Course: Domain Driven Design & Microservices for Architects

Section: Understanding the Domain

http://acloudfan.com/

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Discount Link to course:

https://www.udemy.com/course/domain-driven-design-and-microservices/?referralCode=C5DCD3C4CC0F0298EC1A

Understanding the Domain

Terminology

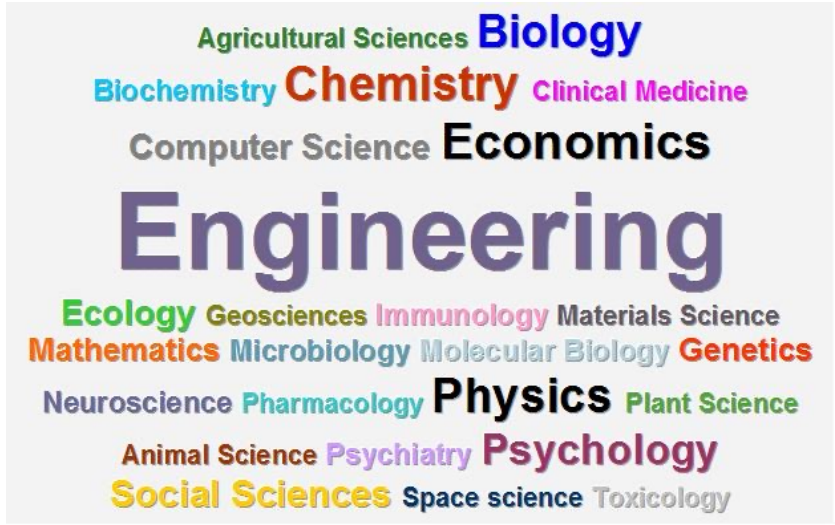
What is a domain?

Domain experts?

Intro to ACME Travels

English Language definition of *Domain*

> A sphere of knowledge, influence, or activity



Business perspective of *Domain*

> A field | industry in which the business operate

Banking

Oil & Gas

Retail

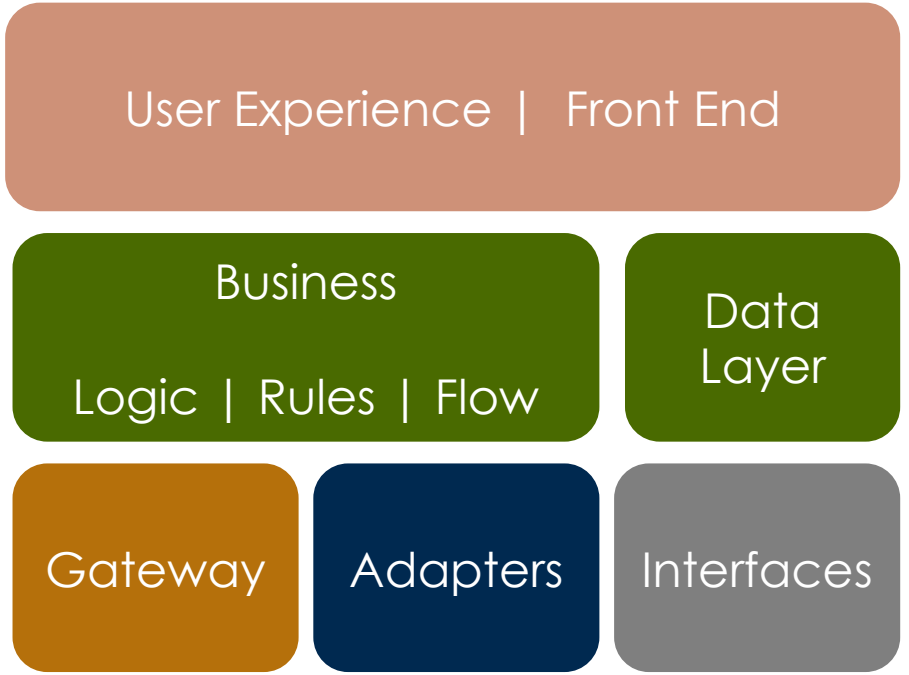
... ...

Technology perspective of *Domain*

> Represents the problem space

eCommerce

eCommerce



Software perspective of *Domain*

> Represents the problem space

- eCommerce
- Social Media
- Media Streaming
- Resource Planning

amazon.com

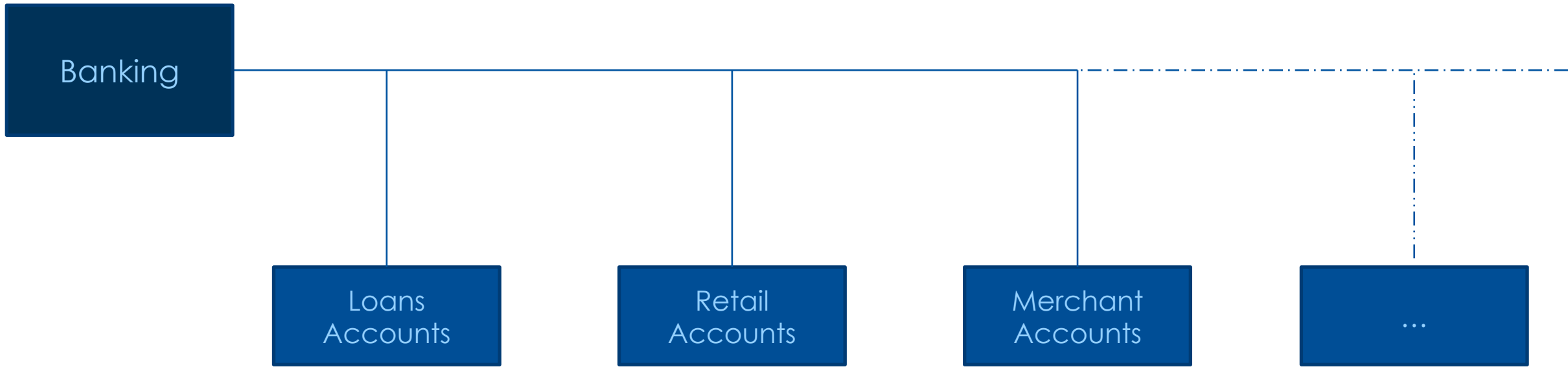
twitter

NETFLIX

SAP

Sub-Domains

Each domain consists of Sub-Domains



Domain Experts

a.k.a. Subject Matter Experts or SME

Thorough understanding of the domain

Banking

Accounts Expert

Domain Experts

a.k.a. Subject Matter Experts or SME

NO one expert knows everything about the domain !!!

Banking

Retail Accounts Expert

Merchant Accounts Expert

Loans Accounts Expert

Compliance & Regulatory

ACME Travel

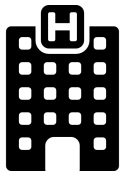
Travel & Leisure industry

Travel Advisor





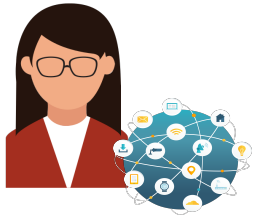





ACME Travel

There are multiple experts within a domain !!!

Travel Advisor



Partner Contracts

Accounts

Customer Support

... ...

Quick Exercise

What domain are you in?

Subdomains within that domain?

List out the domain experts you work with?

Quick Review

Domain = A sphere of knowledge, influence, or activity

- Made up of MULTIPLE Sub-domains
- Multiple Domain Experts needed to support business functions

Architecture & Design

Understanding the idea behind modeling

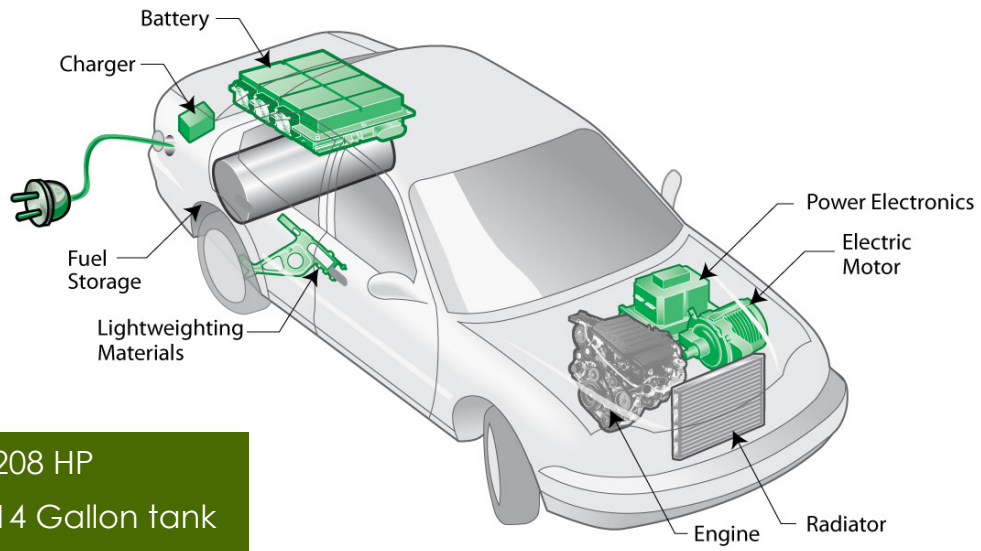
Conceptual Models

Architectural Models

Architecture Vs. Design

Conceptual Models

> A representation of a system made from composition of concepts



208 HP
14 Gallon tank
70 kWH battery

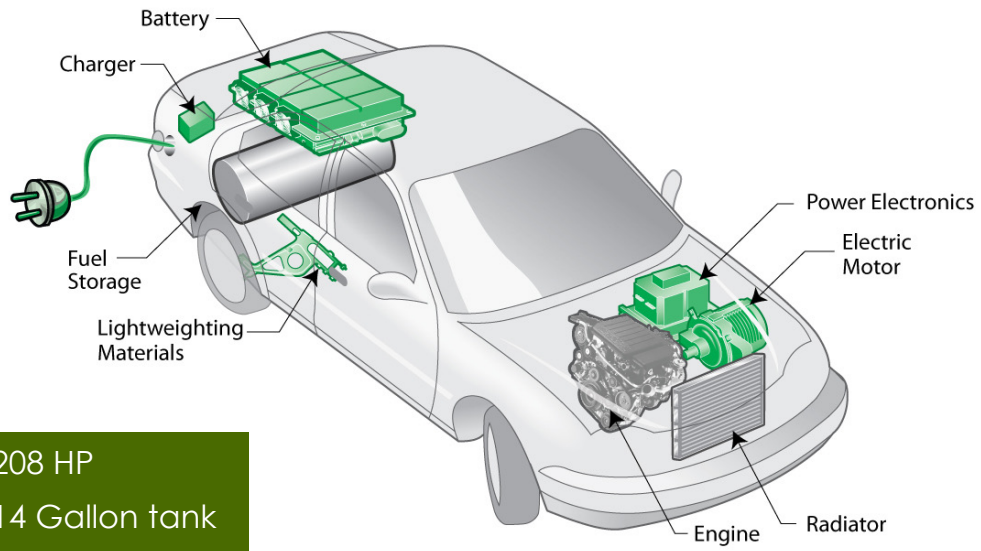
Objective of Conceptual Models

1. Enhance the understanding of the designers

2. Conveying the ideas to stakeholders

3. Provide a point of reference to create detailed specifications

4. Documentation for future reference



208 HP
14 Gallon tank
70 kWH battery

Software : Conceptual Models

Common terminology for the domain concepts

Identifies different parts of the system

Relationships between the concepts

Critical | Foundational parameters are defined

Architectural Model

Visualization of the system represented by the model

Architectural Model

a.k.a. architecture

> Structured representation of a solution that meets the requirements in the problem space

