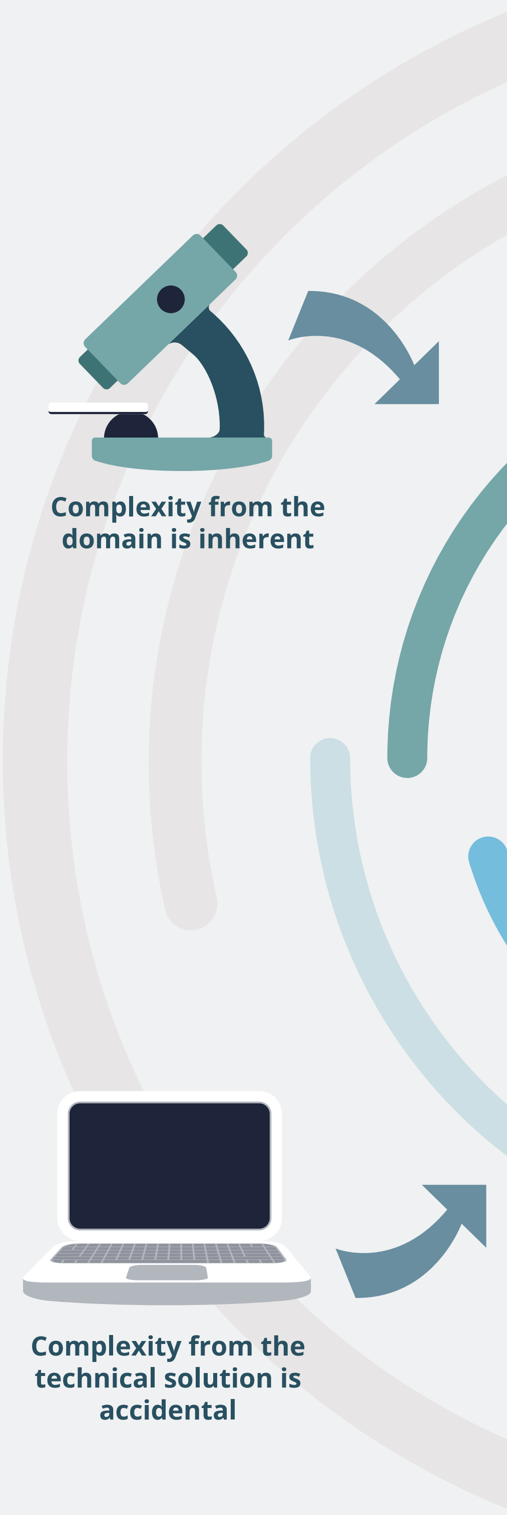
The ANATOMY OF DOMAIN-DRIVEN DESIGN

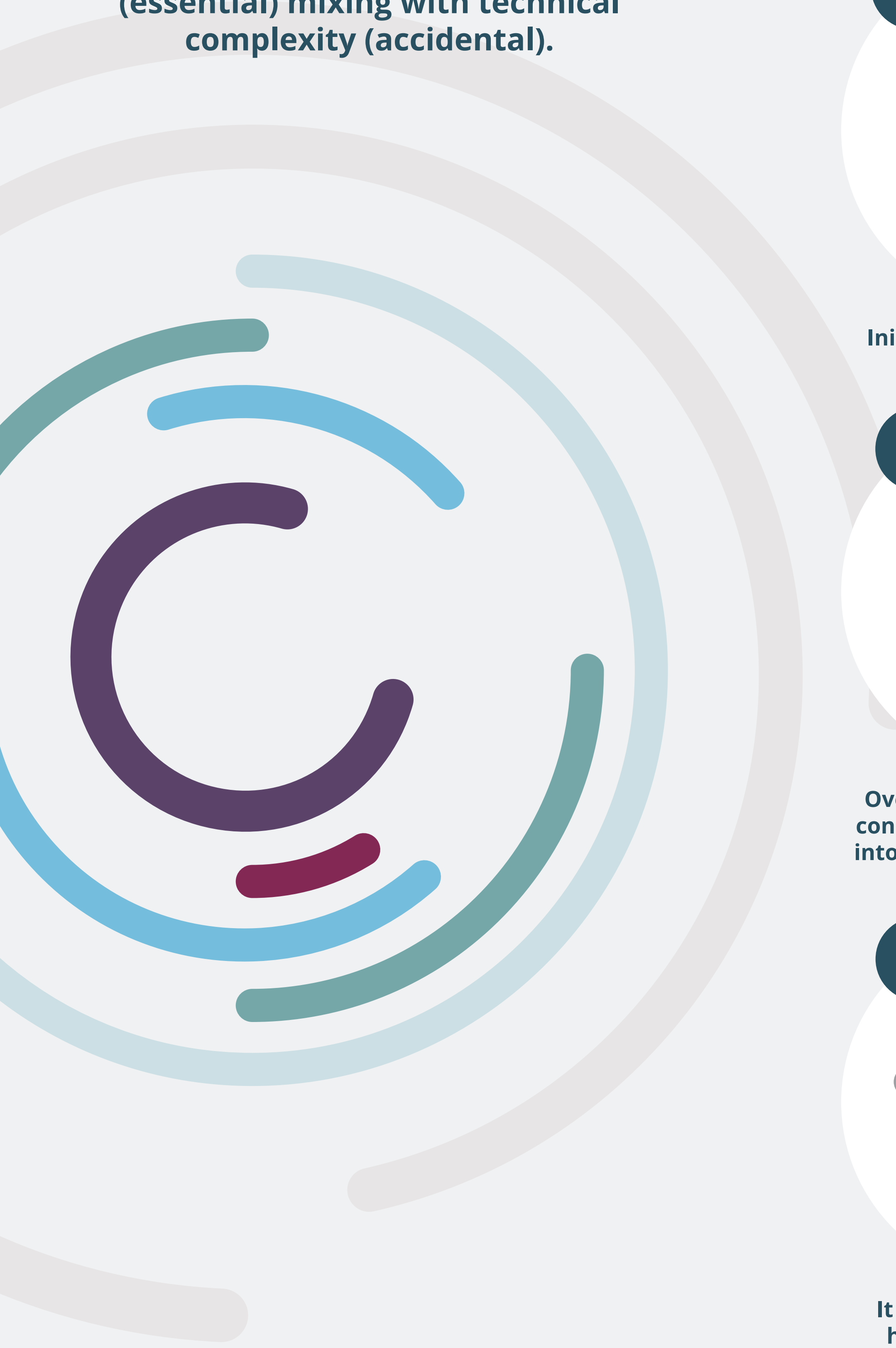
BY SCOTT MILLETT

DOMAIN-DRIVEN DESIGN IS A DEVELOPMENT APPROACH TO MANAGING SOFTWARE FOR COMPLEX DOMAINS

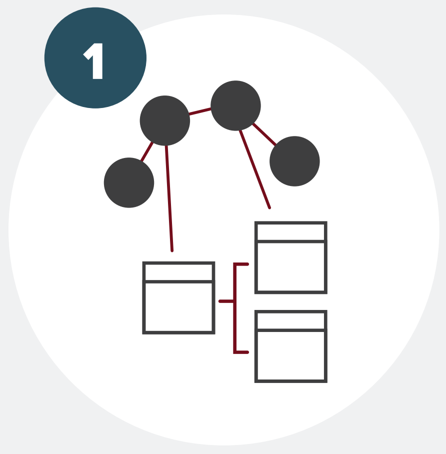
Domain-Driven Design is a language and domain-centric approach to software design for complex problem domains. It consists of a collection of patterns, principles and practices that will enable teams to focus on what is core