Modeling Problems in Software

Envisioning the Domain as a Collection of Separate, Manageable Parts

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pluralsight
hardcore developer training

In This Module

- Breaking Up the Veterinary Office Domain

- The Importance of the Domain Experts

- A Play!

- Core elements of a Domain Model

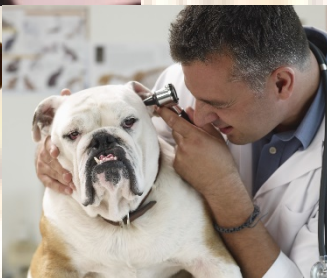- Sub-Domains and Bounded Contexts

- That Ubiquitous Term: Ubiquitous Language

Our Domain: A Veterinary Practice

Our Domain: A Veterinary Practice

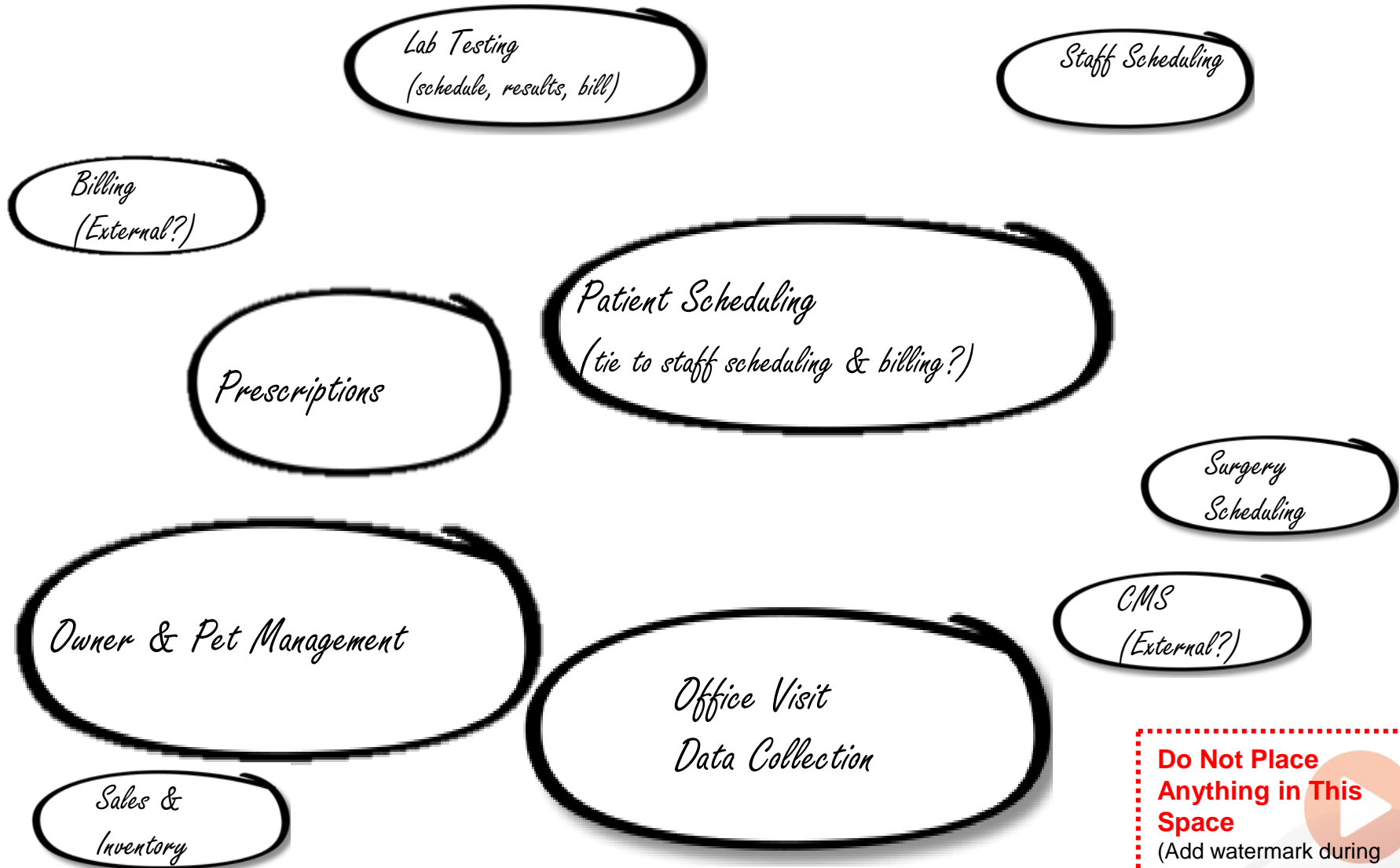Role playing….working with client to discover sub domains

Demo

Learning about the Complete Domain

Lab Testing
(schedule, results, bill)

Staff Scheduling

Billing
(External?)

