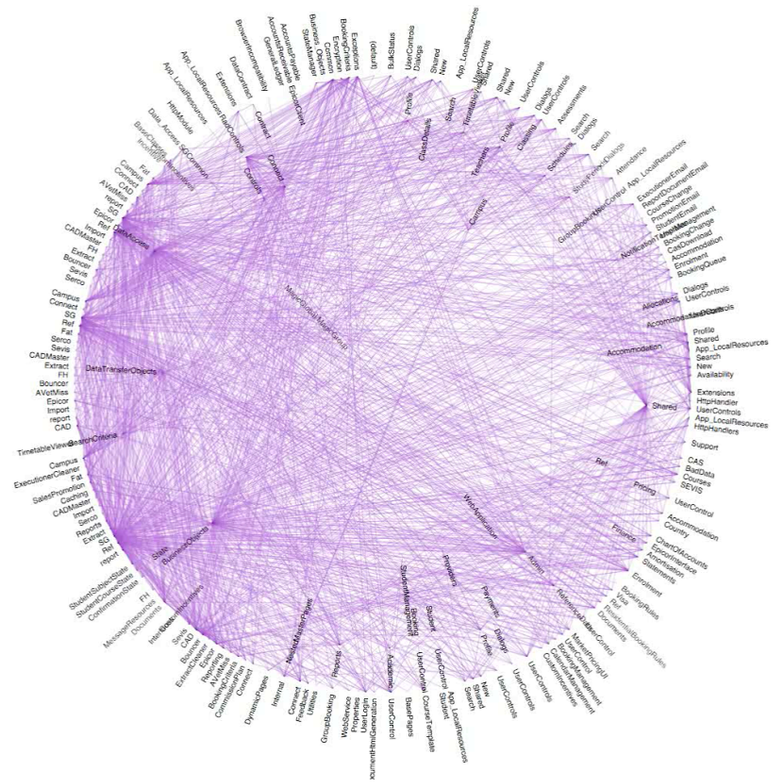
DELIVERING MICROSERVICES

RELEASE 1 - DEPENDENCY GRAPHS WITH D3JS



D3 Sankey Diagram

http://techblog.netflix.com/2015/02/a-microscope-on-microservices.html

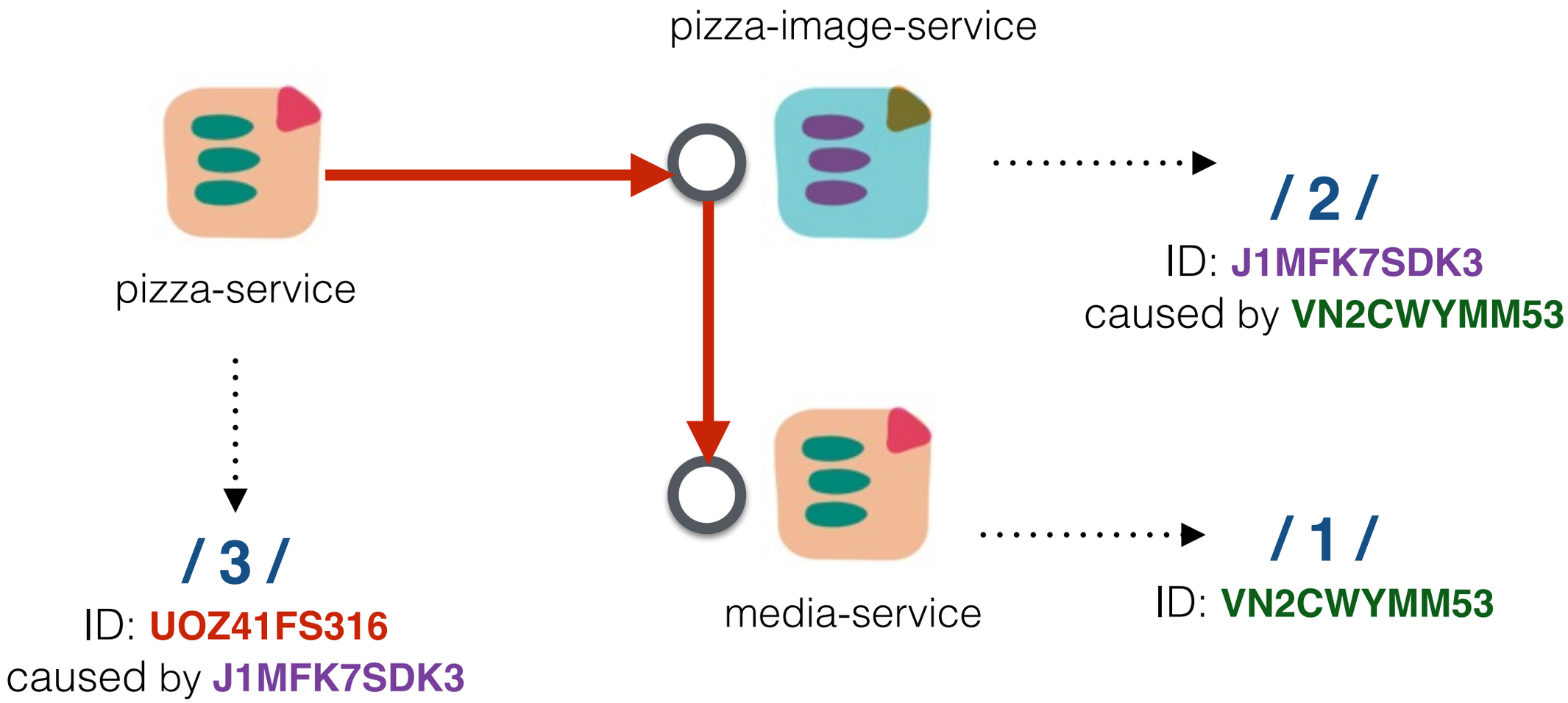


D3 Hierarchic Edge Bundling

https://www.youtube.com/watch?v=hsoovFbpAoE

DELIVERING MICROSERVICES

RELEASE 1 - TRANSACTIONS LOGGING



DELIVERING MICROSERVICES

RELEASE 1 - DIFFERENT LEVELS OF MONITORING

Log	Runtime	Infrastructure
splunk>	New Relic	Nagios®
elastic Logstash & Kibana	Graphite	amazon web services Amazon CloudWatch
	Grafana	

DELIVERING MICROSERVICES

RELEASE 1 - BUILD CAPABILITIES

- Continuously Deliver