to the success of the business while crafting software that manages complexity in both the technical and business spaces.


Complexity from the domain is inherent
Complexity from the technical solution is accidental

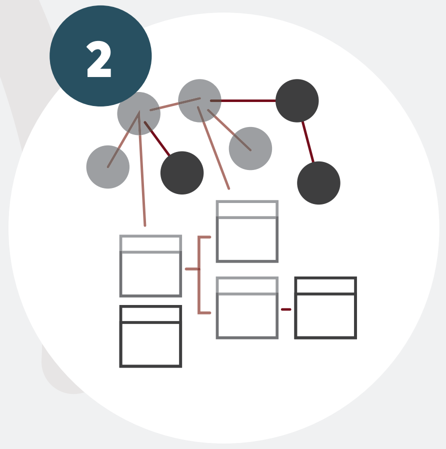
Complexity in software is the result of inherent domain complexity (essential) mixing with technical complexity (accidental).



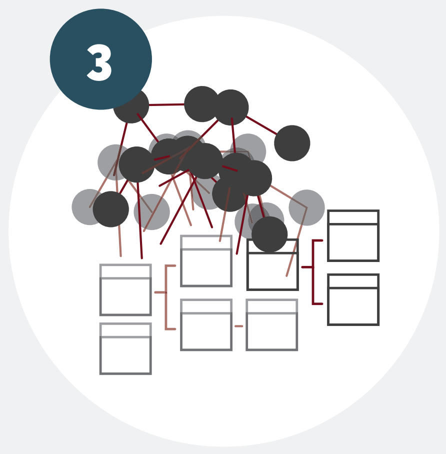
How software for complex domains can become difficult to manage



