The Data-Process Connection:

How Concept Modelling Supports
Process, Business Analysis, and Architecture Work

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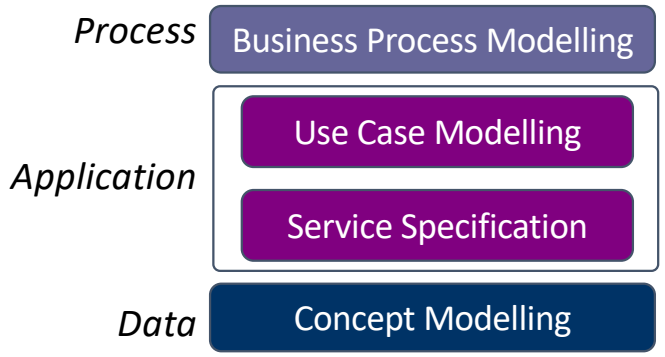
CLARITEQ

AdeptEvents

Speaker background…

Alec Sharp, Clariteq Systems Consulting – *asharp@clariteq.com*

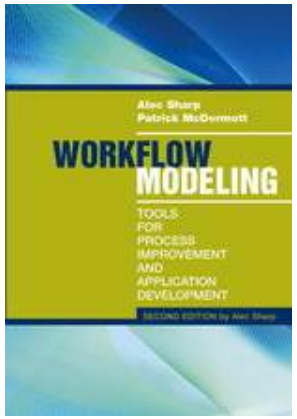
- 40+ years experience as an independent consultant:
  - Business Process Change – discover, model, analyse, and design/redesign processes
  - Application Requirements Specification
  - Business Object Modelling / Concept Modelling
    +
  - Facilitation & Organisational Change
  - Project Recovery



- Consulting, teaching, speaking globally (pre-pandemic)

- Awarded DAMA's global Professional Achievement Award for contributions to the data management field

Check out the nice reviews on Amazon - http://amzn.to/dHun1o



- Author of "Workflow Modeling"
  - best-selling book on process modelling & improvement
  - second edition – 2009 (sole author, complete re-write)

The Lost Art of Conceptual Modeling

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I've been making this point for a long time…

- 2004 DAMA – The Human Side of Data Modeling
- 2005 DAMA Symposium panel
- 2006 DAMA – Lost Art of Conceptual Modeling

CLARITEQ acetta

Presentation background…

- Presentation created for IRMUK's EA-BPM Conference – I introduced my data approach to process folks
- Then, presentation created for IRMUK's ED-BIA Conference – I introduced my process approach to data folks
- Then I was asked to put them together leading to today's session – *The Data-Process Connection* – techniques & *many examples*
- *The plan…*

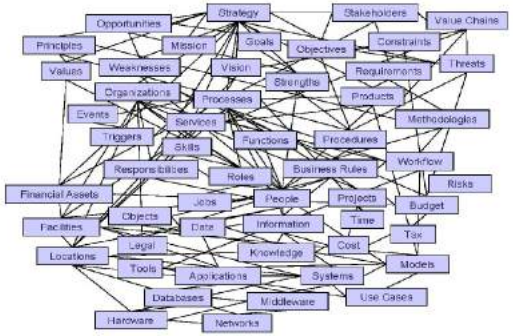
Making Concept Modelling accessible to mere mortals

Business Process concepts and techniques

Putting Data, Process,& Business Analysis together

A few central ideas we'll explore

- *"Data modelling" tools confused data modelling* with detailed *database design* – this discouraged the use of concept modelling / data modelling –



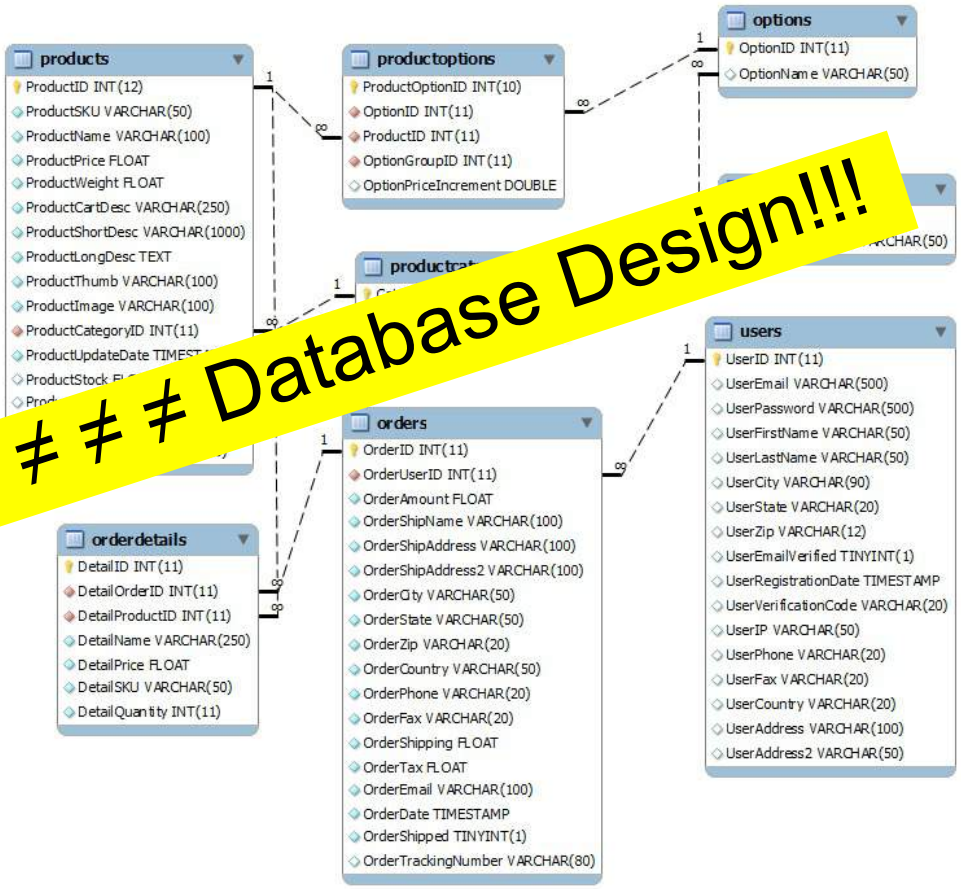
- Professional data modellers often make it too *complex*, too *detailed*, too *abstract*, too *soon!*

- Initially, “data” is not the issue – we model:
  - the “things” / concepts a business cares about: terms and definitions, policies and rules
  - “things first, data later”

- A business-oriented “concept model” provides a great platform for requirements discovery, package selection, business process change, architecture development, etc.

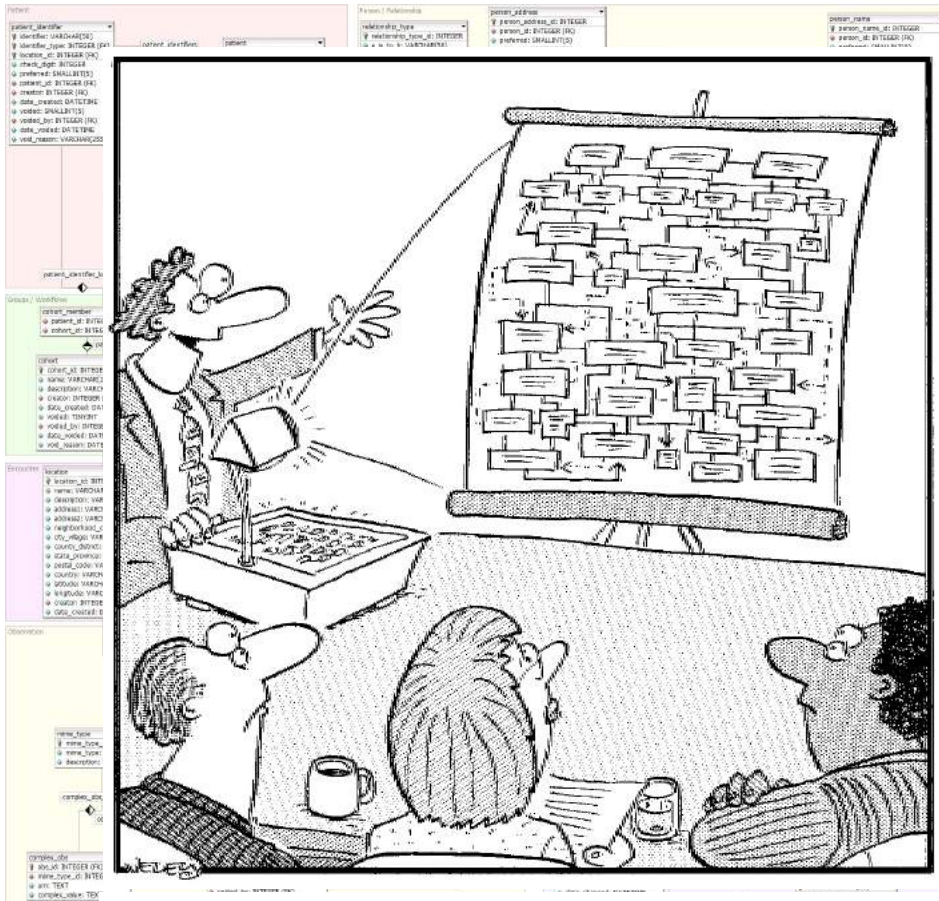
Examples – why Concept / Data Modelling is underutilised

1	id	int(11)
2	email_id	varchar(100)
3	password	varchar(100)
4	name	varchar(100)
5	resume	varchar(200)
6	user_type	varchar(50)
7	mobile_number	varchar(10)
8	active_deactive	varchar(10)
9	gender	varchar(10)
10	age	varchar(2)
11	state_fk	varchar(10)
12	district_fk	varchar(10)
13	experience	
14	key_skills	
		varchar(200)
	ification	varchar(6)
	low_sms	varchar(10)
18	allow_mail	varchar(100)
19	face_image	varchar(200)
20	registration_date	date
21	desired_state_fk	varchar(11)
22	desired_district_fk	varchar(11)



Data Modelling ≠ ≠ ≠ Database Design!!!