  CI, automated builds, tests, and deployments, release management

- Re-think the pyramid of tests

  Favor contracts testing to UI functional testing

- Control dependencies

  Modules integration via HTTP, dependency graph, transaction logging

- Release to production

  Learn about your prod environment, consider containers and/or in-process lightweight web servers, load balancers, caching, etc...

- Monitor & Analyse

  Have system monitoring and data analytics in place.

DELIVERING MICROSERVICES

RELEASE 2 - BREAK THE MINILITH

Discovery

Release 1

Release 2

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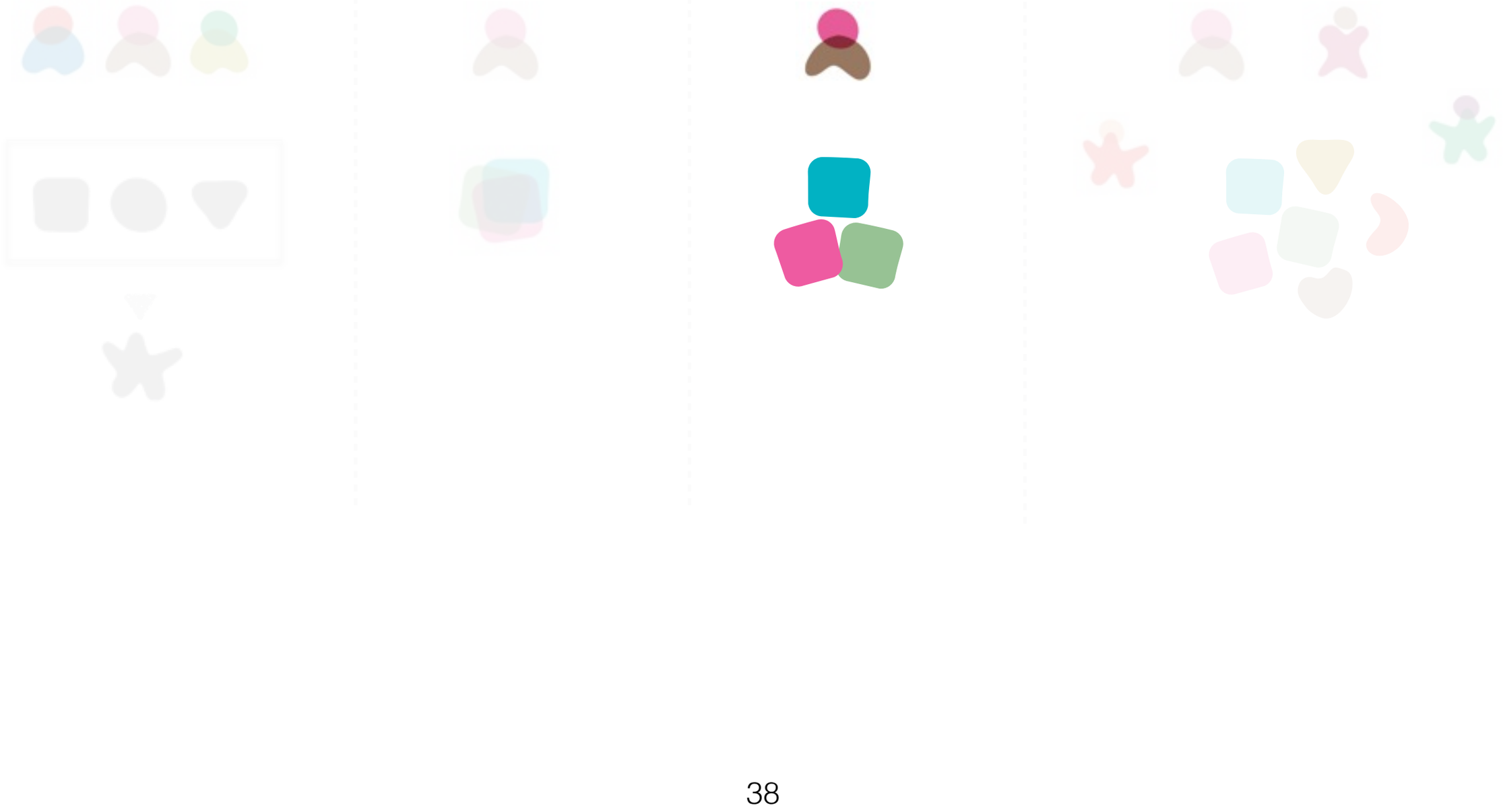
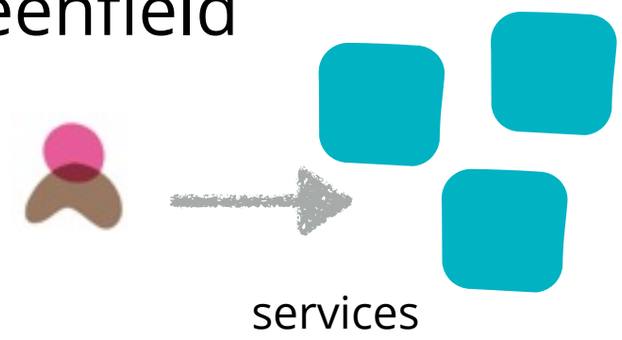
Release N