Initial software incarnation fast to produce



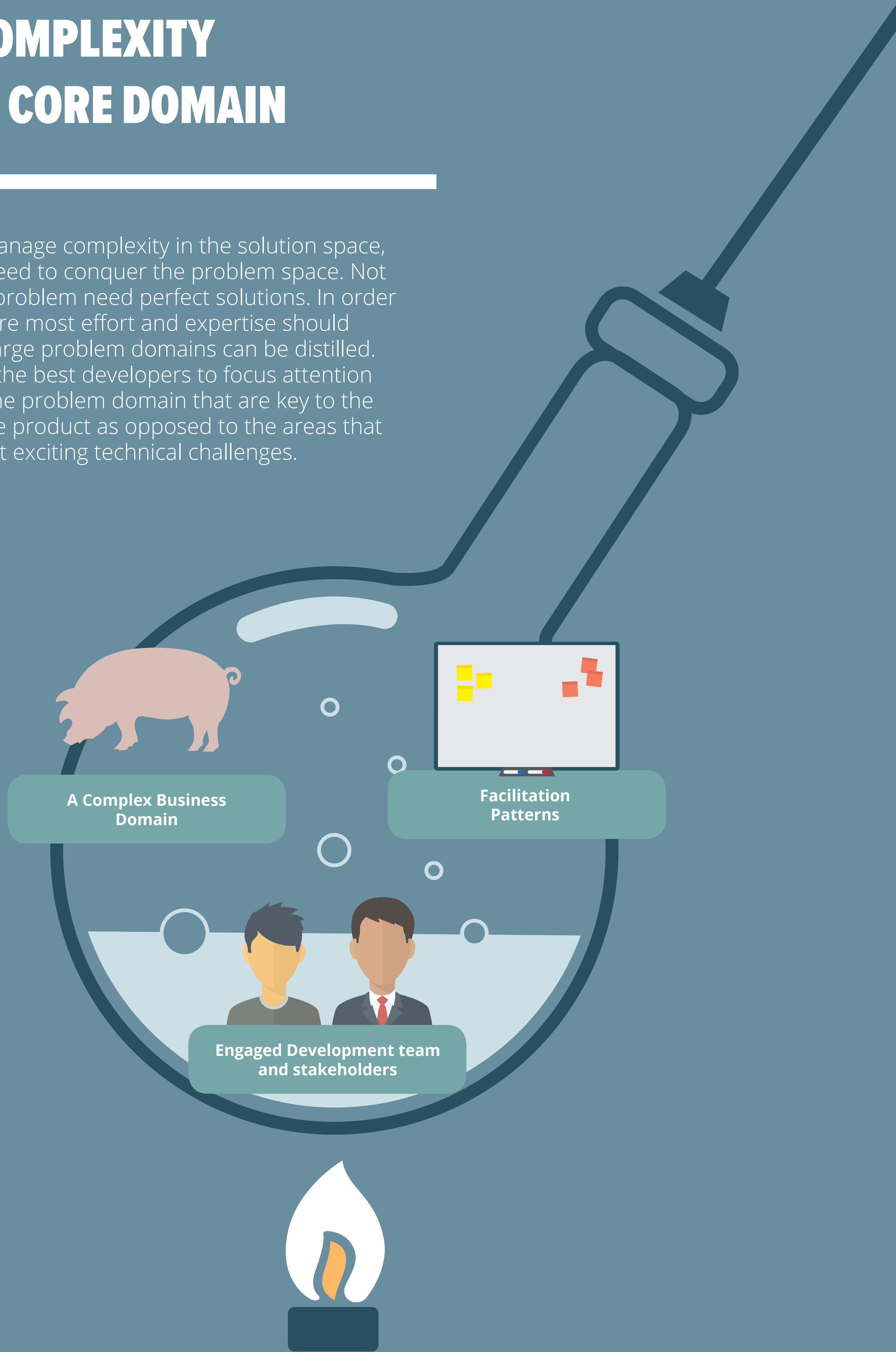
Over time, without care and consideration, software turns into the pattern known as the “ball of mud”



It works but no one knows how. Change is risky and difficult to complete. Where technical complexity exists the best developers will spend time there and not in problem domain

FOCUS ON THE OPPORTUNITY AND COMPLEXITY OF THE CORE DOMAIN

In order to manage complexity in the solution space, developers need to conquer the problem space. Not all parts of a problem need perfect solutions. In order to reveal where most effort and expertise should be focused, large problem domains can be distilled. This enables the best developers to focus attention on areas of the problem domain that are key to the success of the product as opposed to the areas that offer the most exciting technical challenges.


A Complex Business Domain
Facilitation Patterns
Engaged Development team and stakeholders

Start from the Use Cases

The best place to start when trying to understand a new domain is by mapping out use cases. A use case lists the steps required to achieve a business outcome, including the interactions between users and systems.

Visualise the Problem Domain

People often learn quicker by seeing visual representations of the concepts they are discussing. Sketching simple diagrams is a common visualization technique DDD practitioners use to enhance knowledge-crunching sessions and maximize their time with stakeholders and business experts.

Read the Product Vision

Understand the benefits that this project will realise, share the goals with the business stakeholders.