Even experienced data modellers miss the point



“Let's start here with Special Tax Rate Variation Comment Type…”

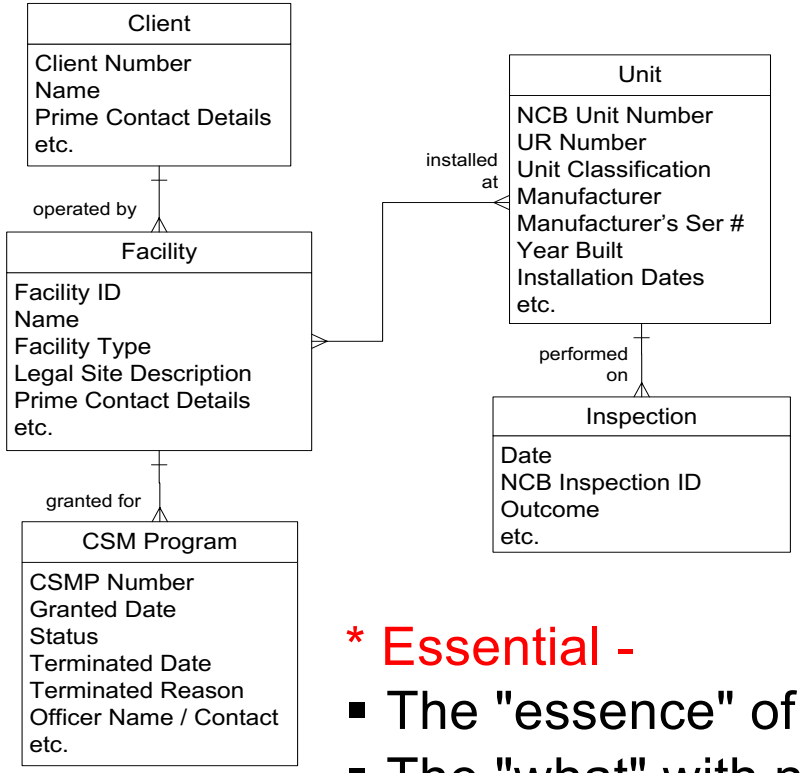
Models should:

- Mask unnecessary detail
- Highlight what matters
- Use visual cues consistently

Focus on:

- Directionality
- Simplicity (abstraction)
- Minimizing widgets

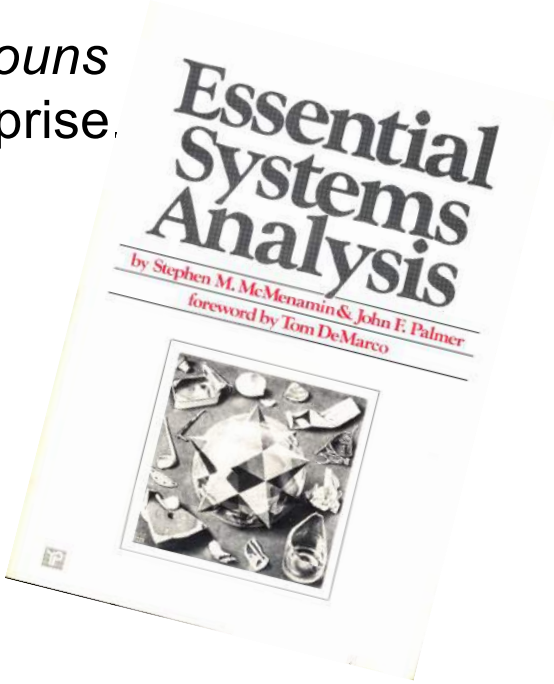
Concept Model – an Essential* model



A description of a business in terms of

- what *things* it needs to know about – entities, business objects, classes, *things,* …
- what *facts* it needs to know about those things – relationships & attributes
- what *policies & rules* govern those things– definitions, constraints, and assertions

A *shared language* of the *nouns* that are central to the enterprise.
Always start here!



* Essential -

- The "essence" of the subject
- The "what" with no reference to "who" (role or organisation) or "how" (implementation or technology)

Painful but useful learning experience

The assignment –
facilitating a concept modelling session for a railway's *Track & Structures* group

I began by explaining data modelling...
"An entity is a uniquely identifiable person, place, thing, event, ..."
Bad idea!!!
"I can't stand you IT guys!"

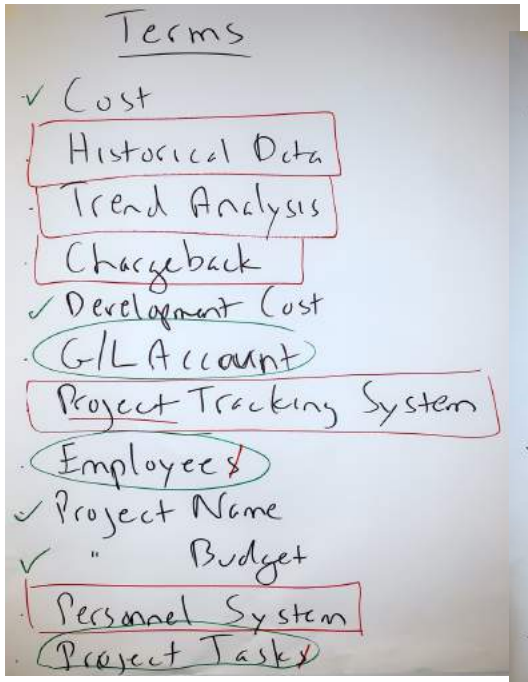
It all begins with language

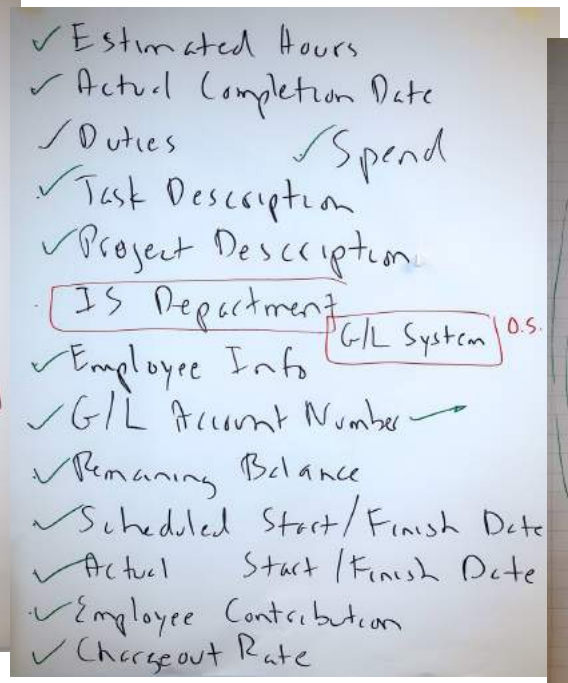
"Why don't you learn *our* language?" *"Fair point!"*

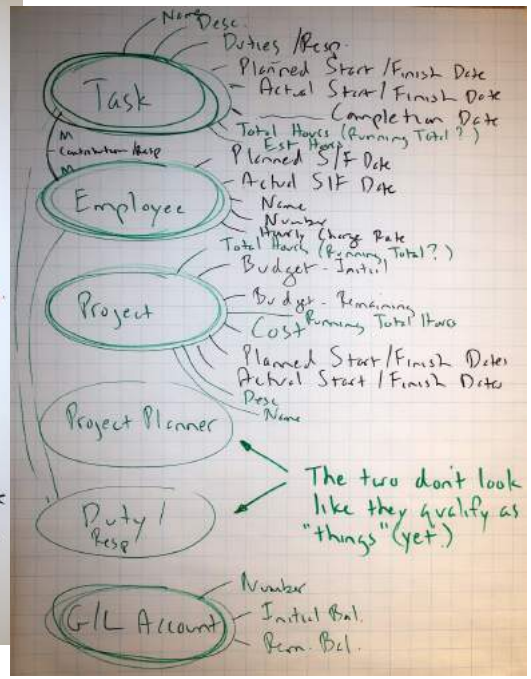
- Brainstormed over 200 terms –
  Track, Structure, Line, Siding, Mileboard, Segment, Sector, Route, …
- Oh-oh... *"Now what?" An idea!*
- Is this "a thing, a fact about a thing, or other stuff?"
- Here's a Project Management example…

Introduce "thing criteria" as necessary:

- *singular noun* – can talk about *one of them* ("Employee," not "Staff")
- *multiple* instances
- must *need to* and be *able to* keep track of *each* instance
- has *facts* that must be recorded
- *NOT an artifact* like a spreadsheet or report







Track & Structures were VERY happy with the 40 entity concept model *they* built.