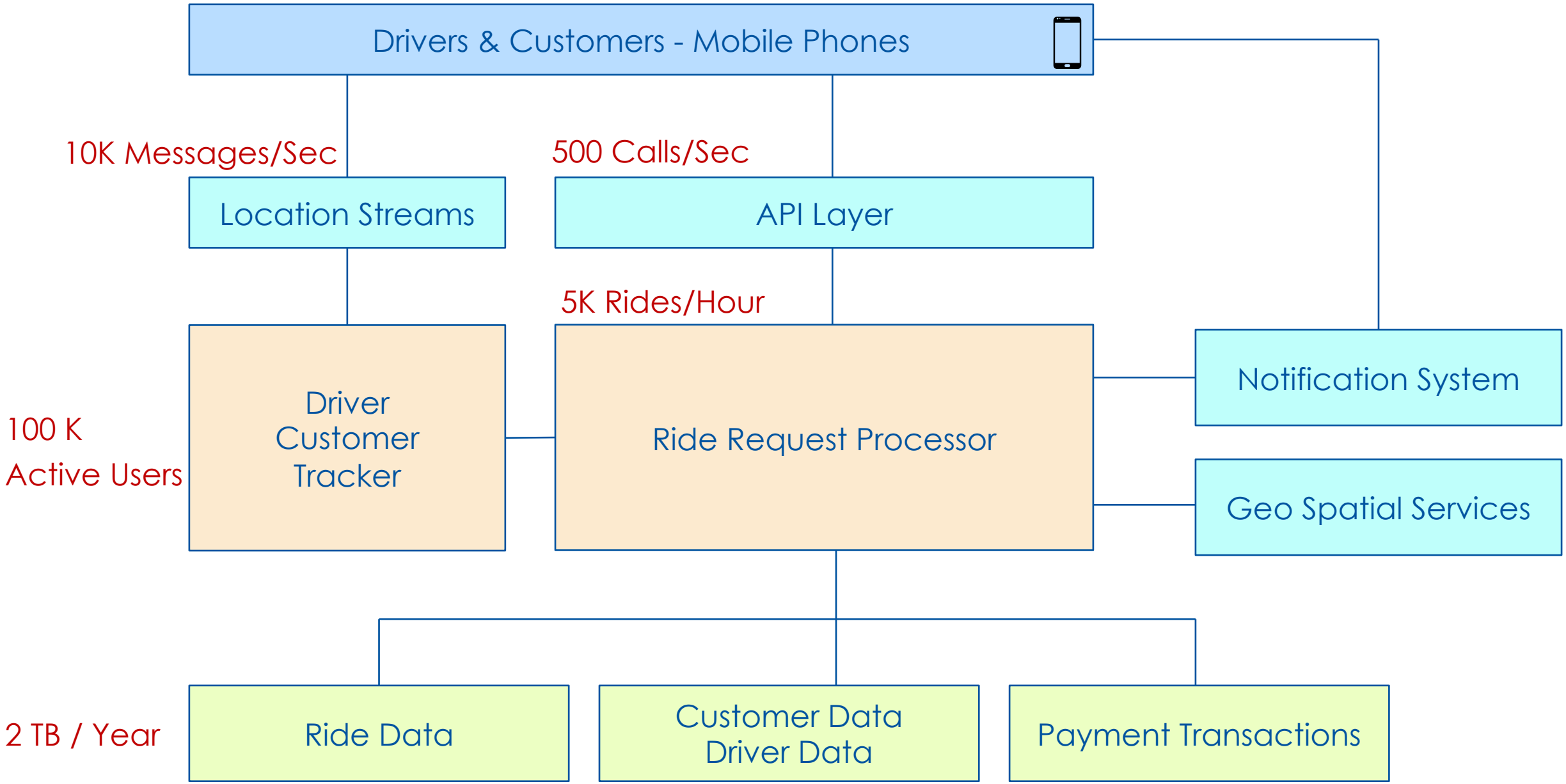
- High level abstraction of parts of the end solution
- Presents a view of how the requirements will be met
- Assist in answering the questions posed by different stakeholders

Architecture Vs. Design

Difference is in the level of details & focus

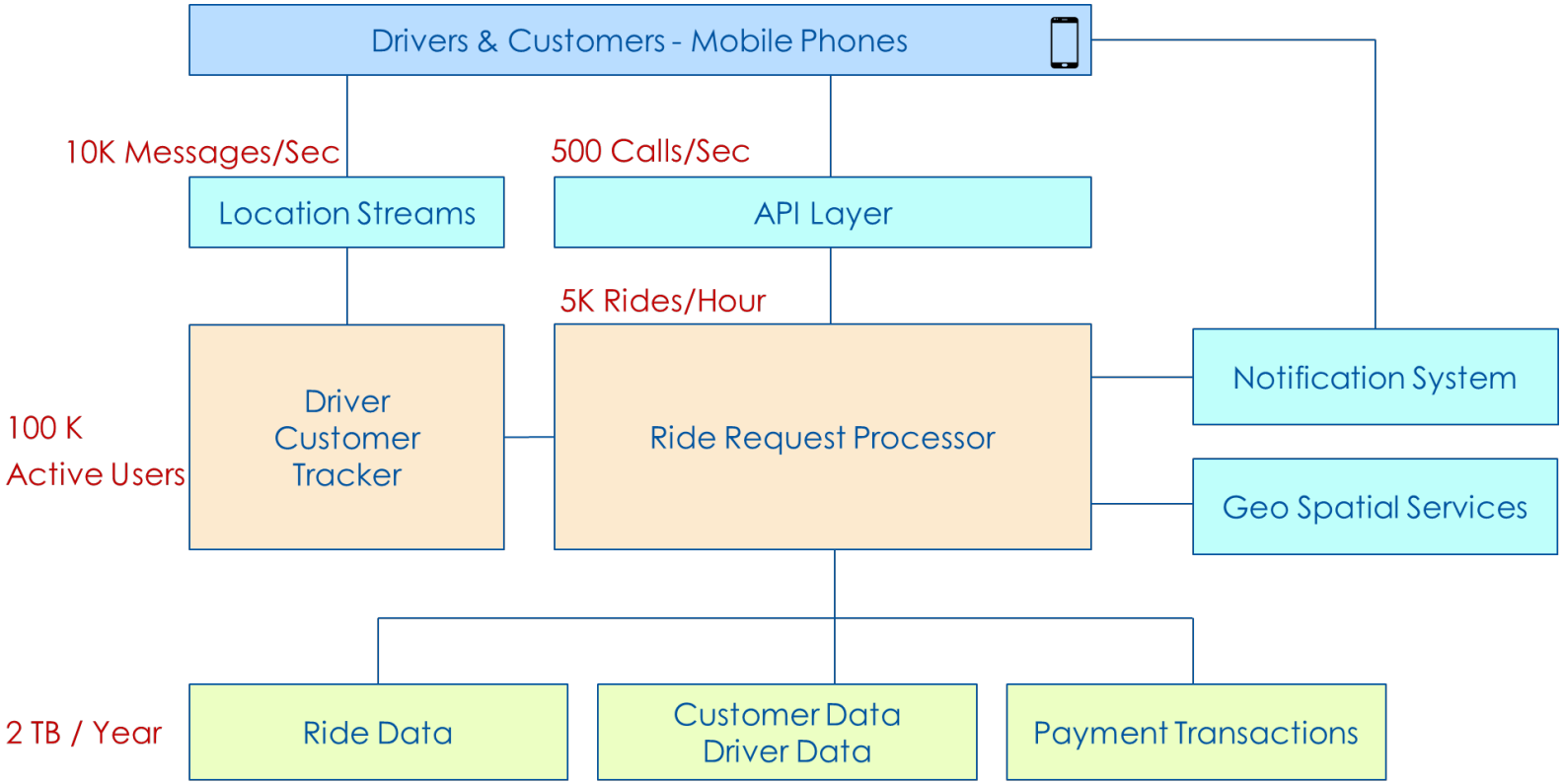
- **Architecture** = High Level | Skeleton | Long term focus
- **Design** = Relatively detailed | Focus on implementation

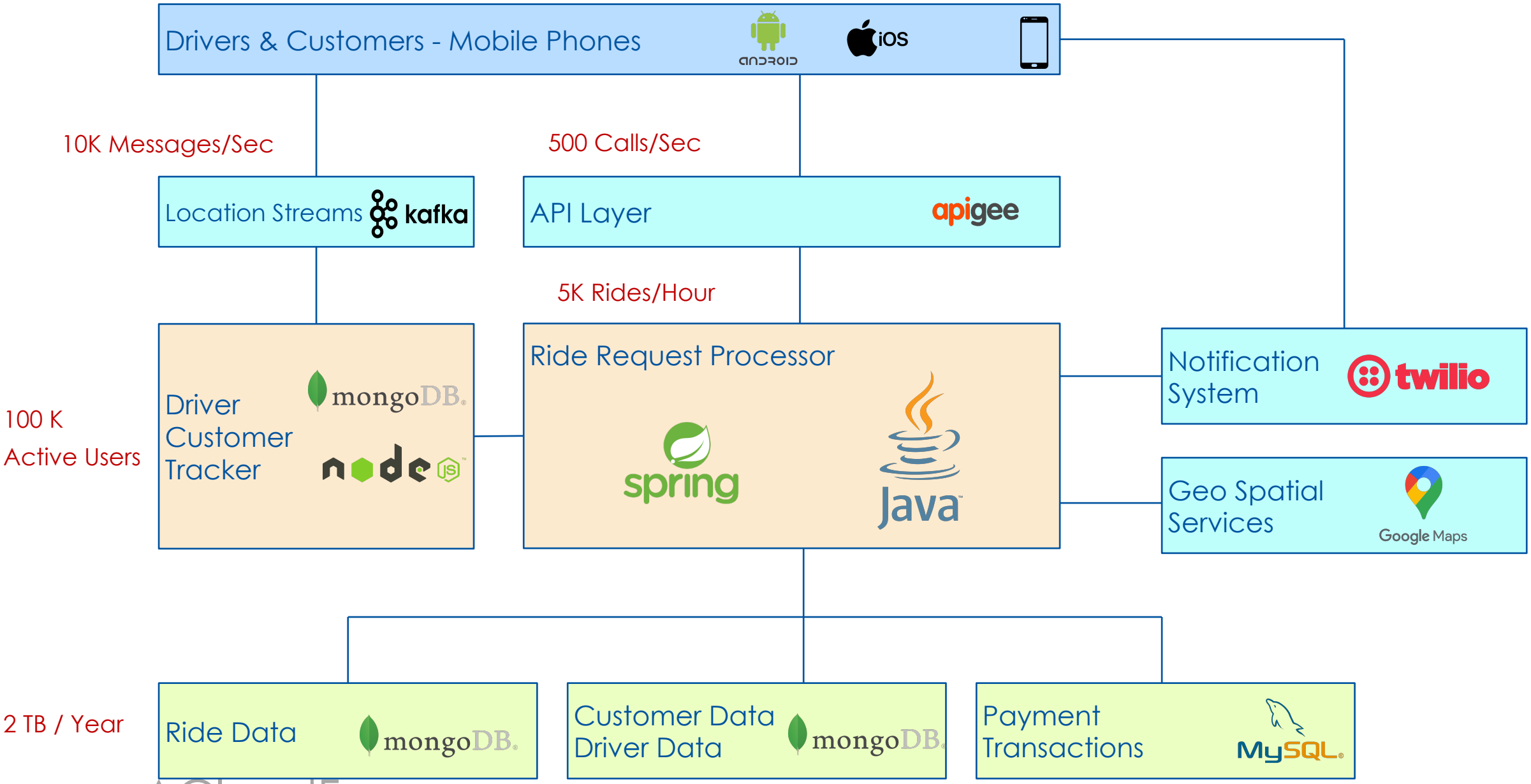
Architecture & Design for a Rideshare System