Employee Facilitation Patterns

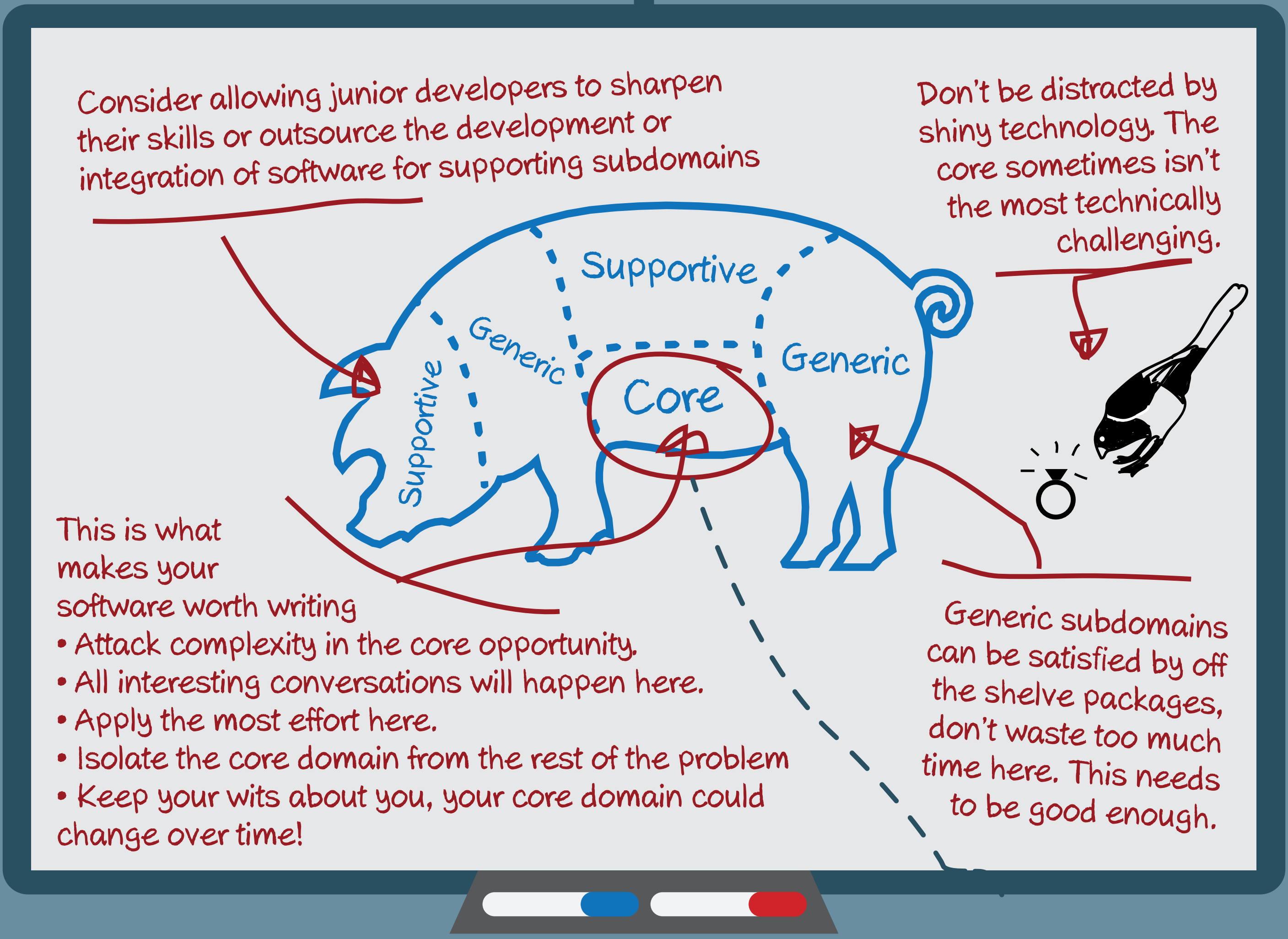
Jeff Pattons' user story mapping, Alberto Brandolini's event storming techniques and Impact Mapping are three great ways to engage stakeholders and reveal the core of the product.

Ask Powerful Questions

What does good look like? What is the success criteria of this product? What will make it a worthwhile endeavour? What is the business trying to achieve? The questions you ask stakeholders and sponsors will go a long way toward your understanding of the importance of the product you are building and the intent behind it.

Focus on the Most Interesting Conversations

Don't bore domain experts and business stakeholders by going through a list of requirements one item at a time. Start with the areas of the problem domain that keep the business up at night—the areas that will make a difference to the business and that are core for the application to be a success.



Consider allowing junior developers to sharpen their skills or outsource the development or integration of software for supporting subdomains

Don't be distracted by shiny technology. The core sometimes isn't the most technically challenging.

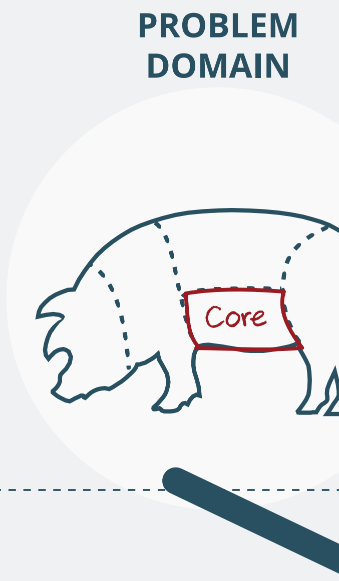
This is what makes your software worth writing
- Attack complexity in the core opportunity.
- All interesting conversations will happen here.
- Apply the most effort here.
- Isolate the core domain from the rest of the problem
- Keep your wits about you, your core domain could change over time!

Generic subdomains can be satisfied by off the shelve packages, don't waste too much time here. This needs to be good enough.

SOLVE COMPLEX PROBLEMS BY USING MODELS

With the domain distilled and primary focus on the core domain a model can be produced to manage the complexity of the domain logic. A model is an abstraction of the problem domain used to solve business use cases. A model is discovered through the act of knowledge crunching business use case scenarios with domain experts. The domain model encapsulates complex business logic, closing the gap between business reality and code.

