WELCOME!

Please write your first name (in BIG letters!) on a name tag using a sharpie or one of the colored pens.

Essential Domain-Driven Design

Paul Rayner

@thepaulrayner

virtualgenius
leading by design

Design is Inevitable

"Questions about whether design is necessary or affordable are quite beside the point…The alternative to good design is bad design, not no design at all."

— *Douglas Martin*

Adaptive, not Predictive

"A good design is not the one that correctly predicts the future, it's one that makes adapting to the future affordable.

—Venkat Subramaniam

Extended Warranties

Technical staff learn to *speak the business (domain) language…*

John,

In the system for Client A, please tell me the source for populating the field Retail Price?

Pam
Accountant

Pam,

Retail Price = **ARRAMT** in **ARRTRXPF** ...
It comes out of the **BARCSTPF** ... either directly or as calculated percentage from **BARCSTPF**.

John
Developer

Claire <Business Analyst>,

Can you please tell me what the @*&#^&^# field John is referring to?

I haven't memorized all of the column headers in the tables in the system that I never see . . . :-)

I'm guessing he means the product maintenance menu, and the screens 1 - 3 and the field marked "sale price" . . .

Pam
Accountant

Reference Scenario

A business example that tells a story about the business need and what makes the software worth writing

Tell us a story...

The Dishwasher


Métro / Metro
Tram / Tramway
1 Weststation / Gare de l'Ouest - Stockel / Stokkel
2 Simonis - Elisabeth
5 Erasme / Erasmus - Herrmann-Debroux
6 Koning Boudewijn / Roi Baudouin - Elisabeth
3 Esplanade - Churchill
4 Gare du Nord / Noordstation - Stalle
7 Heizel / Heysel - Vanderkindere
3 Esplanade
6 Koning Boudewijn Roi Baudouin
1 Heizel Heysel
Houba-Brugmann
Stuyvenbergh
Bockstael
Pannenhuis
Belgica
2 6 Elisabeth
2 Simonis
Ribaucourt
Yser IJzer
4 Gare du Nord Noordstation
Rogier
Botanique Kruidtuin
Ossegem Osseghem
Zwarte Vijvers Etangs Noirs
Comte de Flandre Graaf van Vlaanderen
Sint-Katelijne Sainte Catherine
De Brouckère
Gare Centrale Centraal Station
Park Parc
Madou
Arts-Loi Kunst-Wet
Maalbeek Maelbeek
Schuman
Merode
Diamant
Georges Henri
Montgomery
Boileau
Thieffry
Roodebeek
Vandervelde
Alma
Kruisnem Cranhem
1 Stockel Stokkel
Tomberg
Gribaumont
Joséphine-Charlotte
Beekkant
Bourse Beurs
Tröne Troon
Anneessens
Naamsepoort Porte de Namur
Lemonnier
Louise Louiza
Munthof Hôtel des Monnaies
Sint-Gillisvoorplein Parvis de Saint-Gilles
Horta
Albert
1 Gare de l'Ouest Weststation
Jacques Brel
Delacroix
Clemenceau
Zuidstation Gare du Midi
Porte de Hal Hallepoort
Pétillon
Hankar
Delta
Beaulieu
Demey
5 Herrmann-Debroux
Aumale
Saint-Guidon Sint-Guido
Veeweide Veeweyde
Bizet
5 Erasme Erasmus
Eddy Merckx
CERIA COOVI
Het Rad La Roue
7 Vanderkindere
4 Stalle P
3 Churchill
MIVB STIB
.brussels

Domain Model

It's about **usefulness, not realism**

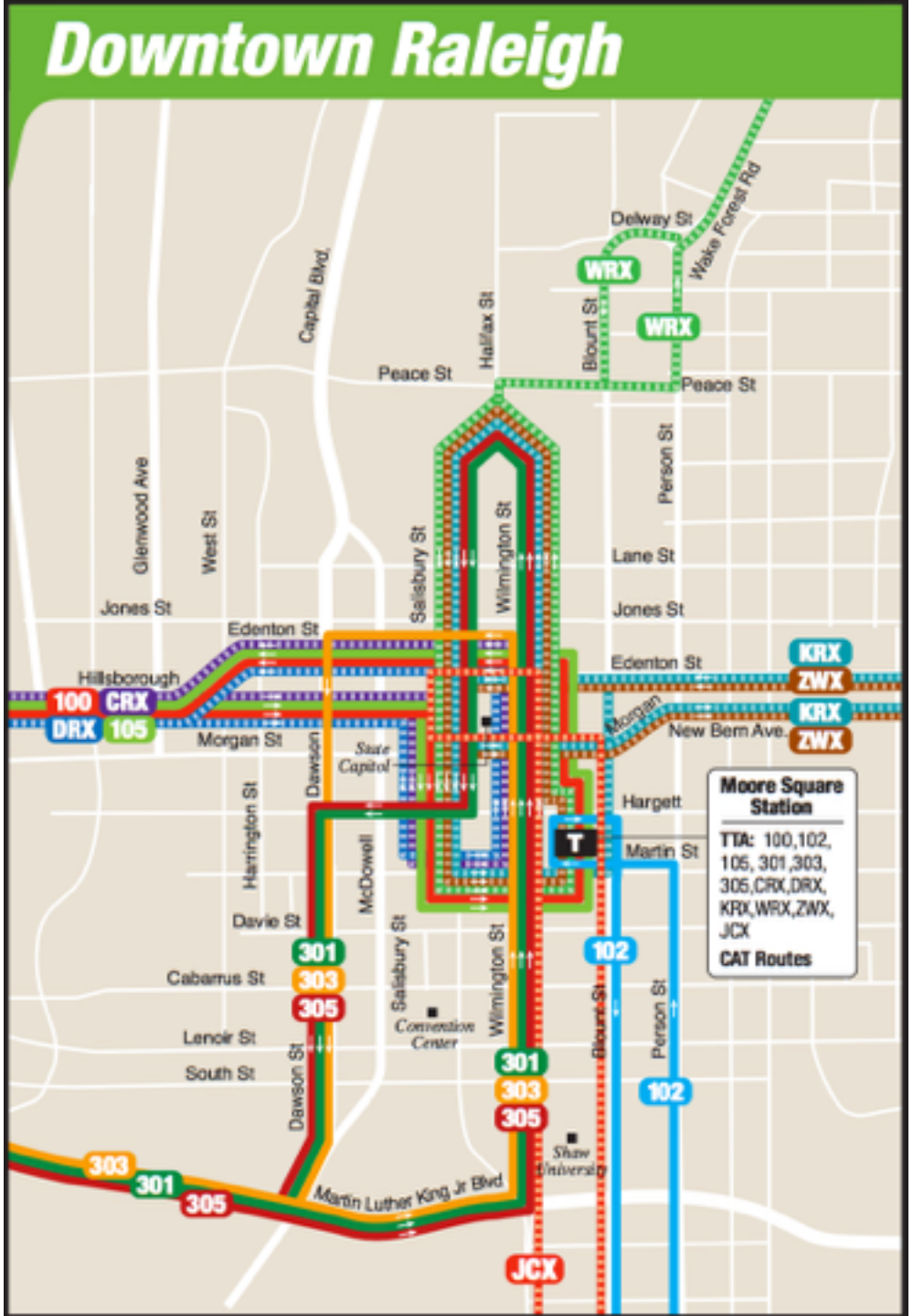
Domain Model

A set of concepts expressing distilled knowledge, rules, assumptions, concepts about a business domain

Assertions about this Model

- Passengers may only access transport at stations or stops
- Passenger transport follows transit lines
- Transit line length does not convey relative distance or direction
- Transit lines terminate at last station