Quick Exercise

Think about the design





Quick Review

Conceptual Model = A set of concepts & their relationships

Architectural Model = A structured representation of a solution

Design = A structured representation of a solution that is closer to the implementation

Modelling & Architecture style

Common Modeling Techniques and Architectural Styles

Modelling techniques

Architectural Styles

Intro to Domain Driven Design

Model Diagrams

Multiple ways of modelling

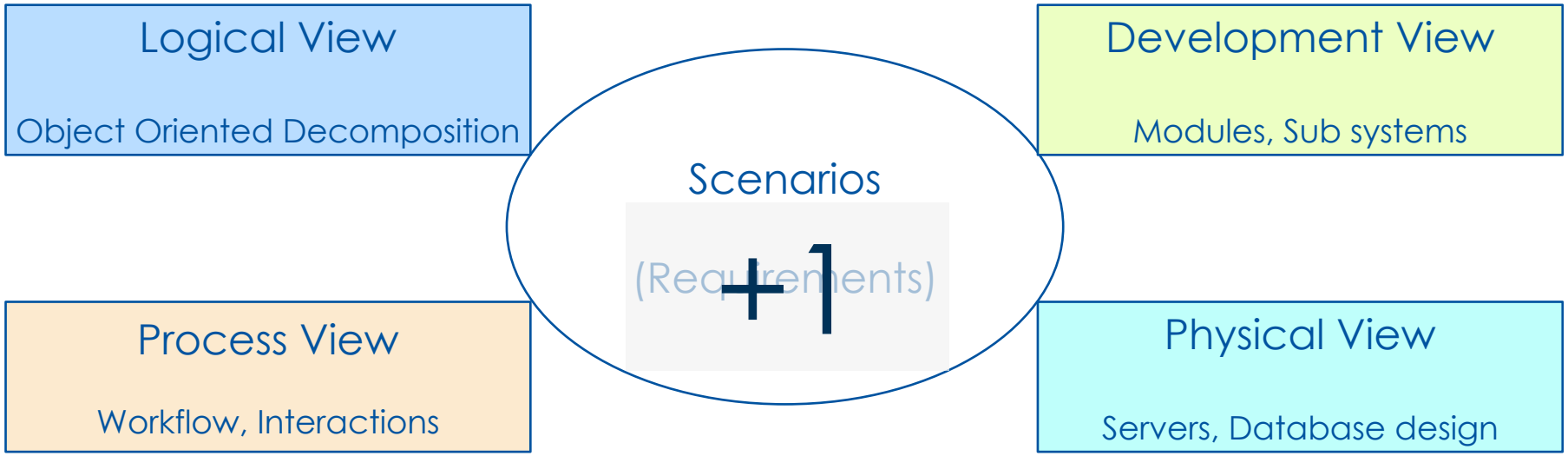
- Purpose
- Perspective | Viewpoint
- Level of Details

Models are NOT mutually exclusive i.e.; you may create multiple models for the same system

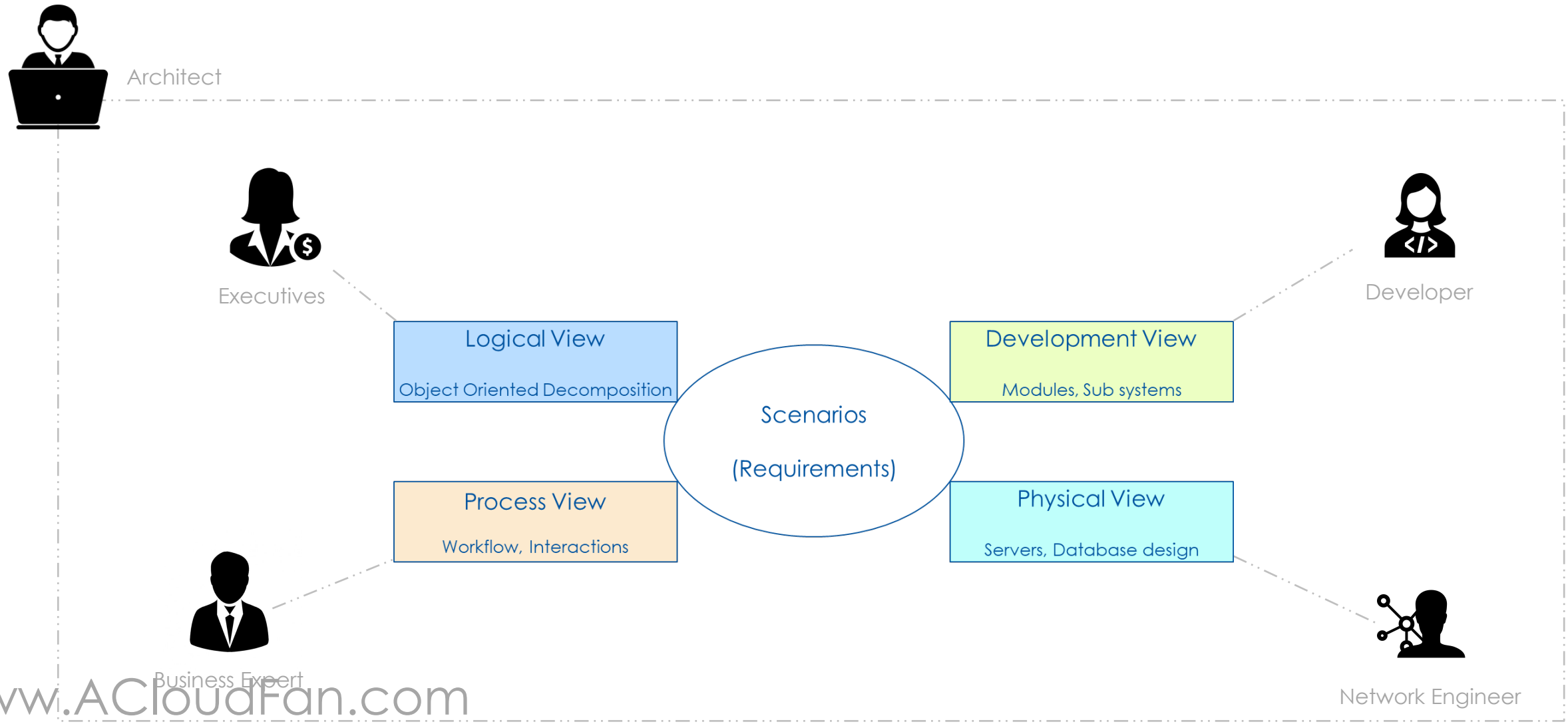
4+1 Architectural View Model

4 +1 Architectural View Model

Describe the architecture from viewpoints of multiple stakeholders

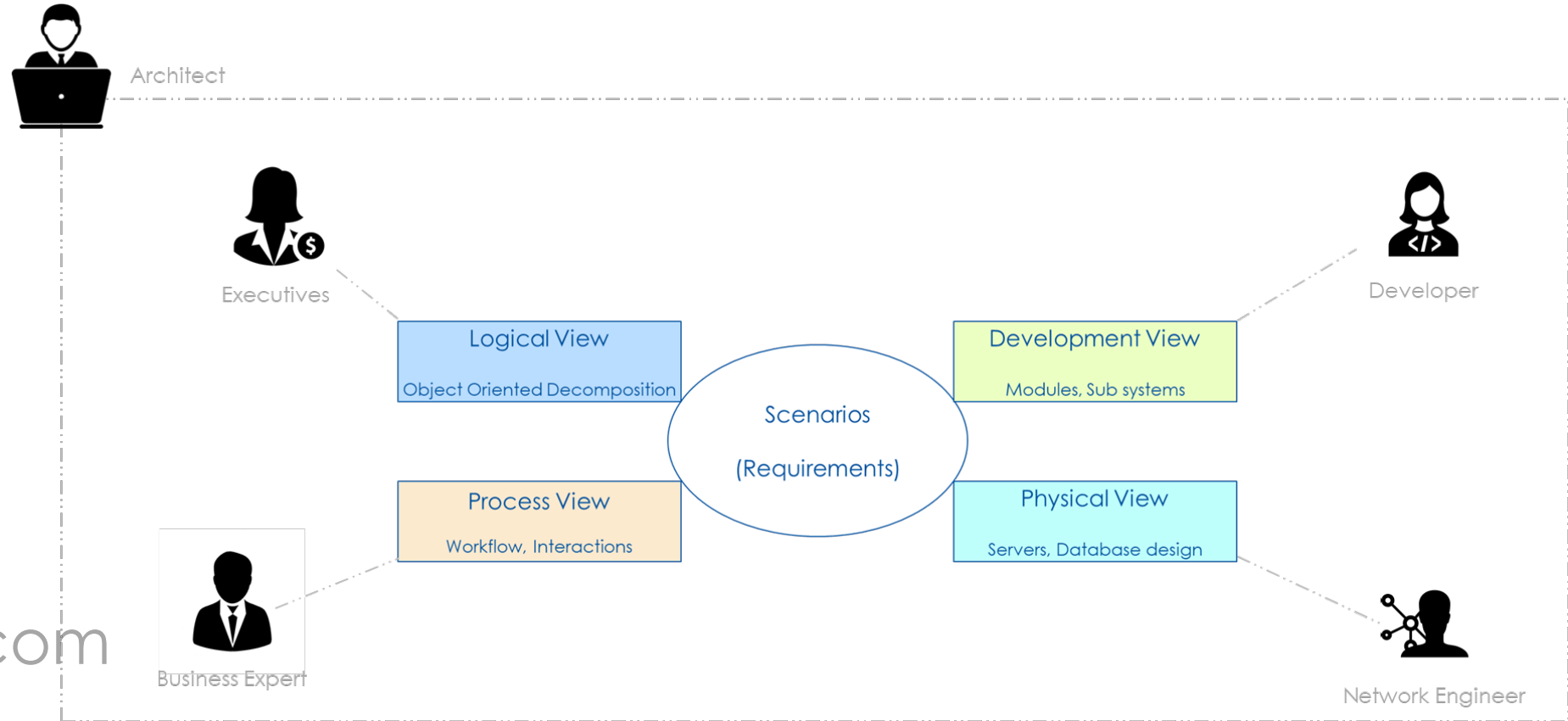


Stakeholder Interests | Concerns



Quick Exercise

List out the stakeholders in your organization



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Please go through basic UML notation & diagrams on your own

