

Pivotal Microservice Design Theory

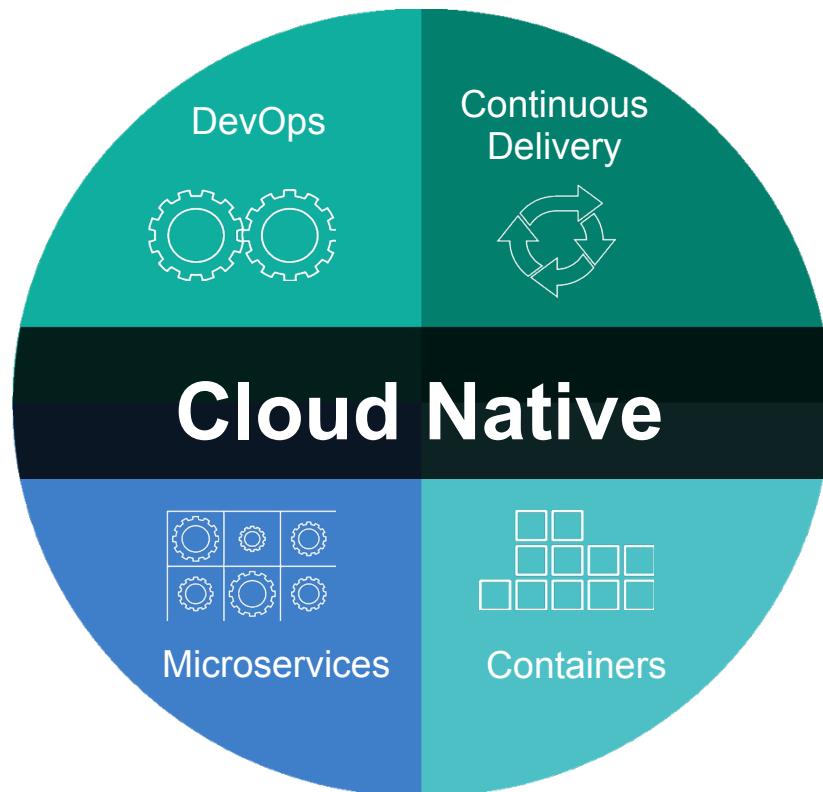
Adib Saikali – @asaikali
Pivotal Platform Architecture



What is our primary goal as Platform Architects?

Pivotal

**Our goal is to engage
customers in the
cloud native
conversation to sell
Pivotal Cloud Foundry**



Pivotal

**We help customers
see the microservices inside their
existing and future systems**

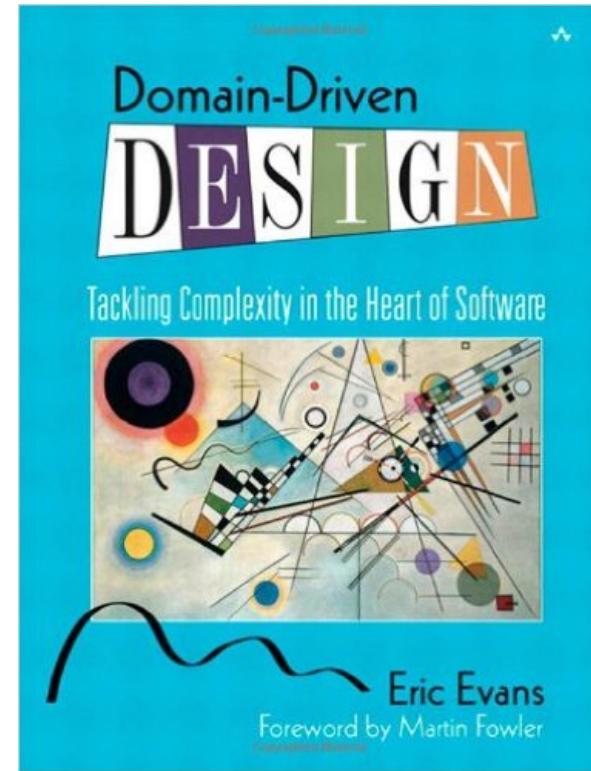
Pivotal

Common Customer Questions

- What is the methodology for designing microservice?
- How to break up a monolith into microservices?
- What are the design patterns for building microservices?

Domain Driven Design

- An approach for designing software systems that model the complexity of the real world
- Kicked off in 2004 by Eric Evans
- A practical micro service design methodology



Pivotal

Strategic Domain Driven Design

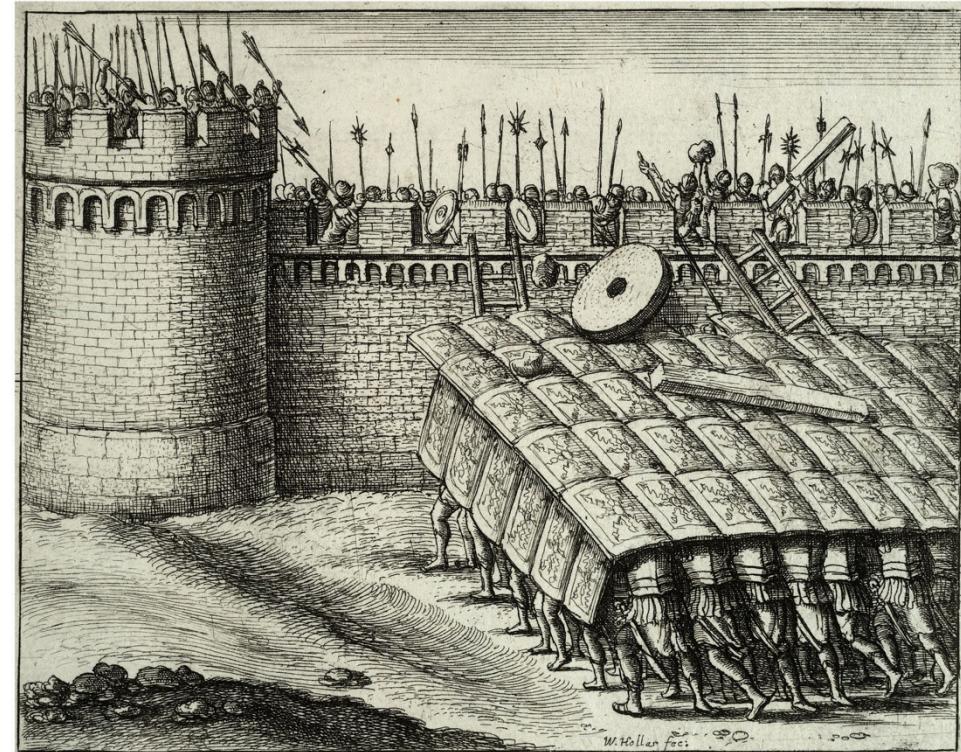
- Domain
- Subdomain
- Bounded Context
- Context Map
- Ubiquitous Language
- Anti corruption layer
- Shared Kernel
- Open Host Service