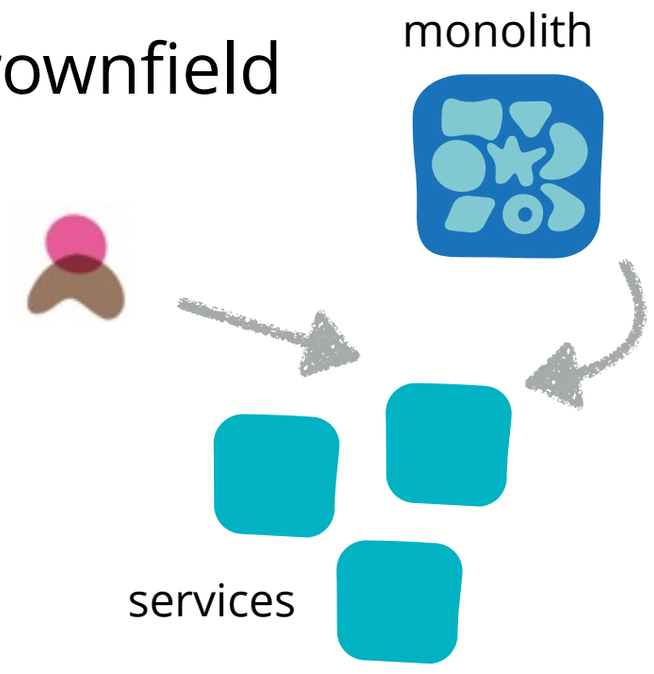
DELIVERING MICROSERVICES

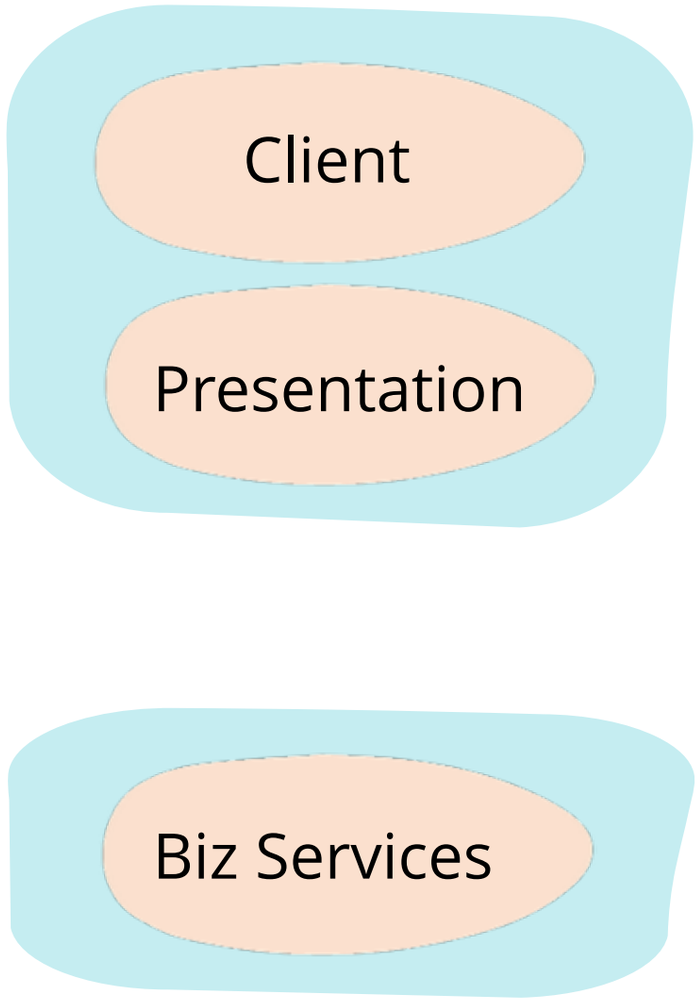
RELEASE 2 - ARCHITECTURE

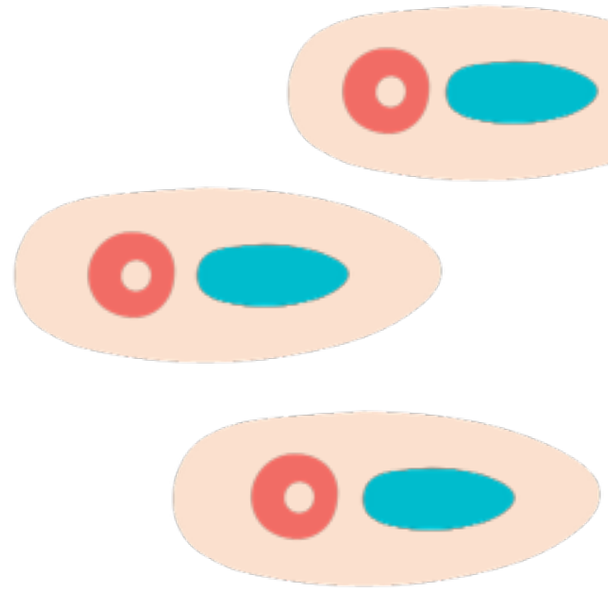
greenfield



brownfield

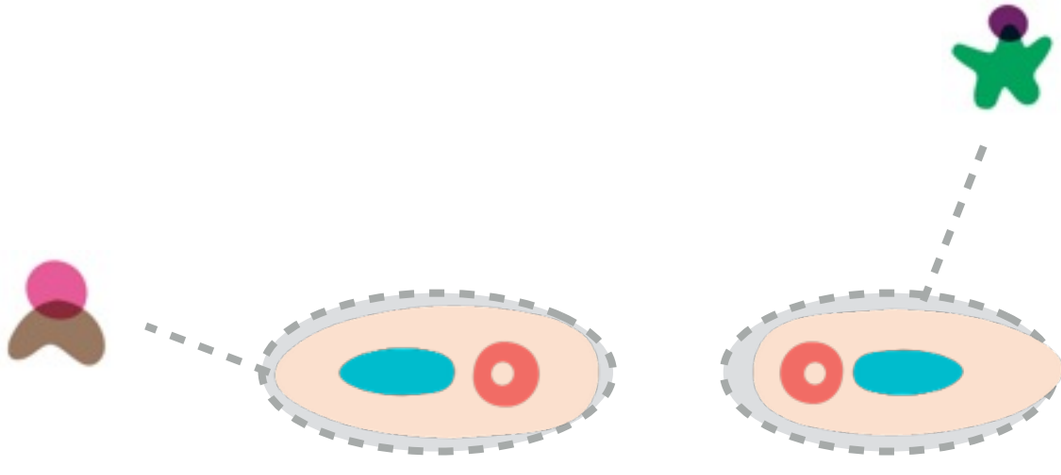




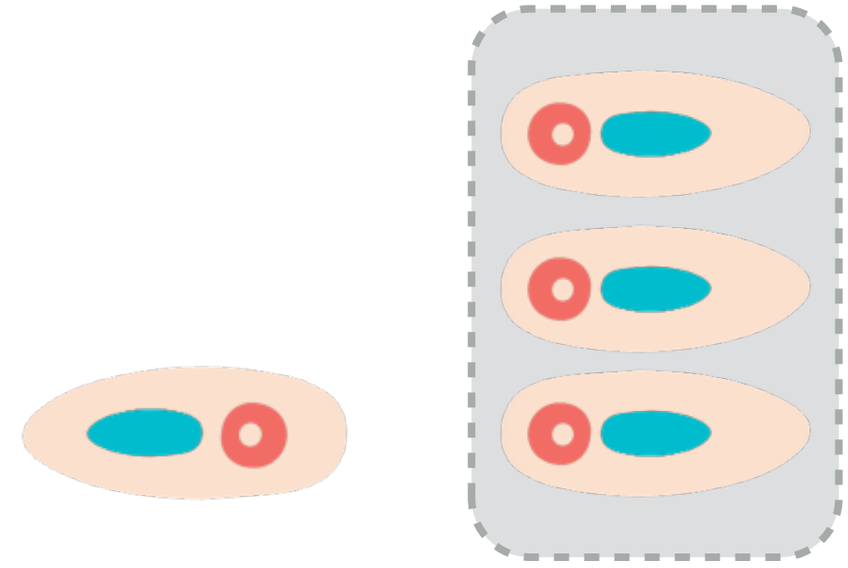