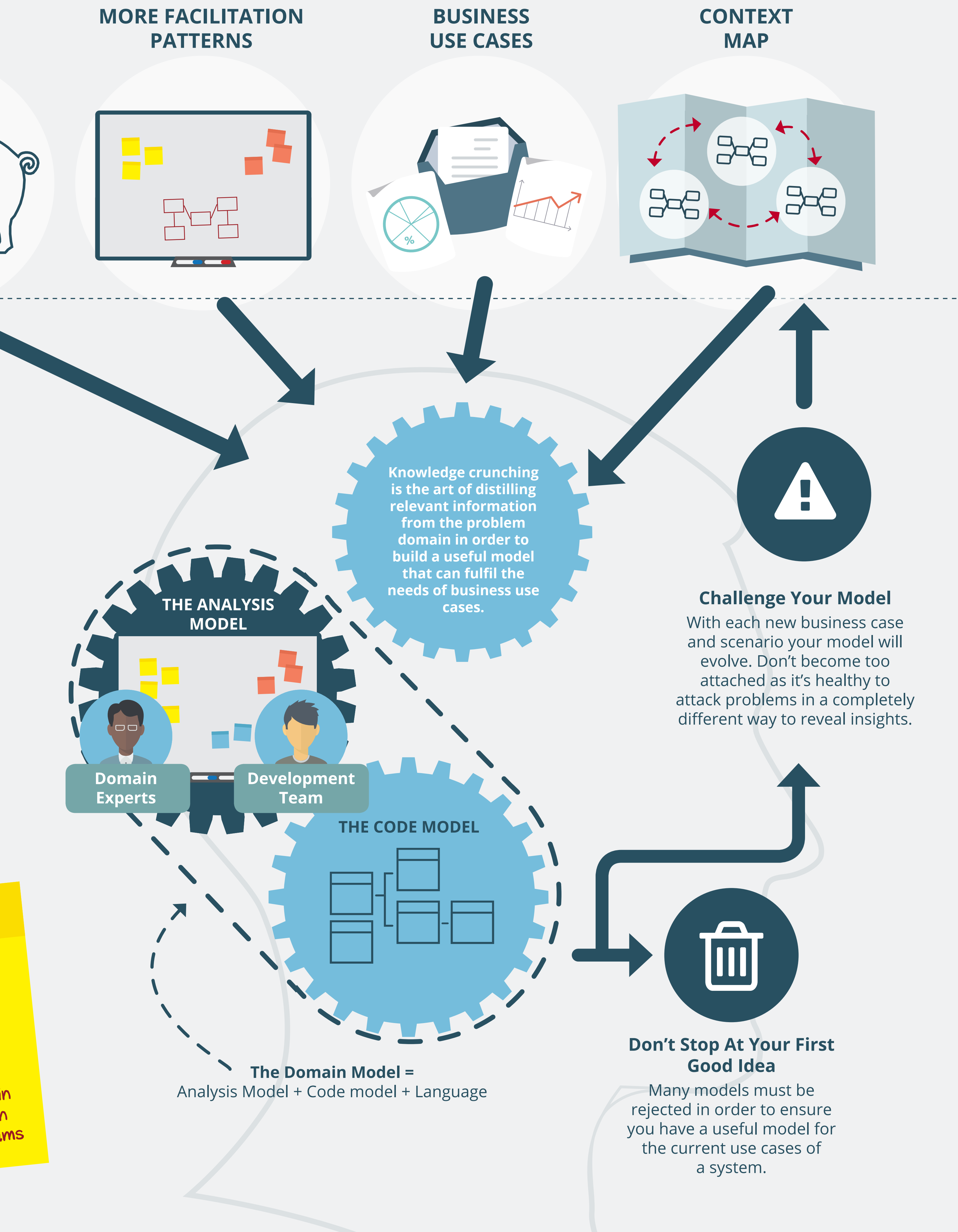
THE PROBLEM SPACE



THE SOLUTION SPACE

The domain model is:

- An abstraction of reality – not a reflection of real life
- Designed to manage complexity for specific business cases.
- A single model that exists i code, language and writte documentation and diagra



Knowledge crunching is the art of distilling relevant information from the problem domain in order to build a useful model that can fulfil the needs of business use cases.

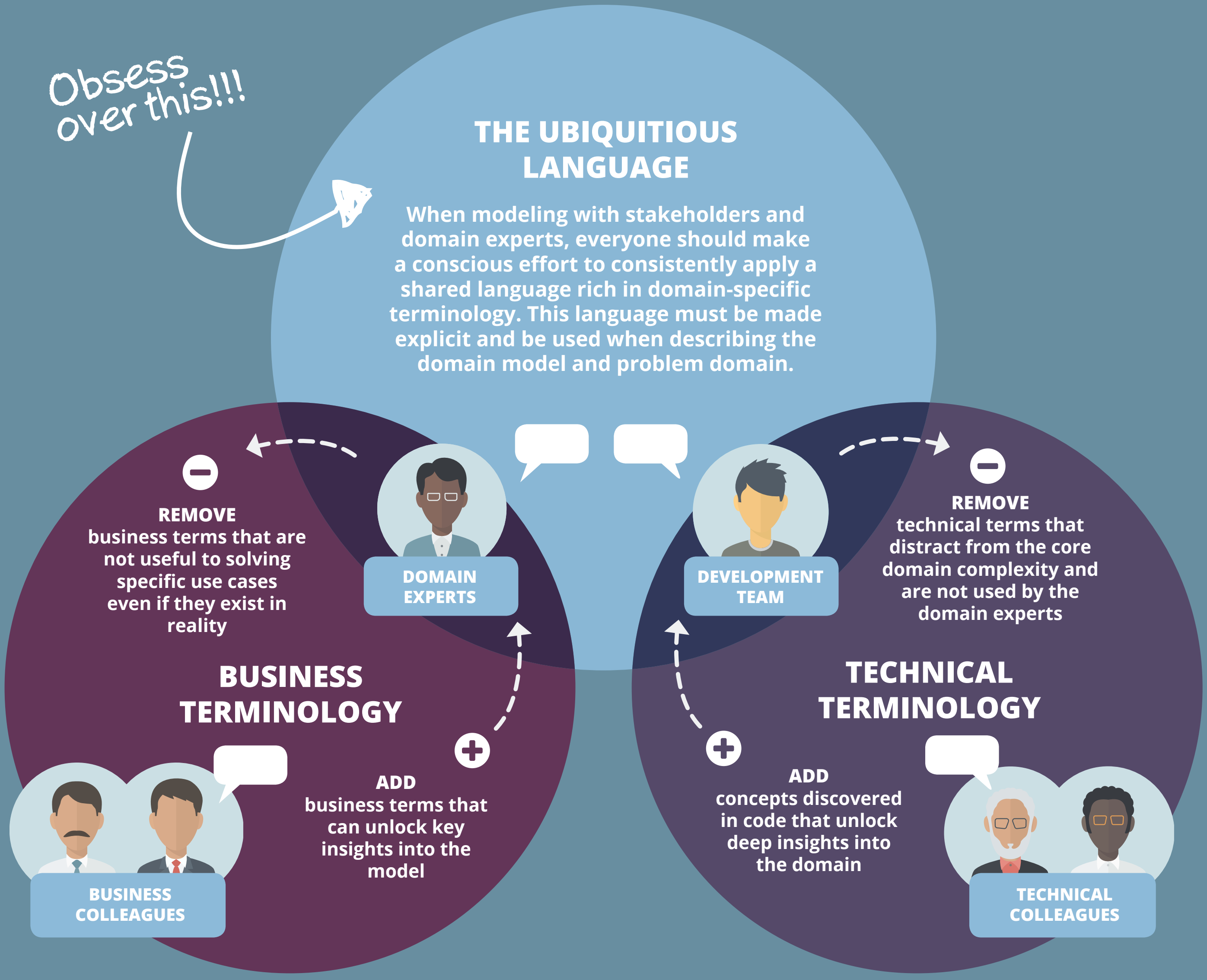
Challenge Your Model
With each new business case and scenario your model will evolve. Don't become too attached as it's healthy to attack problems in a completely different way to reveal insights.

