GRASS-ROOTS microservices

(I had some and I didn't know)

DINO
ESPOSITO

@despos facebook.com/naa4e

What’s that?

- Overall system split into parts
- Each part focuses on a “single” business service
  - The actual meaning of **single** depends on the context
- Single Responsibility Principle applied to architecture

MICROSERVICES

MANY TIMES, THINGS LOOK DIFFERENT FROM **WHAT THEY ARE**…

MICROSERVICE

A particular way of designing software applications as suites of independently deployable services.

- Run in dedicated process
- Communicate through lightweight mechanisms
- Simplified and automated deployment
- Decentralized control of languages and data

https://martinfowler.com/articles/microservices.html

IN OTHER WORDS …

SOA

JUST MADE
SIMPLER

- ❑ Tenet 1: **Boundaries are explicit.**
- ❑ Tenet 2: **Services are autonomous.**
- ❑ Tenet 3: **Services share schema & contract, not class.**
- ❑ Tenet 4: **Service compatibility is based upon policy.**

Wasn’t this just SOA?

- Service-oriented Architecture
  - Primarily about reuse of business services
  - Coarse-grained and made of conceptually bigger components
  - Purpose of making the architecture more efficient and scalable

- Microservices
  - Primarily about team organization and replaceability of functions
  - Fine-grained, devisable as internal components of large business services
  - Purpose of making single pieces easier to replace and scale