Prescriptions

Patient Scheduling
(tie to staff scheduling & billing?)

Surgery
Scheduling

Owner & Pet Management

CMS
(External?)

Office Visit
Data Collection

Sales &
Inventory

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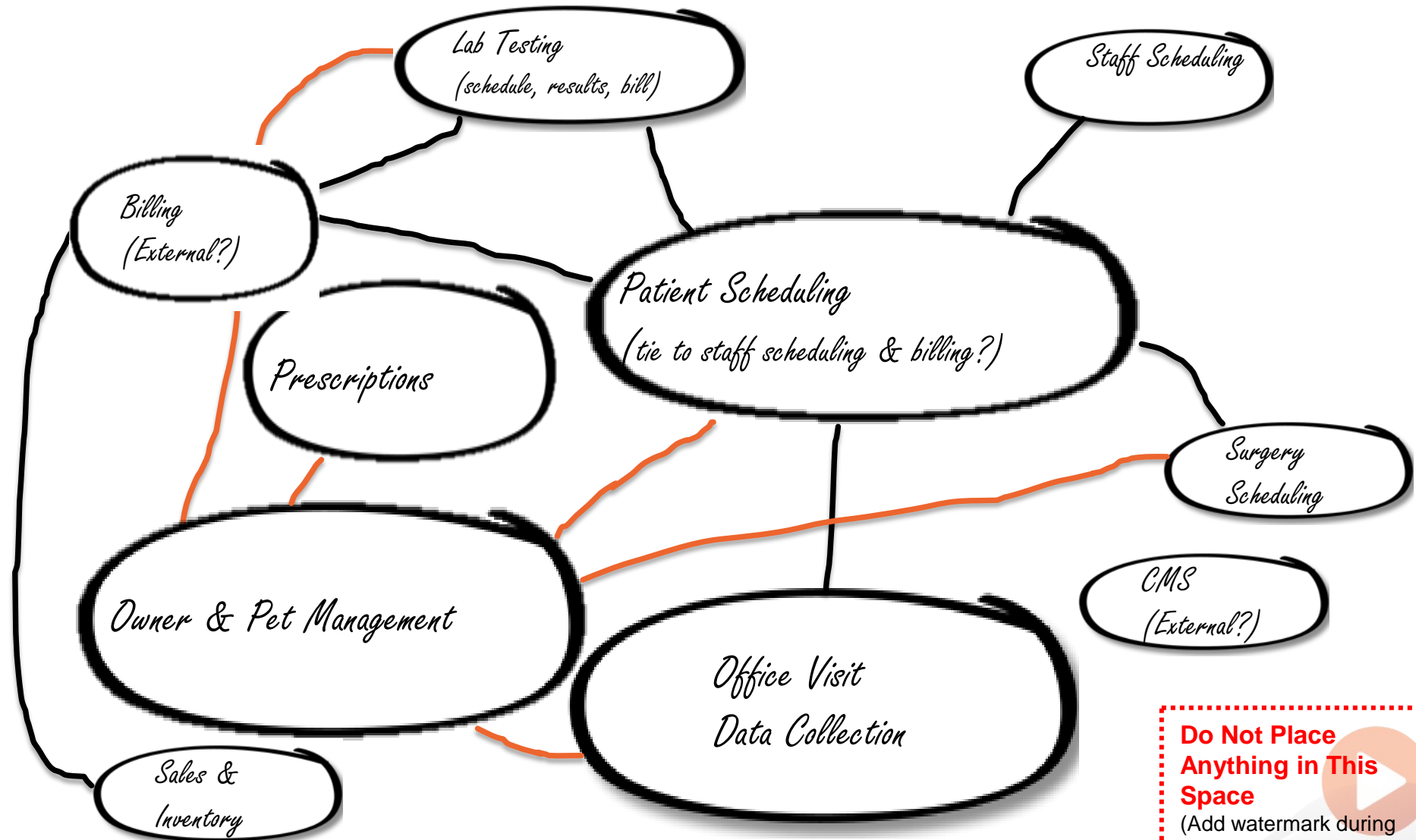
Our Domain: A Veterinary Practice
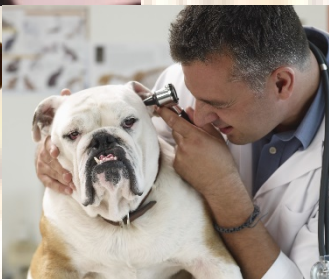
Some of Our Sub-Domains