DELIVERING MICROSERVICES

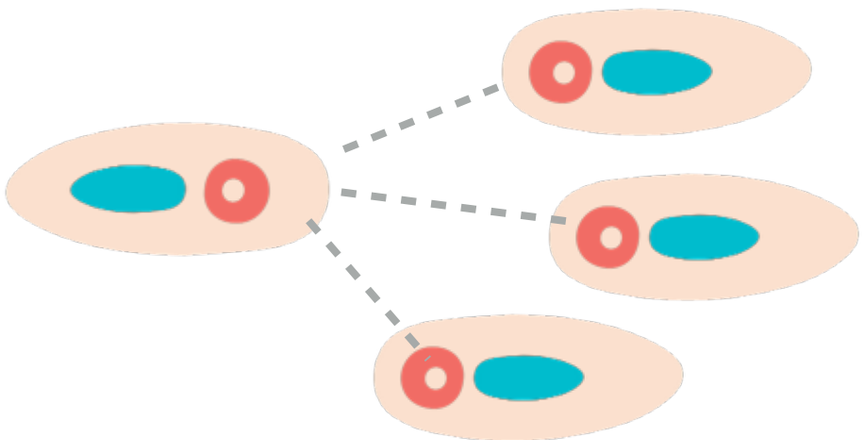
RELEASE 2 - NEW SERVICE USE CASES



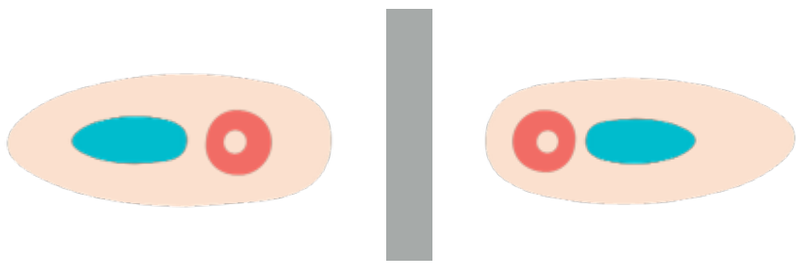
new bounded context



scale separately



data aggregation



security

DELIVERING MICROSERVICES