http://www.omg.org/uml

A standard set of diagrams

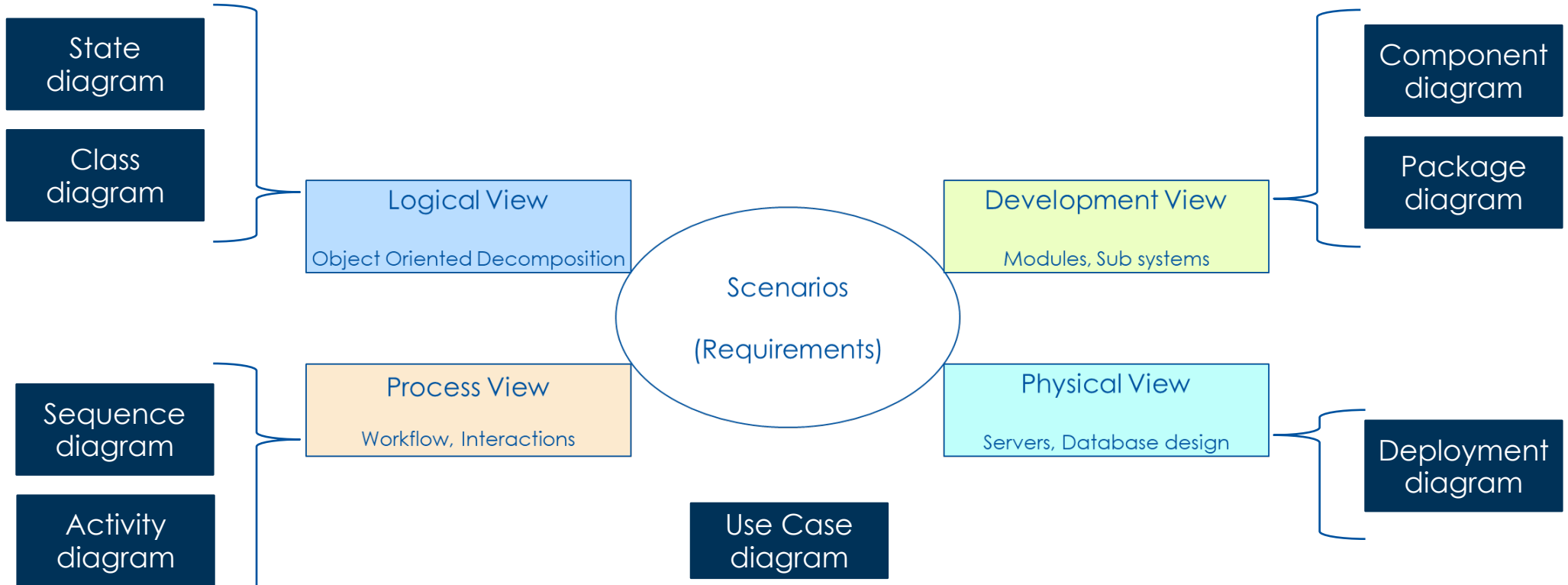
A standard set of notations

Please go through basic UML notation & diagrams on your own

UNIFIED MODELING LANGUAGE™

http://www.omg.org/uml

A standard set of diagrams (14)



Software Architecture Styles

> Reusable architectural pattern which may be used as a solution to a commonly occurring problem

Architectural Styles

> Categorized based on the *Key Focus Area*

Communication

- Service Oriented Architecture (SOA)
- Message Bus Architecture

Structure

- Layered architectures
- Object Oriented Architecture & Design

Architectural Styles

> Categorized based on the *Key Focus Area*

Deployment

- Client Servers
- 3 Tier Architecture

Data

- Database Centric Design
- Data Flow Diagrams

Architectural Styles

> Categorized based on the *Key Focus Area*

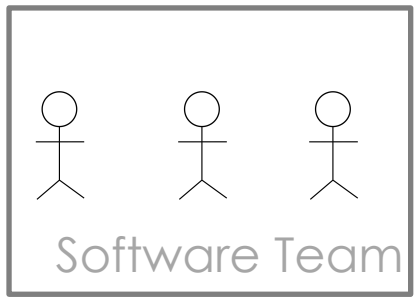
Domain

- Domain Driven Design

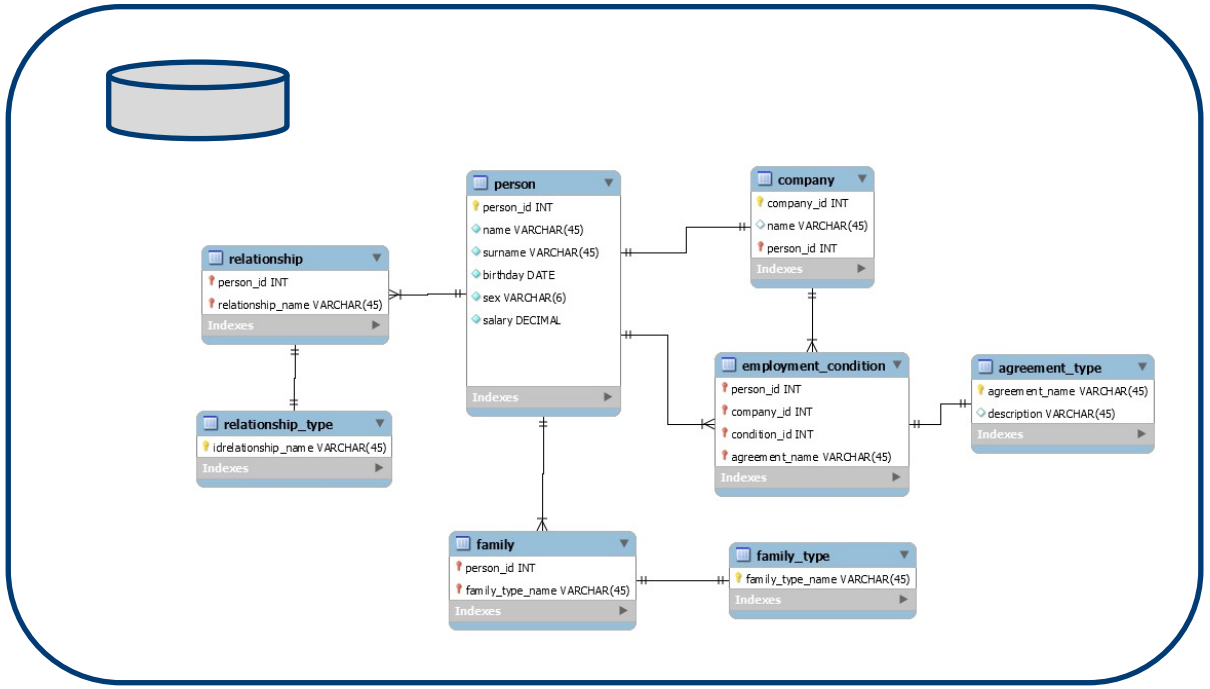
Focus is on Business Domain rather than technology