Downtown Raleigh




newBRUSSELS
START POINT
Meet your guide in front of the tower of City Hall on Grand Place/Grote Markt.
Grand Place - Grote Markt
City Hall
Blvd Anspach Laan
Rue du Midi - Zuidstraat
Rue des Pierres - Steenstr
Lombard
TOURS START HERE
REE TOUR starts EVERY DAY at 11 AM & 2 PM
Blvd Baudouin - Boudewijnlaan
Blvd D'Anvers - Antwerpselaan
Blvd du Roi Albert II Laan
Rue de l'Avenir - Toekomststr
Chaussée de Gand - Gentsesteenweg
Blvd du 9E Ligne Laan
Blvd du Jardin Botanique - Kruidtuinlaan
Blvd Emile Jacqmain Laan
Blvd Pachéco Laan
Rue Royale - Koningsstr
Chaussée de Haecht - Haachtsesteenweg
Rue Rogier
Blvd Bischoffsheim Laan
Rue Scailquin Str
Rue Verbist Str
Chaussée de Louvain - Leuvensesteenweg
Blvd Clovis Laan
Rue de Congrès Str
R Croix de Fer - IJzerenkruisstr
R des Colonies - Koloniënstr
Blvd de Berlaimont Laan
L'Impératrice - Keizerinlaan
R Lombard Str
Rue Ducale - Hertogsstr
Blvd de Régent - Regentlaan
Ave des Arts - Kunstlaan
Rue de la Loi
Wetstraat
Rue Belliard Straat
R Lebeau Str
Rue de la Régence - Regentschapsstr
Ave Marnix Laan
Rue du Trône - Troonstraat
Chaussée de Wavre - Waversesteenweg
Blvd Poincaré - Poincarélaan
Blvd du Midi - Zuidlaan
Ave de Stalingrad Laan
Blvd Maurice Lemonnier Laan
Blvd Jamar Laan
R Quatre Bras Str
Rogier Tower
Botanical Garden
Béguinage Church
Martyrs' Square
Comic Strip Center
Colonne du Congrès
St Catherine's Church
La Monnaie Opera
Galeries Royales St Hubert
St Michel & St Gudule Cathedral
Stock Exchange
City Museum
Town Hall
Federal Parliament
Manneken
Mont des Arts
Magritte Museum
Royal Palace
Parc de Bruxelles Warandepark
Grand Sablon Grote Zavel
Notre Dame du Sablon
Petit Sablon Kleine Zavel
Parc d'Egmont
Marolles Flea Market
Pl du Jeu de Balle
Palace of Justice
Parc Léopold
European Parliament

"…the *most significant complexity* of many applications is *not* technical. It is in the

domain *itself*,

the activity or business of the user."

"A **successful design**

must systematically deal with this business domain complexity

as the

central aspect of the software."

- Eric Evans

Ubiquitous Language

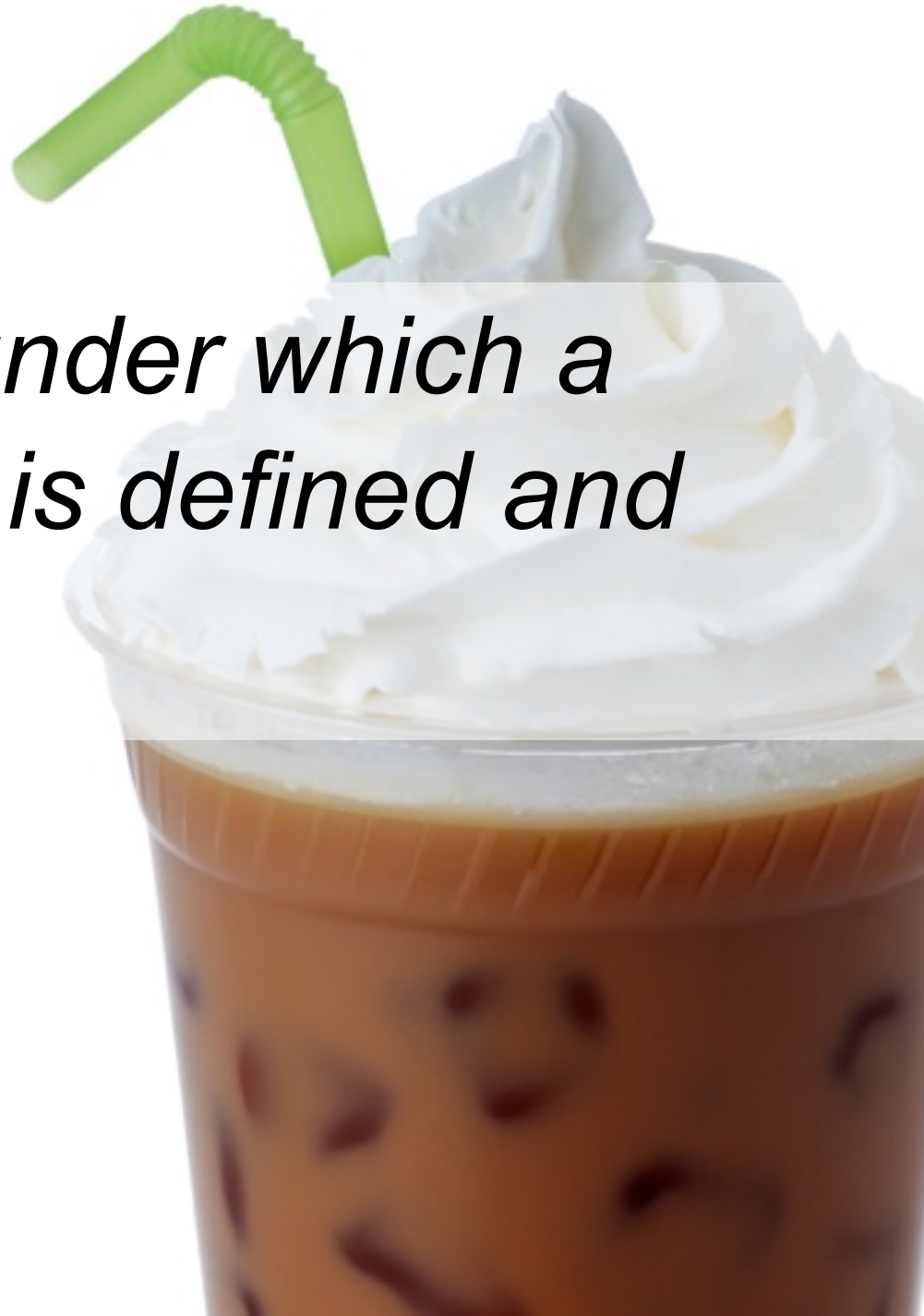
A language structured around the domain model,

used by all team members

to connect all the activities of the team with the software

Context

The conditions under which a particular model is defined and applicable.



