Find Your Inner Bounded Context

A case study of breaking up a large monolithic application

Jim Everett

Developer, Architect, Software Enthusiast



Experience

HMBer

Married father of 2

Software Enthusiast

15 years of .NET Experience

Enterprise Architect

Developer

Scrum Master

Life Learner







Outline

What are we doing today?

1

Bounded Context
Definition of bounded context and why it is important

Problem

What problem are we trying to solve?

3

A Developer's Journey
Case study

Takeaways

Review of practical ideas to be learned from case study

2

4



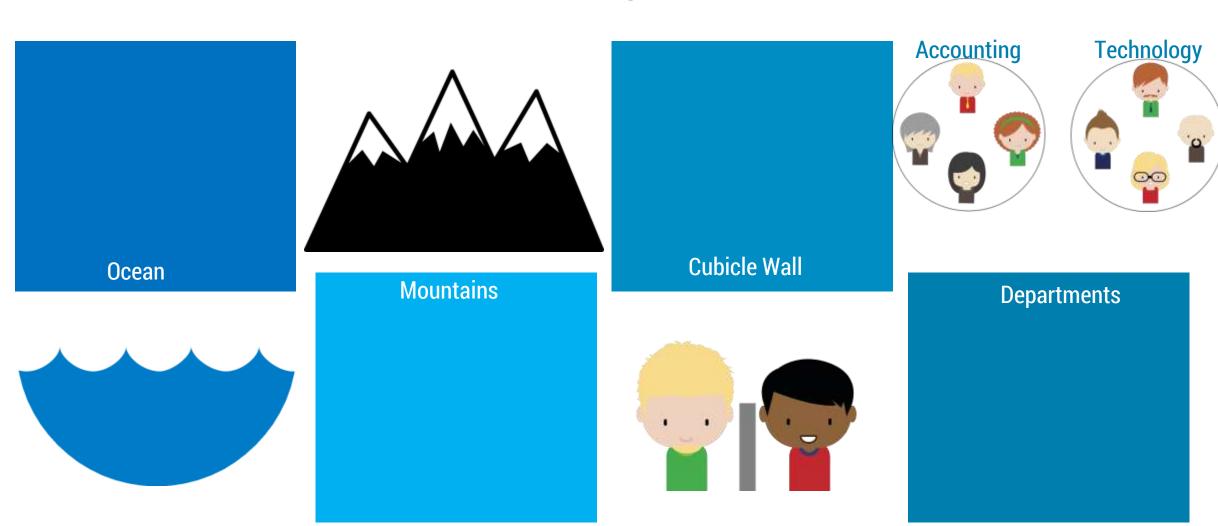
Boundary

Definiton

A real or imagined point or limit that indicates where two things become different.

Boundary Examples

Real or Imagined



Context

Definition

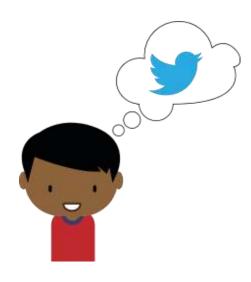
Background, environment, framework, setting, or situation surrounding an event or occurrence, which helps explain its full meaning.

Context Example

Tim concentrated and contorted his face while he created a tweet.

Twitter

Musical



Context

We were all amazed at how insightful and concise his tweet was.

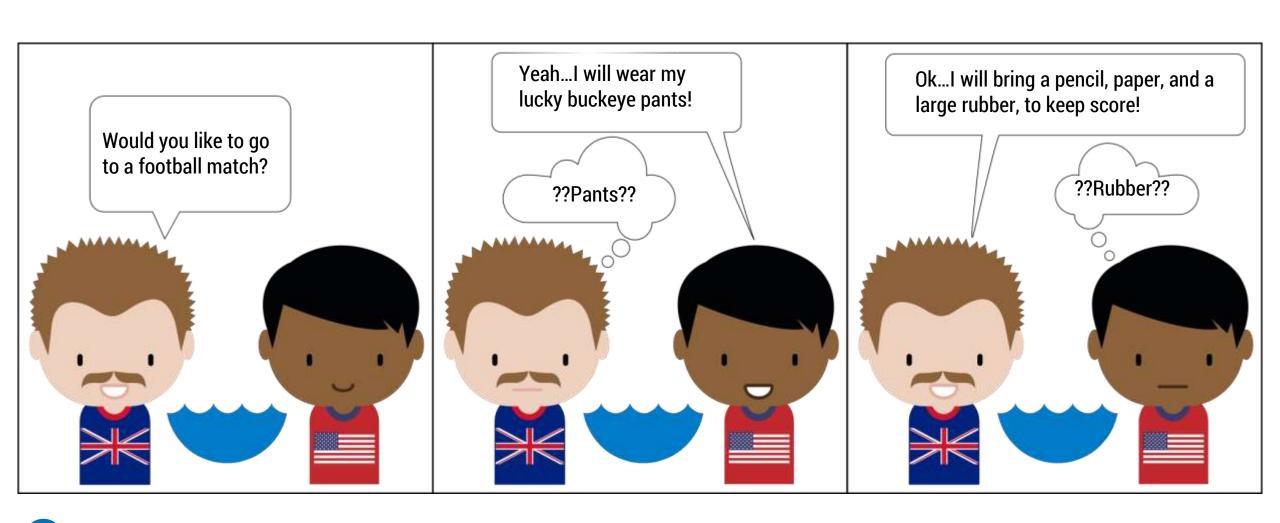


Context

We were all amazed by the sound coming from his face.