Pivotal

Tactical Domain Driven Design

- Entities
- Value Objects
- Aggregates
- Services
- Modules
- Factories
- Repositories



Pivotal

Domain

- Domain is always organization specific
- Captures the unique know how and ways that an organization does business
- Composed of subdomains & Bounded Context

Subdomains

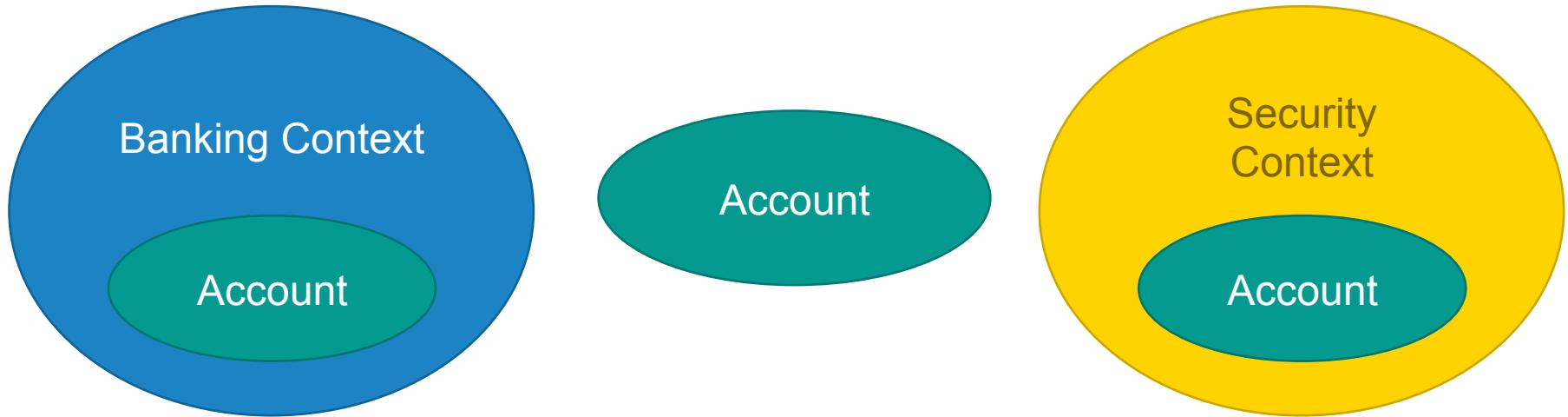
A subdomain is a subset of a domain

Core Subdomain	Supporting Subdomain	Generic Subdomain
Build It Perfectly	Build It Just enough	Buy It