Bounded Context

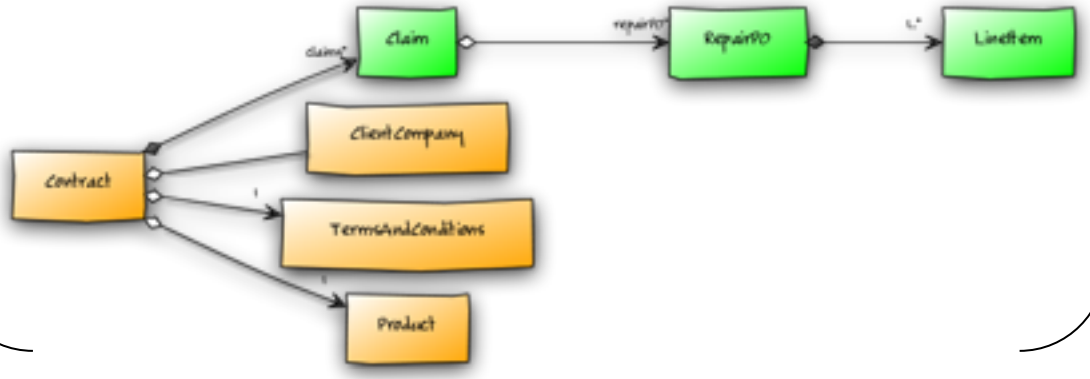
Ubiquitous Language

…within a **Bounded Countext**

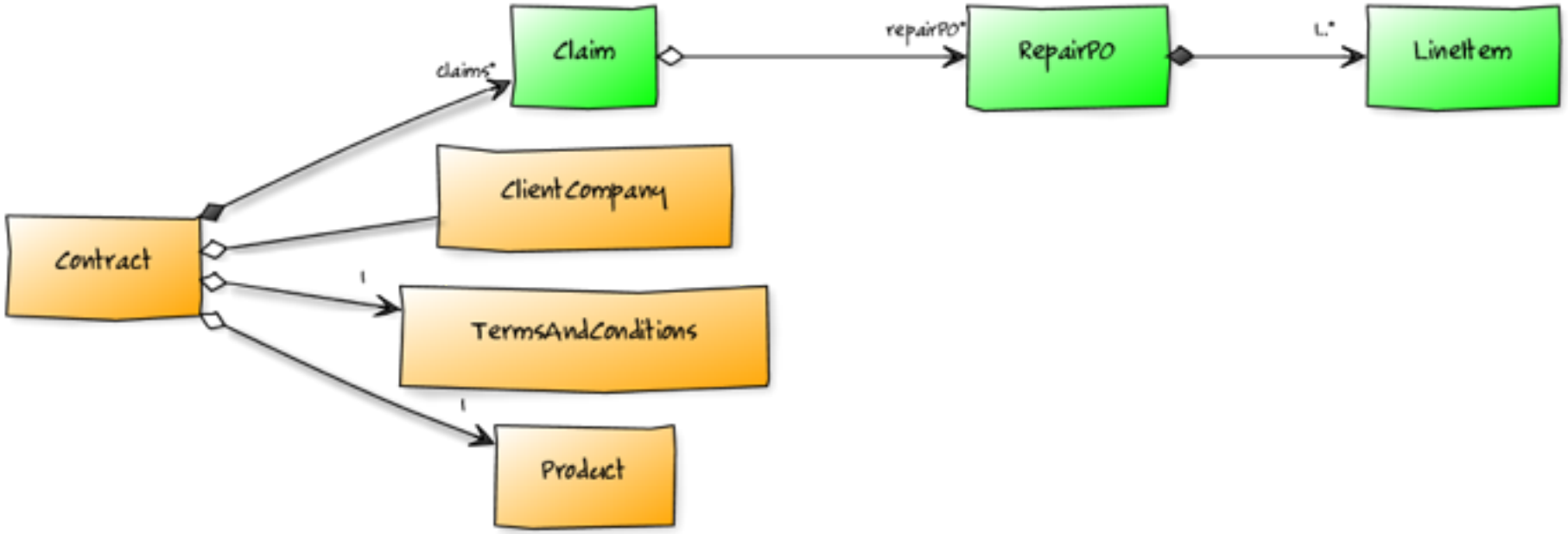
7. LIMIT OF LIABILITY:

The total amount that We will pay for repairs or replacement made in connection with all claims that You make pursuant to this Protection Plan shall not exceed the

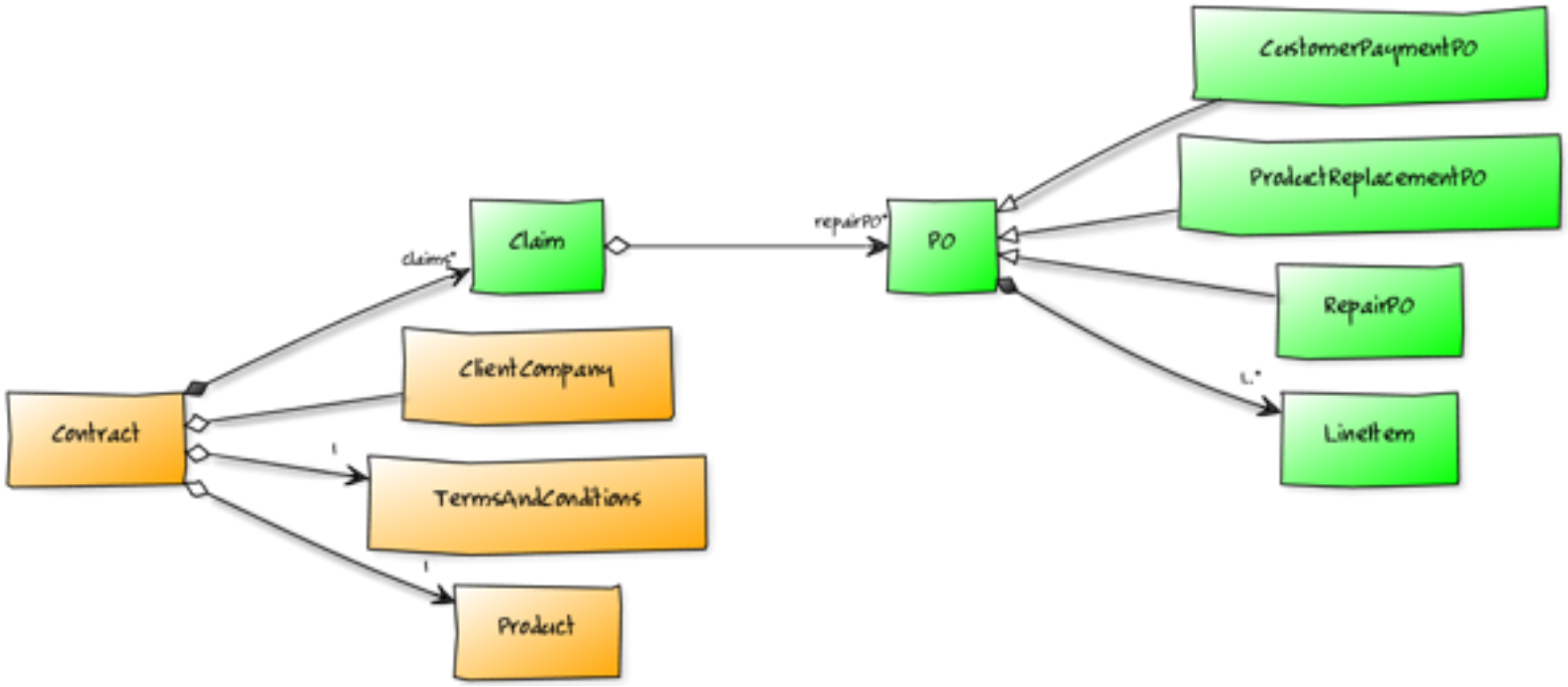
```
public double limitOfLiability()
{
double claimTotal = 0;
List<Claim> claims = new ArrayList<Claim>();
claims.addAll(this.getClaims());

for (Claim claim:claims)
{
  claimTotal += claim.amount;
}

return (this.purchasePrice - claimTotal) * 0.8;
}
```



Incorporate Customer Payment and Product Replacement



Proposed Model



Flesh out Customer Payment

Walk through the model together…

Technical and domain experts
Be concrete
Be specific
Go broad if necessary

Stress Points

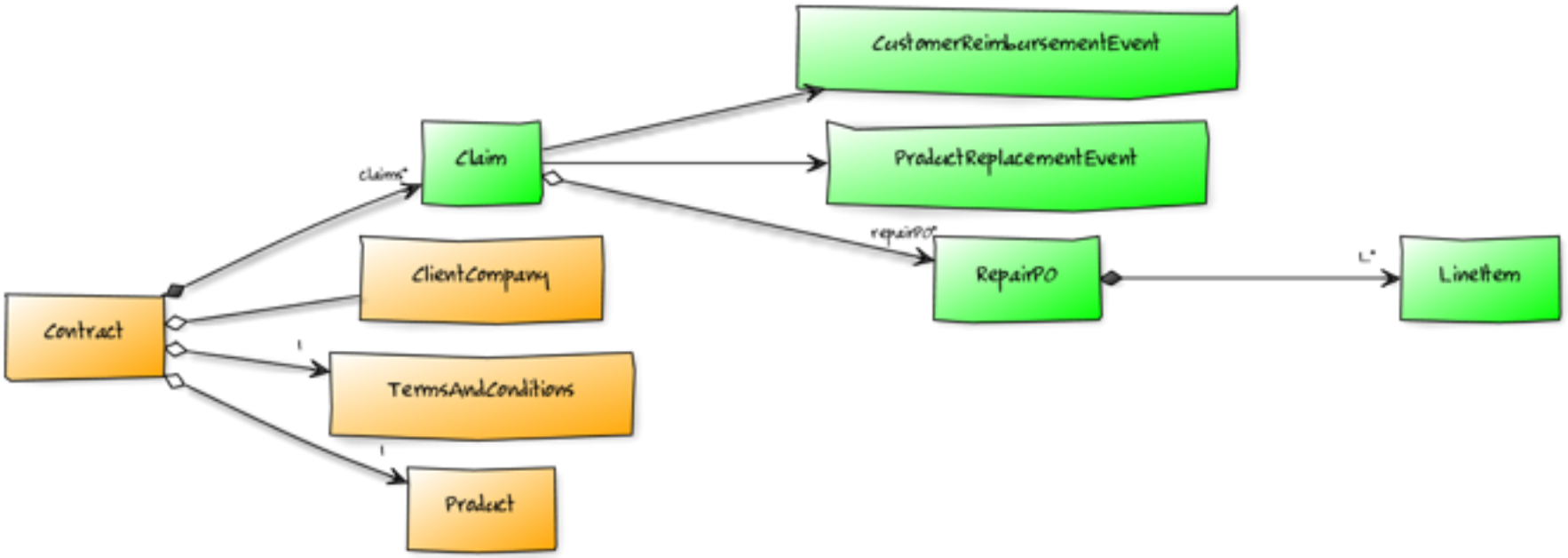
- “Reimbursement,” not “Payment”
- Creation of (unnecessary) Purchase Orders and Line Items
- Contract Fulfillment should be triggered by (one-time only) Customer Reimbursement/Product Replacement
- Not a check, a *store credit*. But would like to support at check later on.