A Boundary Without Context

United Kingdom & United States



Domain-Driven Design Bounded Context

Definition

"DDD deals with large models by dividing them into different Bounded Contexts and being explicit about their interrelationships." — Martin Fowler



DDD Context

Definition

The setting in which a word or a statement appears that determines its meaning.

DDD Unbounded Context Example

Personal Finance Application

Account - Credentials

Account - Money

Login

Username

Password

Sign in

Apply Context To Software

Models

The maximum extent a model can be stretched without compromising its conceptual integrity is called a *context*.

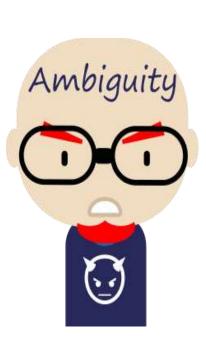
Ubiquitous Language

DDD – Common, Rigorous, Shared Language

Special condition where every term has a single unambiguous definition.

Ambiguity

Super Villain of Ubiquitous Language!

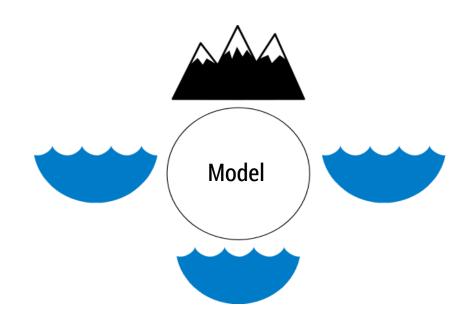


DDD Boundary

- Explicit
- Keeps the knowledge inside consistent whilst ignoring the noise from the outside world
- Formalize interactions between different contexts

DDD Bounded Context

Bounded Contexts are models with explicit boundaries, where the model is unambiguous within the boundary.



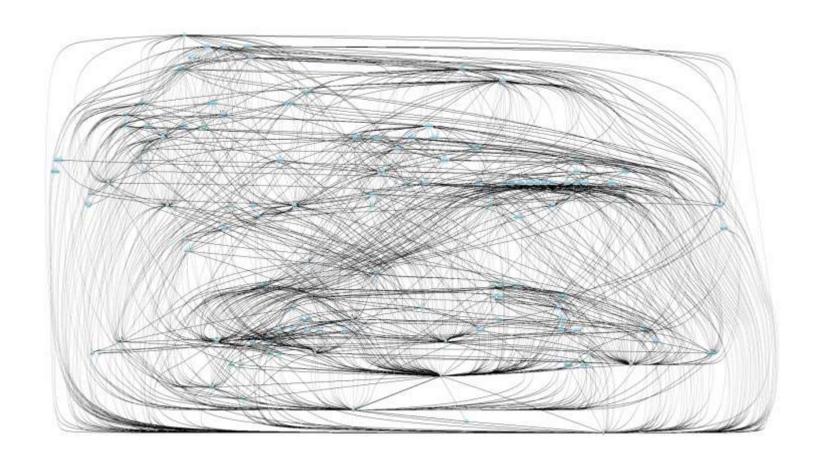
Bounded Context == Language

Defining Bounded Contexts is an exploration of language



Is this yours?

Coupled Dependency Graph



So What?

- Difficult to change
- Difficult to test
- Difficult to reason about

How did we get here?

- Small changes over time
 - Most systems have a stage when they are small
 - As they grow, they become more complex and difficult to understand

Cognitive Burden

- Developers are the limiting factor
- Humans are the limiting factor
- Tools
 - Functions
 - Classes
 - Abstractions
 - Interfaces
 - SOLID
 - Domain-Driven Design
 - Service-Oriented Architecture

Essential Complexity is the Model

- Accidental vs Essential Complexity
- Essential Complexity is in the business domain itself
- Often our issues are not technical hurdles
- Domain a sphere of knowledge, influence, or activity

Importance

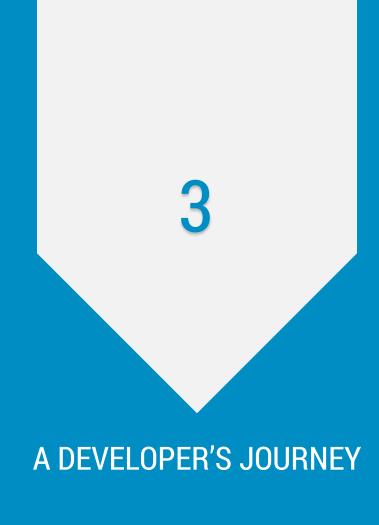
- Bounded Context helps to solve Essential Complexity
- Smaller, more focused model allows for better architecture
- Over time we recognized that "total unification of the domain model for a large system will not be feasible or cost-effective" (Eric Evans)

Application

- Decomposition of problem
- Service-Oriented Architecture (SOA)
 - What use cases should be grouped together? Bounded Context.
 - A service should not cross a bounded context.
- Micro Services
 - How to define what is included in a micro service? Bounded Context.
- Command Query Responsibility Segregation (CQRS)
 - What entities should share code? Bounded Context.
- RestFul Services
 - Which resources should be grouped together? Bounded Context.
- Data Access
 - How do I create a data access layer without a one to one relationship with the database? Bounded Context.