RELEASE 2 - ISOLATION
DATA

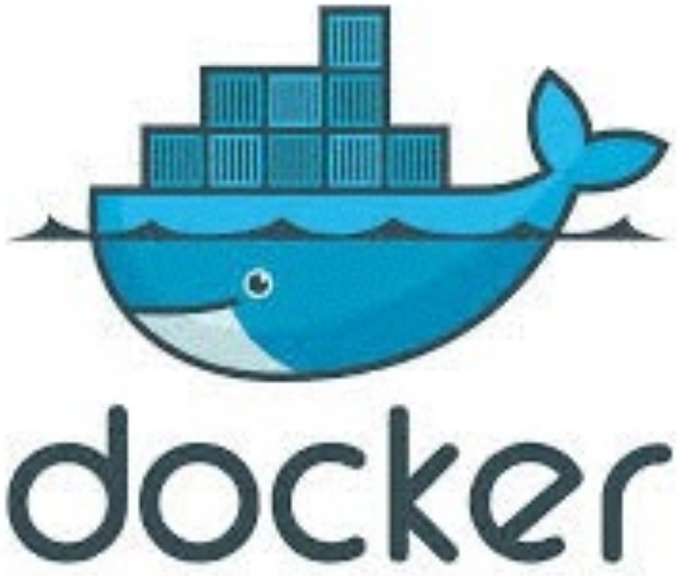
"*No direct database access is allowed from outside the service, and there's no data sharing among the services*"

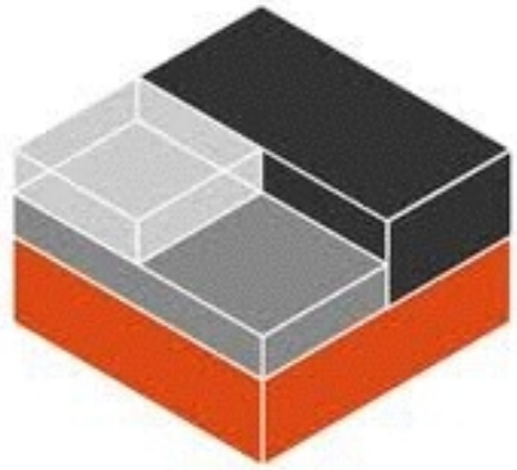
Werner Vogels, CTO and Vice President of amazon.com