Or brainwrite, interview, gather by email, virtual whiteboard, …

For a Concept Modelling session with C-level executives and senior managers at a Credit Union ("a Member-owned bank") I sent the participants this email in advance…

Before the session, it would be very helpful if everyone could do two things:

- Spend up to 10 minutes or so listing any terms you use on a frequent basis. Each item in your list could be the name of some thing you need to track, a fact about a thing, a spreadsheet, a report, a metric, a system, a database, or anything else that comes to mind. I'm hoping everyone can list thirty or forty things. There is no "right or wrong" – this helps me learn your language and provides clues to what the most critical terms might be.
- Think of one to three examples of information you'd like to be able to get, but either you can't, or you're not sure how accurate it is. For instance, at a US university last week, a Vice-Provost said she would like to know "How many non-resident, tenure-track Faculty do we have." Of course, this means agreeing what is meant by "Faculty," "tenure-track," and "non-resident." (I've done a LOT of work in higher education, and can promise you there is not agreement on what those terms mean.)

  That's the whole point of our sessions next week. :-)

Case Study will be covered in a 50-minute presentation at Adept's DW&BI Summit

The Data – Process Connection

More than enough to work with

And now we have a plan!

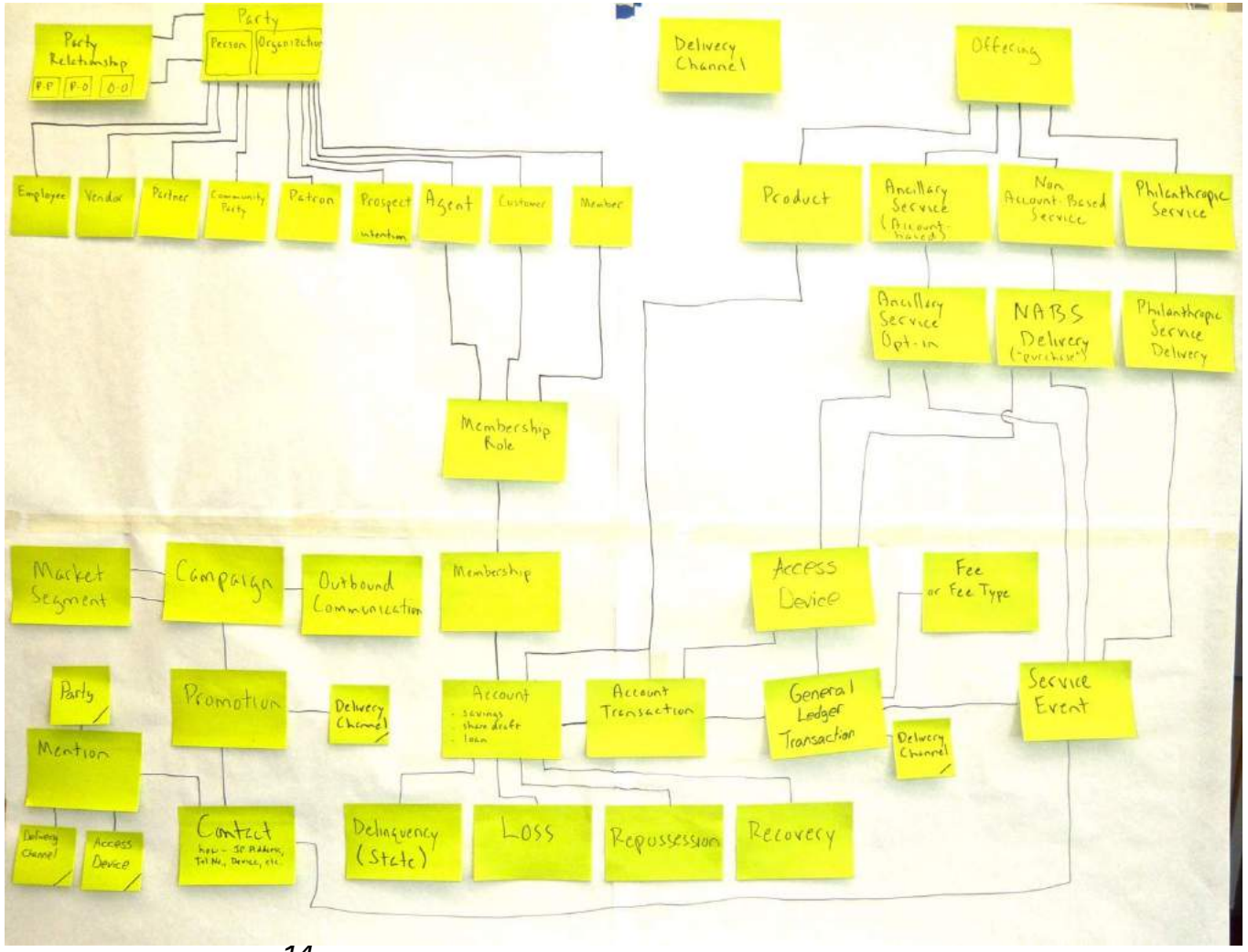
Building definitions:

- first, what are the "anomalies, potential sources of confusion and legitimate differences of opinion?"
- then, what kind of thing is this? (person, event, concept, request, ...) and what criteria must it meet?
- then, list some examples
- then, summarize some anomalies, synonyms, interesting facts.

And after three partial days, a ~40 entity concept model

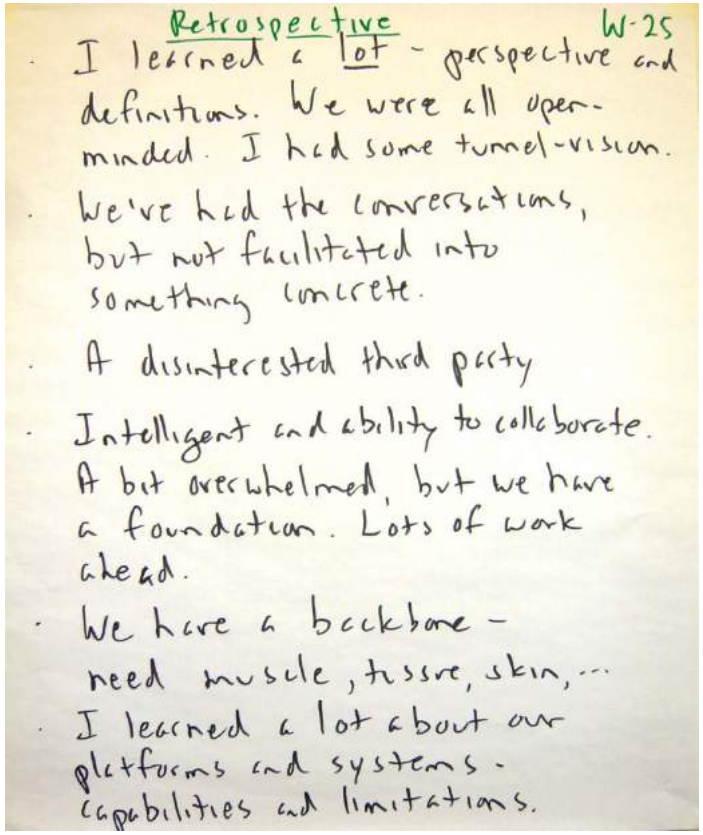
Plus…

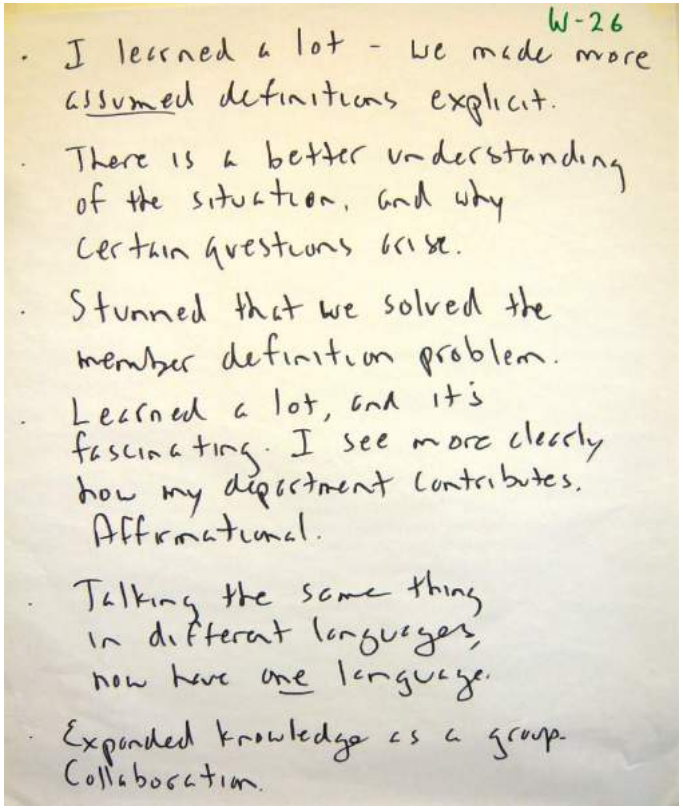
- Over 50 flipcharts of notes – issues, goals, decisions, etc.
- Definitions for all entities
- *Very* positive feedback