Update the ubiquitous language

Make concepts explicit

It's *exploration*, so be humble and make mistakes

Incorporate the Learning



Contracts Software Ecosystem Background Information

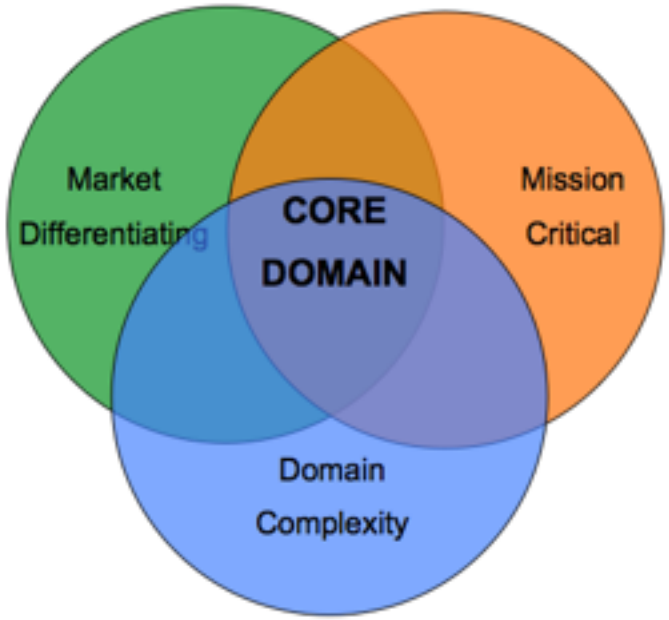
- All contracts and claims created prior to 2012 are still managed in Confluence (legacy AS400 system). We avoid touching this system for fear of breaking something. We manage POs for these legacy contracts using our current system.
- Each client company provides us with point-of-sale (POS) data that we translate and validate before using it to create contracts.
- We provide a REST API for other 3rd-party extended warranty partner companies to manage their own claims using our system.
- We export our contracts and claims data via a nightly ETL process to a reporting database.
- Two different teams work on the contracts and claims system

New feature requests…

- Provide warranties for product bundles (e.g. LCD TV/Bluray player/Sound bar).
- Track performance of servicer management company.
- Switch to a new (better!) servicer management company (will need to integrate with whatever system they have).
- Rewrite AS400 system for legacy contracts.

Appropriate Core Domain Strategies

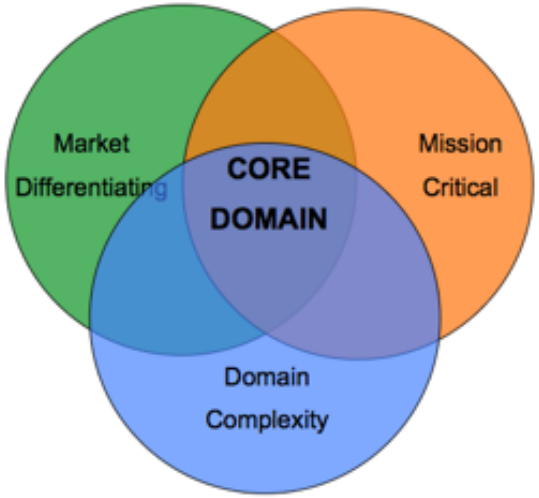
- *Isolate in a clean bounded context, speak a ubiquitous language, explore models in collaboration with domain experts.*
- Utilize the skills of your most experienced developers and skilled domain modelers.
- Avoid churn in the staff to encourage deep domain knowledge acquisition over a period of time.
- Innovate and excel.
- Iterate and experiment.
- Maximize learning - by making (small) mistakes early and often.


Market
Differentiating
Mission
Critical
CORE
DOMAIN
Domain
Complexity

Value
Time

Domain-Driven Design (DDD)

A set of principles and patterns for focusing design effort where it matters most, particularly in complex business domains.

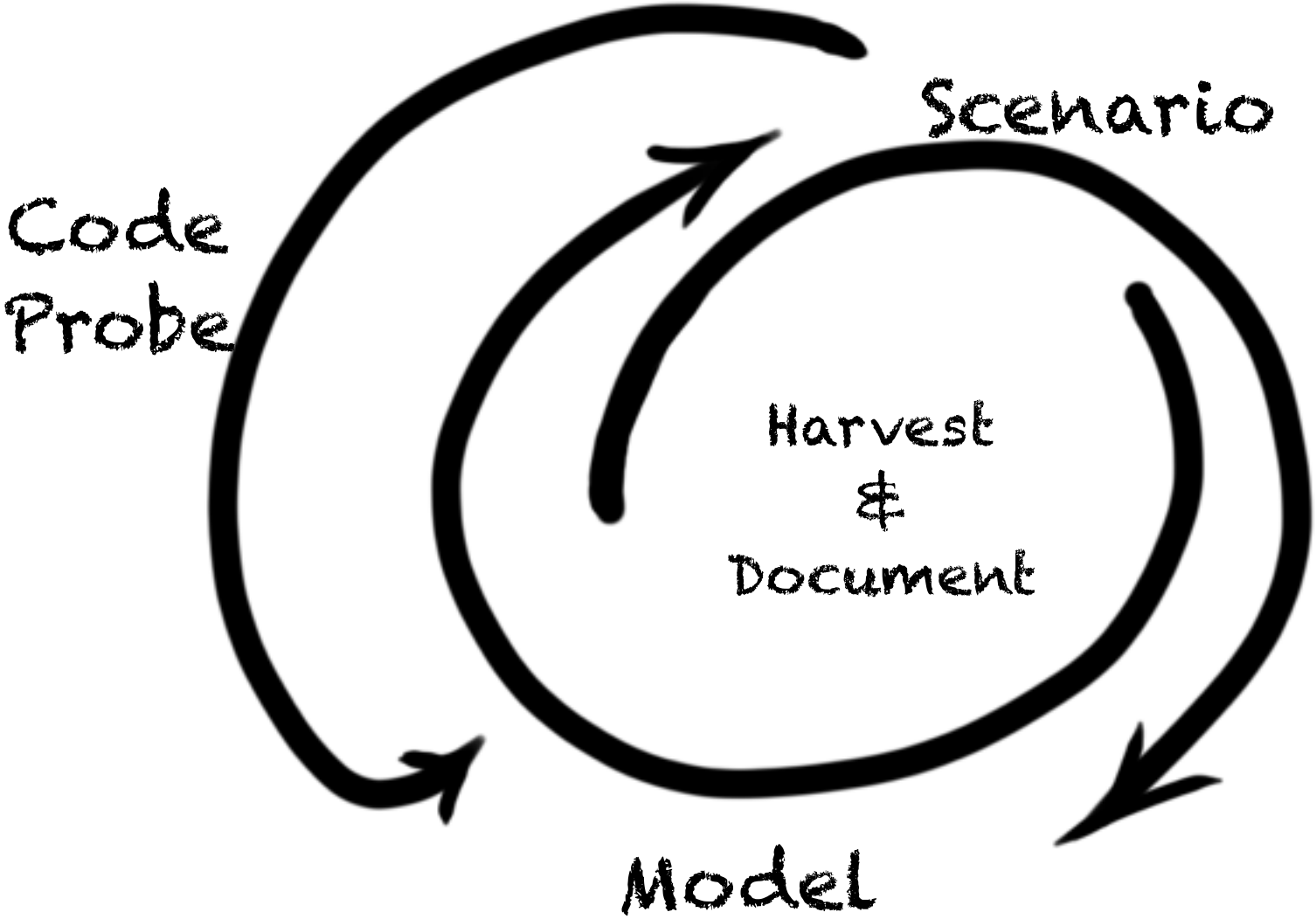



Collaborative Modeling
Pragmatic
Creative
Rigorous
Hard!!!