Staff

Accounting

Patient Records

Visit Records

Appointment Scheduling
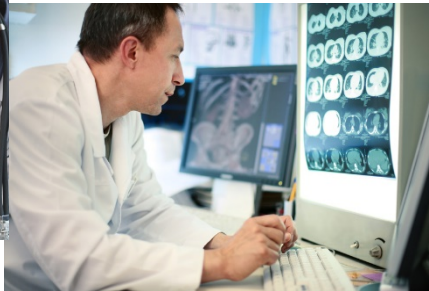
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Modeling a Subdomain

A Play in One Act

Appointment Scheduling

- **Clients (people)** schedule **appointments** for **patients (pets)**

- **Appointments** may be either **office visits** or **surgeries**

- **Office visits** may be an **exam** requiring a **doctor**, or a **tech visit**

- **Office visits** depend on **exam room** availability

- **Surgeries** depend on **O/R** and **recovery** space availability, and can involve different kinds of **procedures**

- Different **appointment types** and **procedures** require different staff

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Modeling a Subdomain

A Play in One Act

Appointment Scheduling

Key Takeaways From the Customer Conversation

- **Patients and Clients are not the same thing to a Veterinarian**

- **The Customer gained better understanding of their own business process by describing it in terms we could understand and model**

- **We did our best to avoid speaking in programmer terms**

- **At this stage, the focus is on how the domain works, not how the software will work**
  - We haven't even gotten to the point of collecting user stories or application requirements

" As software developers, we fail in two ways:
We build the thing wrong, or
We build the wrong thing. "

— Steve Smith

The Appointment Manager Model (so far)
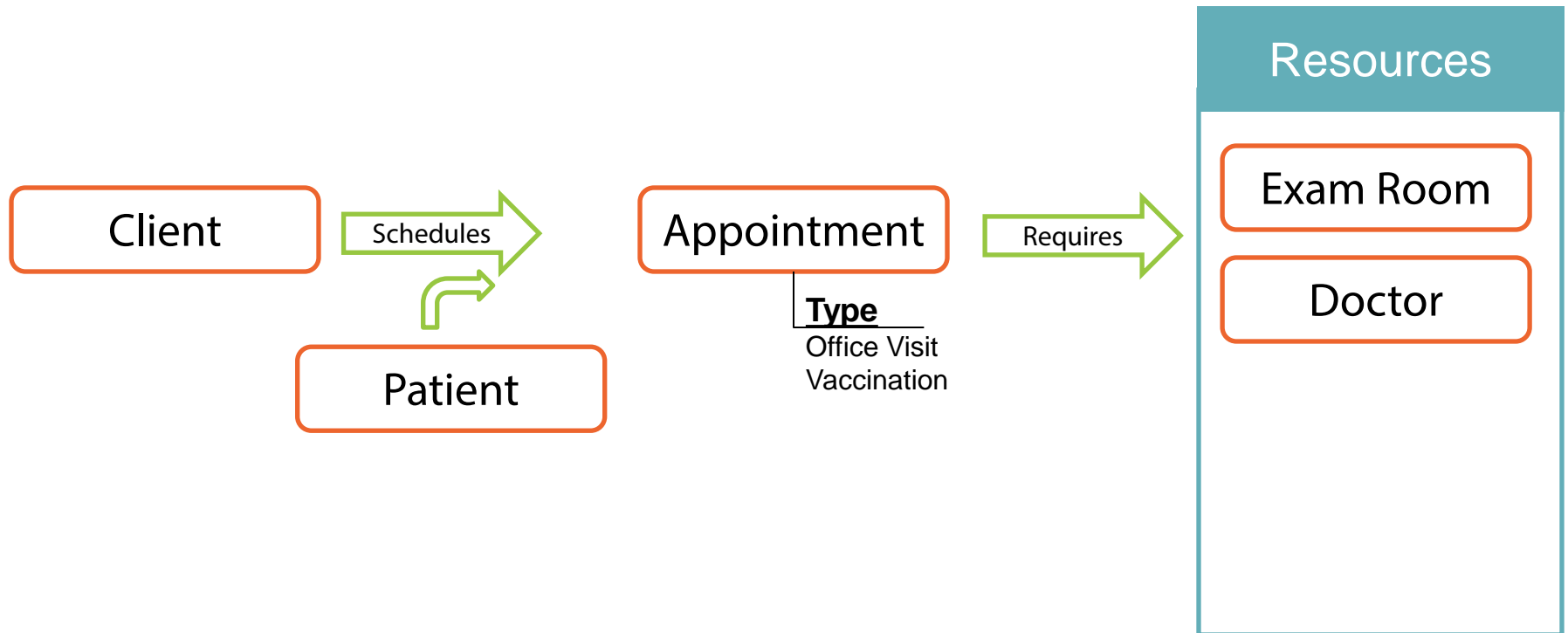

Client —Schedules→ Appointment —Requires→ Resources

Patient

Type
Office Visit
Vaccination

Resources:
- Exam Room
- Doctor

The Appointment Manager Model (so far)