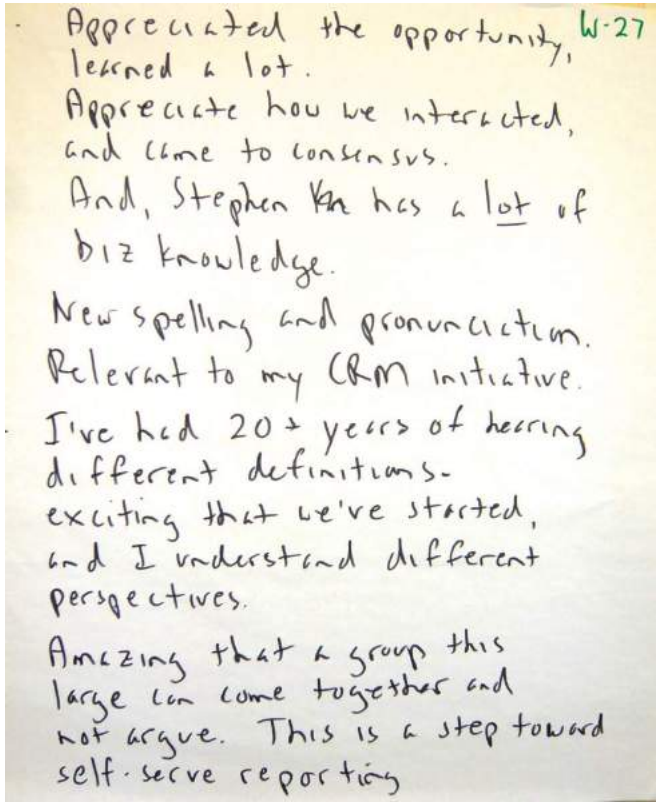


The Data – Process Connection

They were very pleased with the outcome





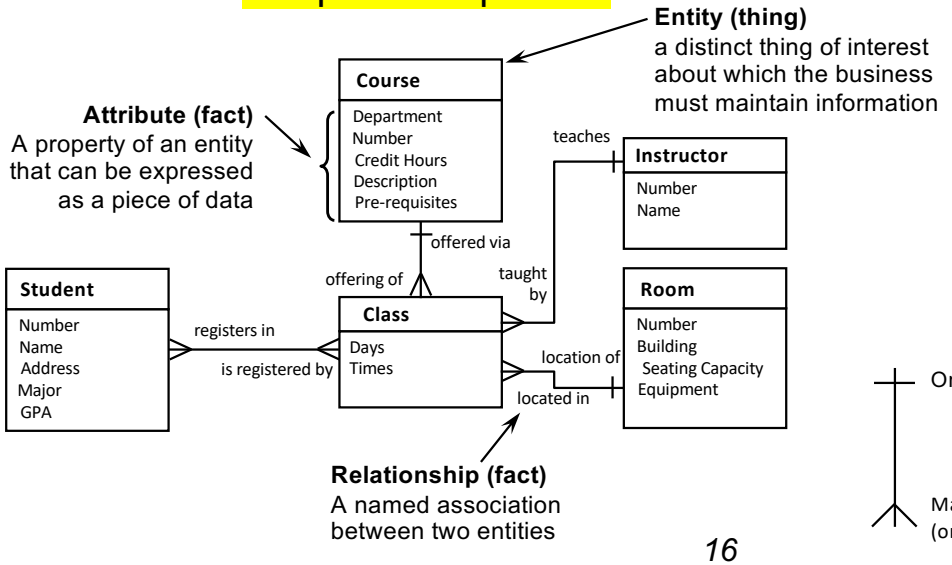


What is a data model / concept model?

- A description of a business in terms of
  - **things** it needs to maintain records of - entities
  - **facts about those things** – relationships & attributes
  - **policies & rules** governing those things and facts
- Models a view of the **real world**, not a technical design (therefore, stable and flexible)
- Graham Witt – "A narrative supported by a graphic"
- Can be comprehended by mere mortals (at least initially)

"Things" first, data later!

Graphic component

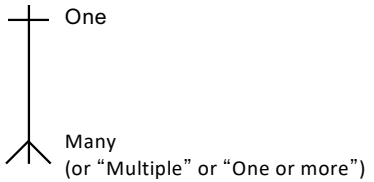


Narrative component

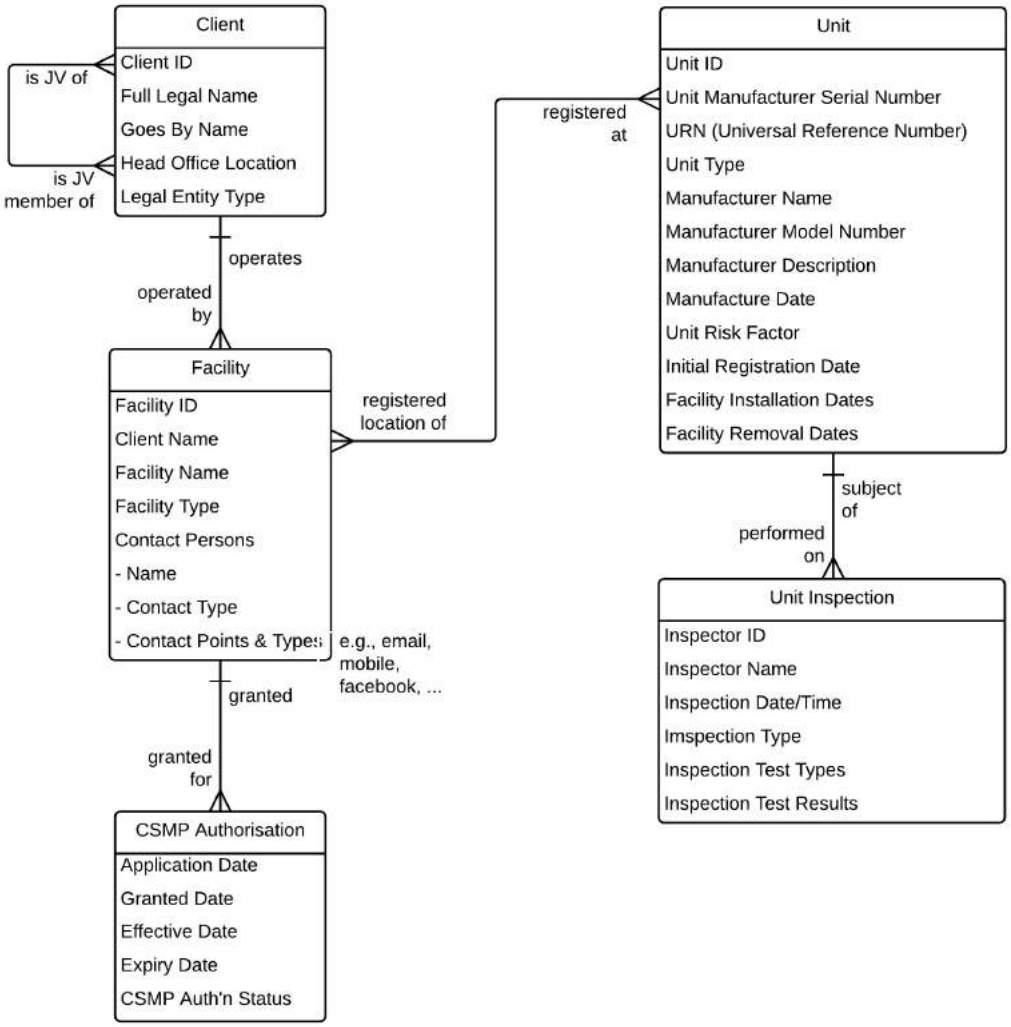
Student definition:
A Student is any person who has been admitted to the University, has accepted, and has enrolled in a course within a designated time. Faculty and staff members may also be Students

Plus "Assertions" (policies & rules)
- Each Course can be offered through one or more Classes
  Each Class is an offering of a single, specific Course
- Each Instructor teaches one or more Classes
- Each Class is taught by one Instructor
  (which may or may not be true…)

Many rules can't be shown on the diagram…
- A Student can not register in two Classes of the same Course in the same Academic Term



An example we will return to



Plus definitions and assertions (rules)

Initially…

- no “crowsfeet” (cardinality)
- no optionality
- no primary or foreign keys
- definitely not normalised
- non-atomic, multi-valued attributes
- …
- Later we'll get very specific about Conceptual vs. Logical Data Models

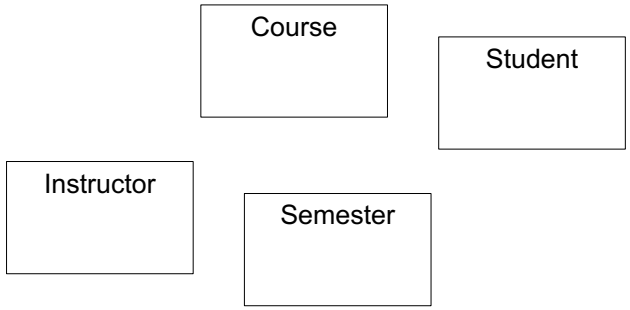
The basics – ERA – Entities

- A distinct *thing* about which the business must maintain information in order to operate

- Criteria
  - ***singular noun*** (“Employee,” not “Staff”)
  - *multiple* instances (occurrences)
  - must need to keep track of *each* instance (sensible to talk about specific one of them)
  - has *facts* that must be recorded
  - makes sense in a "verb-noun" pair
  - ***NOT an artifact like a spreadsheet or report***

- Fundamental to business analysis. Entities are the things
  - *processes* act on
  - *applications* manipulate
  - *databases* record
  - *BI & Analytics* tools provide info about

- Two basic types:
  - independent – can *stand alone*
  - dependent – must have one or more *parents*

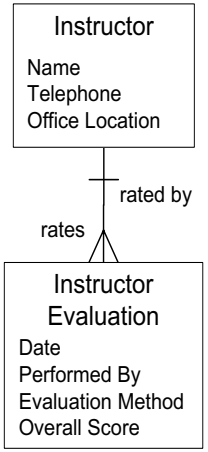


Must be:

- *named:* business-oriented noun / noun phrase
- *defined:* “What *is* one of these things?”
  “What do you *mean* by _____?”