Data Centric Architecture

> Focus is on core data in the domain

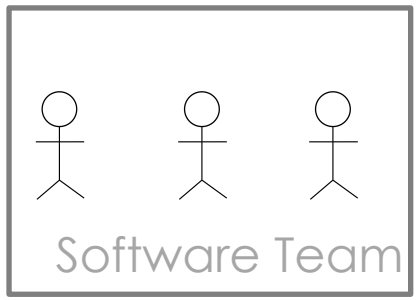


Develops

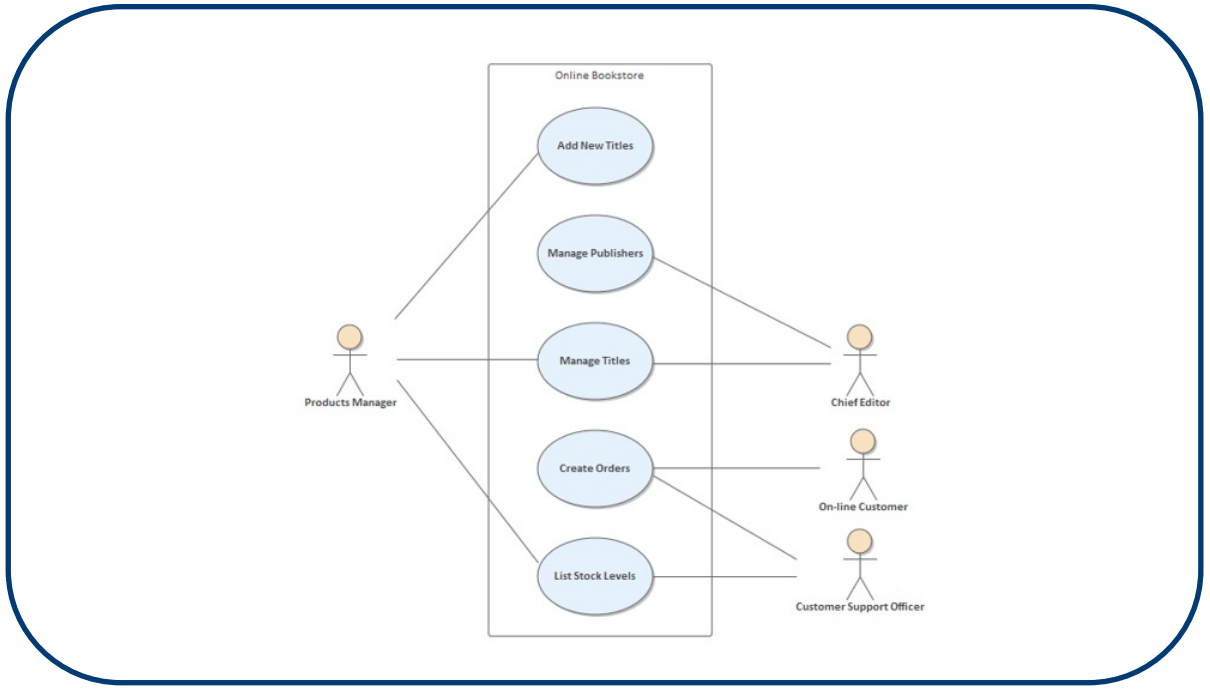


Process Centric Architecture

> Focus is on core use cases in the business

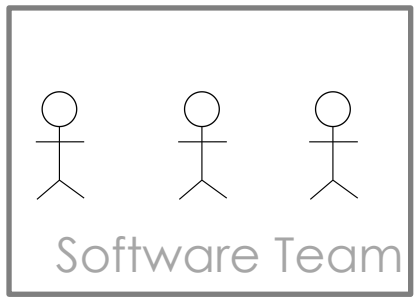


Develops

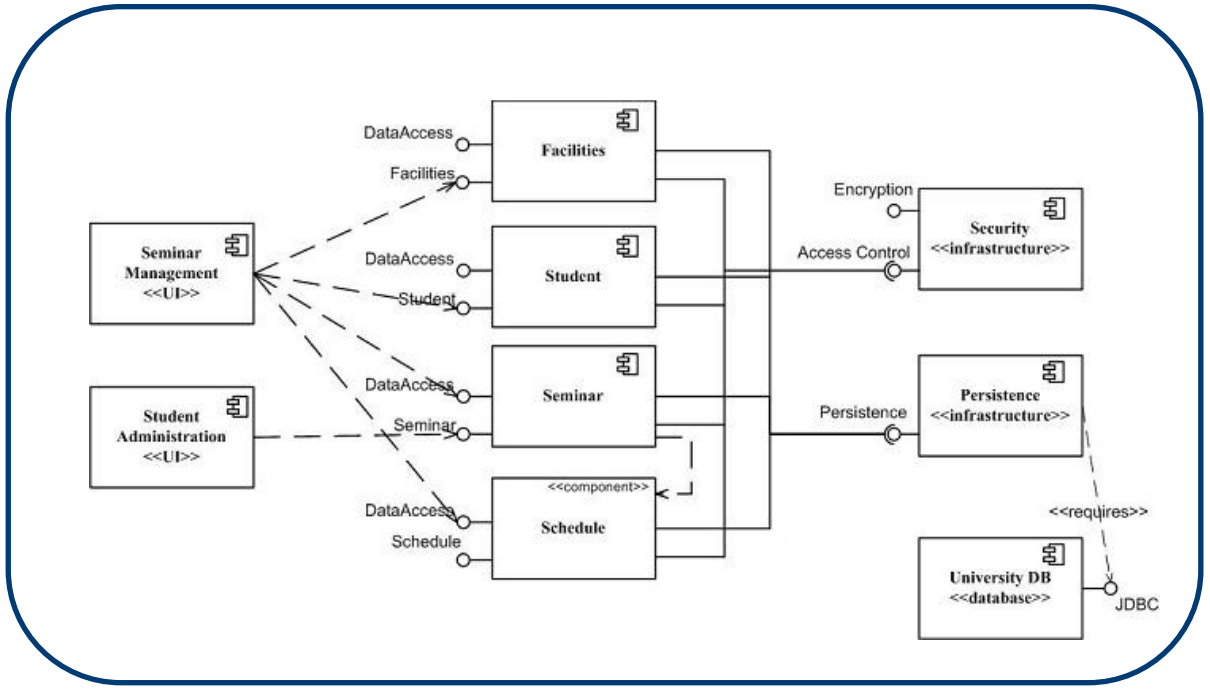


Services Centric Architecture (SOA | REST)

> Focus is on core capabilities exposed as services

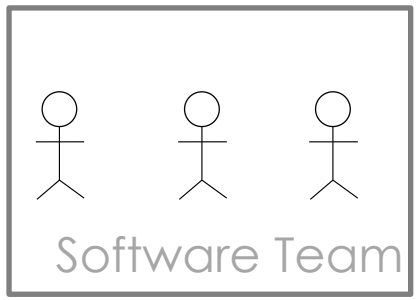


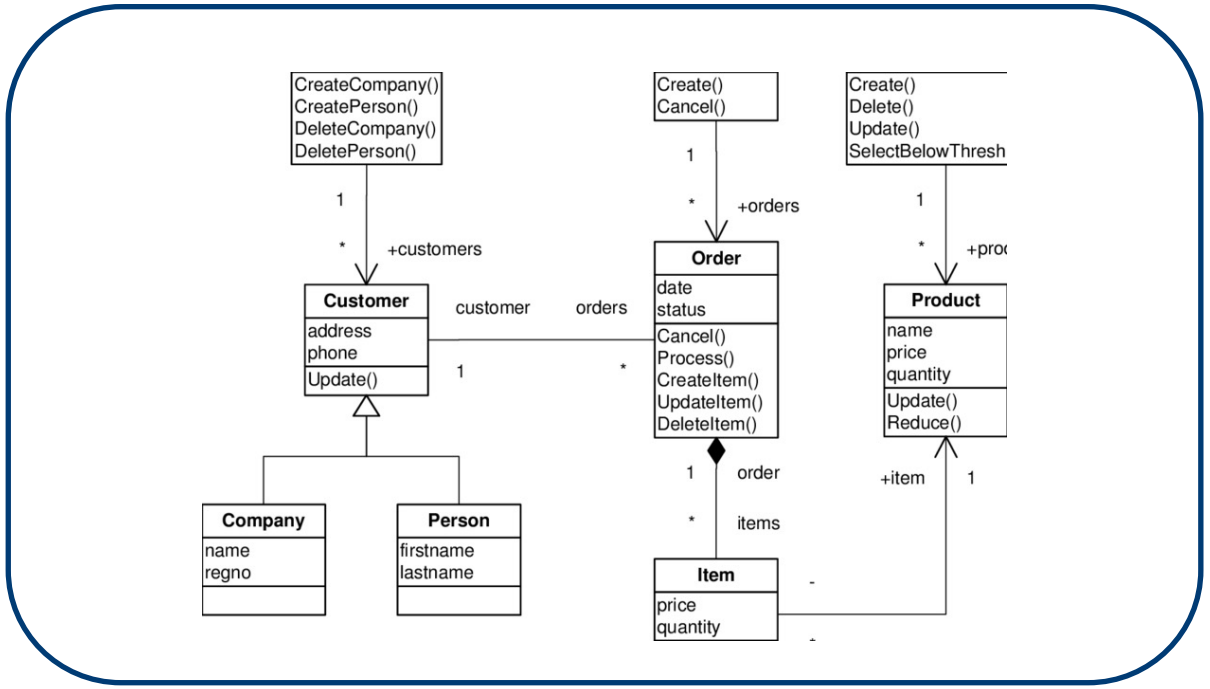
Develops



Object Oriented Architecture (OOA)

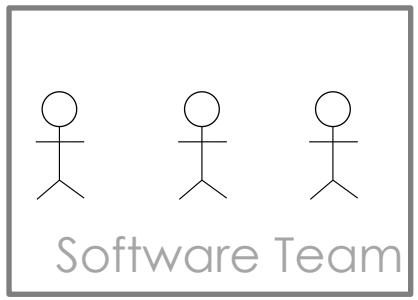
> Focus is on identifying real work objects classes

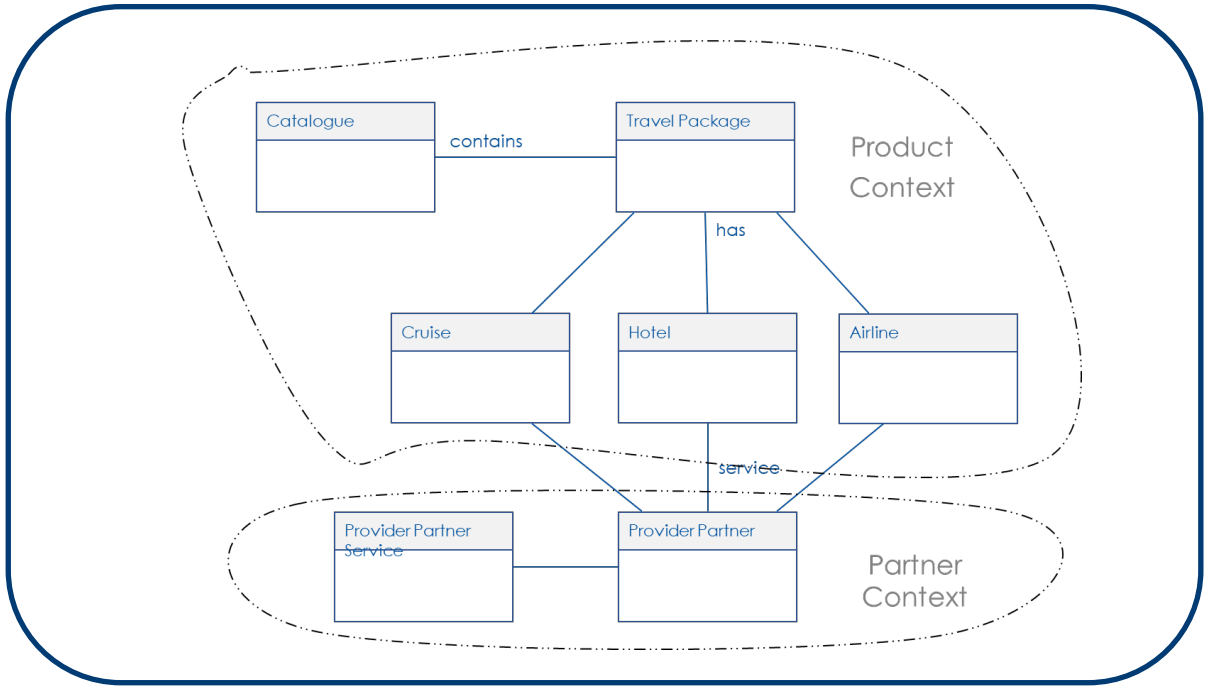




Domain Driven Design

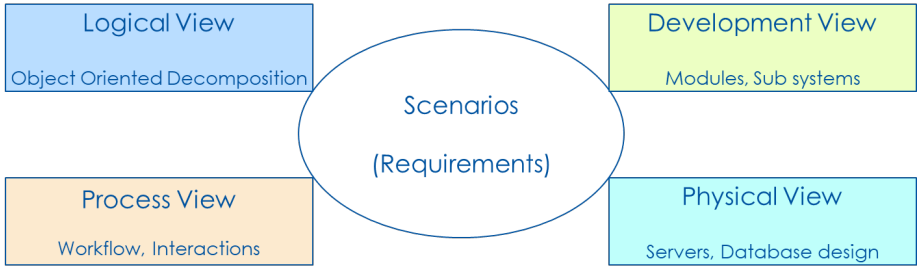
> Focus is on the business domain





Review

- Architects create models using different modeling techniques



http://www.omg.org/uml

- There are multiple architectural styles
  - Domain Driven Design = focusses on Business Domain

Domain Models

Understanding the business domain

Domain model

Elements of a Domain model

WHY do businesses invest in software?

WHY do businesses invest in software?

- To fulfill some need(s) of the business | enterprise

Reduce manual labor

Increase Efficiency

Competitive Edge

… …

WHY do businesses invest in software?