Client — Schedules → Appointment

Patient

Appointment
Type
Office Visit
Vaccination

Surgery
Procedure
Spay

Requires →

Resources
Exam Room
Doctor
O/R
Recovery

Bounded Context

Appointment Scheduling

Billing
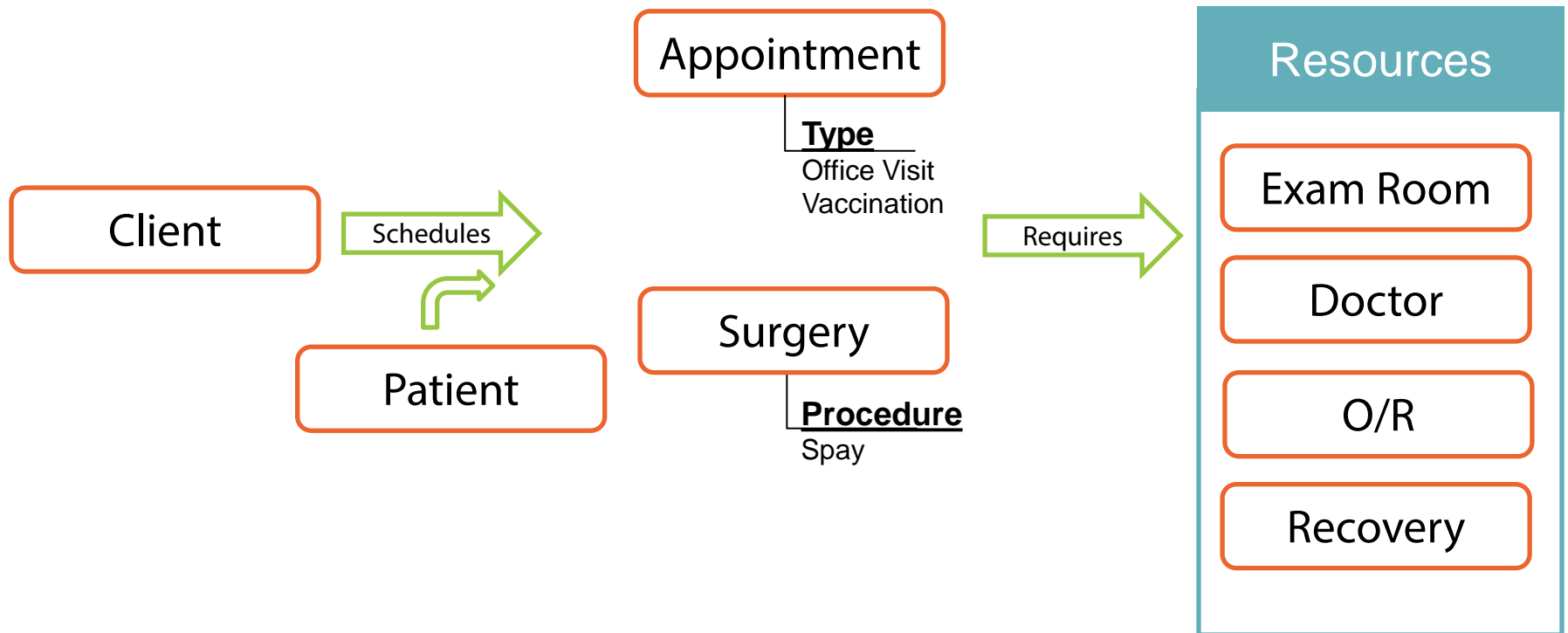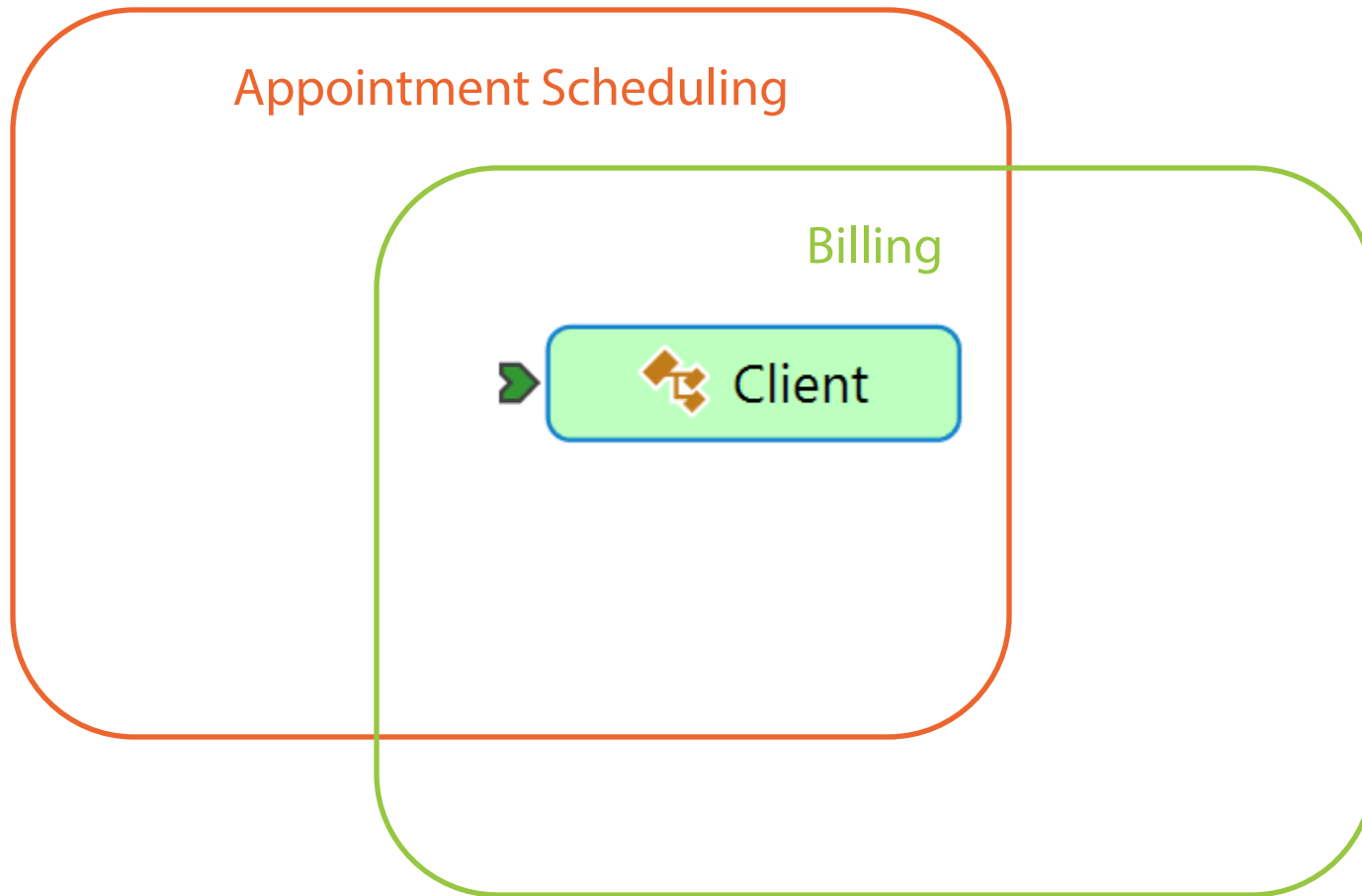
Client