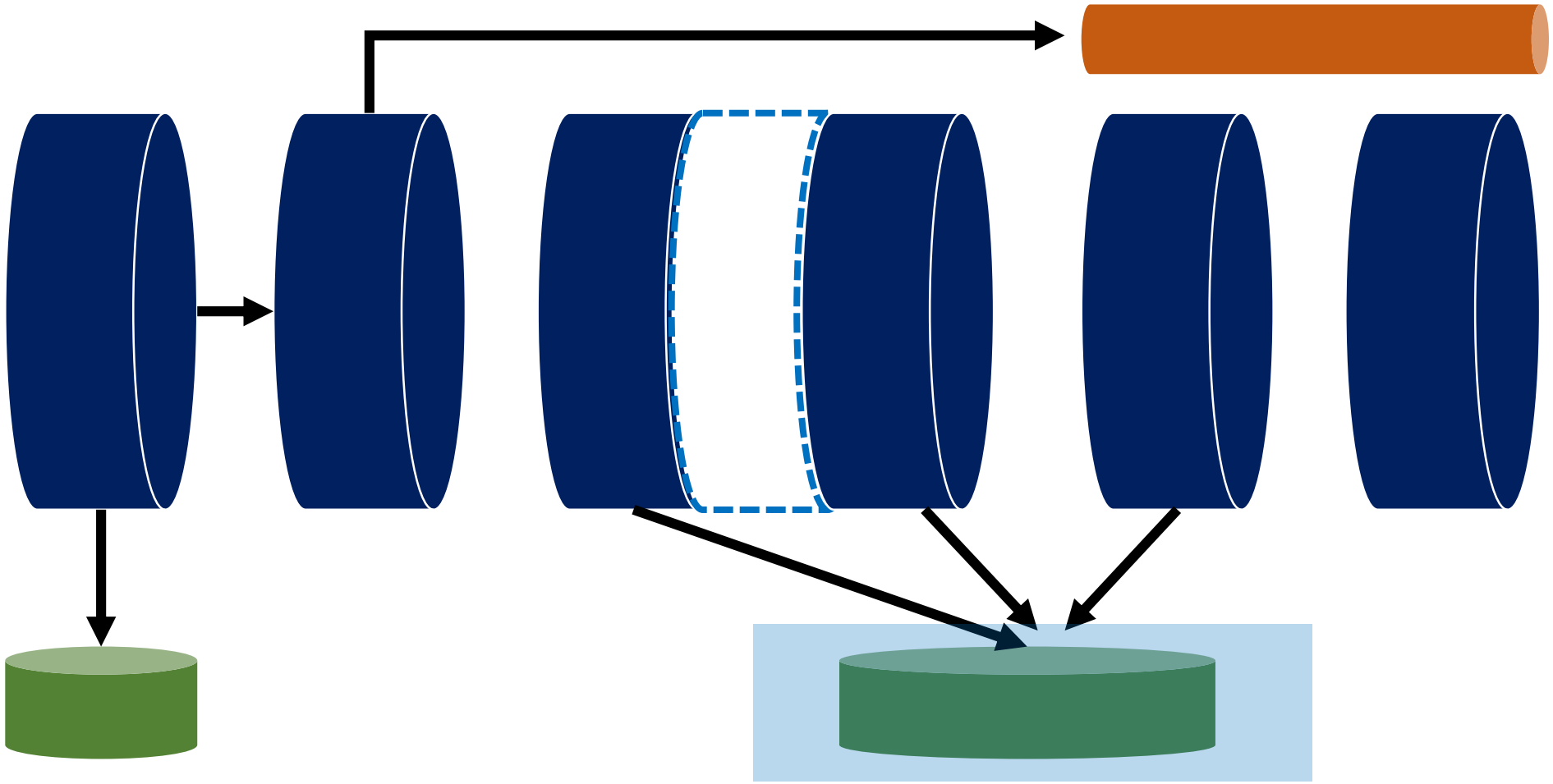
Perspectives of Scalability

- SOA
  - We build an overall scalable architecture
- Microservices
  - We create independently scalable smaller components and build an overall scalable architecture by harmonizing the scalability of constituent blocks

MONOLITHIC APPLICATION

SEGMENTED APPLICATION

BOUNDED CONTEXT to MICROSERVICE



Challenges of Modern Software

- Easy to replace
  - Rewrite entire sections from scratch to add functions and/or switch to a different stack of technologies
- Easy to deploy
  - Frequent releases require the certainty of being able to deploy quickly and reliably without side effects and regression
  - Update individual blocks as soon as they get ready
- Easy to scale
  - Scalability at a finer level of granularity

At a Glance

- Independent vertical stacks of logic and data
- Independently packaged and deployed

- Communicating (if necessary) in some way
  - Mostly and preferably via API

“Organizations which design systems are constrained to produce designs which are copies of the communication structures of these organizations.”

Melvin Conway, 1967

Teams and Microservices

- One team gets one (family of) microservice(s)
  - Actual size and granularity **always** depend on the project and organization
- Bounded Context in DDD
  - Theoretical foundation of microservices

- Common implementation
  - One team responsible for global technology stack
  - Each team free to make decisions and select tools and technologies
  - High autonomy, little coupling with other teams