Cost of Bounded Contexts

- Identifying Bounded Contexts requires significant effort, so focus on your core business
- Many large business applications would derive value from utilizing Bounded Contexts

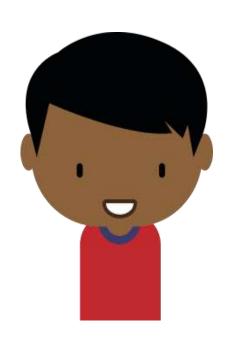


A LONG TIME AGO IN A FAR AWAY PLACE.

Colorado

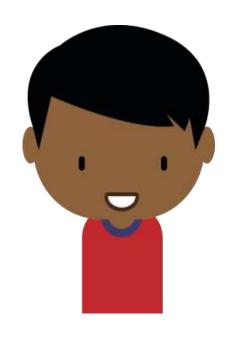


Developer



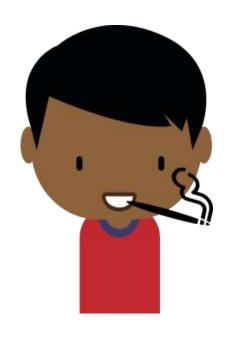


Tim is Reasonably Bright



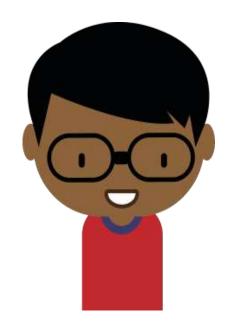


Marijuana is Not Legal

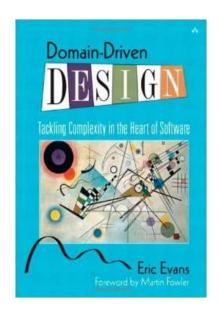




2009

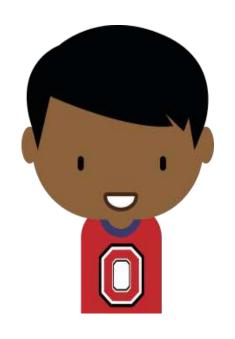


Yes Tim can ReadBut only read Chapters 1 - 11

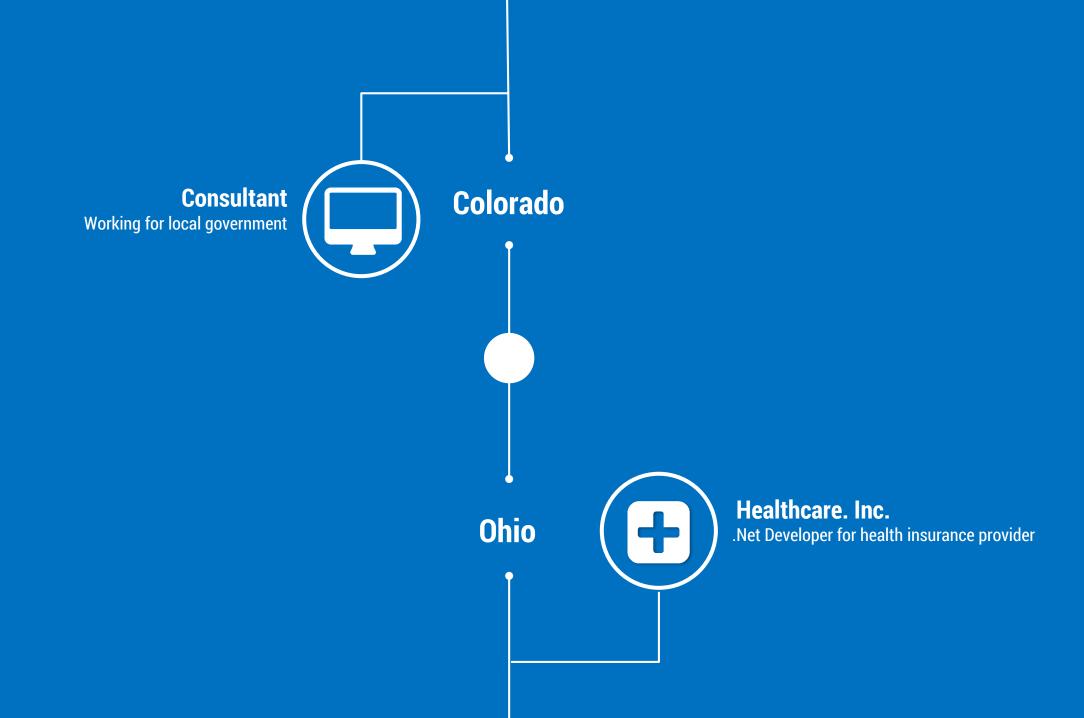


Domain Driven Design