The Domain Model =
Analysis Model + Code model + Language

Don't Stop At Your First Good Idea
Many models must be rejected in order to ensure you have a useful model for the current use cases of a system.

DESIGN A MODEL IN COLLABORATION USING A UBIQUITOUS LANGUAGE

The development team and domain experts knowledge crunch to produce a model that satisfies the needs of the business use cases. Communication happens because of the ubiquitous language. Collaboration is key to creating a useful model and the ubiquitous language binds the abstract mental model to the underlying software model, enabling developers and domain experts to talk about things easily. It is the language that enables both the business and development teams to have meaningful communication about the software.


Obsess over this!!!
THE UBIQUITOUS LANGUAGE
When modeling with stakeholders and domain experts, everyone should make a conscious effort to consistently apply a shared language rich in domain-specific terminology. This language must be made explicit and be used when describing the domain model and problem domain.
REMOVE business terms that are not useful to solving specific use cases even if they exist in reality
DOMAIN EXPERTS
BUSINESS TERMINOLOGY
ADD business terms that can unlock key insights into the model
BUSINESS COLLEAGUES
DEVELOPMENT TEAM
REMOVE technical terms that distract from the core domain complexity and are not used by the domain experts
TECHNICAL TERMINOLOGY
ADD concepts discovered in code that unlock deep insights into the domain
TECHNICAL COLLEAGUES

WRITE SOFTWARE THAT EXPLICITLY EXPRESSES THE MODEL

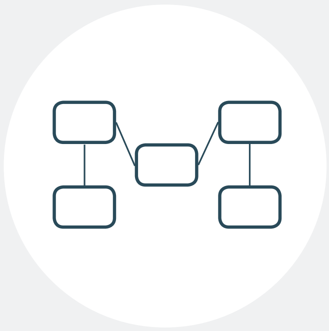
The ubiquitous language should be used in the code implementation of the model, with the same terms and concepts used as class names, properties, and method names. Continuous experimentation and exploration in the design of a model is where the power of DDD is realised.

DDD does not dictate any specific architectural style for development, it only ensures that the model is kept isolated from technical complexities so that it can focus on domain logic concerns.

START HERE

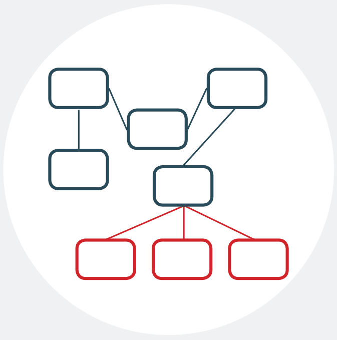
Focus on a single business use case

at a time and model the various concrete scenarios for each use case.



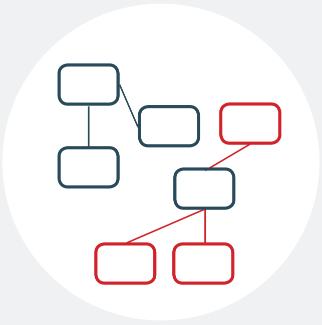
Create a useful model

that satisfies the needs of the use case. Don't be over ambitious, avoid perfectionism and avoid modelling reality.



Reveal hidden insights and simplify the model

by exploring and experimenting with new ideas. You will understand more about the problem domain the more you play with it.



Don't stop modelling at the first useful model.

Experiment with different designs to find a supple model and design breakthrough. Challenge your assumptions and look at things from a different perspective.

Apply tactical design patterns

to model the rich domain behaviours and to ensure that the model is supple enough to adapt as new requirements surface.