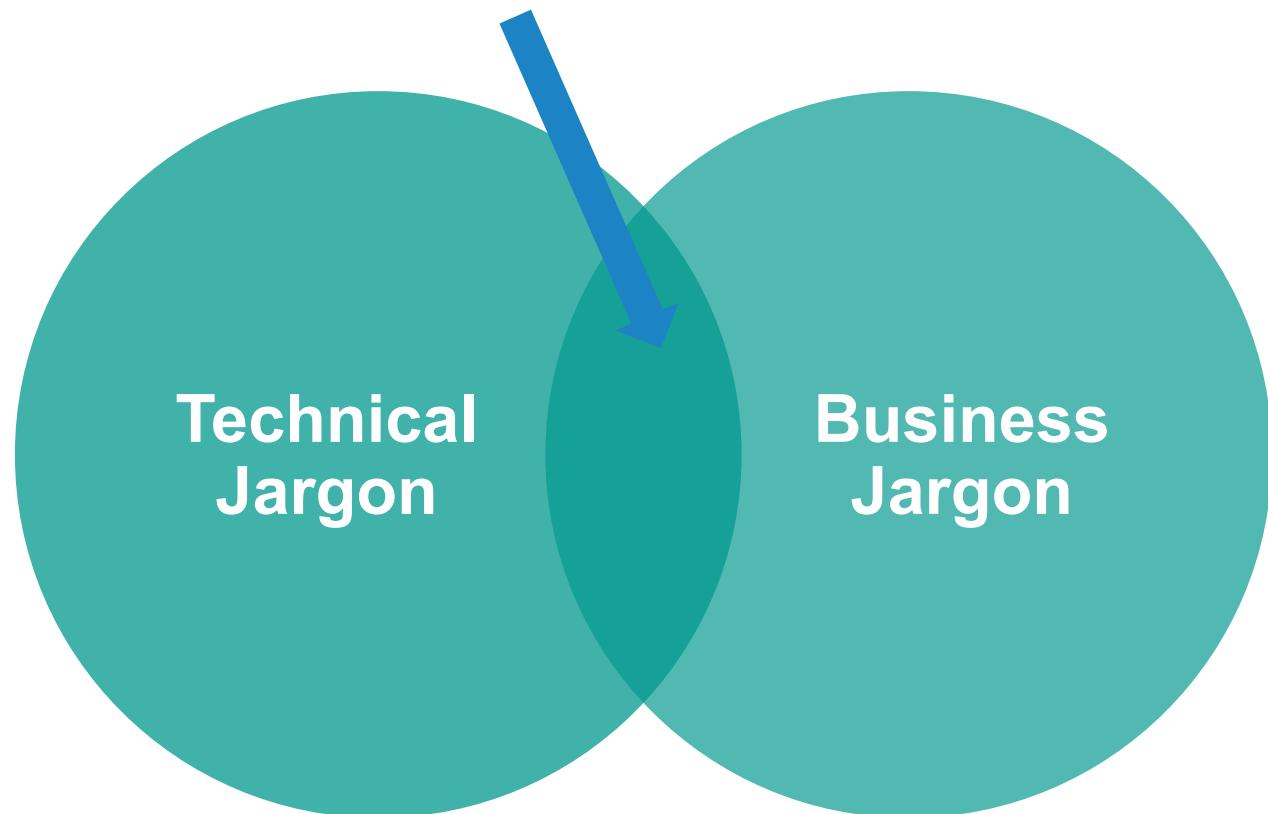
Pivotal

Bounded Context

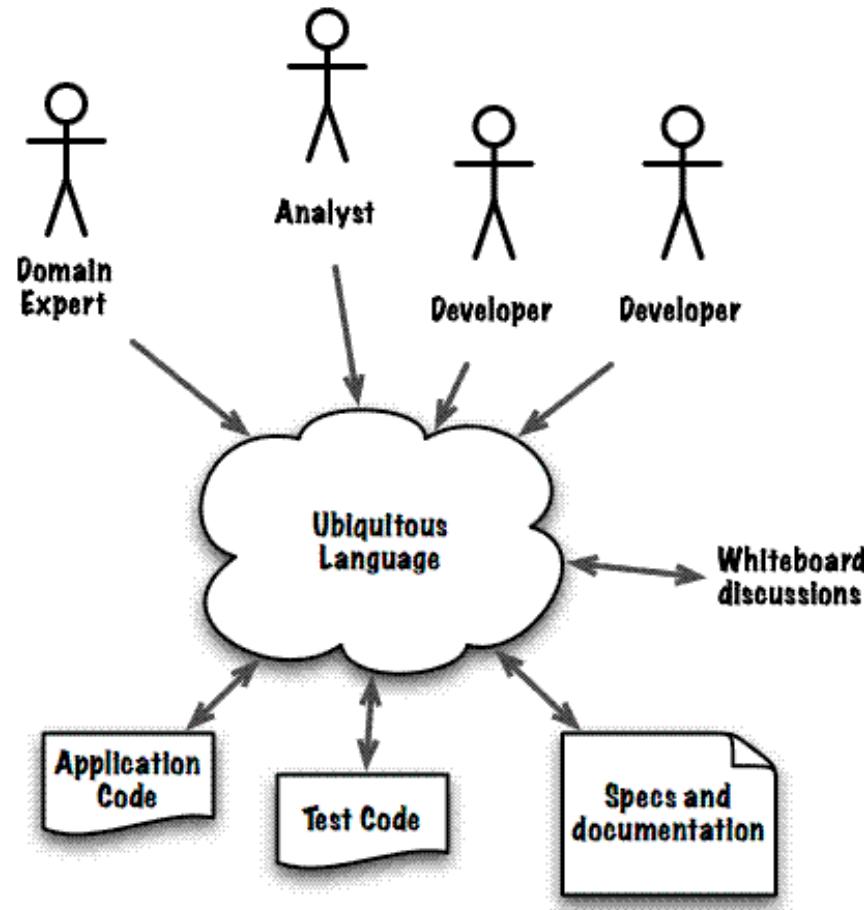
A boundary inside which the meaning of a model is contained