- To Solve some Business Problem(s)

Reduce manual labor	*Reduce the size of the workforce to save $$$!!*
Increase Efficiency	*Customer complaints about long response times !!*
Competitive Edge	*Competitors are pulling away customers !!*
… …	…

Business Problems

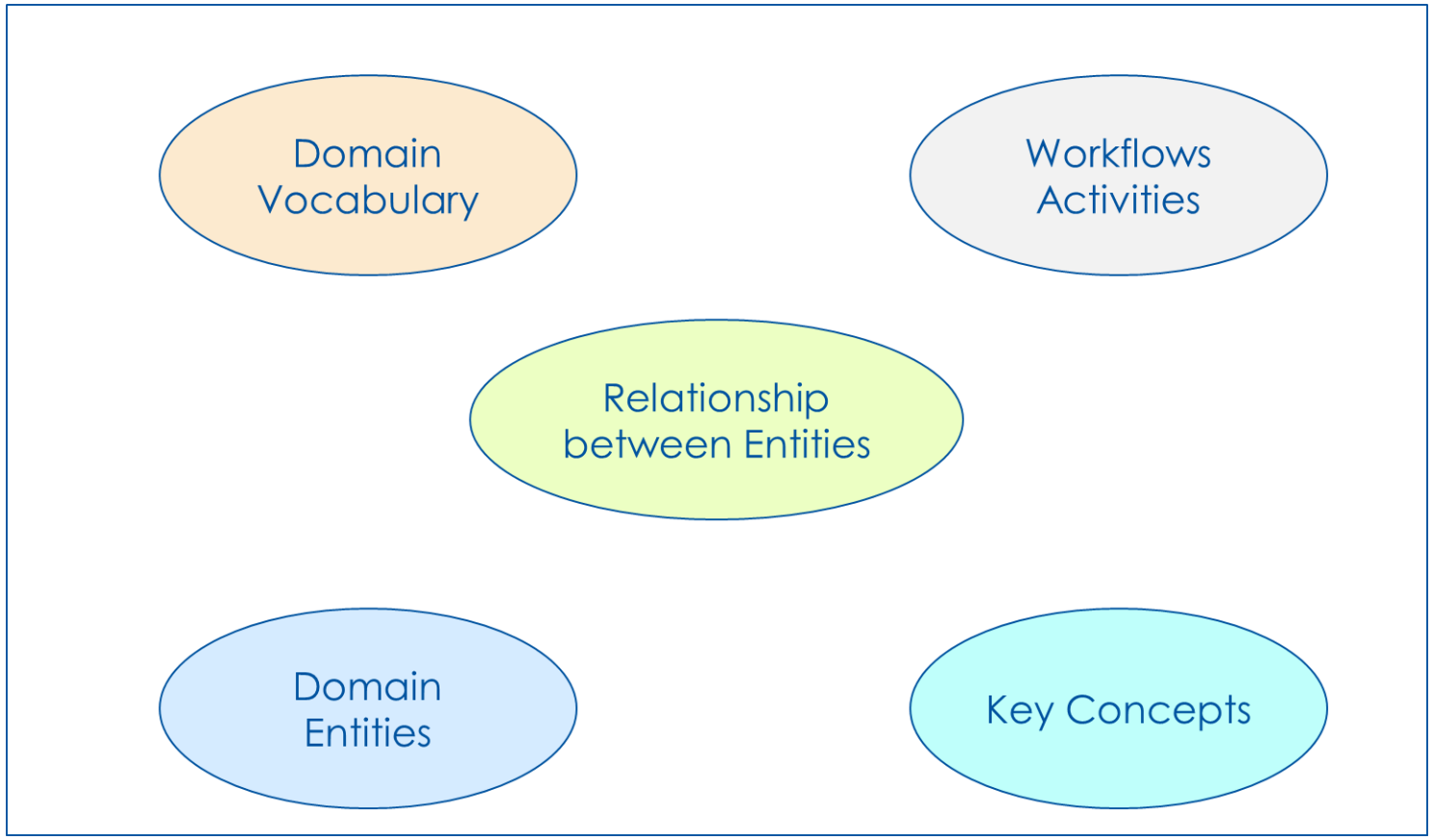
Current or long-term challenges & issues faced by the business that may prevent the business from achieving its goals.

To understand the problem, architects MUST understand the domain first !!!

Domain Model

Organized and structured knowledge of the domain that is relevant for solving a business problem

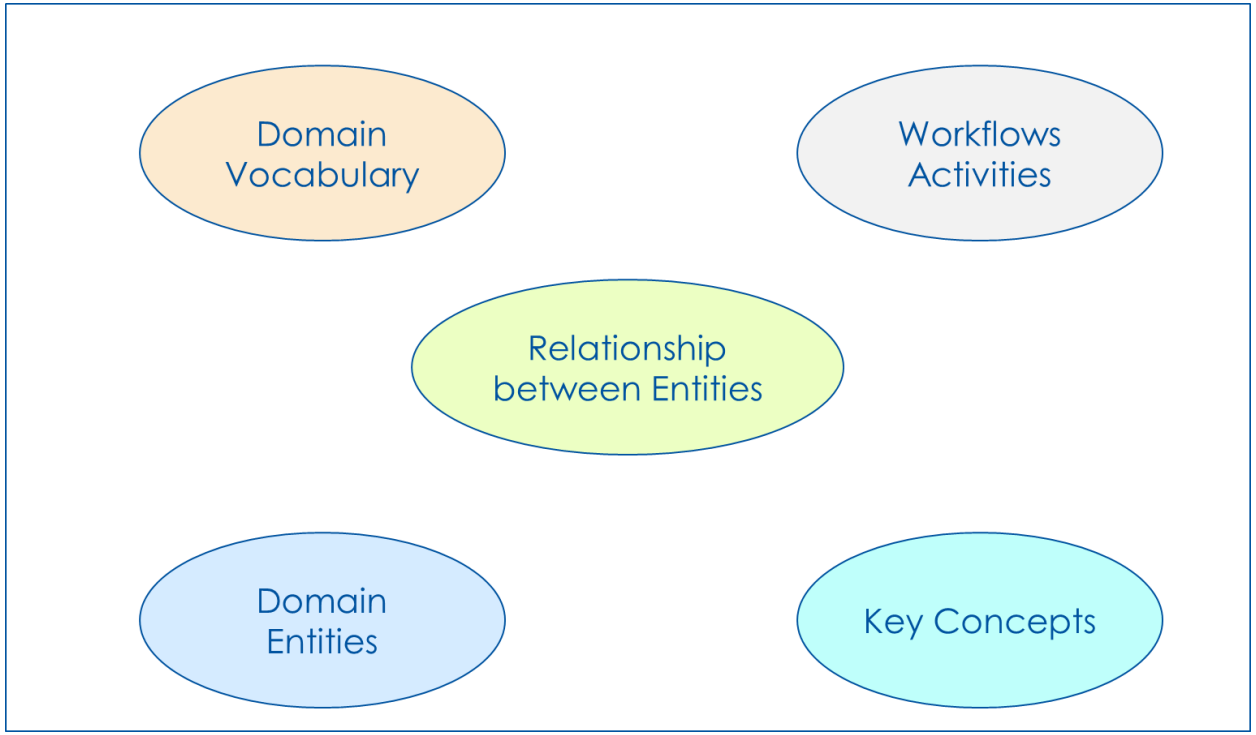
Domain Model



May contain additional knowledge

Review

- Domain Model = Structured Knowledge
  - Purpose = Solution for a Business Problem



Enterprise Domain Models

Also Known as "Aggregate" / "Unified" Domain Model

Knowledge crunching

Enterprise Domain Models

What challenges does DDD address?

WHO in your Organization *REALLY* understands your Org's Business Processes?

Domain Experts

a.k.a. Subject Matter Experts or SME

Complex Domains - NO one expert knows everything about the domain !!!

Banking

Retail Accounts Expert

Merchant Accounts Expert

Loans Accounts Expert

Compliance & Regulatory

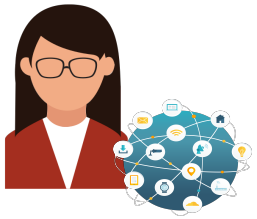
Domain Experts

a.k.a. Subject Matter Experts or SME

Complex Domains - NO one expert knows everything about the domain !!!