Model Exploration

Whirlpool

domainlanguage.com/ddd/whirlpool



CORE DOMAIN

Focused on business goals and business capabilities

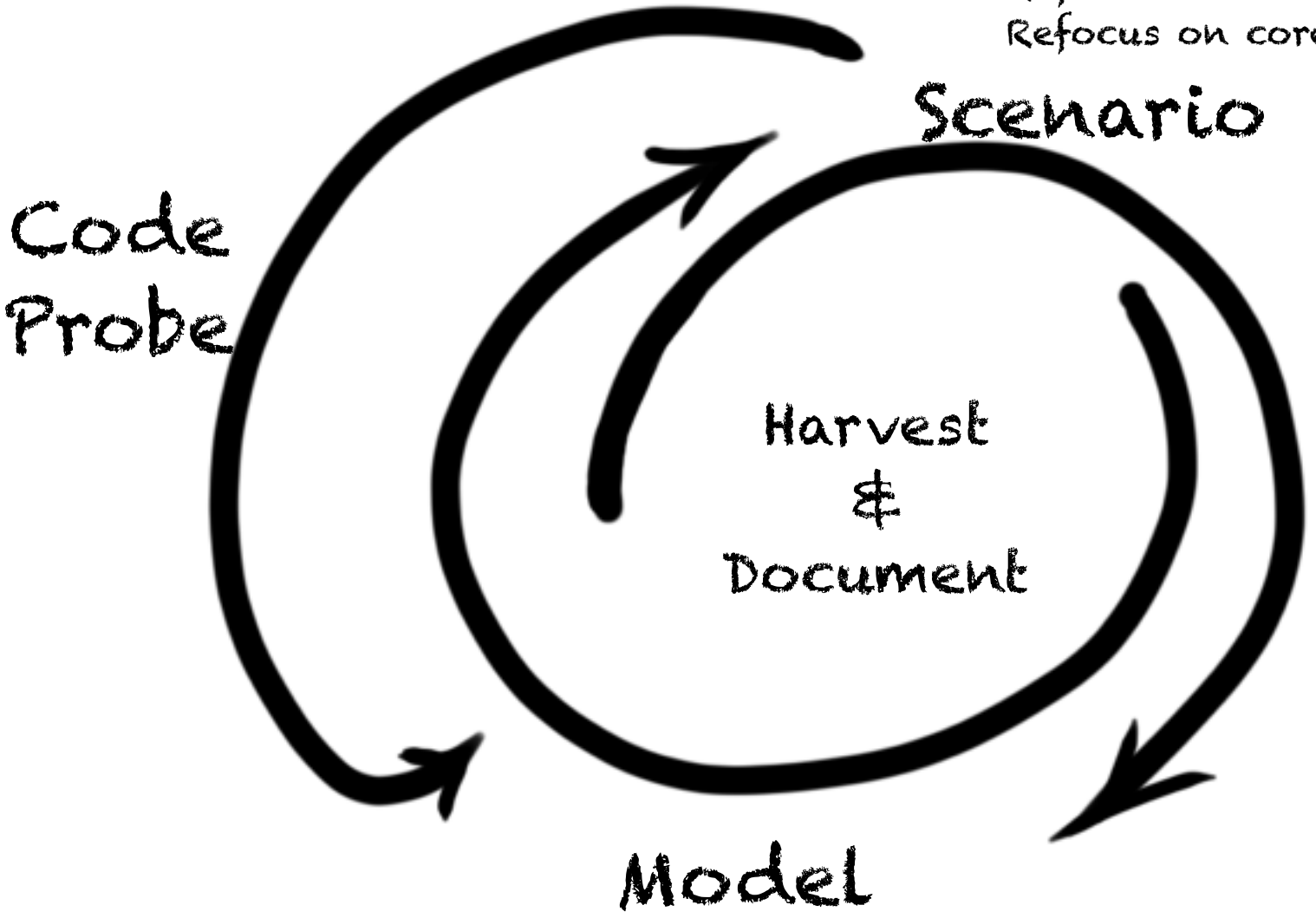
"How will this solution contribute to your company's competitive edge?"

Write as little code as possible to meet the business need.