Ubiquitous Language



Pivotal



<http://www.infoq.com/articles/ddd-contextmapping>

Pivotal

Domain / Subdomain / Bounded Context

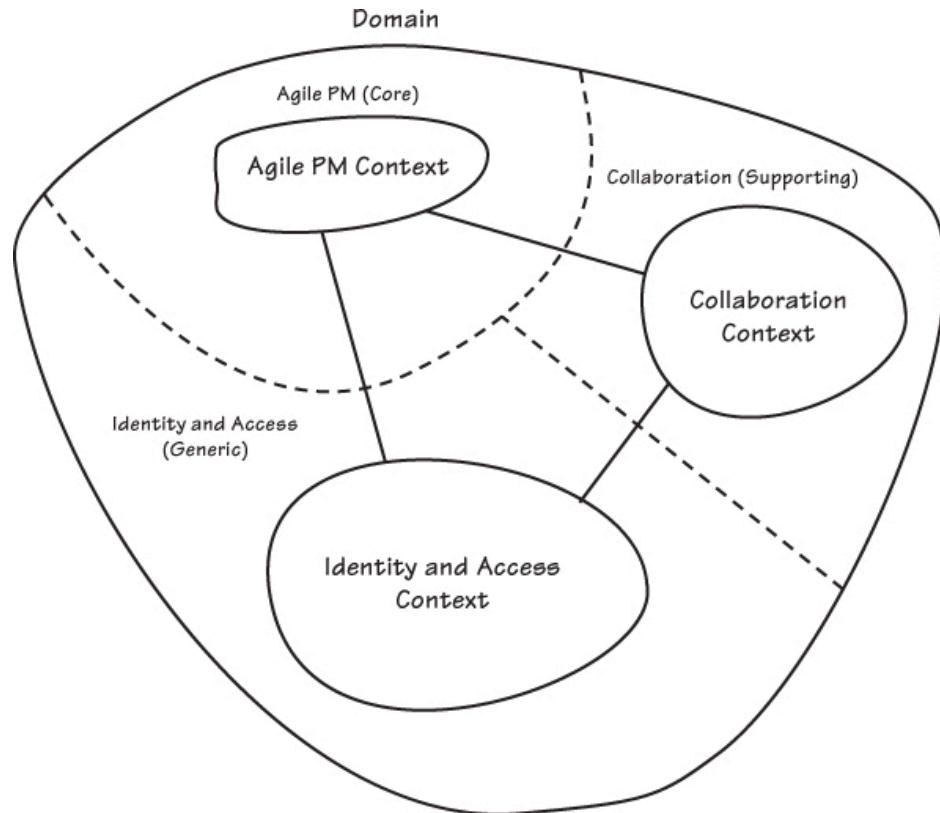
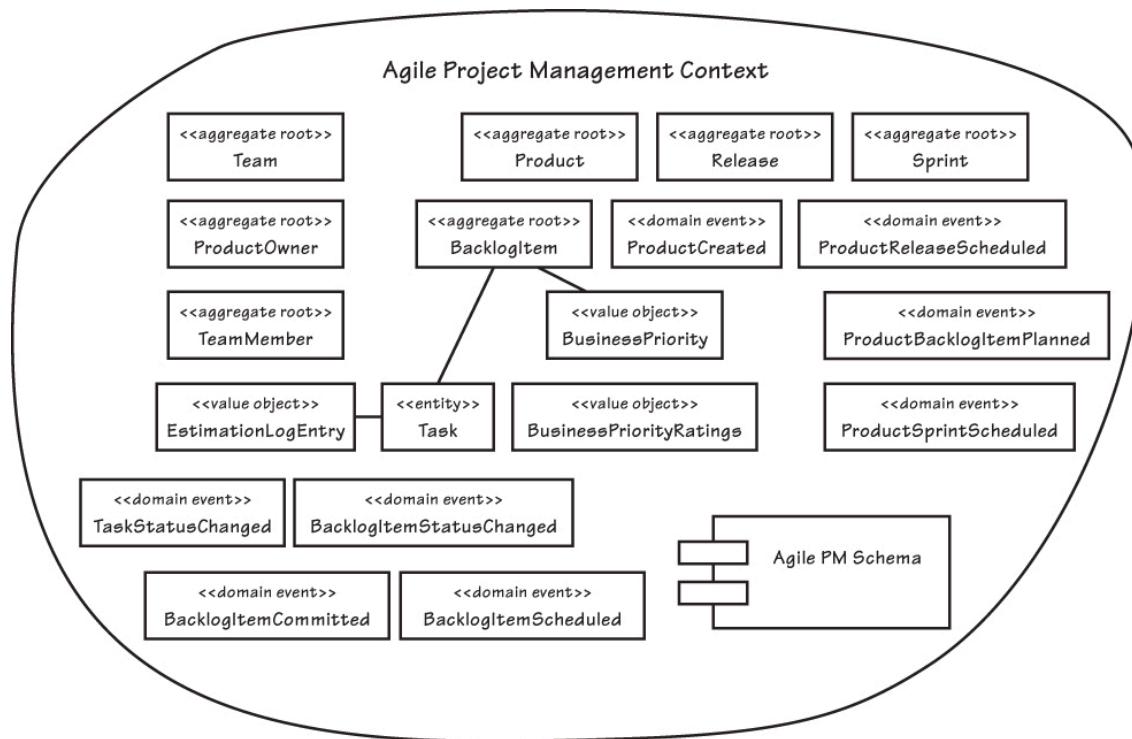


Figure 2.7 from Implementing Domain Driven Design

Pivotal

Example Bounded Context

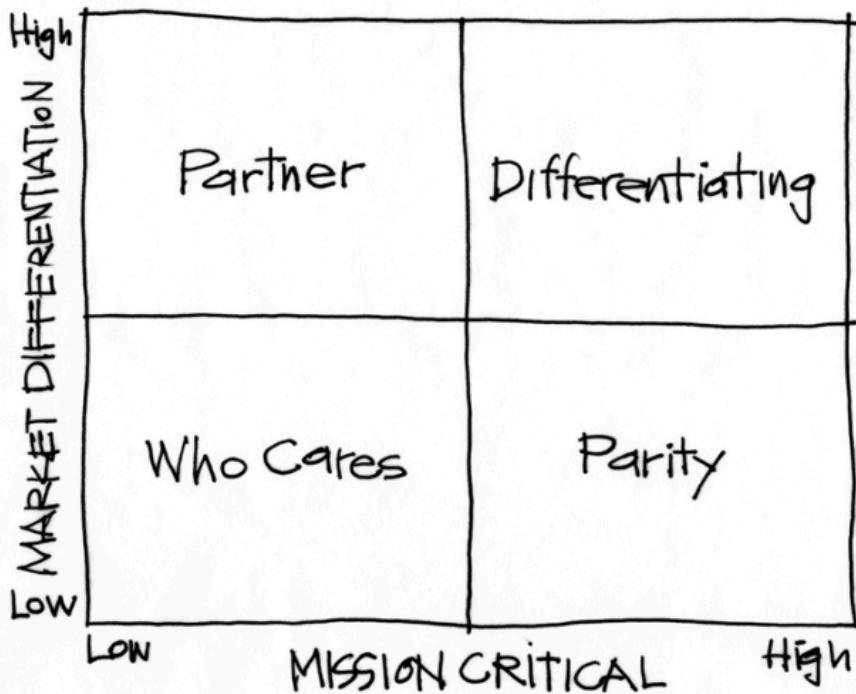


- Entities
- Domain Event
- Value Objects
- Aggregates
- Services
- Modules
- Factories
- Repositories