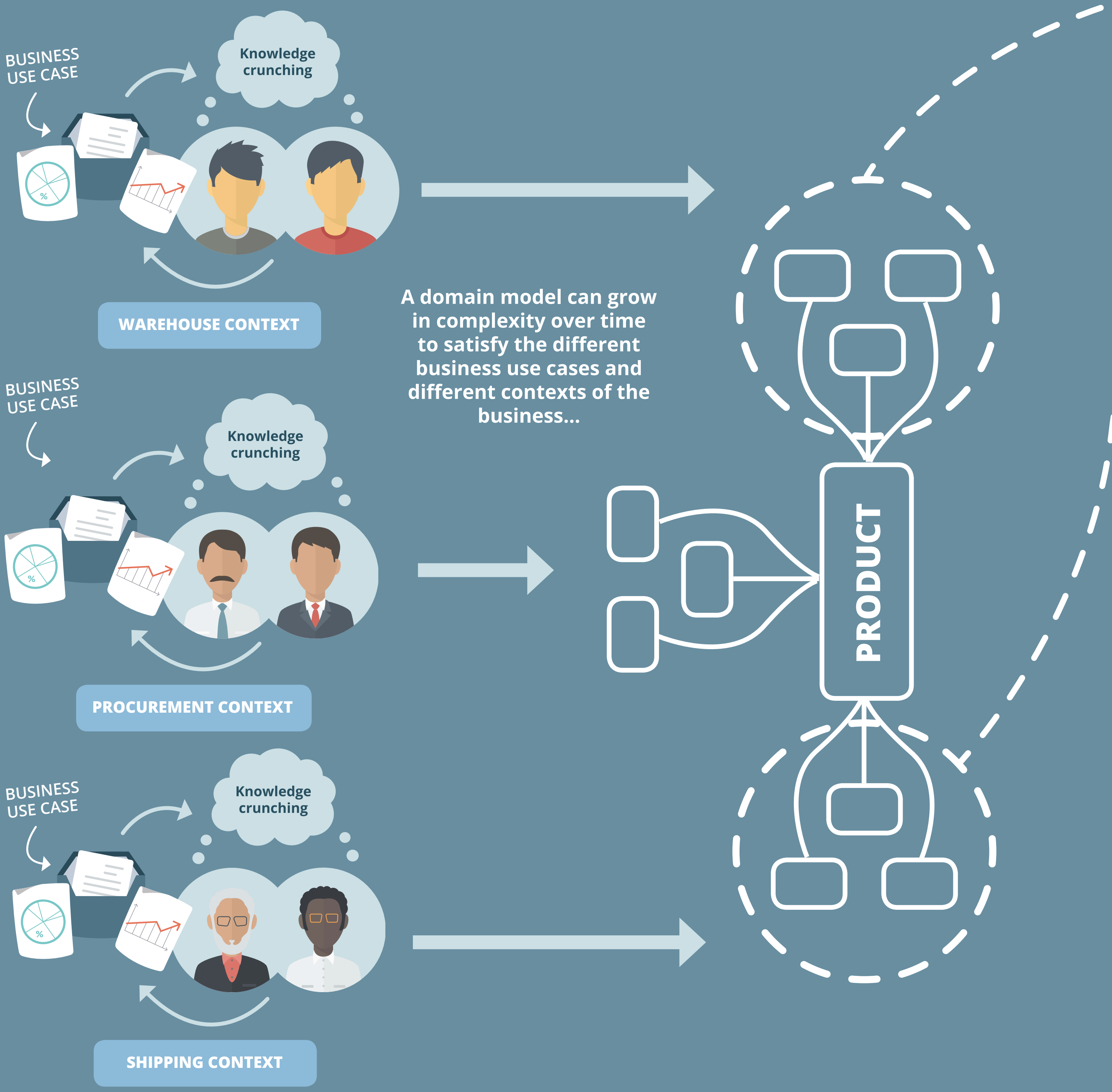
Warning!; DDD is not a patterns language, don't fall into the trap of solely focusing on tactical code design patterns.

Isolate the model

from infrastructure concerns and keep technical complexities separate from domain complexities. Use application services to model use cases and delegate to the domain model to solve.