"

Explicitly define the context within which a model applies… Keep the model strictly consistent within these bounds, but don't be distracted or confused by issues outside.

— Eric Evans

Bounded Context

Appointment Scheduling

➤ ◆ Client

Billing

➤ ◆ Client

Context Maps

Legend 1:

Foreign territory — Other International Boundaries

Foreign territory (Claimed by India) — Boundary Claimed by India

Siachen Glacier (Conflict Zone) — Line of Actual Control (In Dispute)

Indian territory (Claimed by Other countries)

Indian territory — International Boundary

State / Union Territory Boundary

District Boundary

Fresh water body

River

SALT WATER BODY — Coastline

Legend 2:

⭐ NATIONAL CAPITAL
✪ METRO CITY
✪ State Capital
✪ Union Territory Capital

STATE NAME
Union Territory

◉ Major City
○ Tourist City
• Other City

Legend 3:

Modern Boundaries   Historic Region

Foreign Boundary — — — —   Other Empires / Territories

Boundary under Dispute — · — · —

Indian Frontier — — — —   Extent of Historical Empire

Indian State Boundary — — — — —
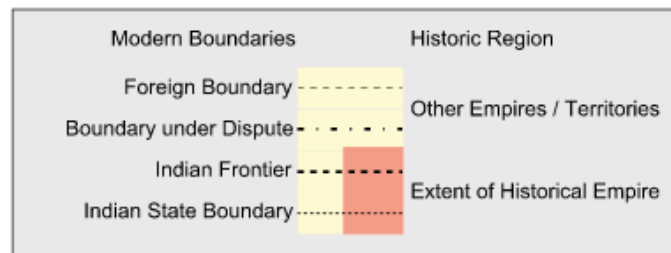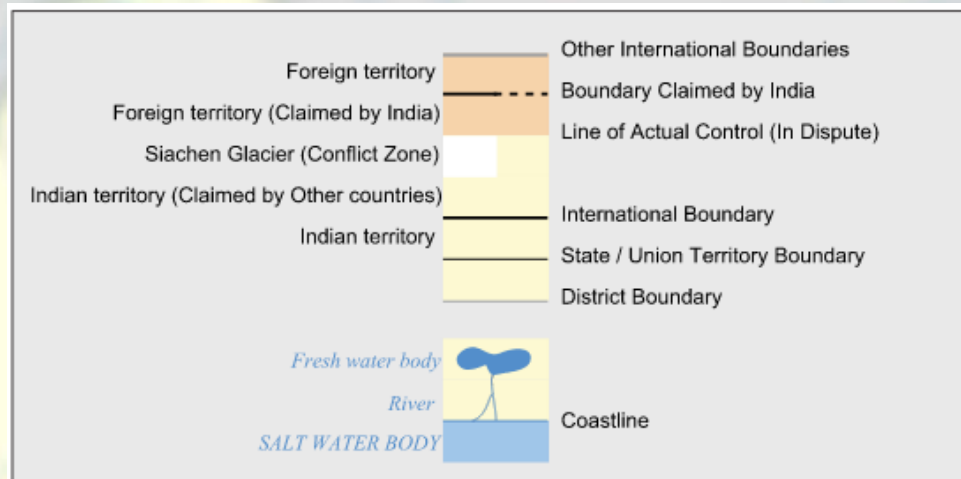
Context Maps