Figure 2.10 from Implementing Domain Driven Design

Pivotal

Purpose Alignment Model



- **Making a build vs. buy decisions at the level of bounded contexts leads to better results**

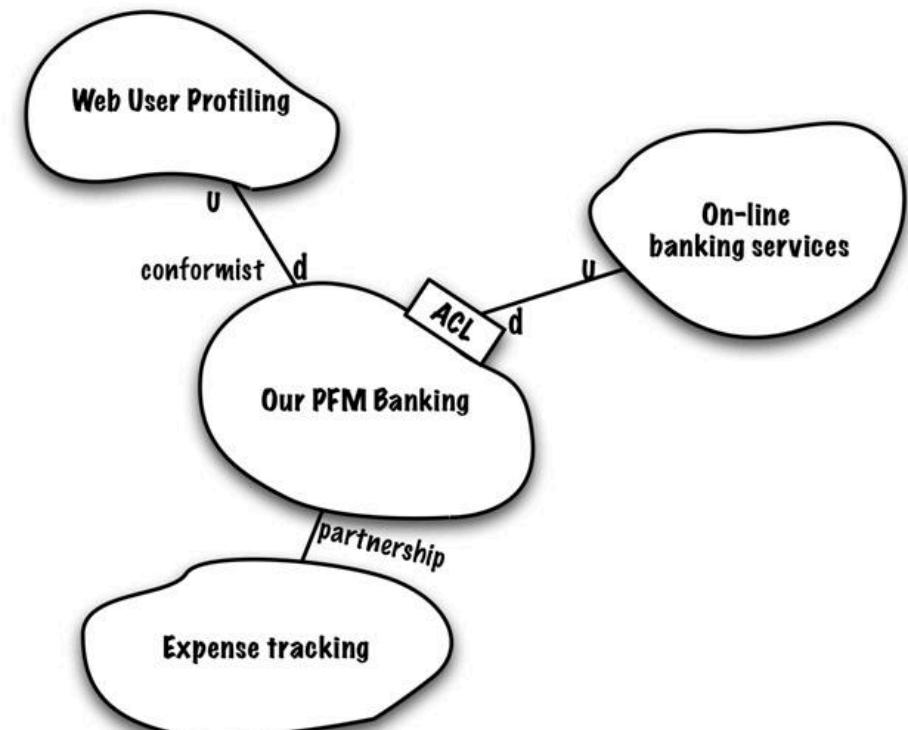
<http://beyondrequirements.com/2012/02/18/purpose-based-alignment-model/>

Pivotal

Context Maps

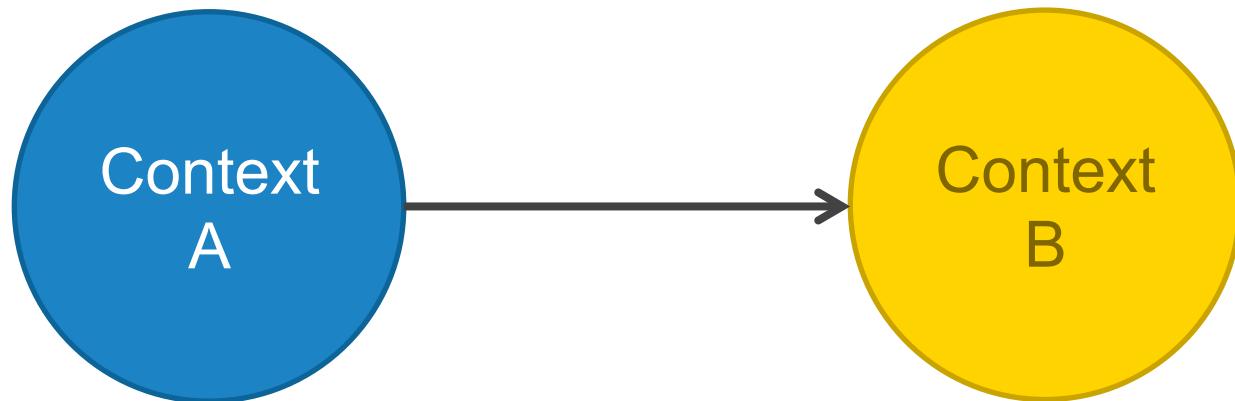
A map of the existing organizational & Integration relationships between different bounded contexts

- Partnership
- Shared Kernel
- Customer-Supplier Development
- Conformist
- Anticorruption layer
- Open Host Service
- Published Language
- Separate Ways
- Big Ball of Mud



Partnership

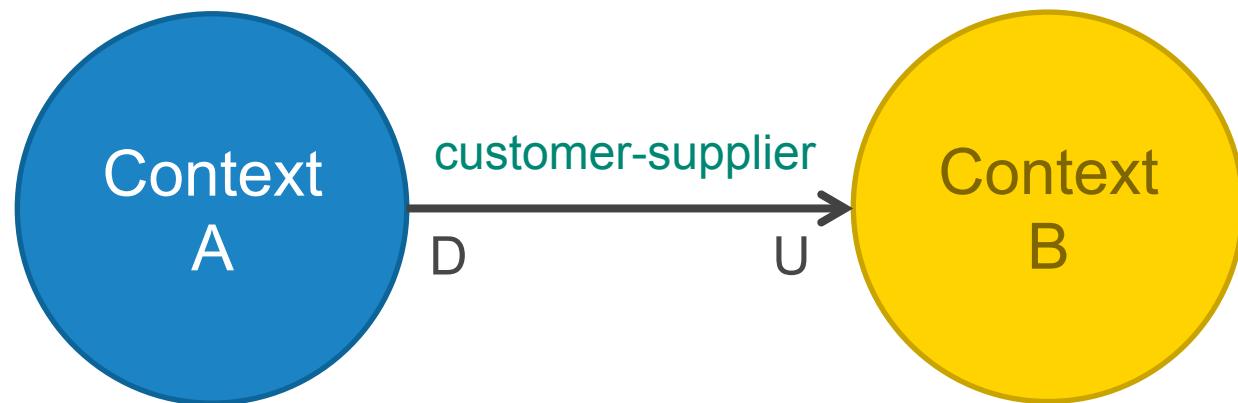
Succeed or fail together promoting a close co-operation between teams working on the bounded contexts