DELIVERING MICROSERVICES

RELEASE 2 - ISOLATION

CONTAINERS





DELIVERING MICROSERVICES

RELEASE 2 - ISOLATION
INTEGRATION

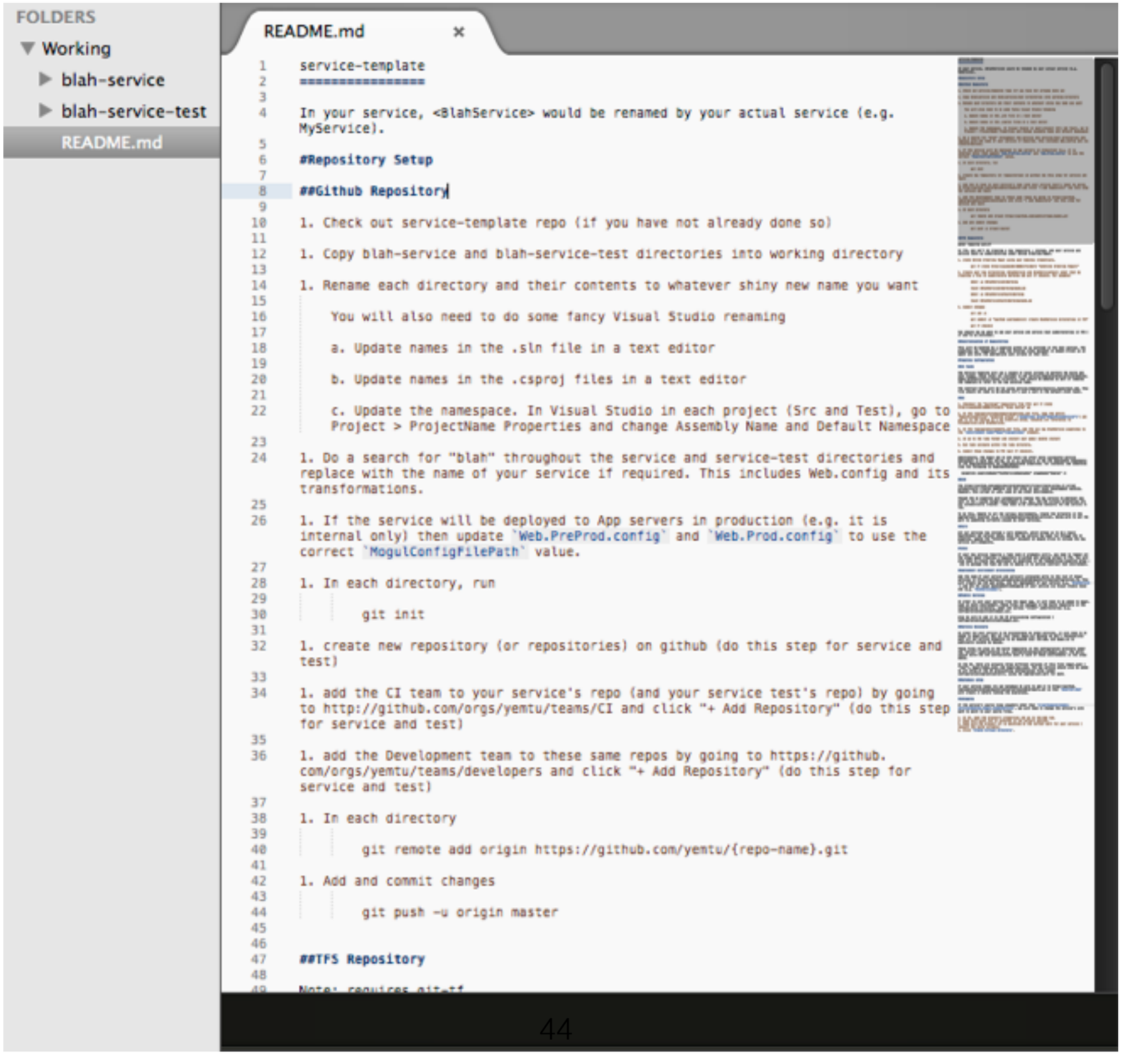
Orchestration

Choreography

http://www.thoughtworks.com/insights/blog/scaling-microservices-event-stream

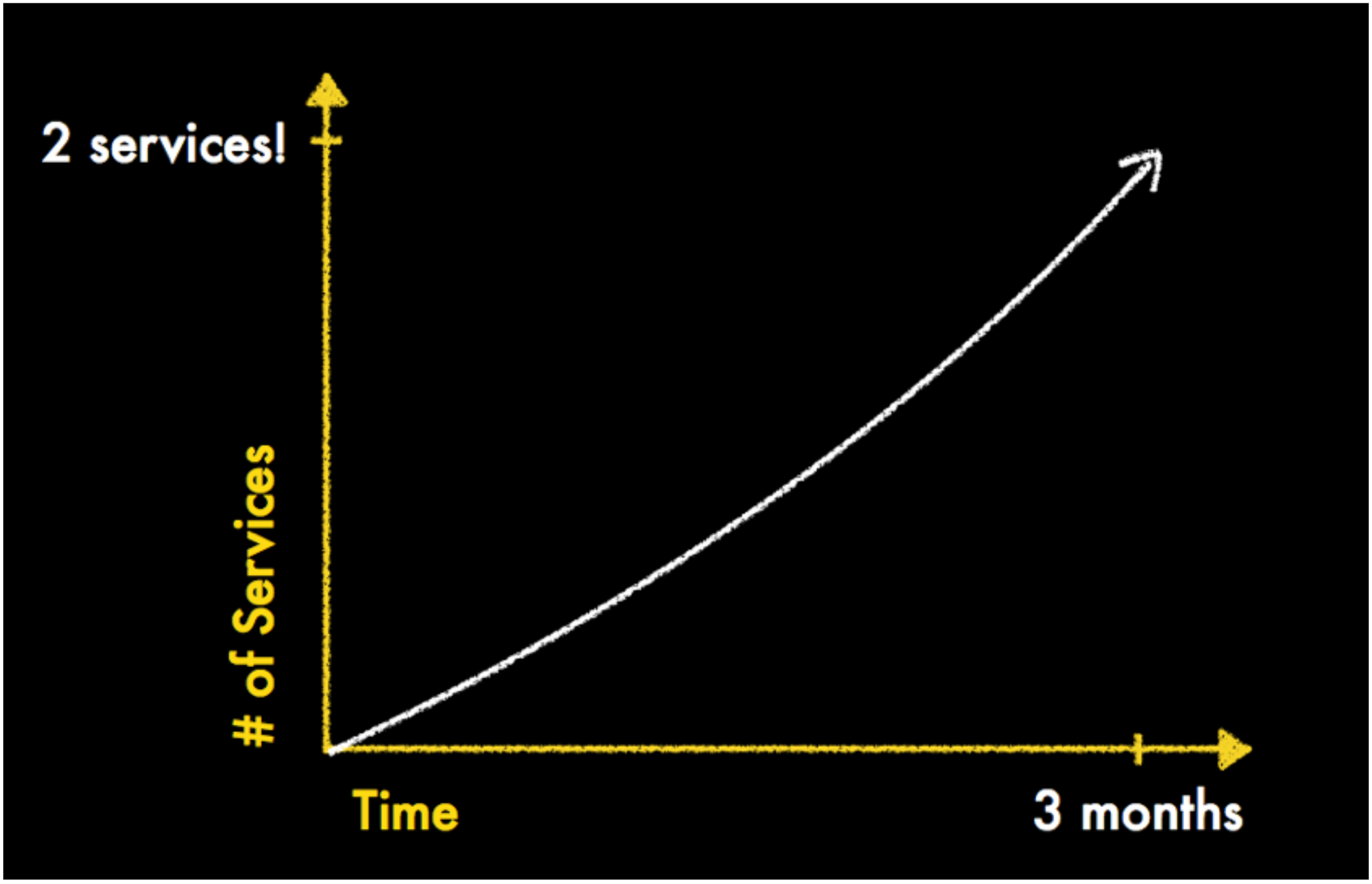
DELIVERING MICROSERVICES

RELEASE 2 - SERVICE TEMPLATES



DELIVERING MICROSERVICES

RELEASE 2 - BUILD WHAT YOU CAN SUPPORT



DELIVERING MICROSERVICES