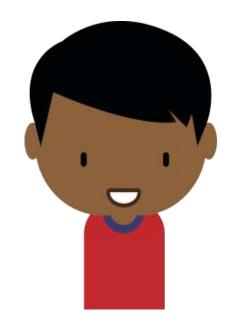
New Opportunity

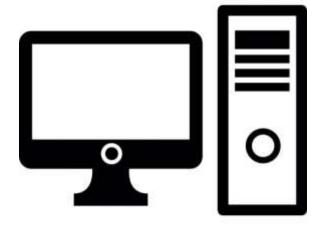




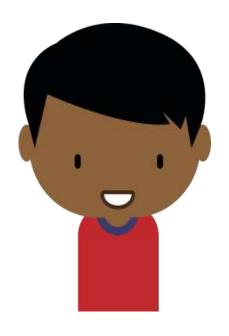


Tool On Boarding



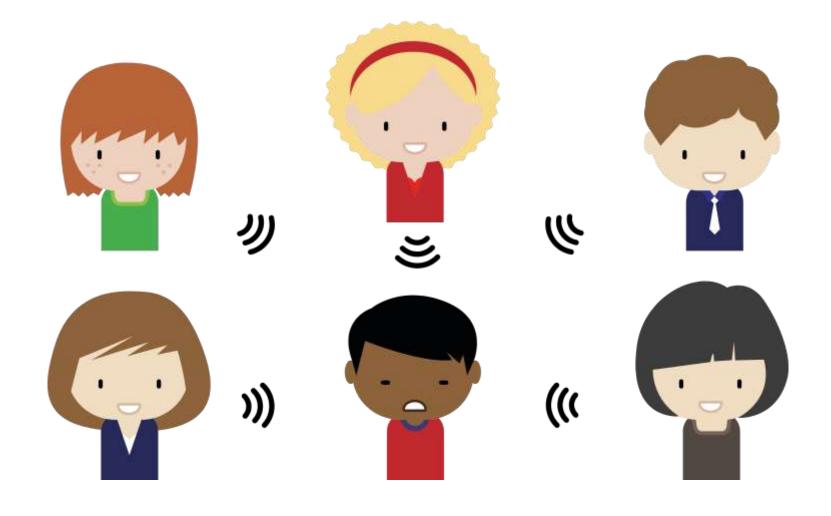


Technical On Boarding

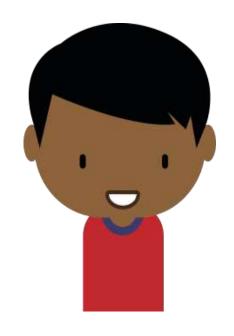


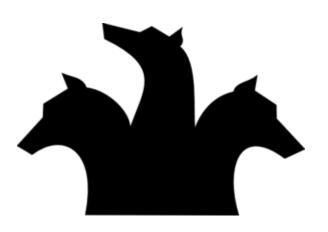


Application On Boarding



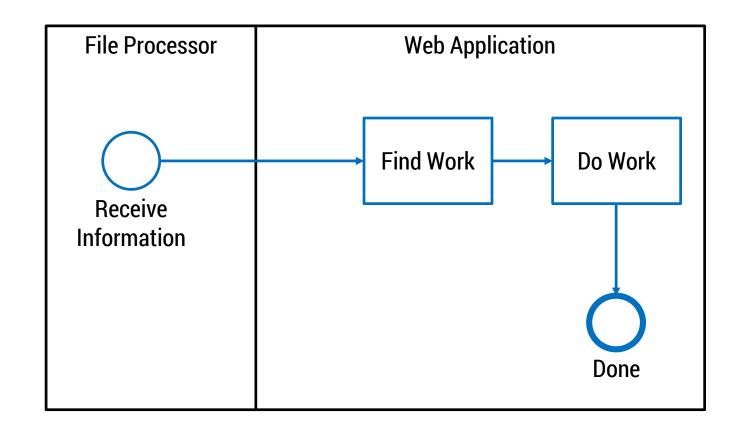
Cerberus





Tim's Mental Model 1

Cerberus



The Code



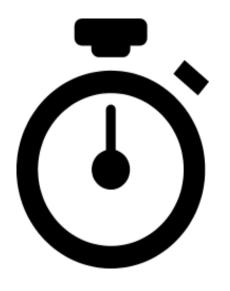
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Medical Event





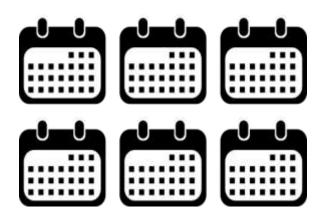
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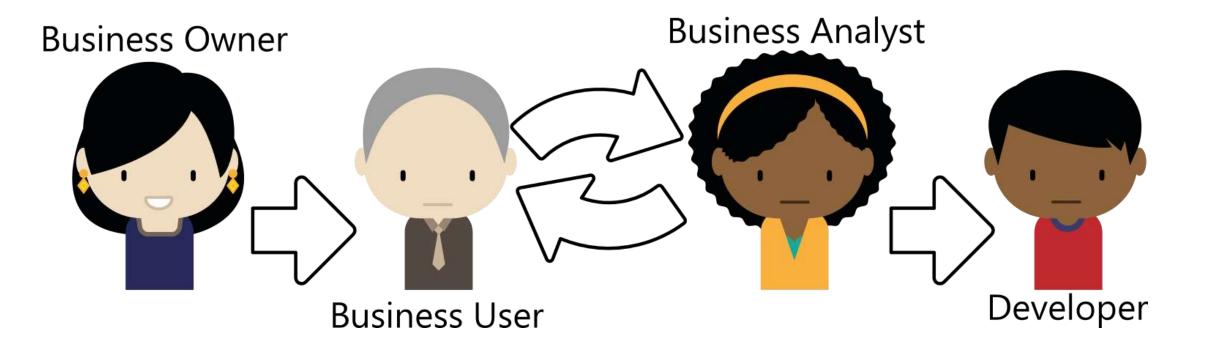