Pivotal

Customer Supplier

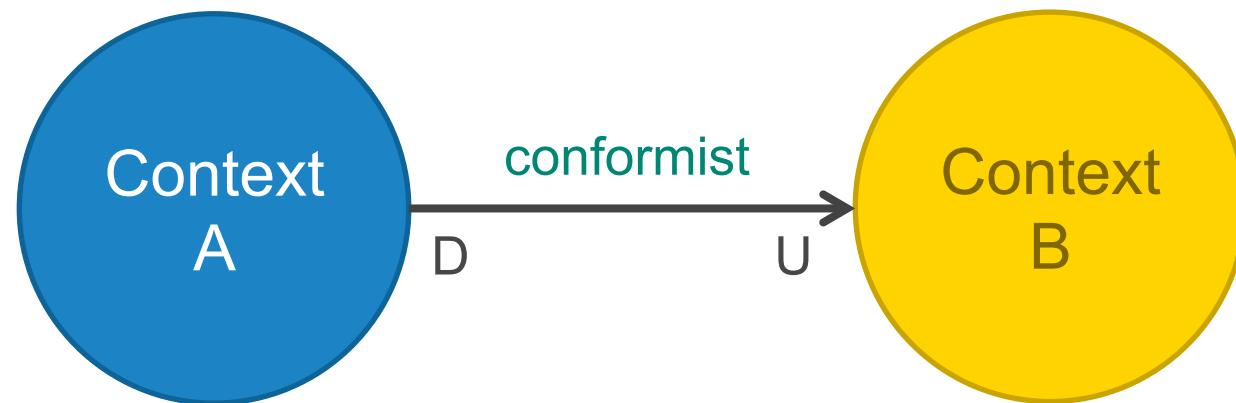
Success of the supplier partially depends on the success of the customer



Pivotal

Conformist

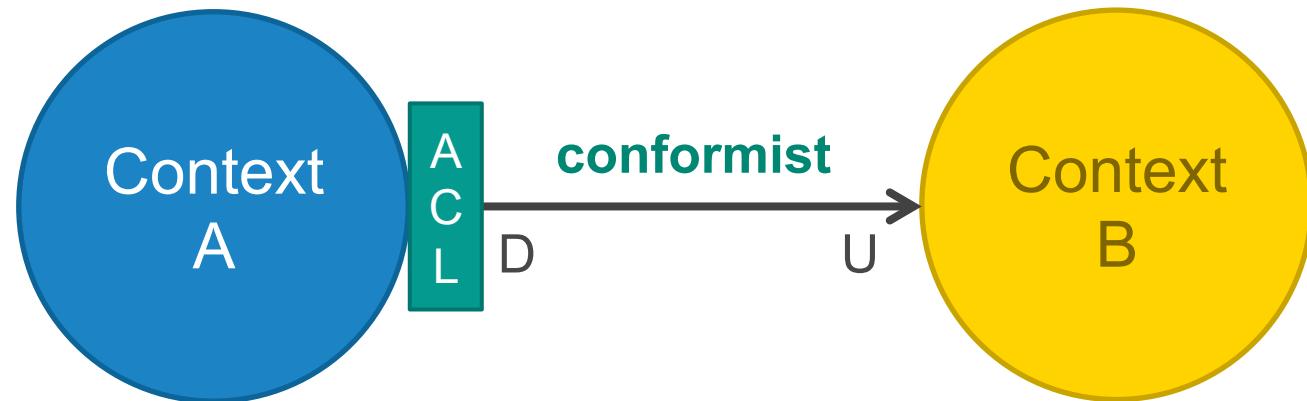
Upstream does not care about downstream



Pivotal

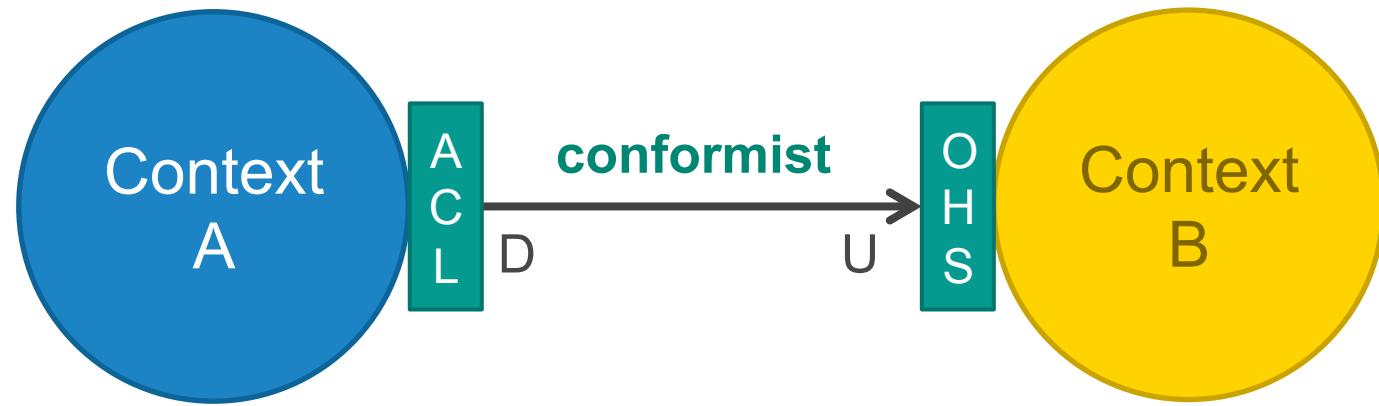
Anticorruption layer

An isolation translation layer allowing downstream to work with upstream using downstream bounded context domain concepts