Independent
- “strong”
- no relationships “on top”
  (no parents)

Dependent
- “weak”
- one or more relationships “on top”
  (to parent(s))



Identifying entities – two common errors

1. Treating an "artifact" (a spreadsheet, report, web page, form, etc.) as an entity – entities reflect a specific *"what"* with no reference to *"who or how,"* and an artifact will almost always include attributes from *multiple* entities.
   e.g., *"Admission Request Form"* or *"Orders Summary Spreadsheet"*
   or *"Daily Call Log"* or *"Class Roster"* or…

2. The "types vs. instances" problem:
   failing to clarify if the entity (thing) deals with
   types of things (or *categories* or *kinds* or *classes* of things)
   vs. specific *instances* of things
   e.g., "*Vehicle"* was being discussed at an insurance company –
   asking "Is *Vehicle* a *thing* or a *type of thing?*" revealed three entities:
   - *Vehicle Category* – a high-level "type"
   - *Vehicle Make/Model* – a lower-level "type"
   - *Vehicle – the instance*

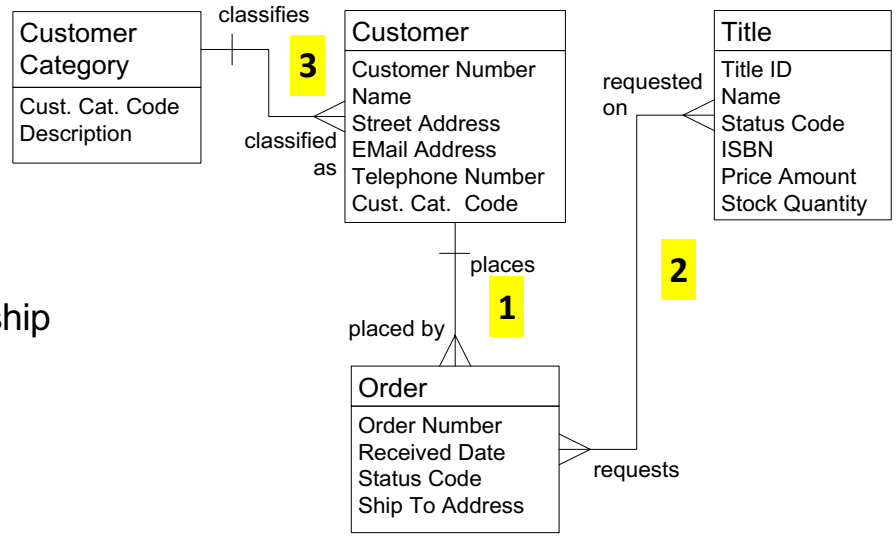
3. Identifying an entity that exists in the real world,
   but whose *instances* can't be uniquely identified
   e.g. *"Transit System Passenger"*

The basics – ERA – *Relationships*

An association between entities that the business must keep track of

Named in both directions

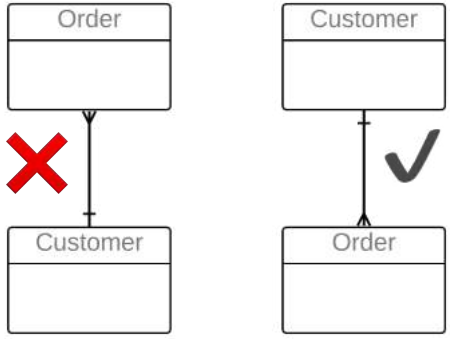
- verb-based phrase
- the line tells us they *are* related,
  the name tells us *how*



Different types of relationships

1. parent-child or characterising – "bottom to top" relationship
   from an entity to a dependent entity
2. associating – "side to side" relationship
   between entities that are not dependent on one another
3. classifying – "side to side" relationship
   from reference data to the classified entity

Dependency is shown top down – No Dead Crows

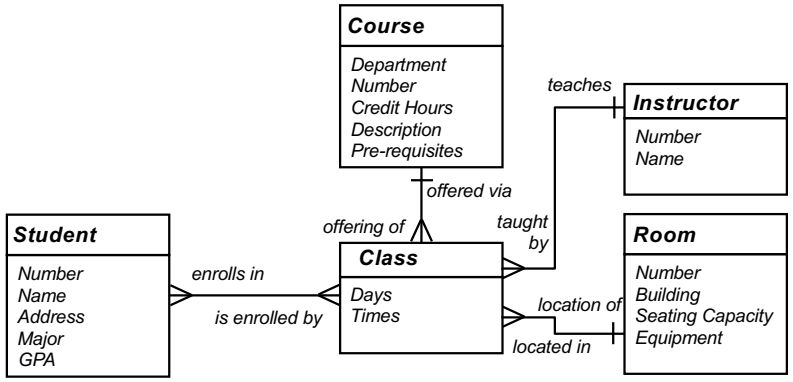


Relationships have rules

- cardinality –
  1:1 (almost certainly wrong when time is considered,) 1:M, M:M
- optionality – relationship *may be* present or *must be* present
  (not shown until later, in the logical model)

Relationships – state as assertions

1. You *must* state the relationship name as an assertion, in both directions (for clarity and confirmation)
2. Be clear on whether cardinality is “one” or “one or more” (don't worry about “may” and “must” at first)
3. *Emphatically* begin the assertion with the word “Each”
4. Try it on this model…



Each Instructor teaches one or more Classes (Sounds good…)

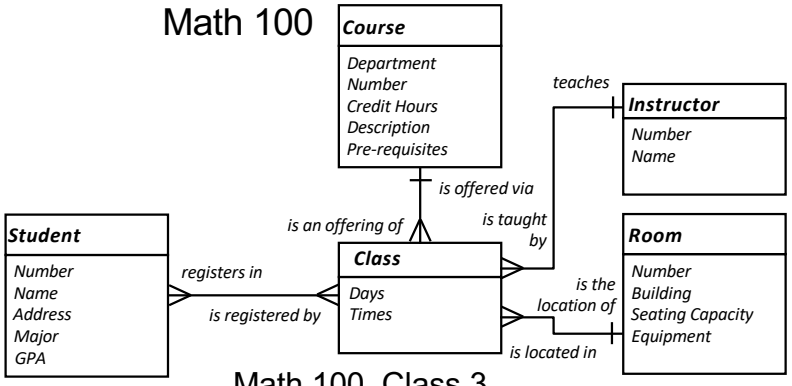
Each Class is taught by one Instructor…

1. Student-Class
2. Course-Class
3. Instructor-Class
4. Room-Class

Which ones might be *incorrect?*

Discussion – state as assertions, identify incorrect ones

In some universities, Students in the same Class could be earning credit for *different* Courses – it could be a M:M relationship.