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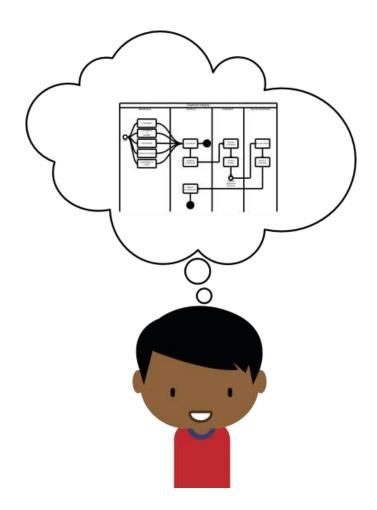




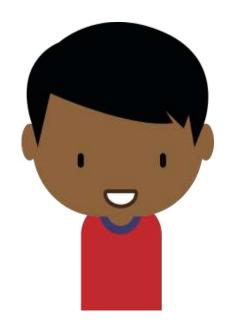
Communication Pattern



Mental Model Is Context



New Project





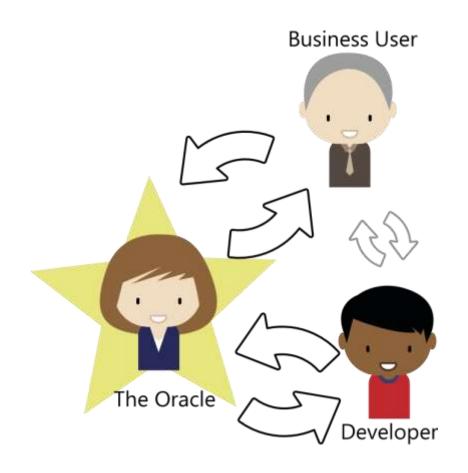
The Oracle



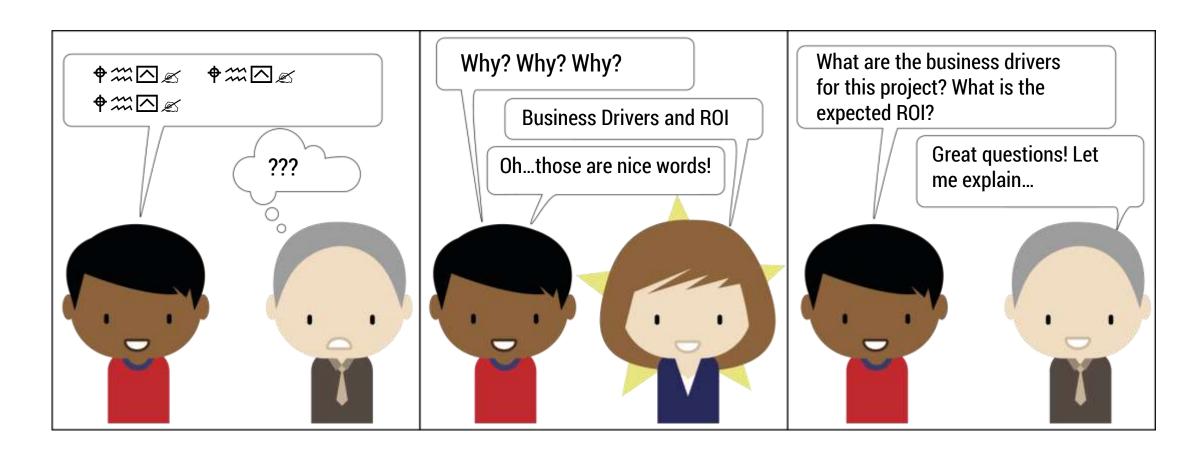
Attributes

- Access to Business Users
- Understanding of Business Process
- Rough understanding of technology
- Wants to discuss how business works and how technology is being applied to solve problems