Open Host Service

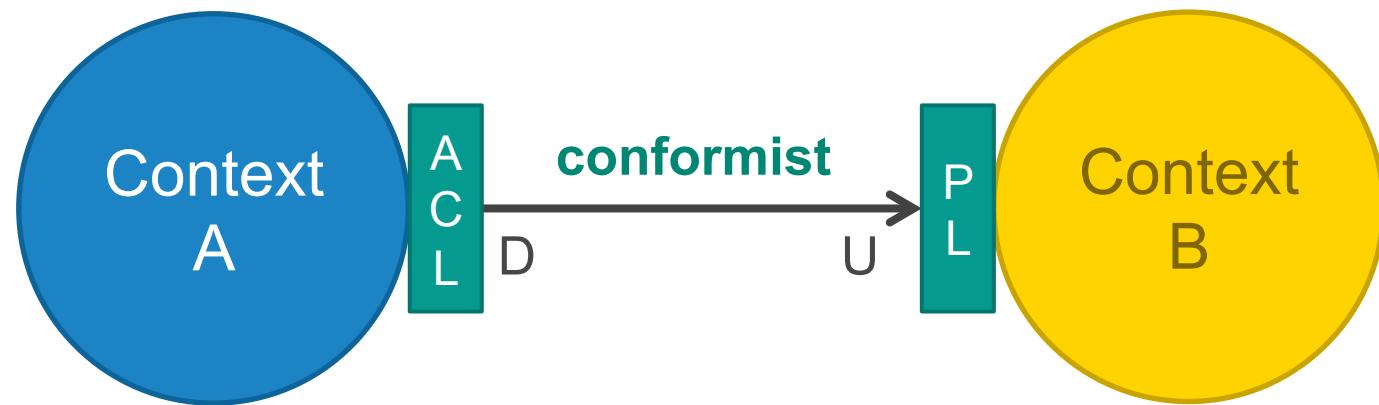
An upstream protocol for accessing its services



Pivotal

Published Language

A common well documented language that facilitates translation between different contexts