Math 100, Class 3,
Spring Semester 2022

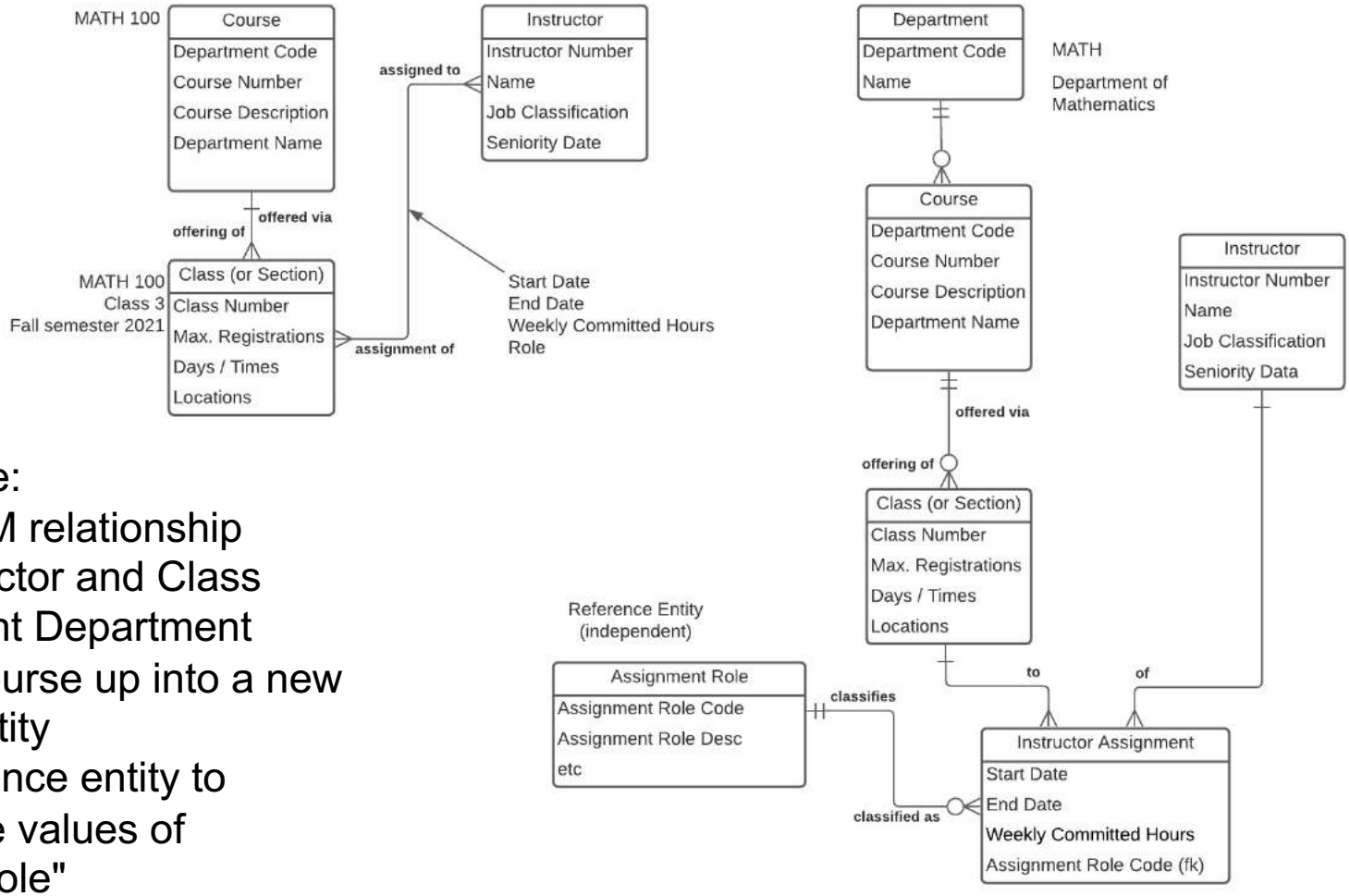
1. Student-Class
   Each Student *registers in* one or more Classes
   Each Class *is registered by* one or more Students
2. Course-Class
   Each Course *is offered via* one or more Classes
   Each Class *is an offering of* one Course
3. Instructor-Class
   Each Instructor *teaches* one or more Classes
   Each Class *is taught by* one Instructor
4. Room-Class
   Each Room *is the location of* one or more Classes
   Each Class *is located in* one Room

Each Class is taught by One or More Instructors. On what basis?

- team teaching
- backup
- replacement
- specialist
- guest lecturer
- lab assistant
- teaching assistant

We are discovering reference data to describe an Instructor's Role.

Looking ahead – Conceptual to Logical



In this example we:

- resolve the M:M relationship between Instructor and Class
- move redundant Department attributes in Course up into a new Department entity
- Create a reference entity to standardise the values of "Assignment Role"

The basics – ERA – *Attributes*

- A fact about an entity recorded as a piece of data.
  If facts are needed about a relationship,
  we will later create an entity that represents the relationship
  and records its facts

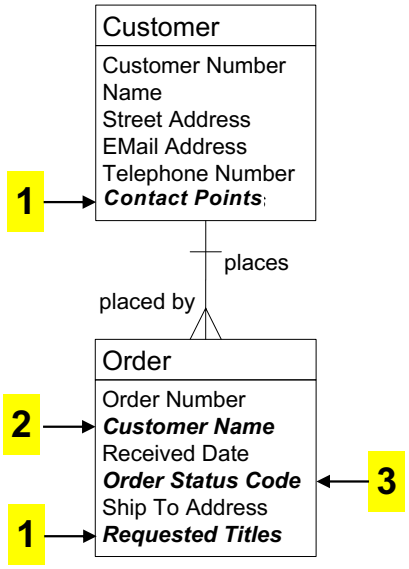
- Like entities, attributes are named and defined

- Not every possible fact –
  just the ones that are needed

- Have properties ("Normalisation in a nutshell.")
  1. single-valued vs. *multivalued* –
     one attribute can have multiple values,
     at a time or over time

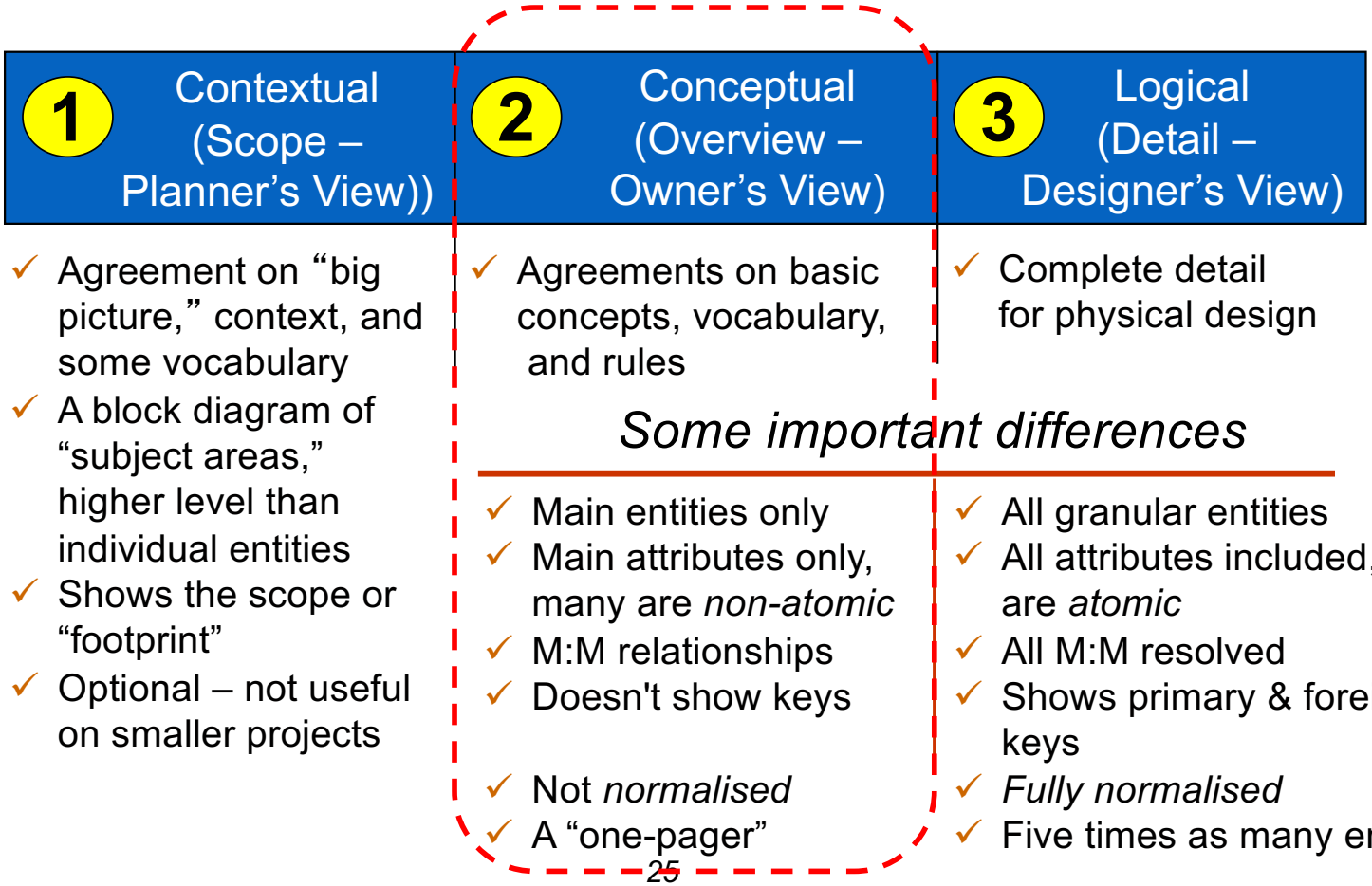
  2. fundamental vs. *redundant* –
     the same value is recorded multiple times
     in different entities

  3. "user-entered" vs. *constrained* –
     attribute can only come from a limited set,
     as in a drop-down list



Three types of data models

Different levels of detail support different perspectives



Specifics – for reference

1 Contextual (Scope)

- ✓ Agree context or "big picture" – the scope in terms of topics or subjects that are in or out, plus core terms and definitions
- ✓ May be a simple block diagram of topics/subjects, or primarily textual (a list)
- ✓ Optional – not necessary on smaller projects

2 Conceptual (Overview)

- ✓ Agreement on basic concepts and rules

Main differences

- ✓ Ensures everyone is using the same vocabulary and concepts before diving into detail
- ✓ Overview: *main* entities, attributes, relationships, rules
- ✓ Lots of M:M relationships
- ✓ Relationships show cardinality
- ✓ No keys
- ✓ Few if any reference entities
- ✓ Many attributes will be non-atomic and multi-valued
- ✓ Verified by direct inspection
- ✓ A "one-pager"
- ✓ 20% of the modelling effort