DOMAIN-DRIVEN DESIGN

Strategic Design

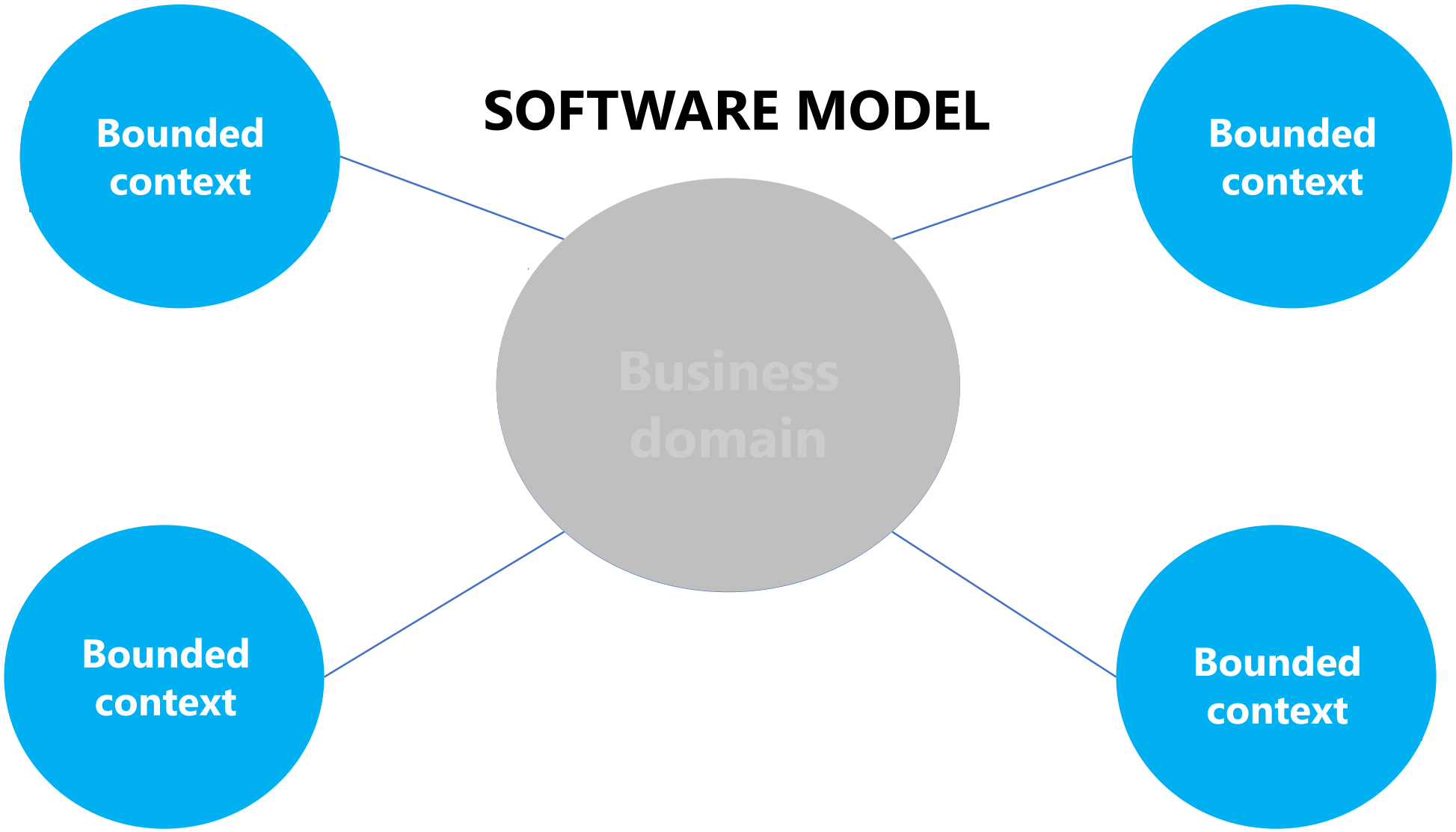
Ubiquitous language

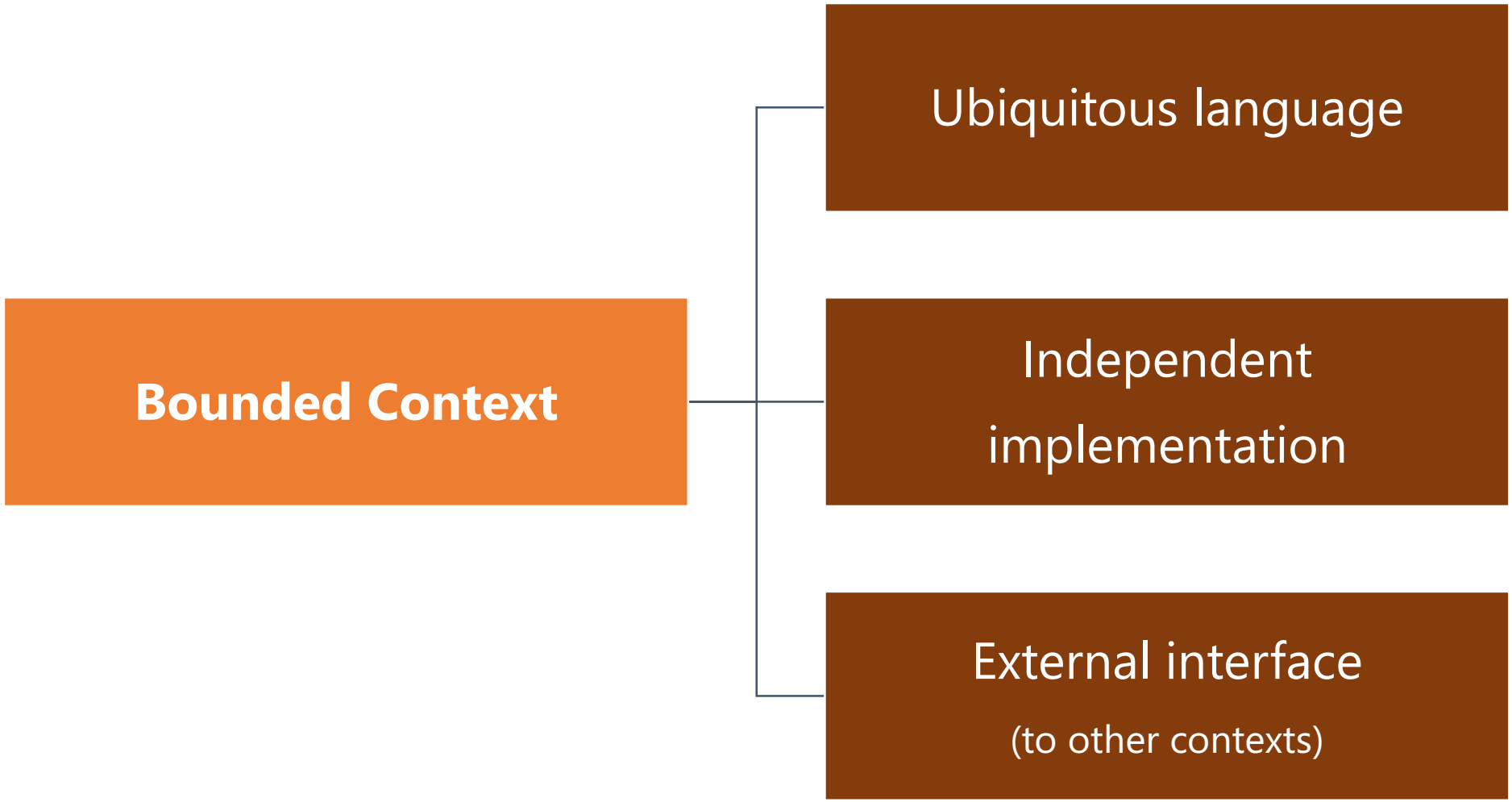
Bounded contexts

Implementation

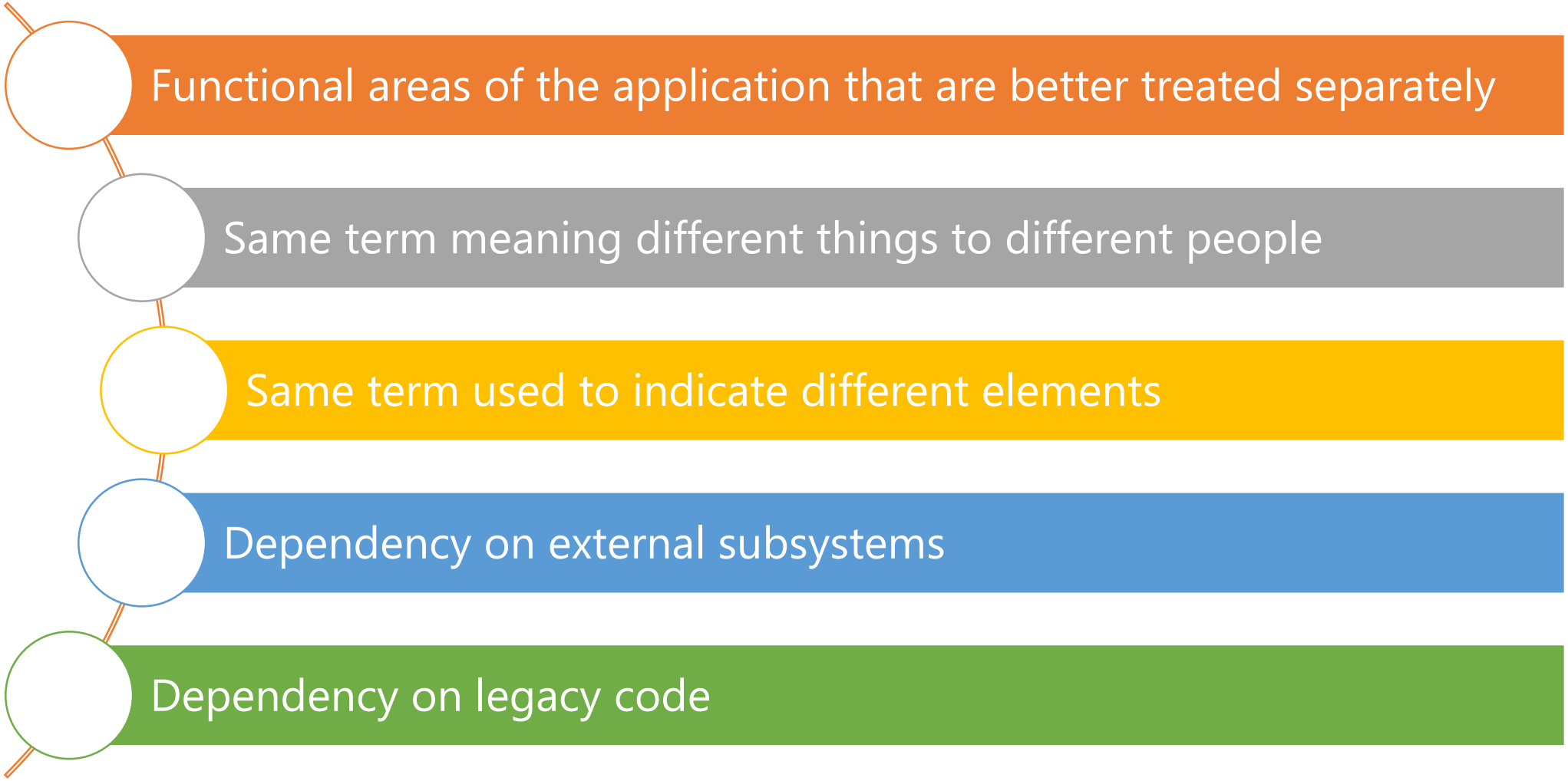
Domain model

Layered architecture

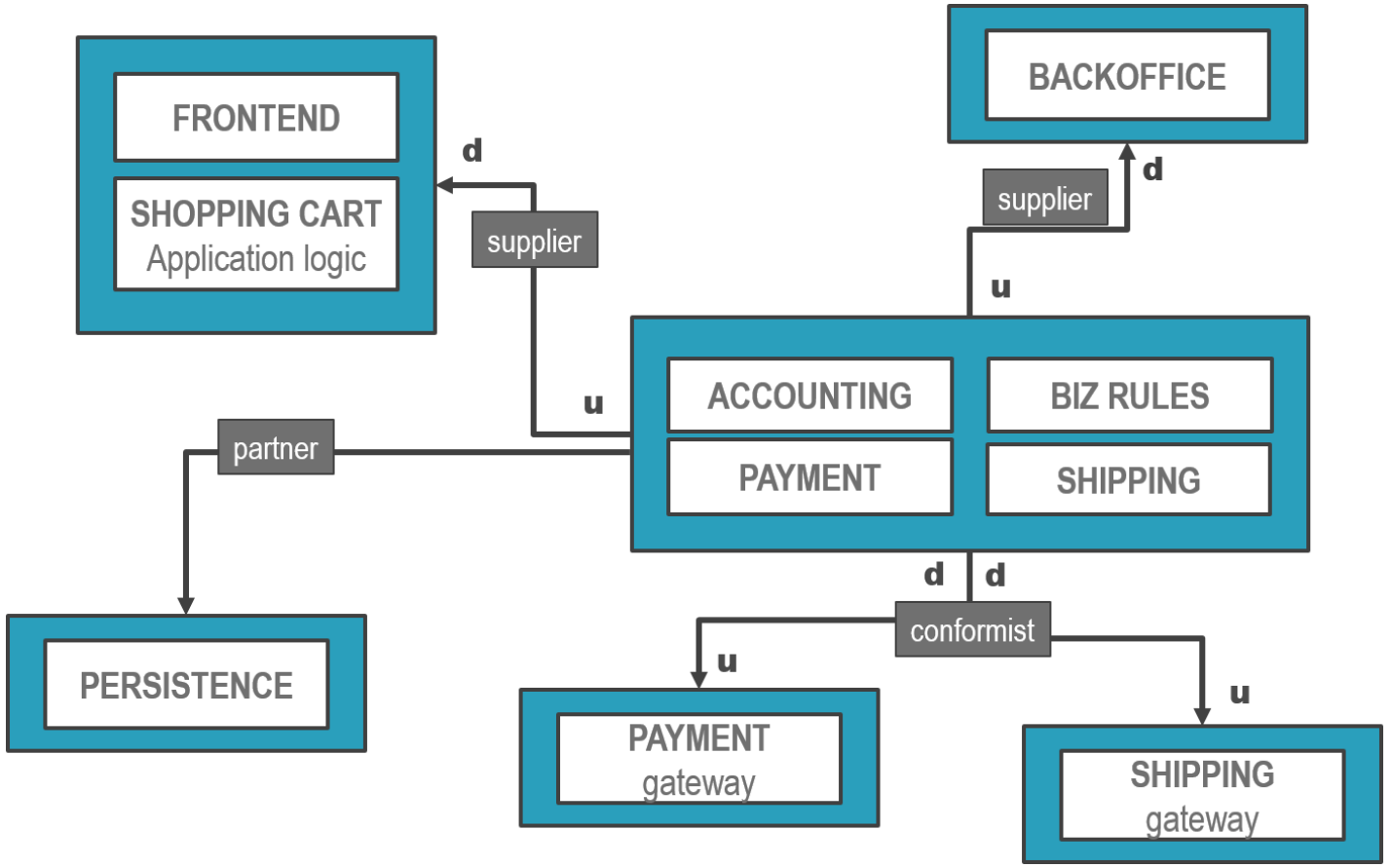