Pivotal

Context Mapping Example

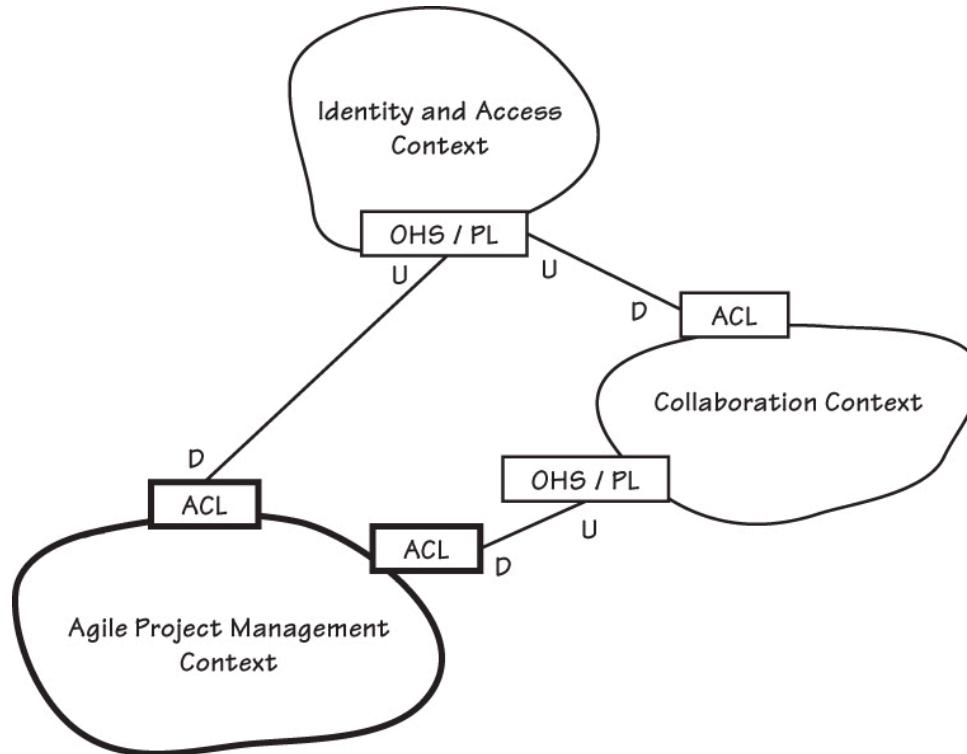


Figure 2.10 from Implementing Domain Driven Design

Pivotal

Hexagonal Architecture

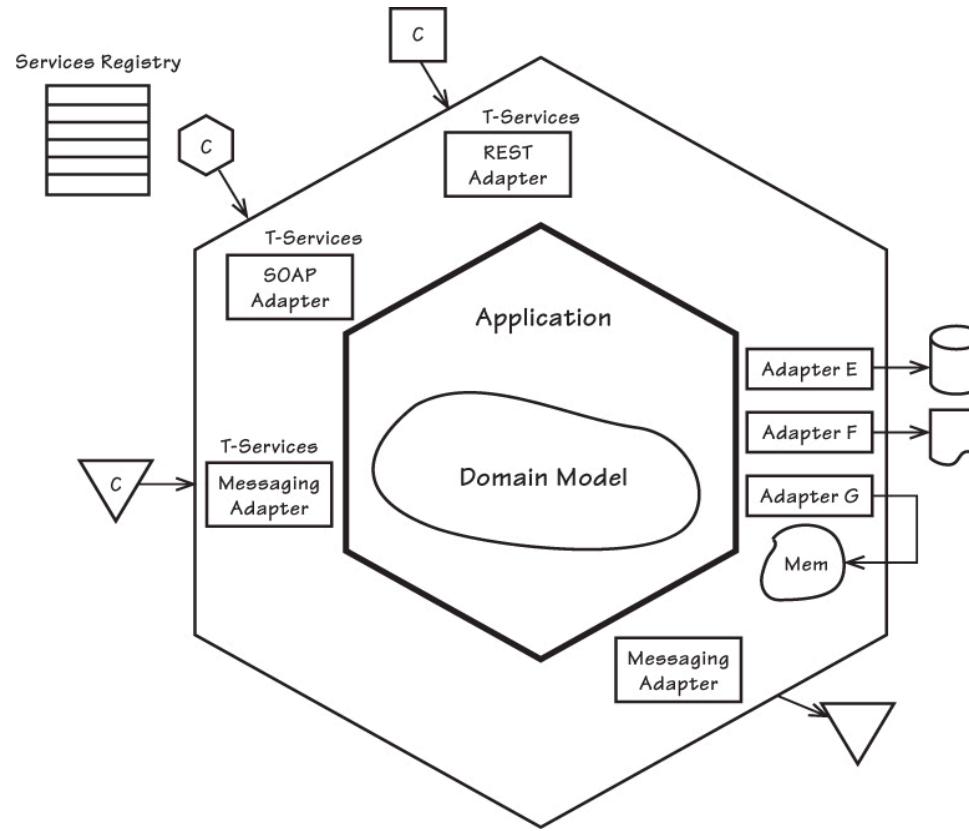


Figure 4.5 from Implementing Domain Driven Design

Pivotal

“Domain-Driven Design for the Database Driven Mind”

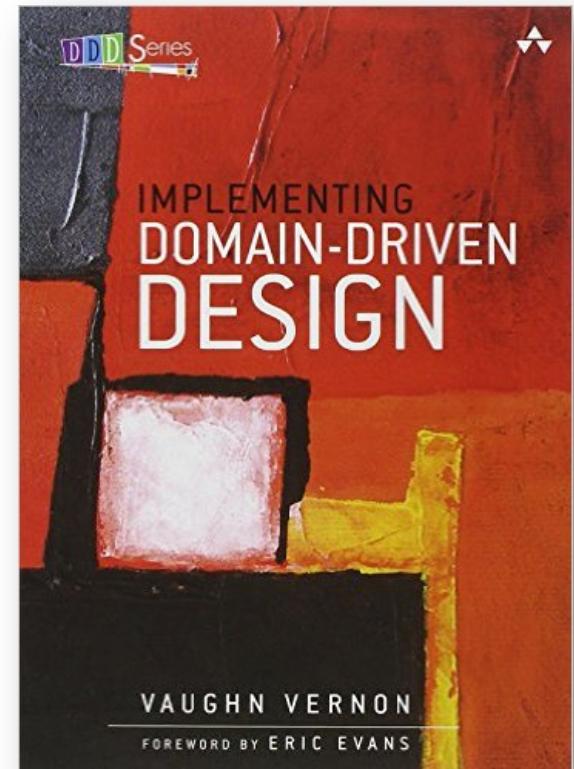
- 80 min video by Julie Lerman from May 2015
- Focuses on Bounded Contexts and their relationship to databases along with common technical objections for implementing Bounded Contexts
- Uses .NET Entity Framework examples but equally applicable to JPA
- <https://channel9.msdn.com/Events/Ignite/2015/BRK3724>

DDD & Microservices: At Last, Some Boundaries!

- 49 minute video by Eric Evans from Dec 2015
- Focus on Context Mapping and integration between different bounded contexts
- Great stuff for what a microservice & DDD
- <https://www.youtube.com/watch?v=yPvef9R3k-M>

Recommended Reading

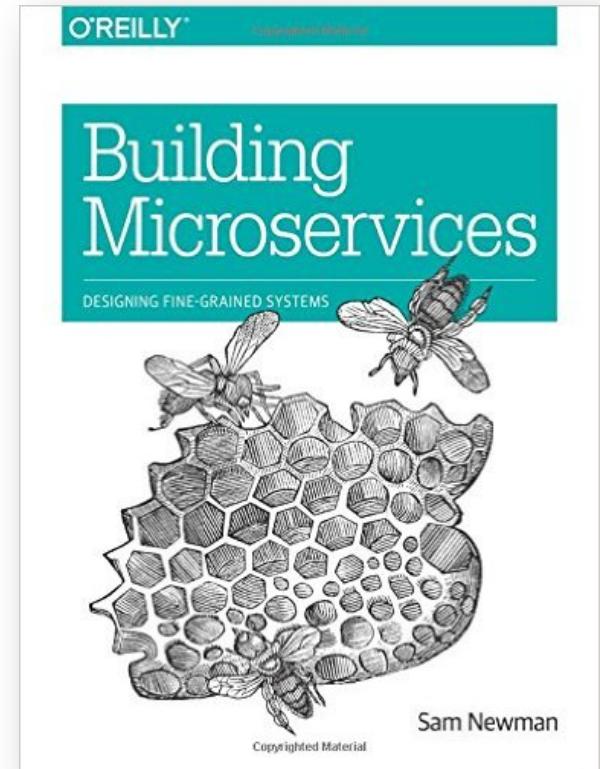
- New to DDD? start with this book
- Published in 2013
- 612 pages
- Easier read than Eric Evans book
- Clarifies things that are easy to miss in Evans book



Pivotal

Recommended Reading

- Fast read
- Published in 2015
- 259 pages
- Covers a lot of the design micro service issues does it dive in depth on any specific issues
- Assumes a background with larger topics such as DDD



Pivotal



Pivotal®

Transforming How The World Builds Software