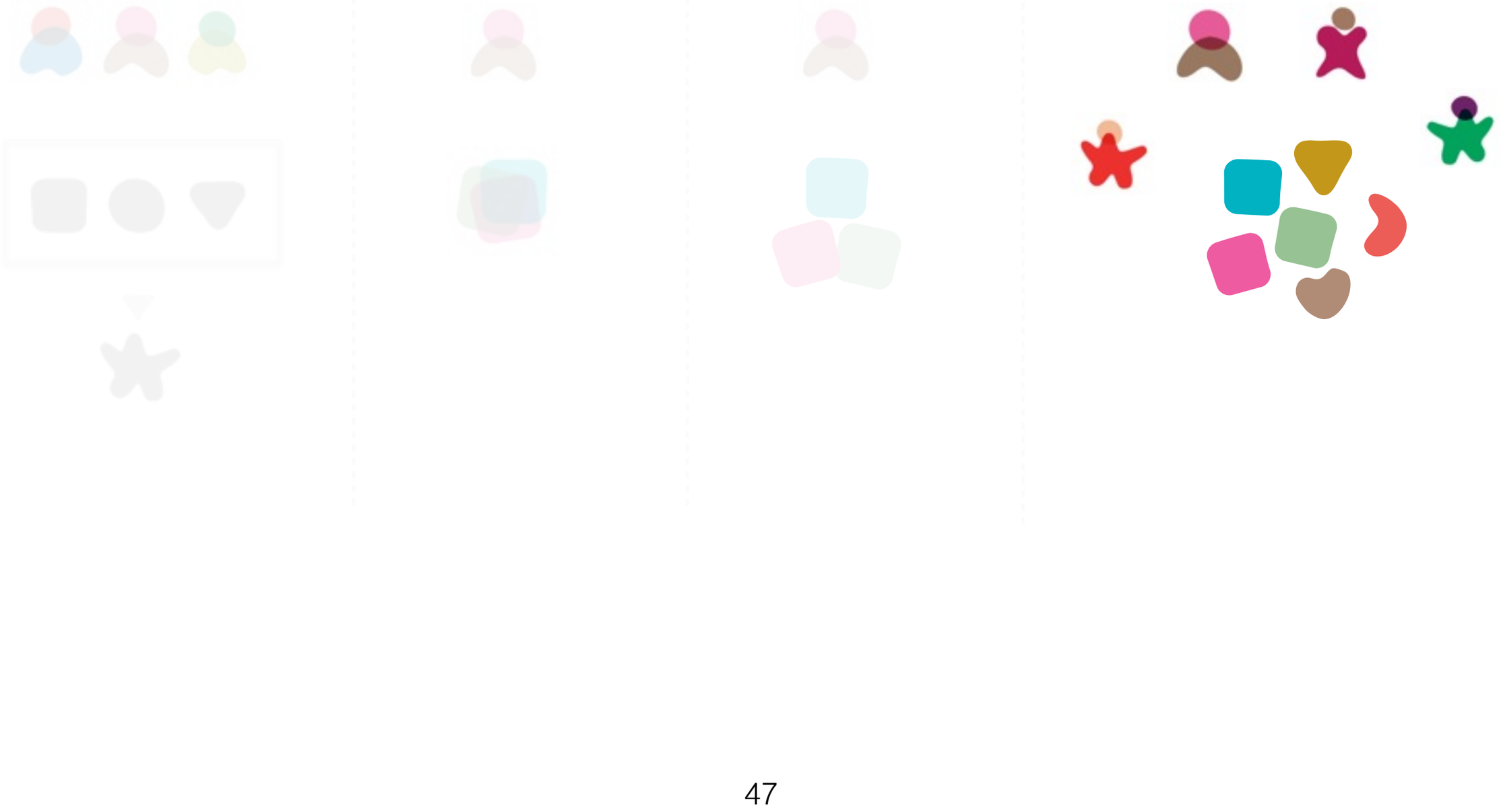
RELEASE 2 - UNDERSTAND SERVICES

- Know if and when to create a new service
  new bounded context, aggregation, security, scale independently
- Define (your level of) isolation
  code, compilation, runtime, persistence, integration
- Reduce barrier to entry
  repository blueprint, pipeline template, scaffolding script
- Build what you can support
  develop DevOps culture (e.g. infrastructure as code)

DELIVERING MICROSERVICES

RELEASE N - SCALE