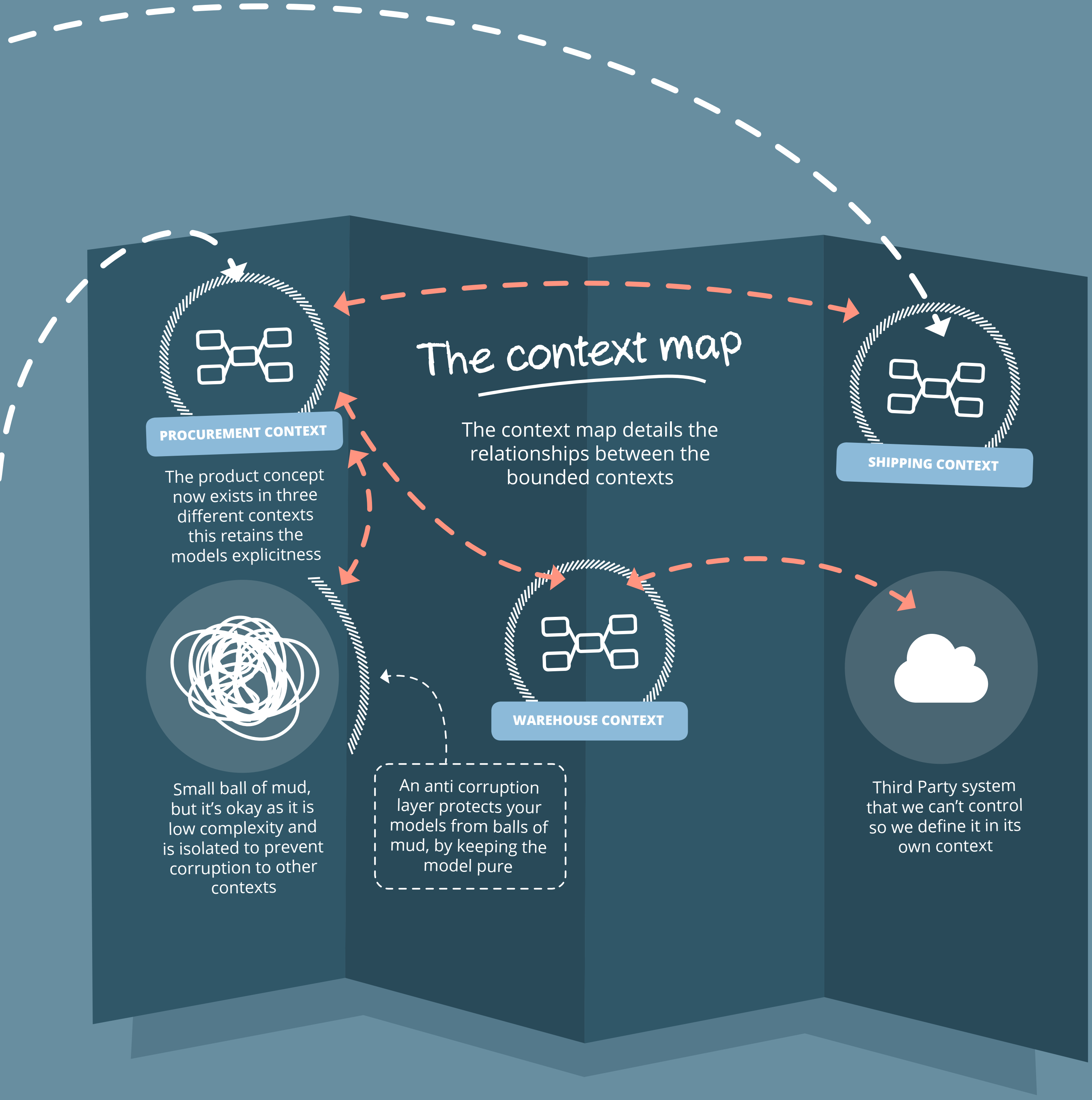
DIVIDE COMPLEX AND LARGE MODELS INTO SEPARATE BOUNDED CONTEXTS

Large or complex models are divided into bounded contexts where there is ambiguity in terminology, multiple teams are involved, where subdomains exists or where legacy code remains. Software that fails to isolate and insulate a model in a bounded context will often slip into the Ball of Mud pattern.



In a single model, multiple teams will dilute the explicitness due to a lack of shared context.

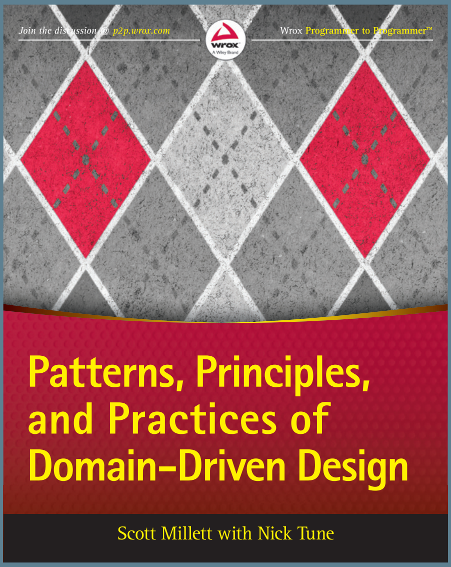
In order to retain the integrity of a model, it is defined within a bounded context.



The context map
The context map details the relationships between the bounded contexts
PROCUREMENT CONTEXT
The product concept now exists in three different contexts this retains the models explicitness
SHIPPING CONTEXT
WAREHOUSE CONTEXT
Small ball of mud, but it's okay as it is low complexity and is isolated to prevent corruption to other contexts
An anti corruption layer protects your models from balls of mud, by keeping the model pure
Third Party system that we can't control so we define it in its own context

PATTERNS, PRINCIPLES, AND PRACTICES OF DOMAIN-DRIVEN DESIGN

BY **SCOTT MILLETT** & **NICK TUNE**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Patterns, Principles, and Practices of Domain-Driven Design
Scott Millett with Nick Tune

Build solutions for complex business problems more effectively with Domain-Driven Design

This book distills the ideas and theories of the Domain-Driven Design (DDD) philosophy into a practical playbook that you can leverage to simplify application development for complex problem domains. A focus is placed on the principles and practices of decomposing a complex problem space as well as the implementation patterns and best practices for shaping a maintainable solution space. You will learn how to build effective domain models through the use of tactical patterns and how to retain their integrity by applying the strategic patterns of DDD. Full end-to-end coding examples demonstrate techniques for integrating a decomposed and distributed solution space while coding best practices and patterns advise you on how to architect applications for maintenance and scale.

- ✓ Offers a thorough introduction to the philosophy of DDD for professional developers
- ✓ Simplifies the theories of Domain-Driven Design into practical principles and practices
- ✓ Includes masses of code and examples of concepts in action that other books have only covered theoretically
- ✓ Covers the patterns of CQRS, Messaging, REST, Event Sourcing and Event-Driven Architectures
- ✓ Ideal for developers using Java, Ruby, and other languages who want to learn common DDD implementation patterns
- ✓ Code examples presented in C# demonstrating concepts that can be applied in any language