SOFTWARE MODEL
Bounded context
Bounded context
Business domain
Bounded context
Bounded context


Bounded Context
Ubiquitous language
Independent implementation
External interface
(to other contexts)

Why Having Bounded Contexts



CONTEXT MAP


FRONTEND
SHOPPING CART
Application logic
d
supplier
u
BACKOFFICE
supplier
d
u
ACCOUNTING
BIZ RULES
PAYMENT
SHIPPING
partner
u
PERSISTENCE
d
d
conformist
u
u
PAYMENT
gateway
SHIPPING
gateway

Mapping Processes to Microservices

Independence of Microservices

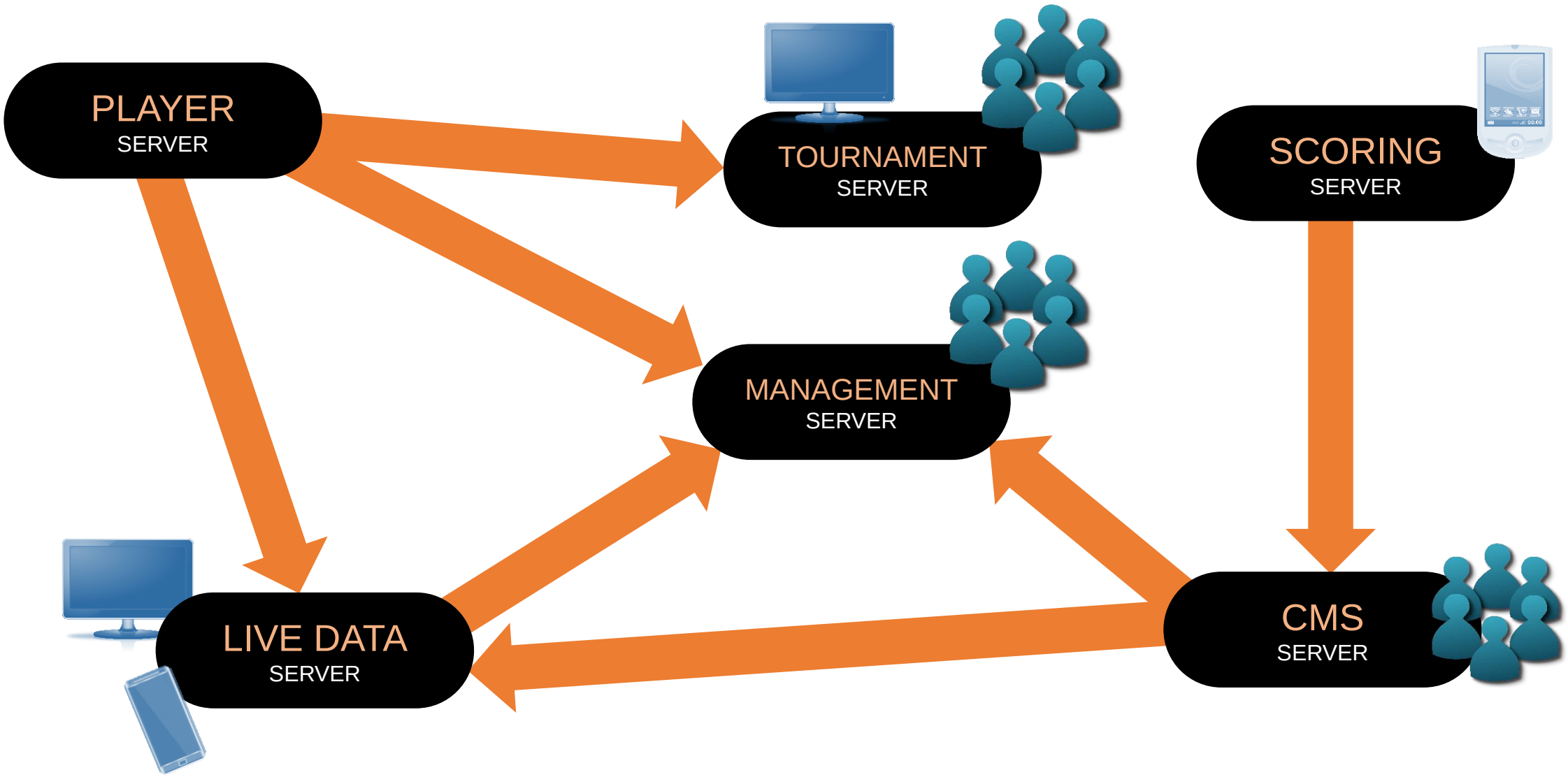
- Lifecycle
  - Each microservice has its own implementation and stack
  - Can (ideally) be deployed without synchronization with other teams
- Contracted interface
  - Stable interfaces for communicating
  - Versioning
- Data storage
  - Owner of its data, data duplication is not an issue
  - May keep local copies of global data