Model Exploration

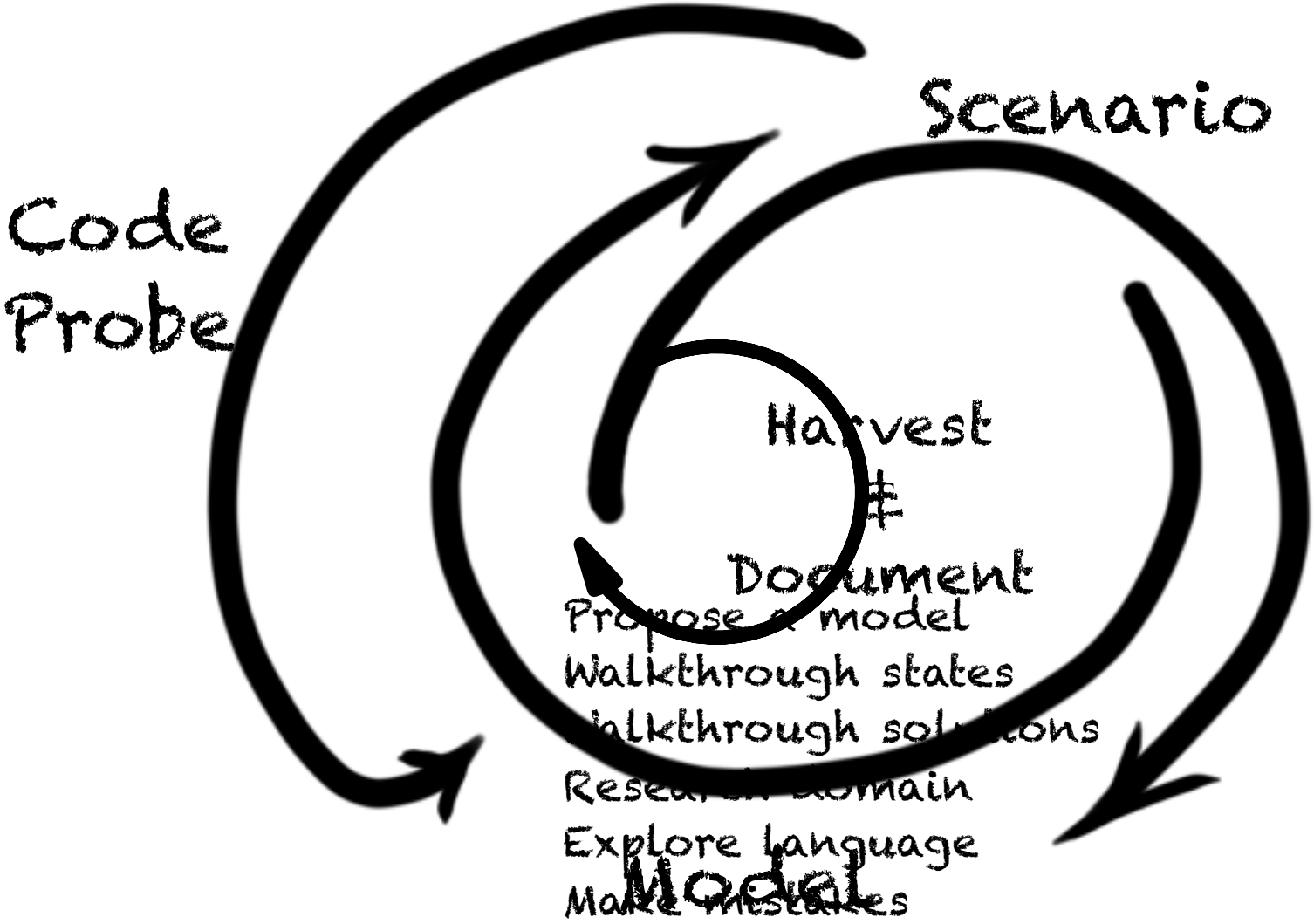
Whirlpool

Tell us a story
Flesh it out
Refocus on the hard part
Refocus on core domain



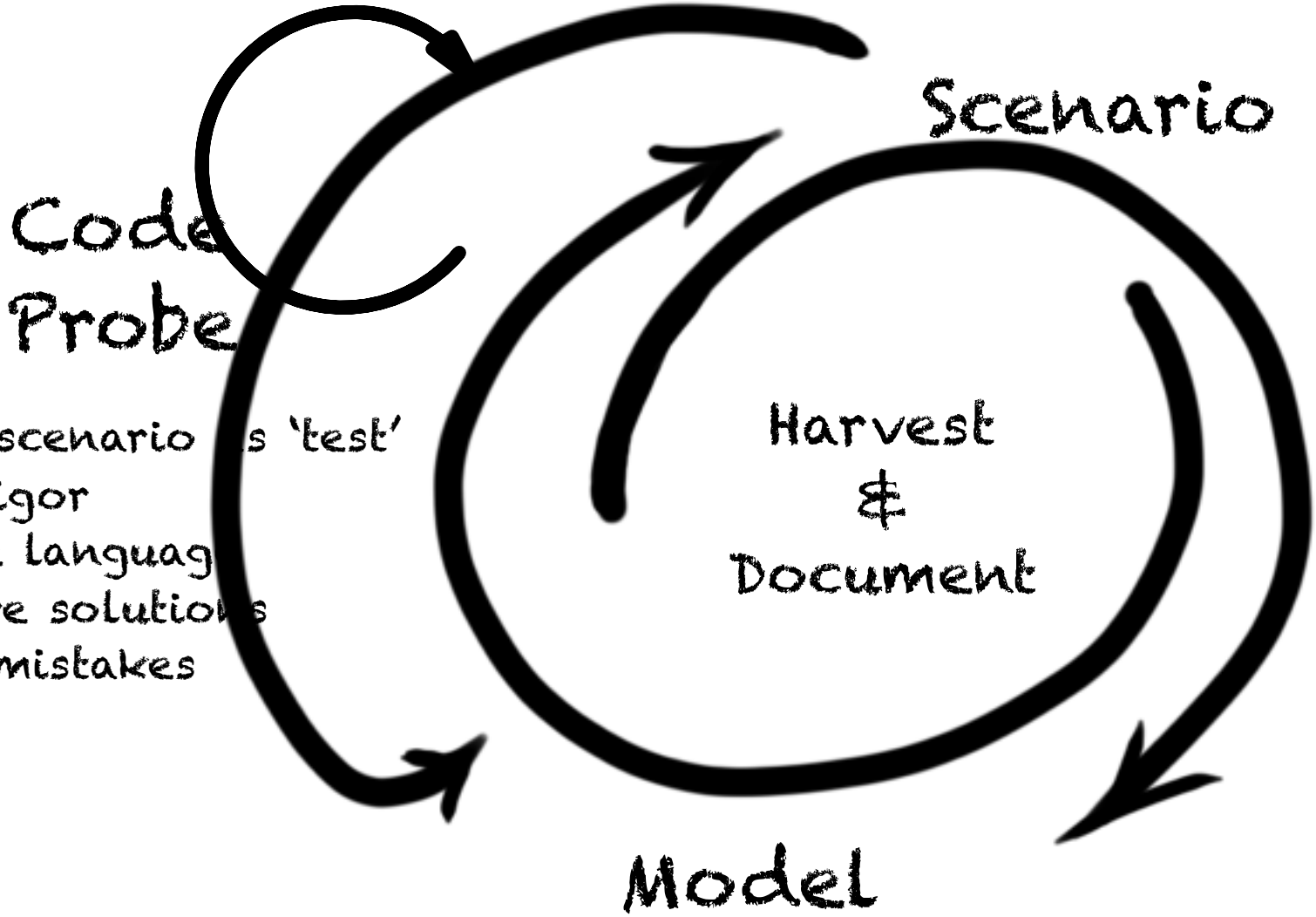
Model Exploration

Whirlpool



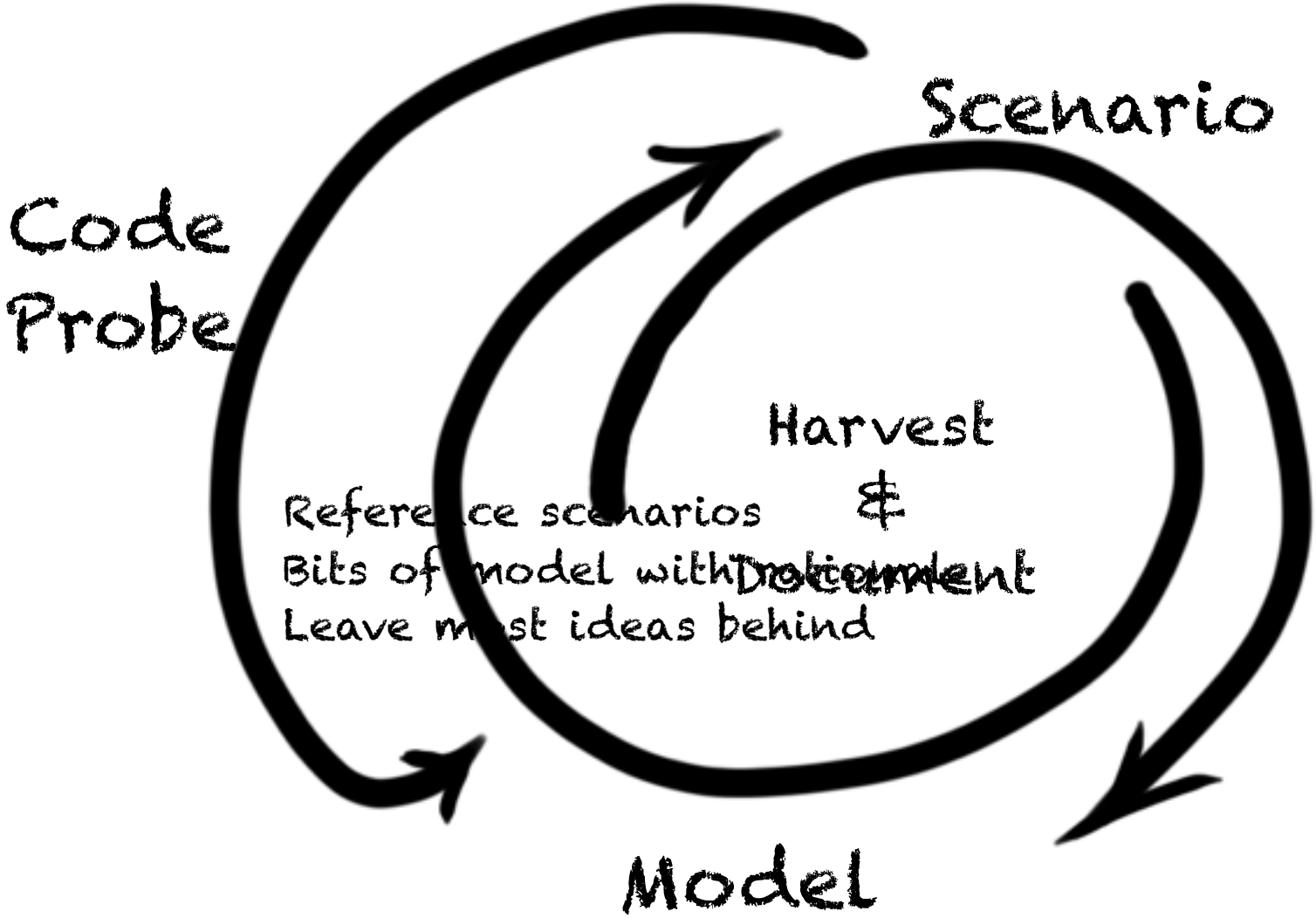
Model Exploration