Oracle, Developer, Business



Learning a new Language

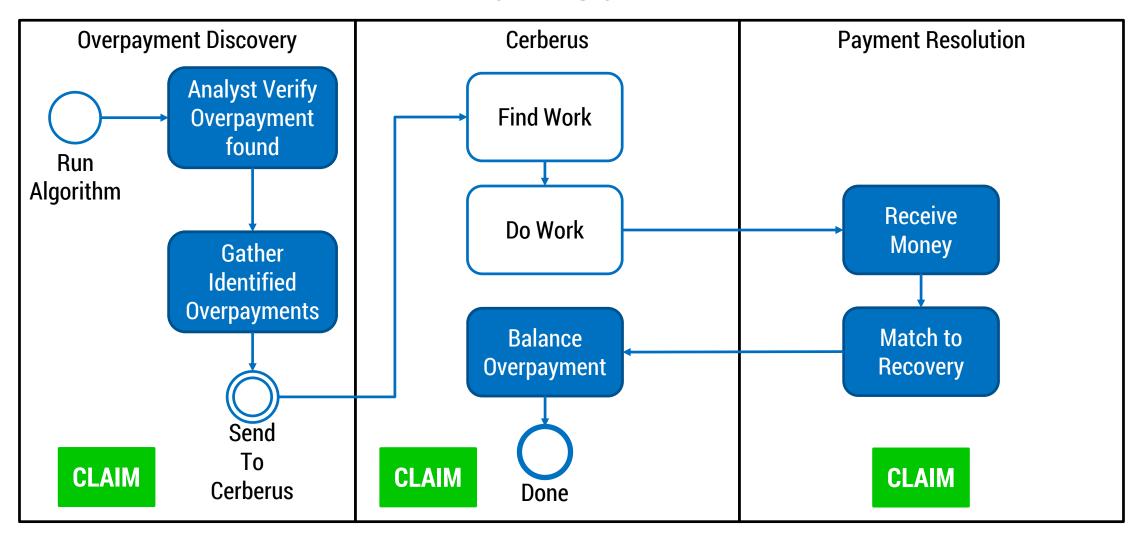


Success



Tim's Mental Model 2

Payment Integrity

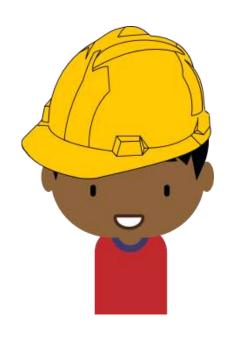


Tim the Architect





Solution Architecture Document





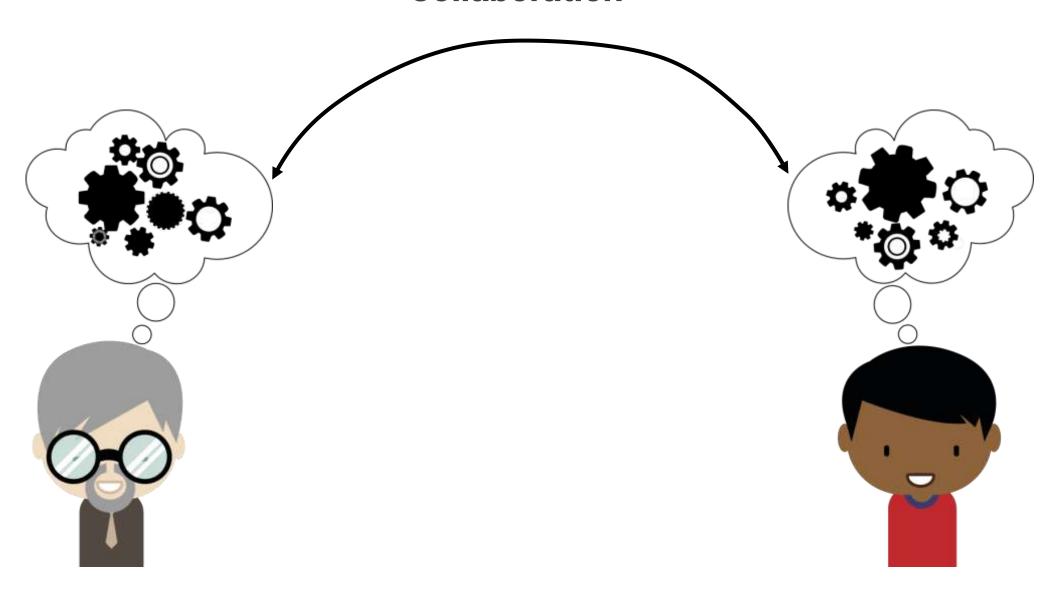
The Guru

Attributes

- Highly technical
- A sounding board for ideas
- Interested in tackling Essential Complexity
- Life long learner