Appointment Scheduler

Client	Notification

Patient	Exam Room

Appointment

Billing

Client

Procedure	Invoice

Notification

The Dev Team

vet-managr
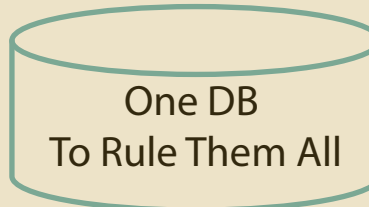
One DB
To Rule Them All

Context Maps

Appointment Scheduler

Client

Notification

Patient

Exam Room

Appointment

Team Awesome

vet-appt-sched

DB

Billing

Client

Procedure

Invoice

Notification

Team Ultimate

vet-billing

DB

Shared Kernel

Authentication

User
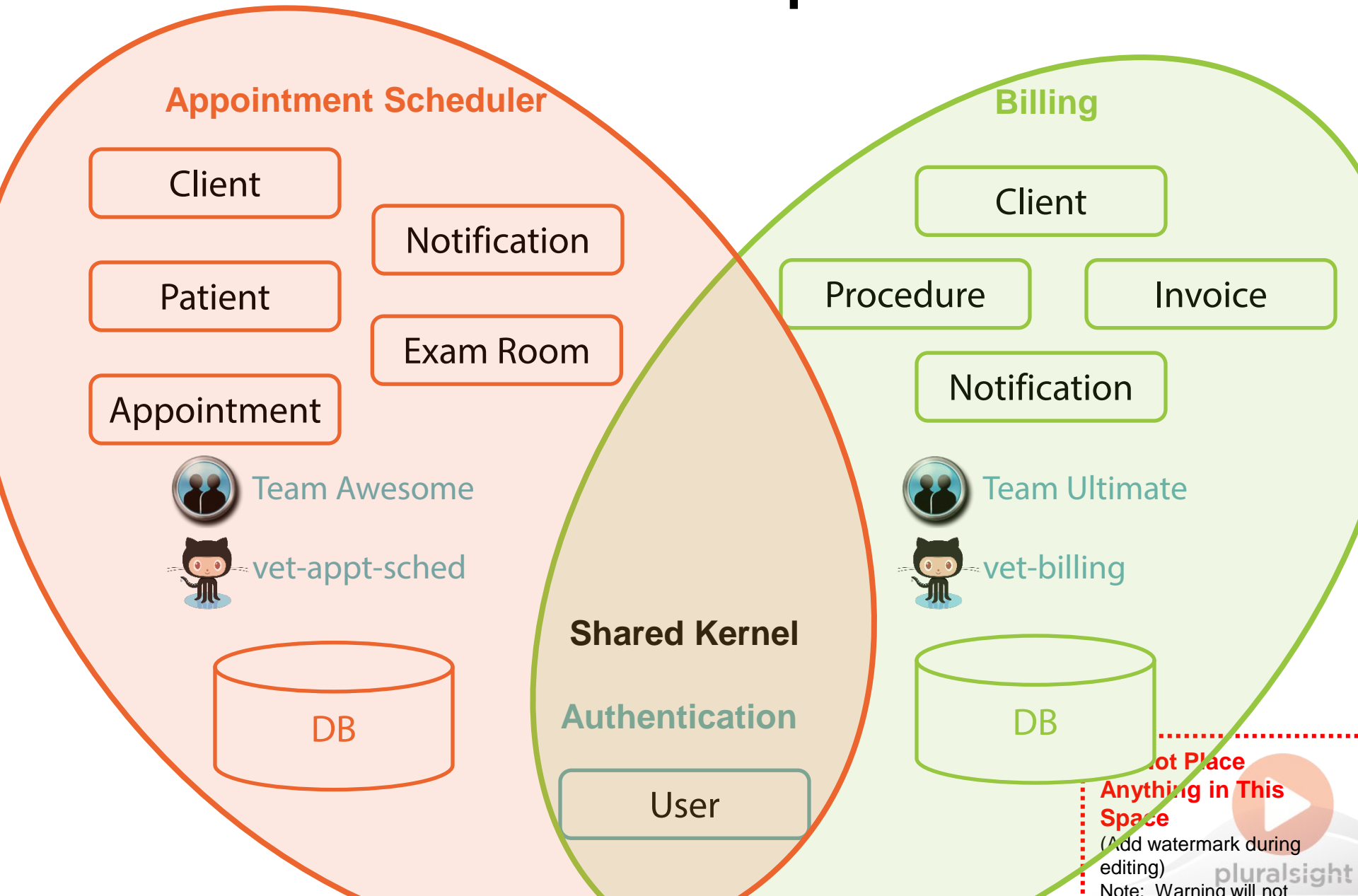
Bounded Contexts in the Application
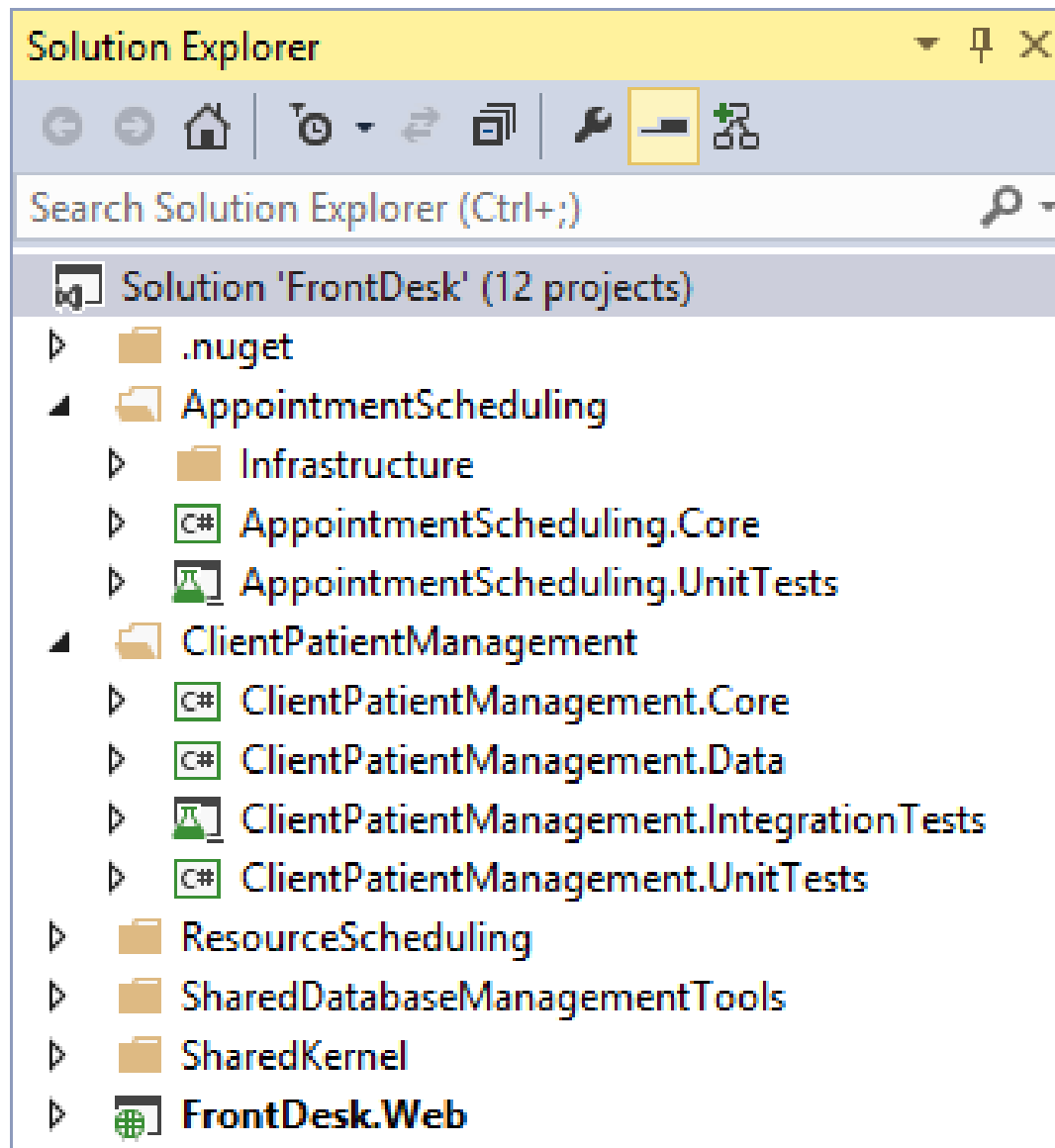
Ubiquitous Language