ACME Travel

Travel Advisor



Partner Contracts

Accounts

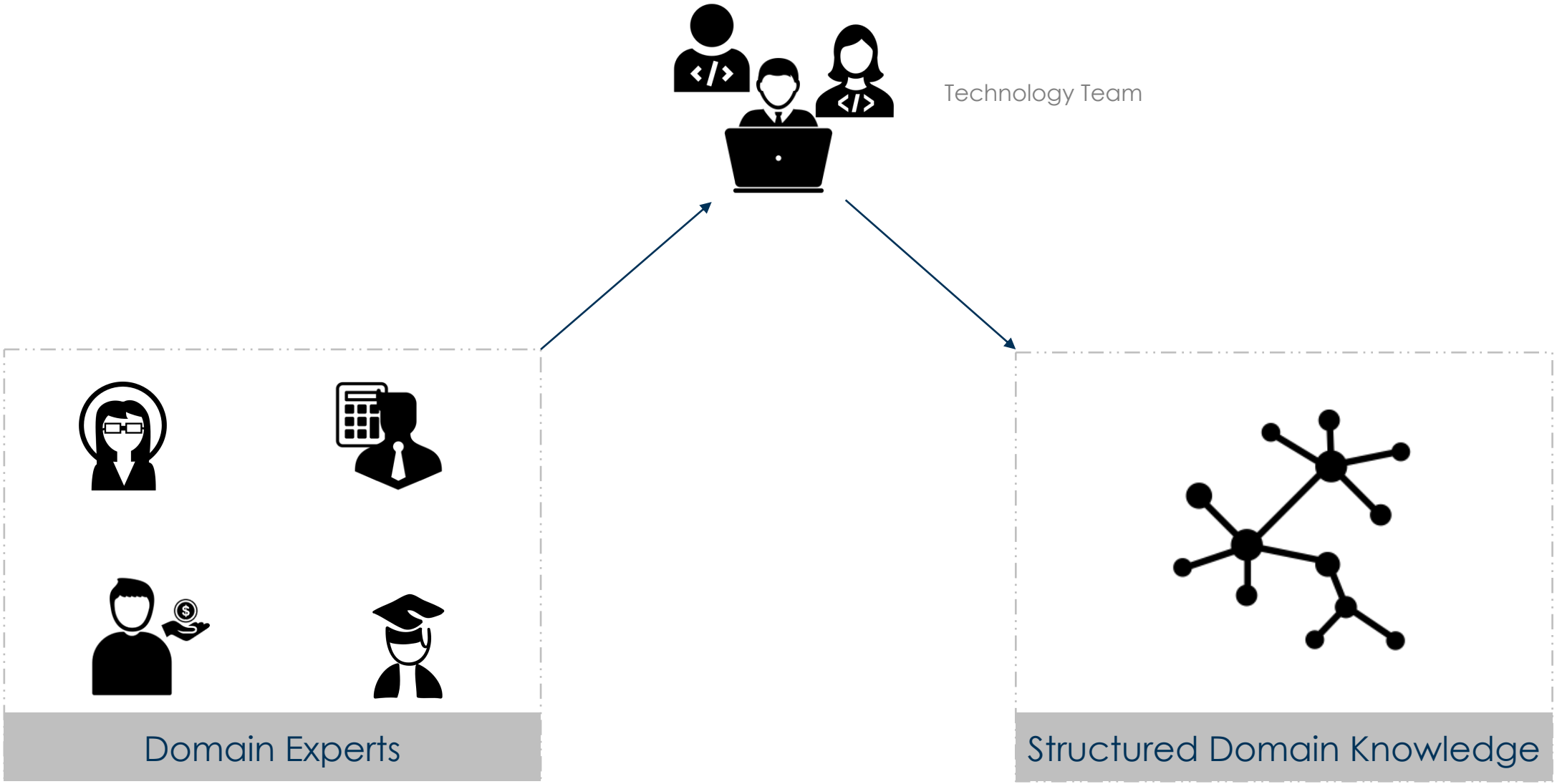
Customer Support

Knowledge Crunching

Teams process the knowledge received from the Domain Experts into domain models

This process is referred to as Knowledge Crunching

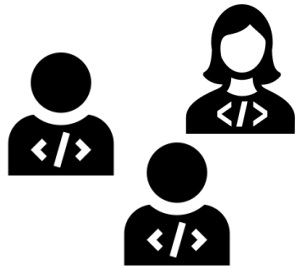
Knowledge Crunching



Technology Team

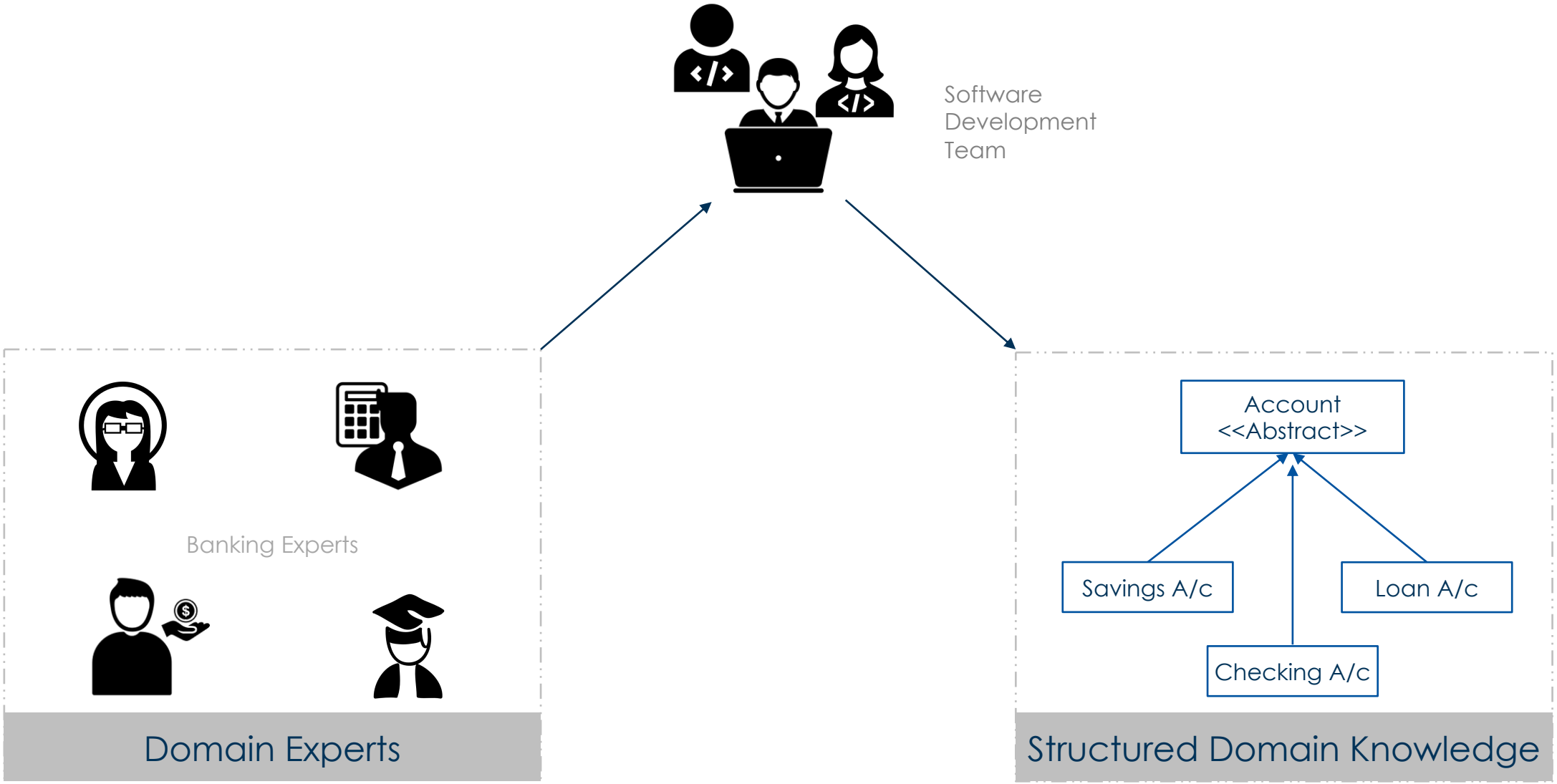
Led by an experienced technologist

- IT Lead e.g., Architect, Lead Developer ….



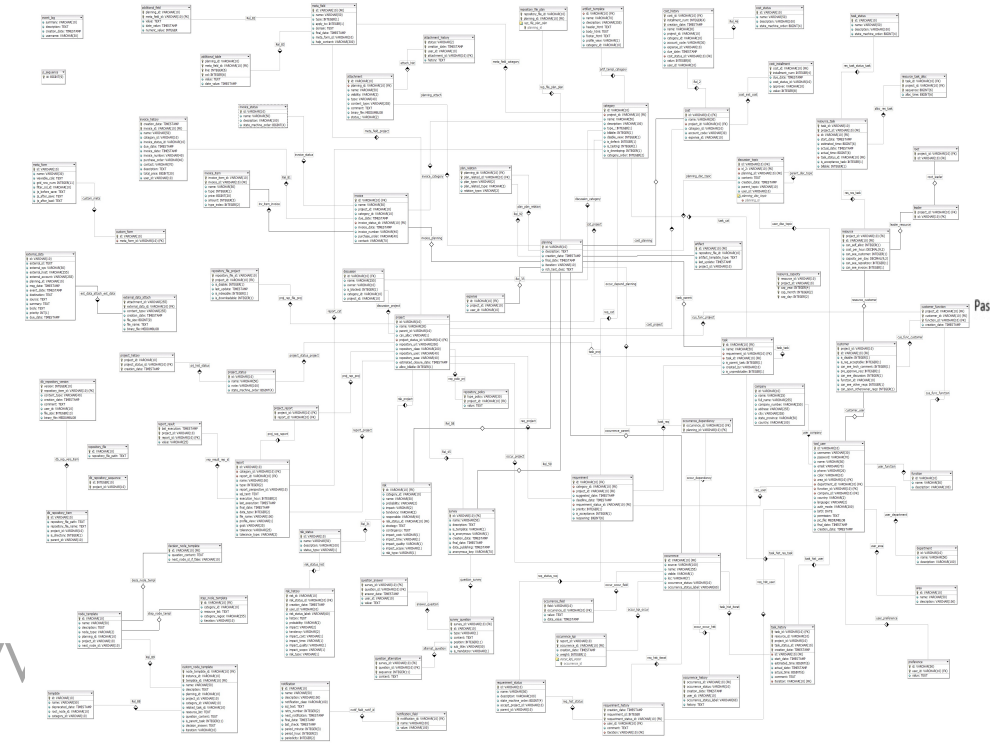
- Team members e.g., Developers, Analyst ….

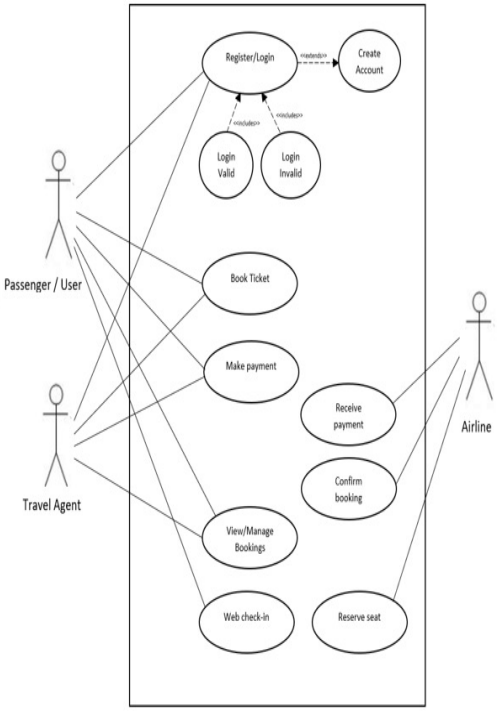
Knowledge Crunching

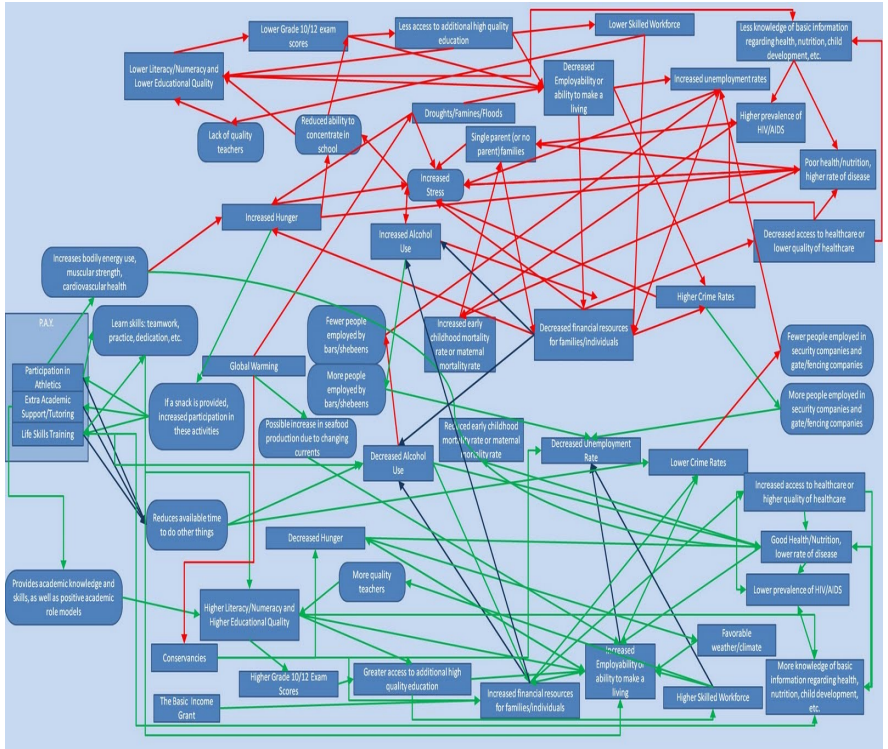


Enterprise Models

Knowledge was gathered from multiple experts to create an enterprise domain model