Interaction between Microservices

- Communication
  - Connected microservices should expect communication to be async
  - Critical microservices should be isolated in multiple pools so that if one fails operations can continue
- Robustness
  - Build microservices to be resilient to errors and always try to recover
  - Assume you absorb in some way the failure of connected services
- Functional scalability
  - Each microservice takes the resources it needs to work as expected
  - Independent scalability

When You Get Microservices (and you didn’t know)

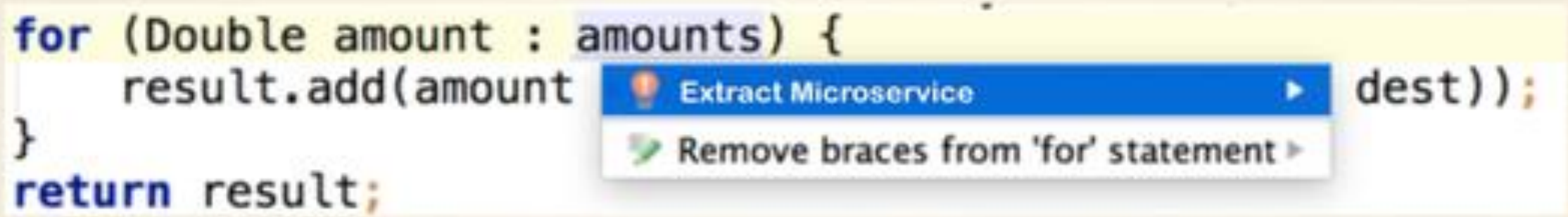
SAY YOU'RE A STARTUP



The reason we **ended up** to microservices has to do much more with **productivity** than pure technical matters or **technologies**.

It had to do much more with **common sense** and attitude to solve **concrete** (and small) business problems than religion or **design** for big-scale.

Every method is a Microservice



http://twitter.com/hhariri/status/540463864622895104

Humphrey's Law

The user of the software won't know what she wants until she sees the software.

Wegner's Lemma

An interactive system can never be fully specified nor can it ever be fully tested.

Pluralsight courses
UXDD/DDD

@despos


GREAT INDIAN
DEVELOPER™
SUMMIT 2019
Conference : April 23-26, Bangalore
12th EDITION
#gids19
Register early and get the best discounts!
www.developersummit.com
@greatindiandev
bit.ly/gidslinkedin
facebook.com/gids19
bit.ly/saltmarchyoutube
flickr.com/photos/saltmarch/