> A project faces serious problems
> when its language is fractured.

— **Eric Evans**

Ubiquitous Language

For a single Bounded Context

Used throughout that context, from conversations to code

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Translation

Paste Your Text Here (250 characters max)

As a veterinary technician
I want to create an appointment for a patient
So they know when to return for their office visit.

Translation:

Back to English: Technical vétérinaire knows when to visit the patient close.

To Bulgarian: Технически Федералната знае кога да посетите пациента близо.

Back to English: Technical Federal knows when to visit the patient.

Working Toward a Ubiquitous Language

Another Conversation

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"

Recognize that a change in the ubiquitous language is a change in the model.

— Eric Evans

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Glossary of Terms from this Module

Problem Domain

The specific problem the software you're working on is trying to solve.

Core Domain

The key differentiator for the customer's business – something they must do well and cannot outsource.

Sub-Domains

Separate applications or features your software must support or interact with.

Bounded Context

A specific responsibility, with explicit boundaries that separate it from other parts of the system.

Glossary of Terms from this Module (cont.)

Context Mapping

The process of identifying bounded contexts and their relationships to one another.

Shared Kernel

Part of the model that is shared by two or more teams, who agree not to change it without collaboration
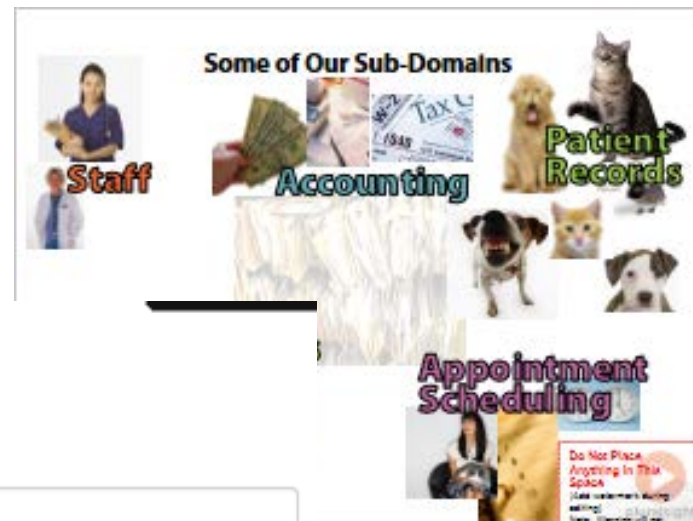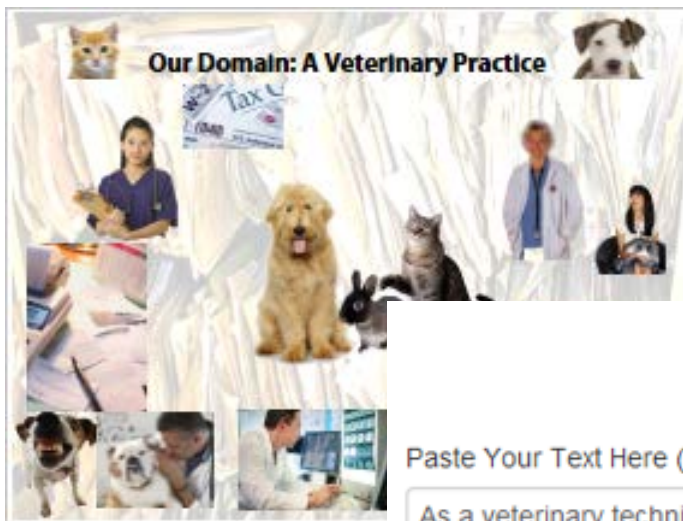
Ubiquitous Language

A language using terms from the domain model that programmers and domain experts use to discuss the system.

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Appointment Sche

Client

References

Books

Domain-Driven Design http://amzn.to/1kstiRg

Implementing Domain-Driven Design http://amzn.to/1dgYRY3

Web

DDDCommunity.org

InfoQ.com/domain-driven-design

DomainLanguage.com

Thanks!

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To Teach Is To Learn Twice

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