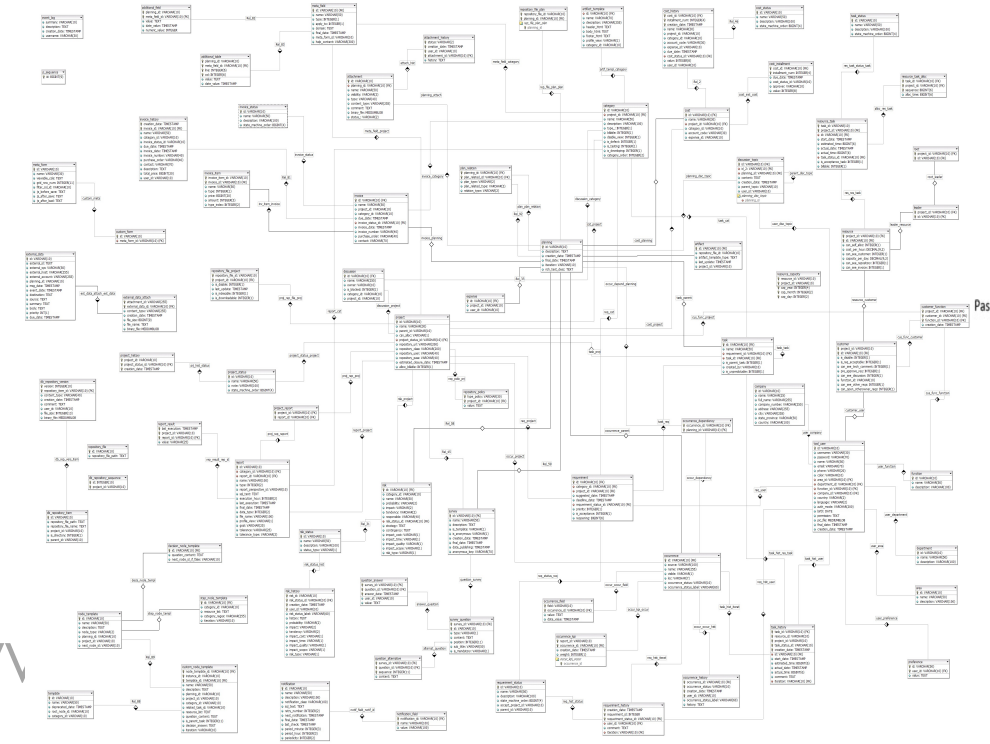


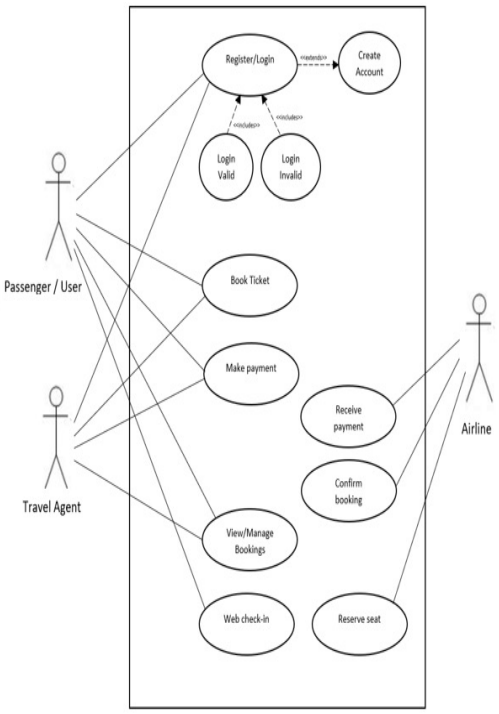
Enterprise Models

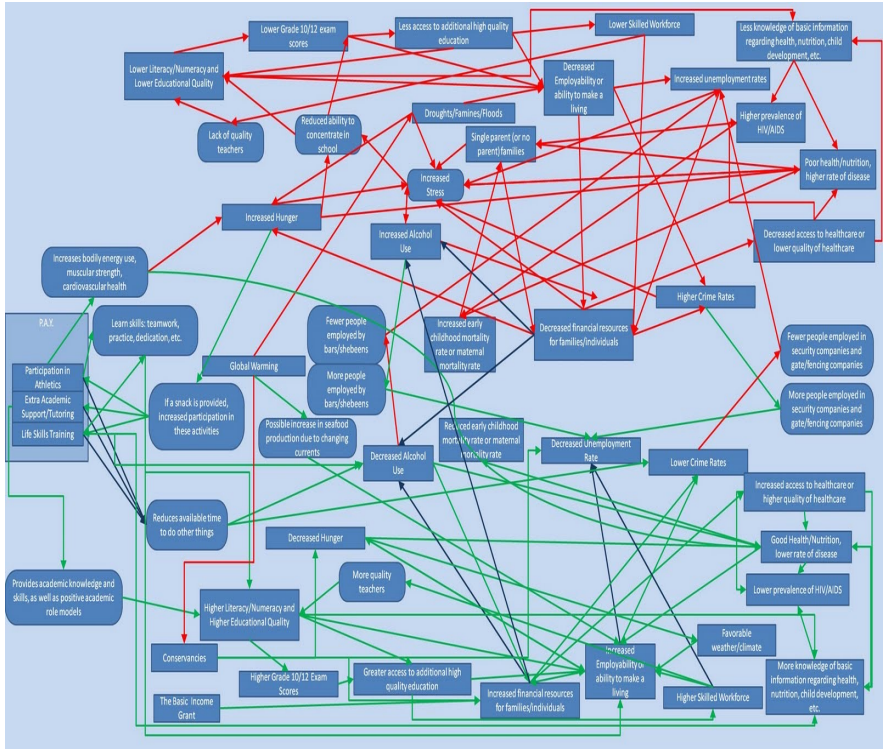
Also known as Unified Models

Also known as Canonical Models

Also known as Aggregate Models







Challenges with Unified models

1. Complexity
2. Ownership
3. Linguistic

1 Complexity

Inherent complexity due to scope and size

Overlapping & Redundant capabilities

2 Ownership

No single expert who own's the entire model

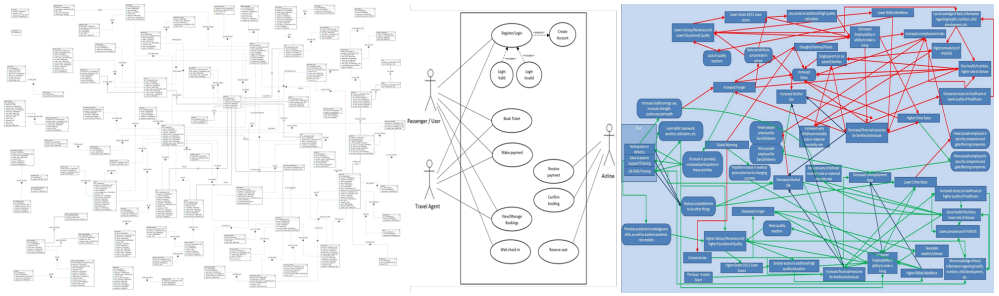
Model falls behind the reality and over time loses its value

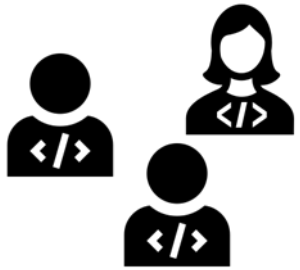
3 Linguistic

Same business term has different meanings in different domains

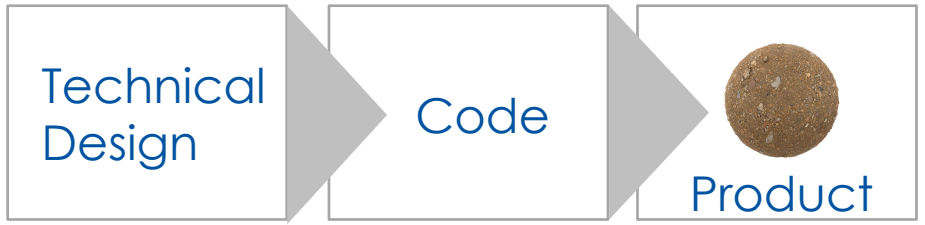
Technology teams | Business teams speak different languages

Software Development





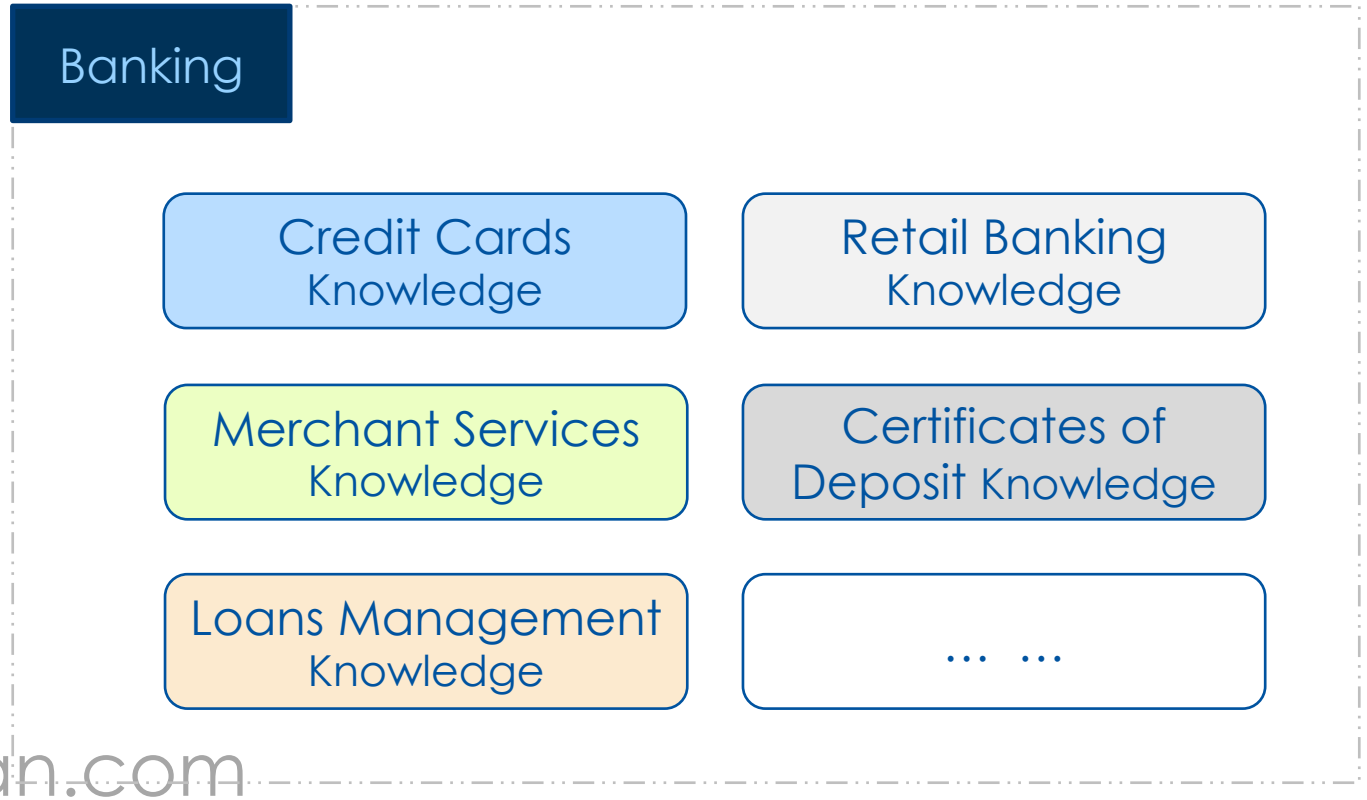
Software Development Team



Aggregate Domain Models

a.k.a. Holistic/Enterprise Domain Model

A domain model that covers all the facets of the domain



Addressing the Challenges

> Domain Driven Design approach provides principles and patterns to address the challenges faced with developing complex domain models

Review

- Knowledge Crunching = Creating the Domain Model
- Multiple challenges with creating models for complex domains
- DDD addresses these challenges