Whirlpool



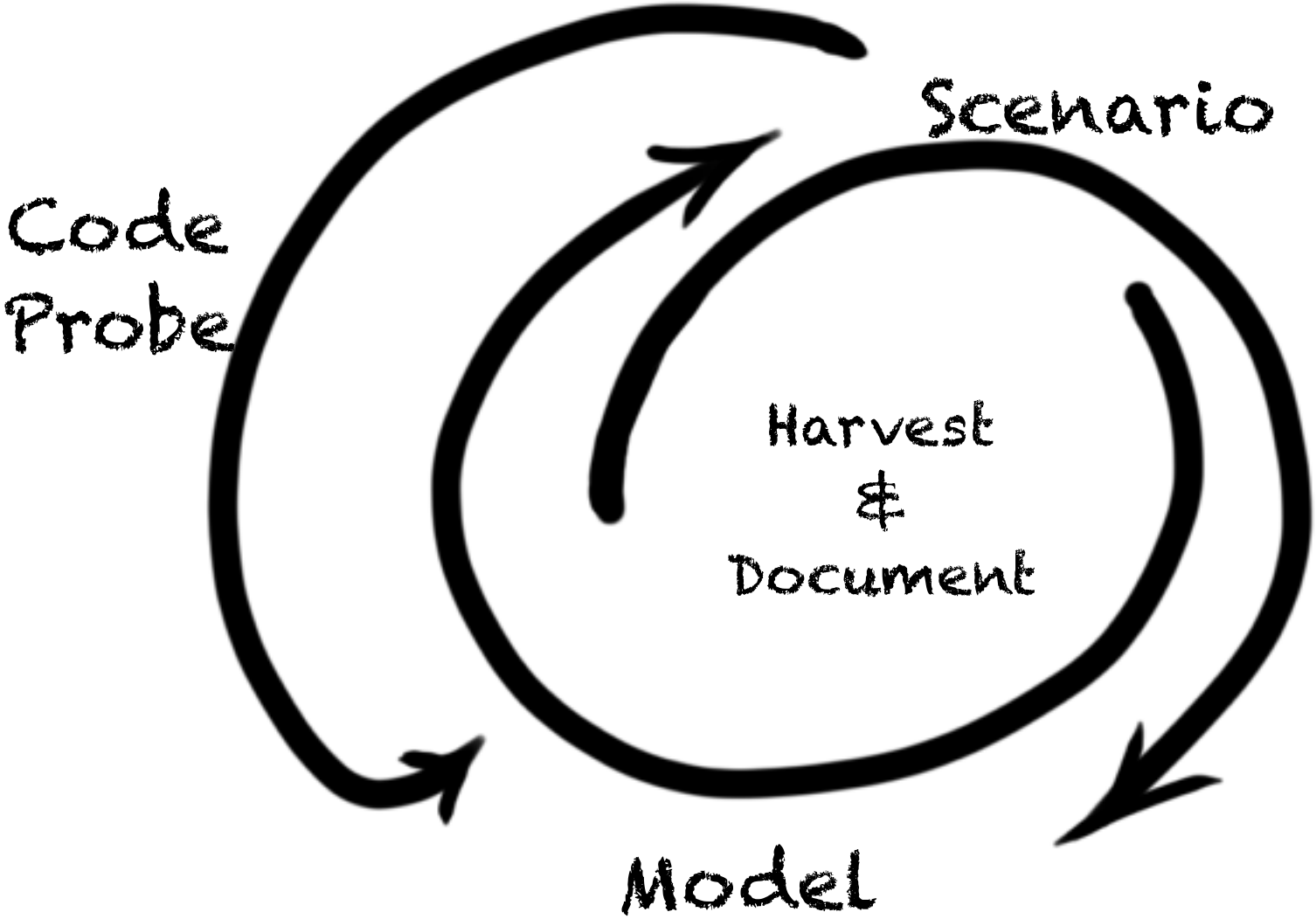
Model Exploration

Whirlpool



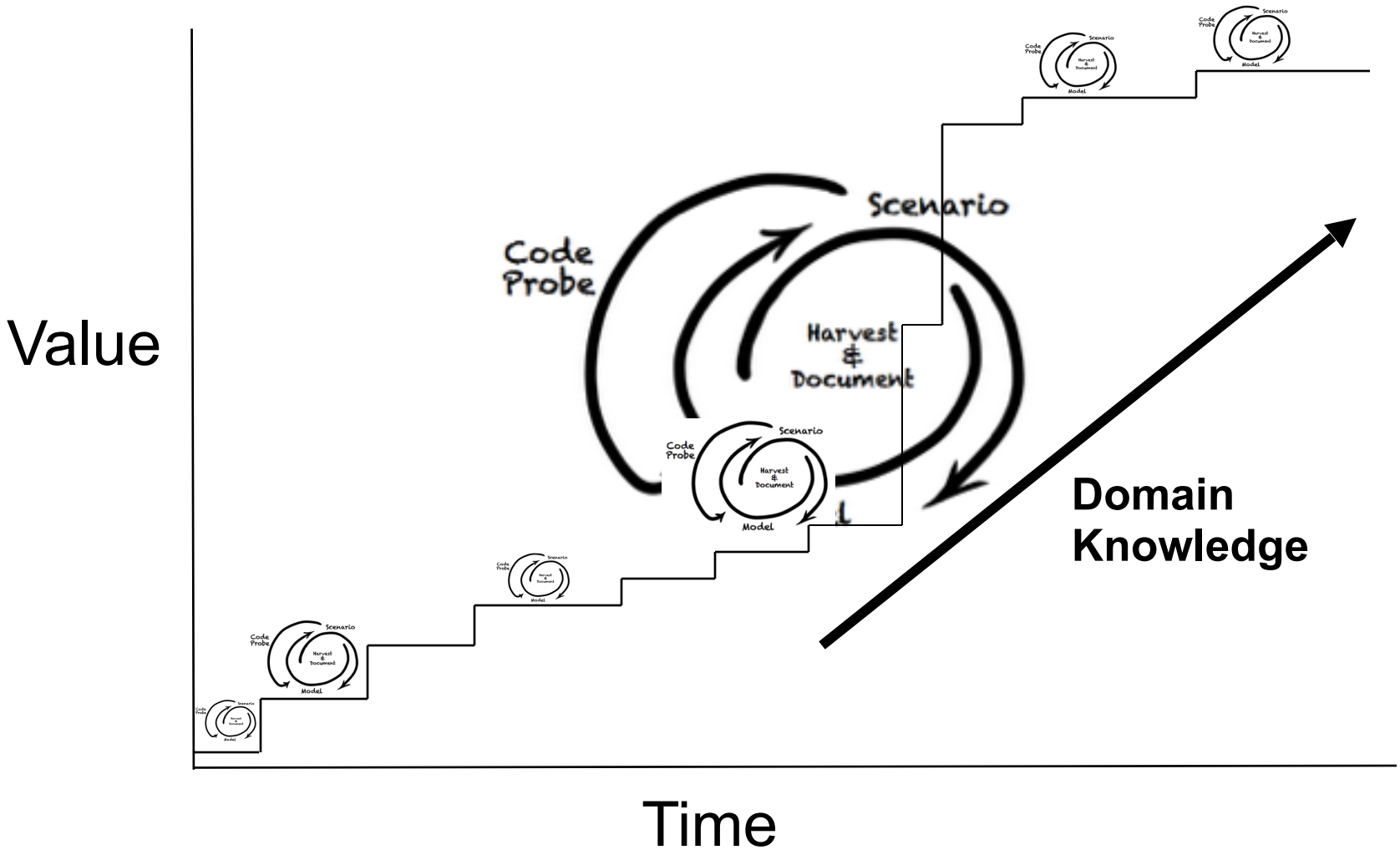
Model Exploration

Whirlpool

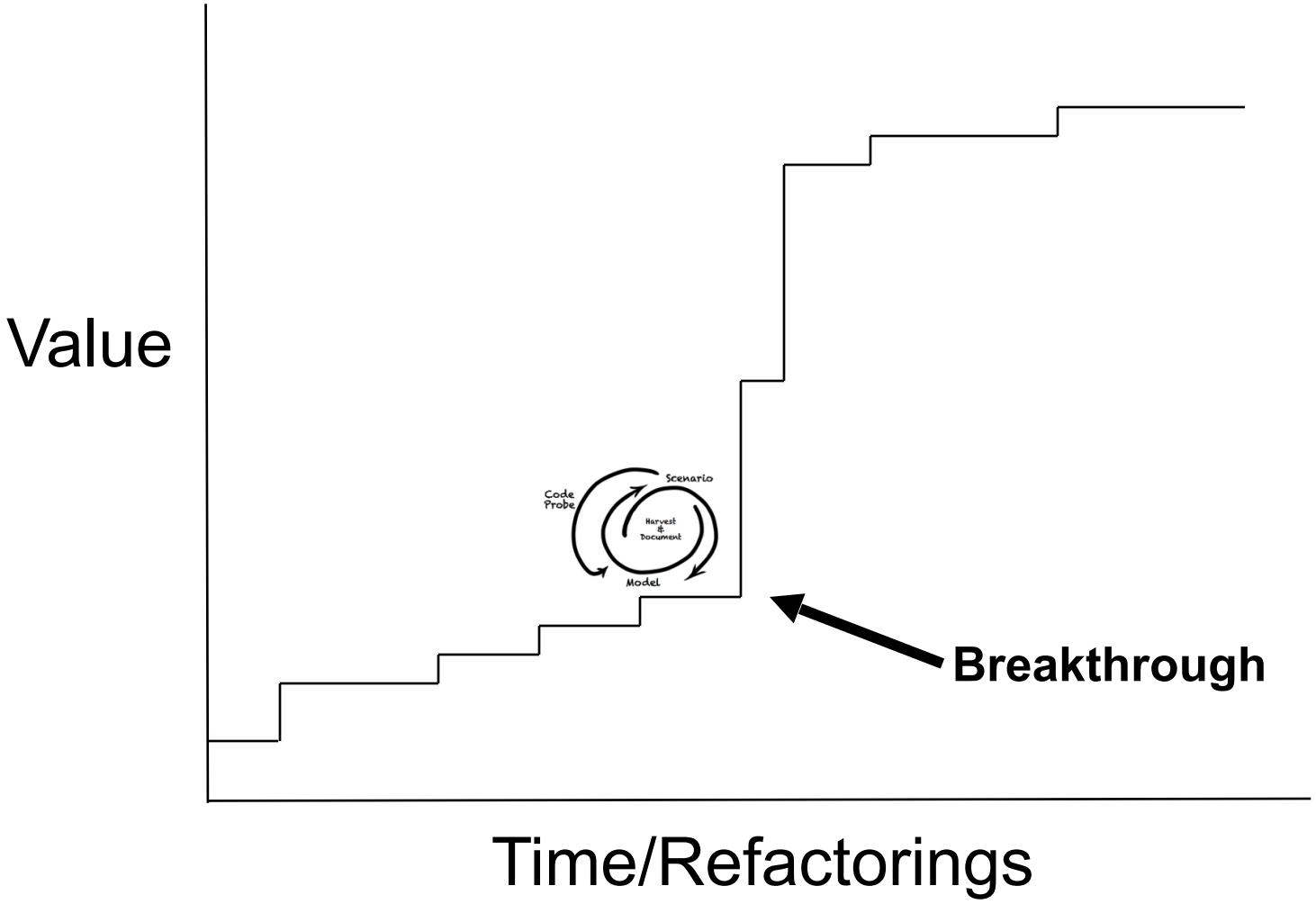


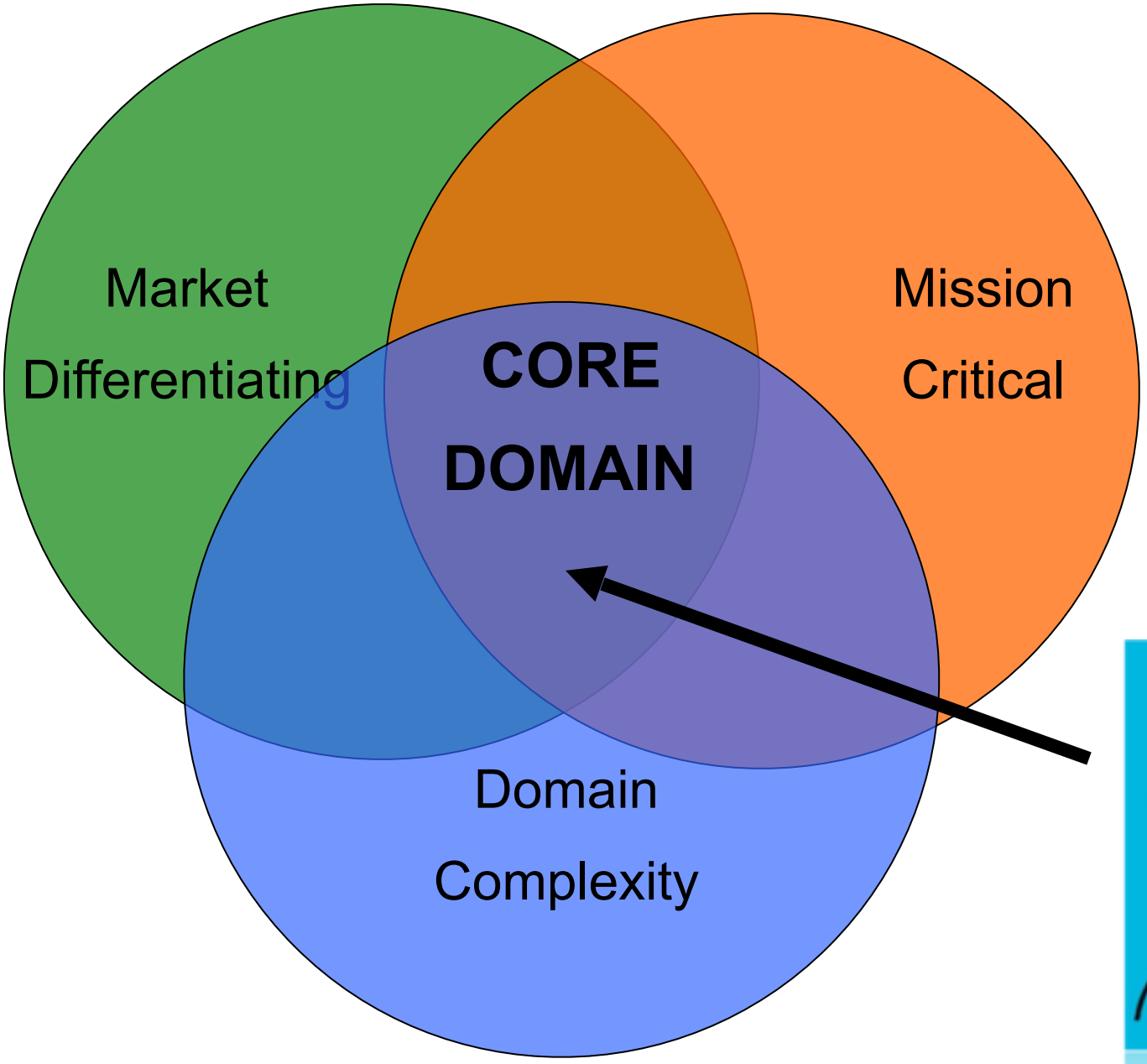
Iterative Design + Incremental Development =

Accelerated Product Delivery



Refactoring to a Deeper Model

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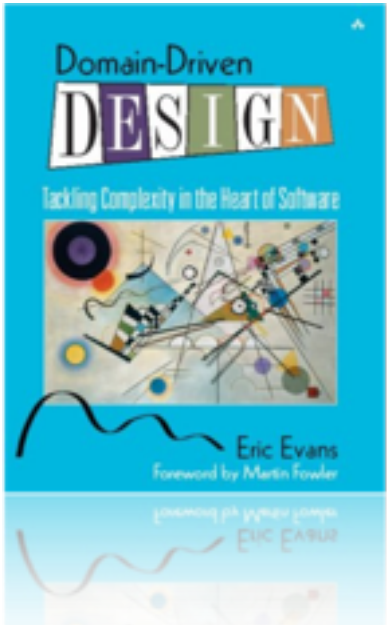
Domain-Driven
DESIGN
Tackling Complexity in the Heart of Software
Eric Evans
Foreword by Martin Fowler