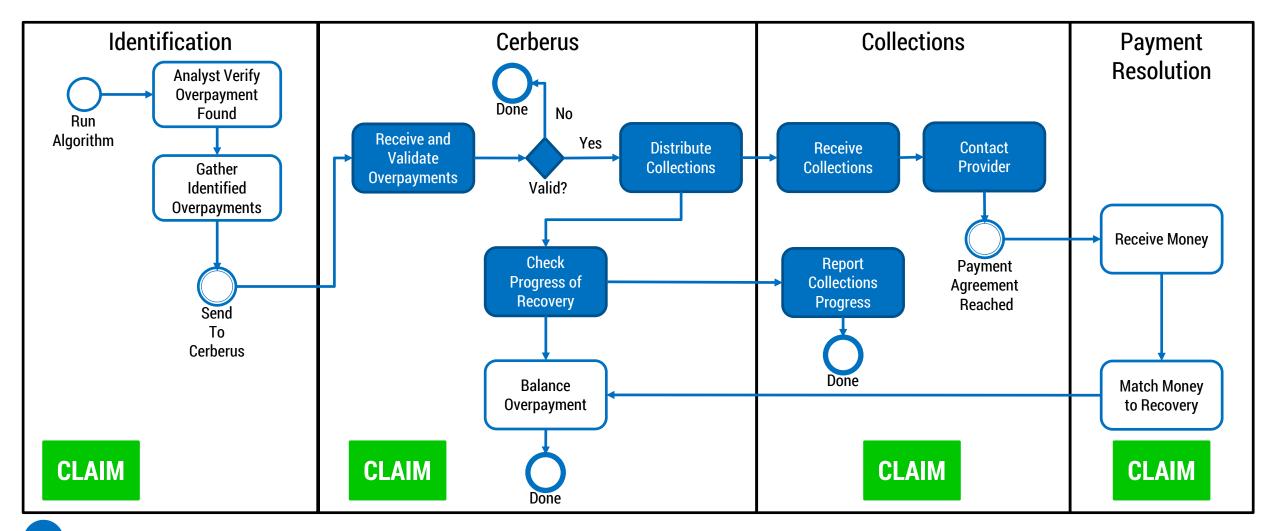


Collaboration

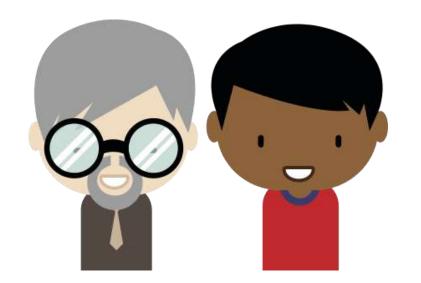


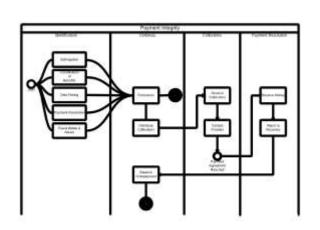
Tim's Mental Model 3

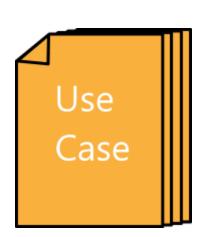
Payment Integrity



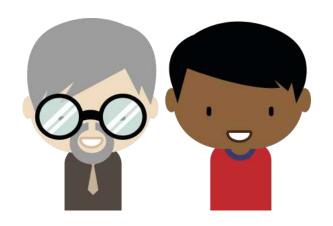
Validate Model







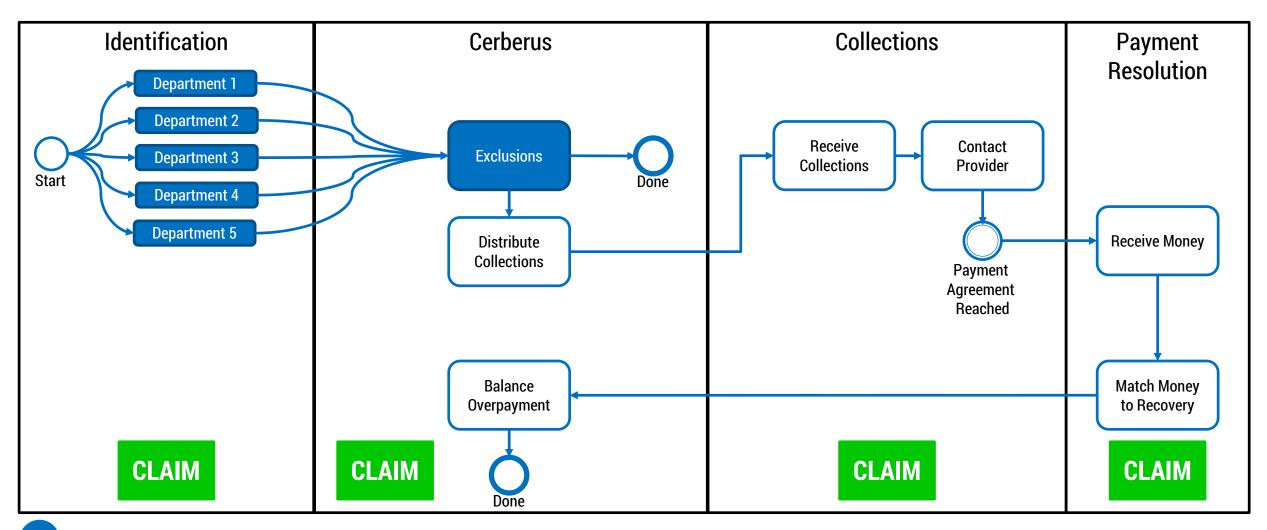
New Integration



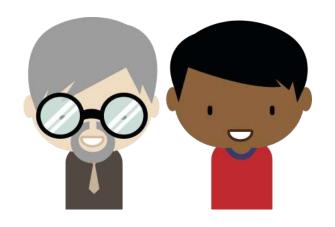


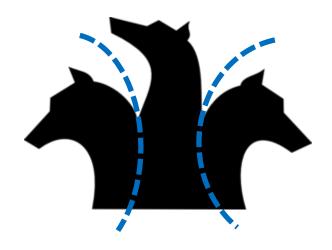
Tim's Mental Model 4

Payment Integrity

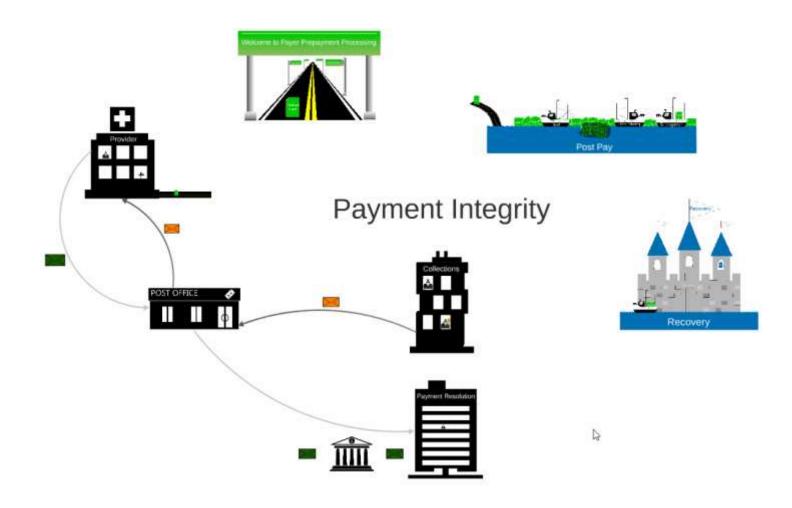


Result

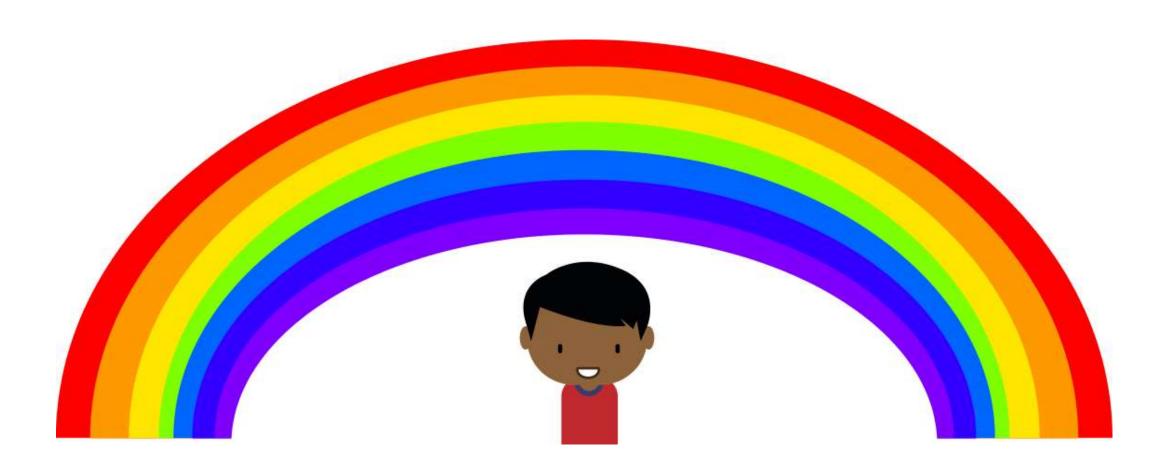




Prezi

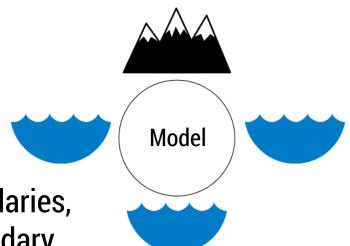


What Could Have Been





Bounded Context



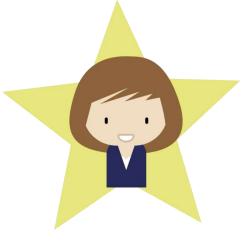
- Bounded Contexts are models with explicit boundaries, where the model is unambiguous within the boundary
- Bounded Contexts are useful in many different architectural styles
- Identifying Bounded Contexts requires significant effort, so focus on your core business
- Many large business applications would derive value from utilizing Bounded Contexts

On Boarding



- Focus on the essential complexity, the domain
- It takes time for humans to digest new information
- A person will not gain deep knowledge without asking questions

The Oracle



- Identify an Oracle and/or business users to help refine the model
- Learn how to shape questions in business terms
- Software design is a collaborative process and requires open communication between business users and developers

The Guru



- Stitch together other peoples' experience to create a larger model
- Identify a Guru to use as a sounding board
- Use relationships with gray beards to establish context of decisions
- Utilize Use Cases to continually validate the model
- Take time to analyze the problem domain

New Integration



- Identify all upstream and downstream business users
- Learn about how the business units who interact with your system are divided and what their responsibilities are

References

- Greg Young CQRS/DDD talks extensively about bounded context
 - https://youtu.be/KXqrBySgX-s
- Udi Dahan CQRS and DDD
 - https://youtu.be/EkEz3pcLdgY
- A good discussion of Bounded Context
 - http://programmers.stackexchange.com/questions/237513/what-in-reference-to-ddd-is-a-bounded-context
- Eric Evans Domain Driven Design
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- Bounded Context Discussion
 - http://culttt.com/2014/11/19/bounded-contexts-context-maps-domain-driven-design/
- Eric Evans 5 Years after DDD pushed
 - http://dddcommunity.org/library/evans_2009_1/
- Discussion of importance of bounded context
 - http://eventuallyconsistent.net/2012/05/14/why-bounded-context-really-matters/
- Definition of Context
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