Discovery | Release 1 | Release 2 | ... | Release N



RELEASE N - SCALING FDELIVERY

SCALABLE
ARCHITECTURE ??

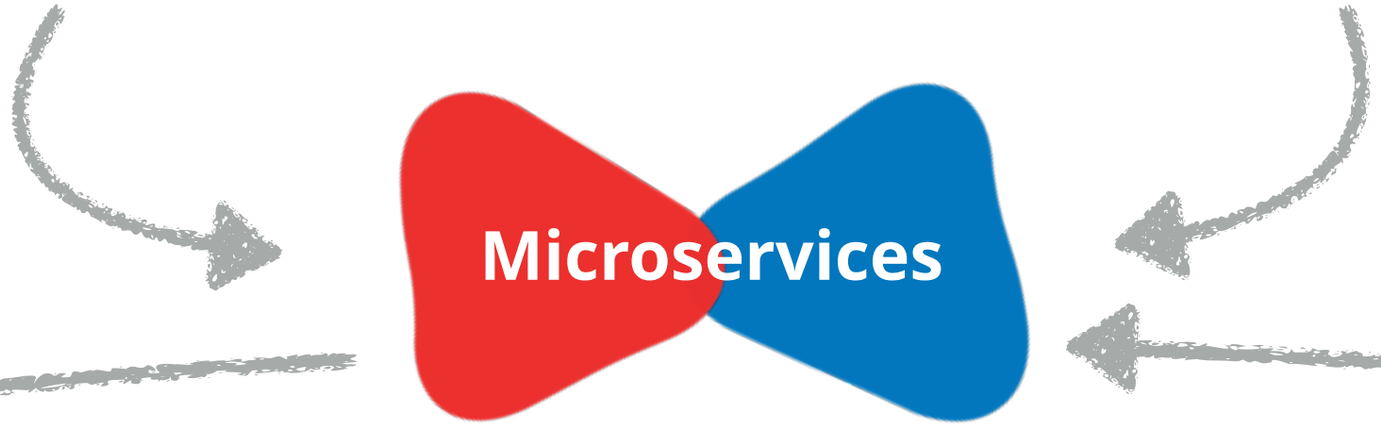
RELEASE N - SCALING FOR LOAD

DISTRIBUTING THE TEAMS?

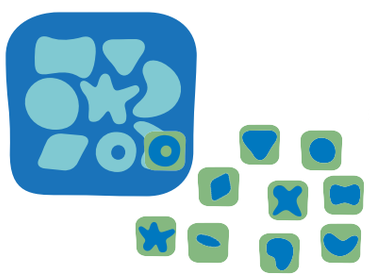
CONCLUSION

microservices?

need big upfront design?



strategic value



break the monolith

scale

re-org

ABOUT ME

Jean D'Amore

Technology Market Principal

ThoughtWorks®

jdamore@thoughtworks.com

jeandamore

jeandamore

jdamore

blog.corsamore.com