3 Logical (Detail)

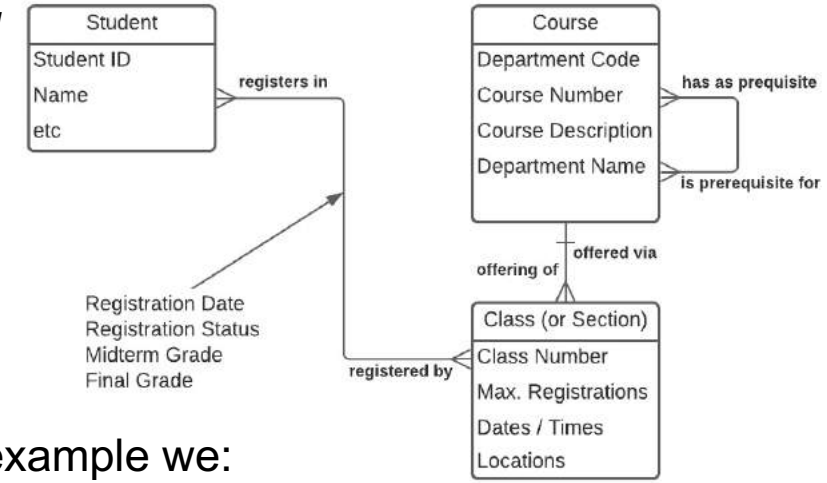
- ✓ Excruciating detail for physical design

Main differences

- ✓ Provides all detail for first-cut physical database design and requirements specification
- ✓ Detailed: ~ 5 times as many entities as the conceptual model
- ✓ M:M relationships resolved
- ✓ Relationship optionality added
- ✓ Primary, foreign, alternate keys
- ✓ Lots of reference entities
- ✓ Fully normalised – no multi-valued, redundant, or non-atomic attributes. All attributes defined and "propertised"
- ✓ May be verified by other means: sample data, report mockups, …
- ✓ May be partitioned
- ✓ 80% of the modelling effort

Conceptual to logical example, drawn top-down

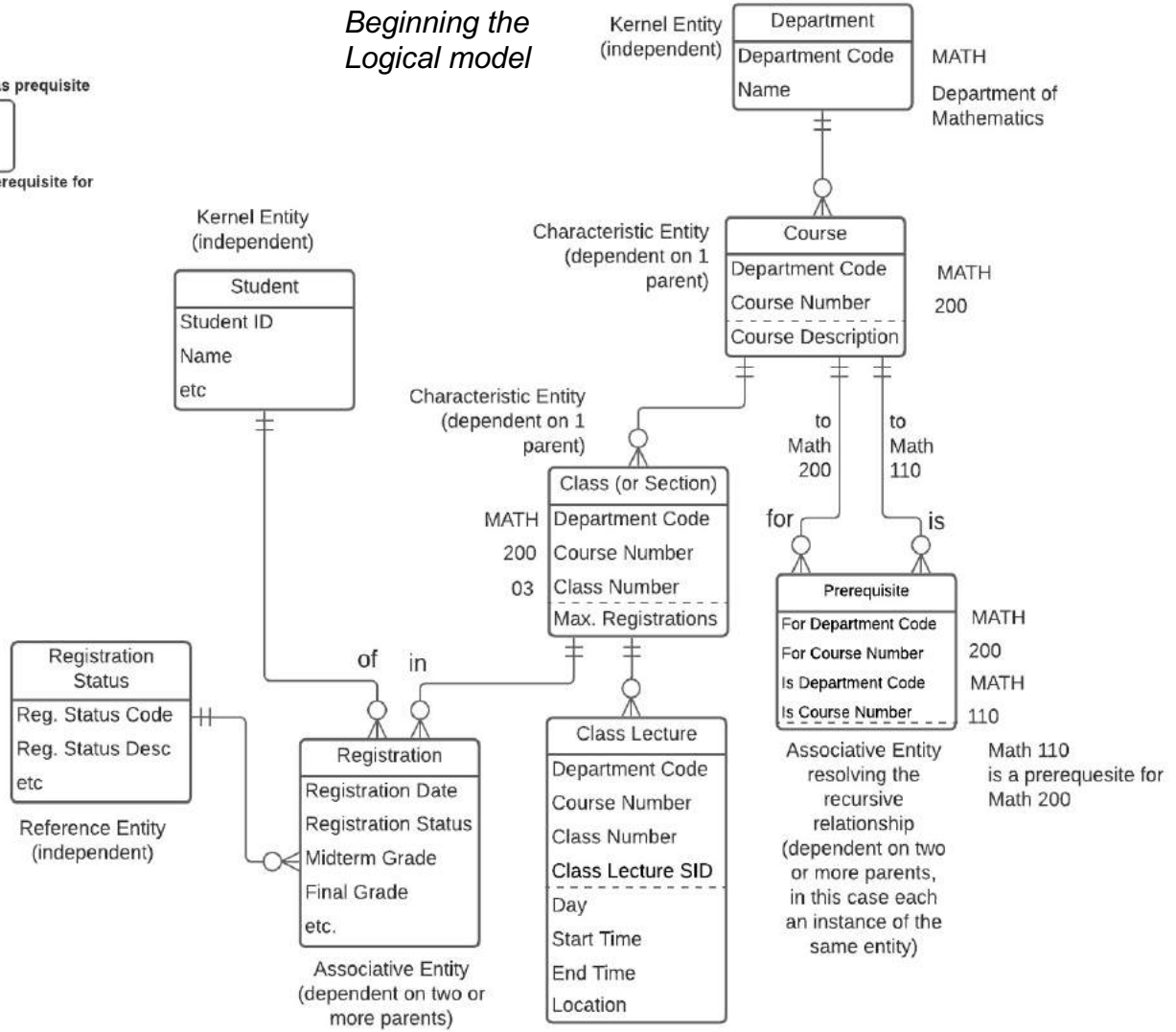
Conceptual



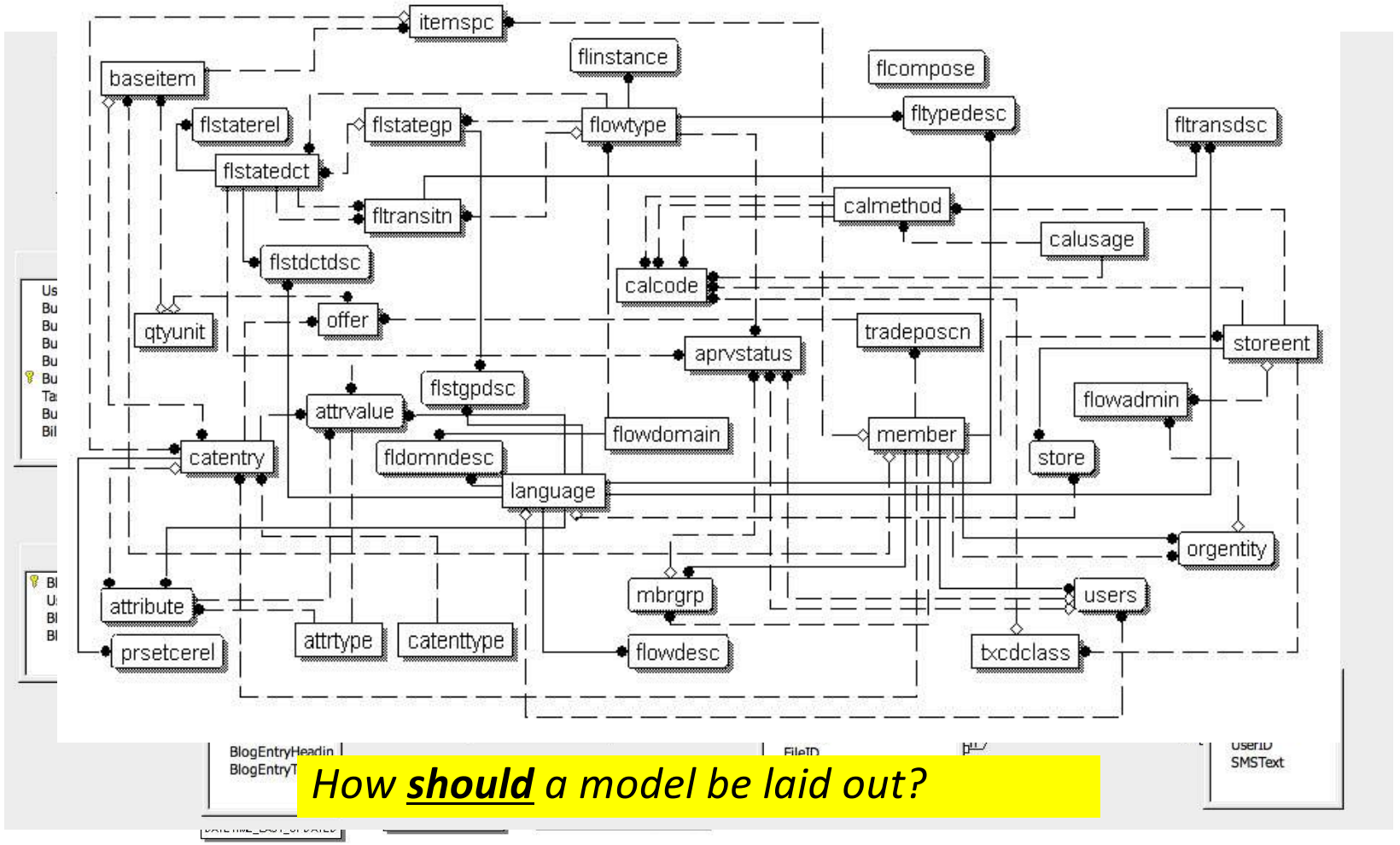
In this example we:

- move multi-valued Class attributes into their own entity – Class Lecture
- resolve the M:M relationship between Student and Class
- resolve the recursive Course to Course M:M relationship
- move redundant Department attributes in Course up into a new Department entity
- illustrate all four entity types in the emerging logical model

Beginning the Logical model



Samples from the 'net – evidently, help is needed…

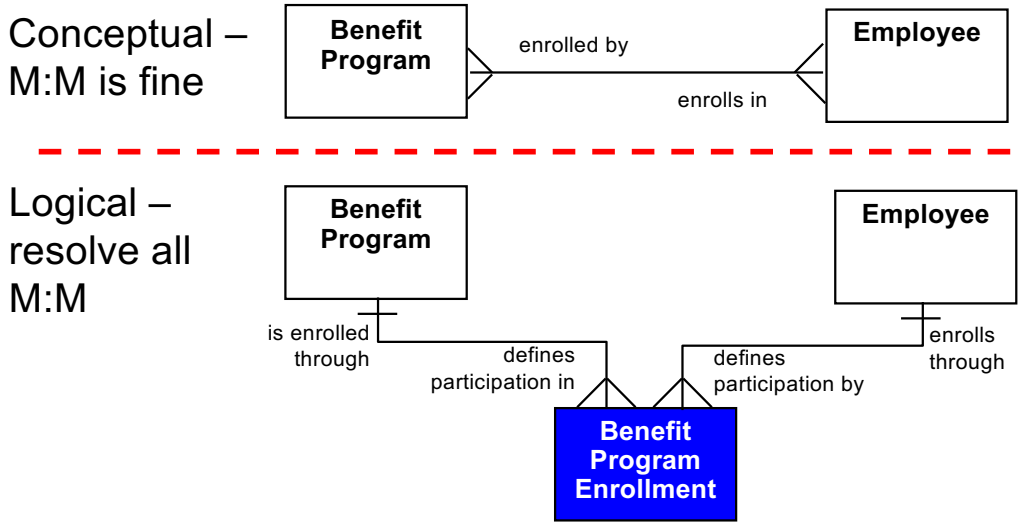


*How **should** a model be laid out?*

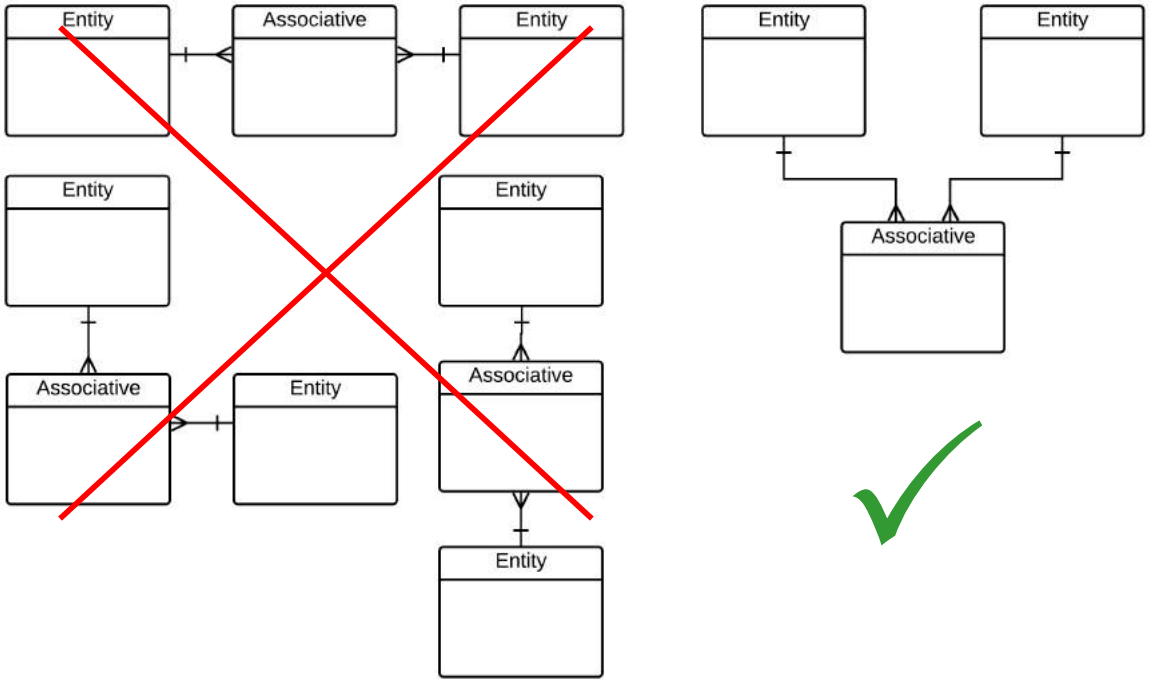
Tips – Consistency in drawing and developing

People pick up data modelling without training if you:

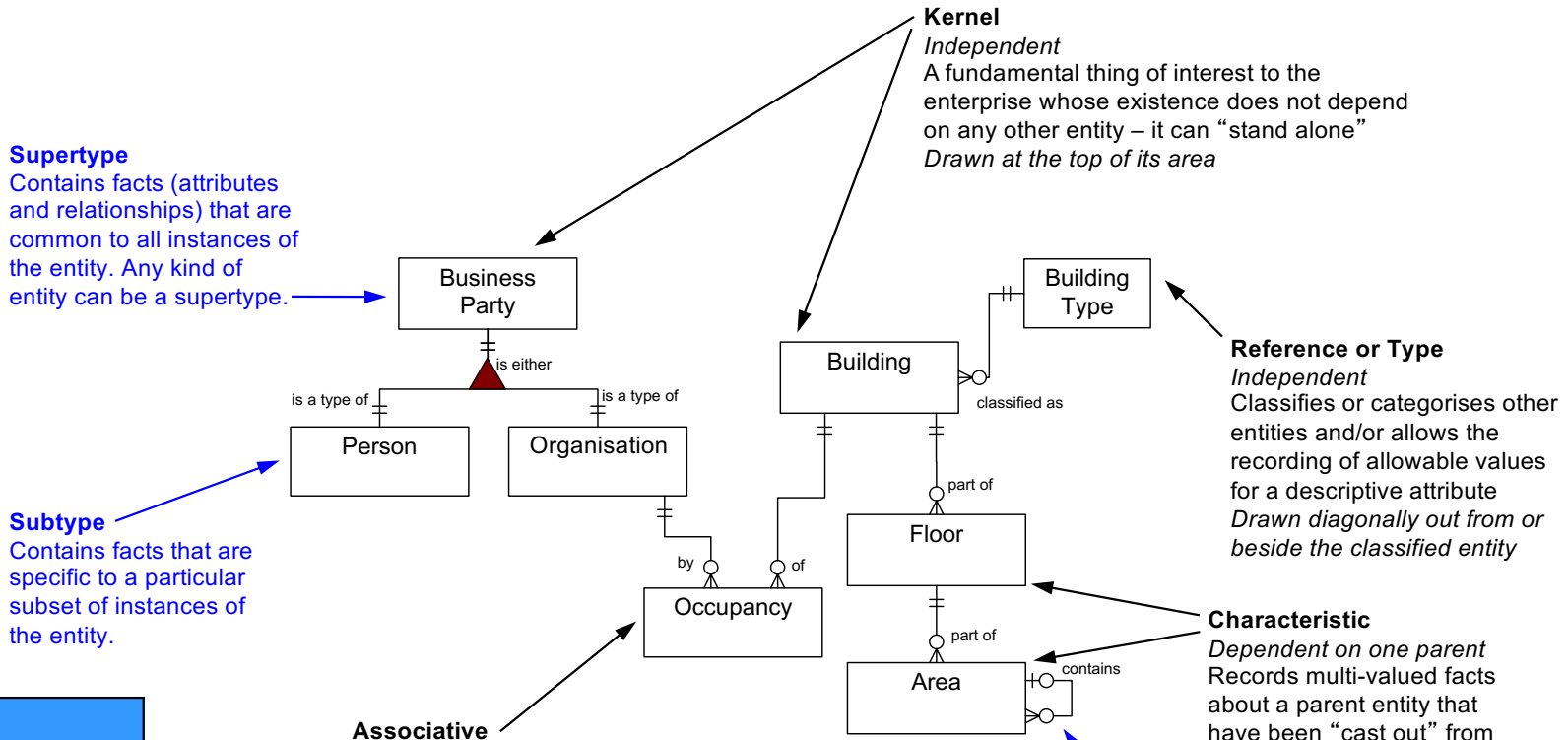
- treat it as a natural way to *describe a business* (not a new technique being imposed on them)
- always draw the same kinds of things *the same way*
- draw the model top-down by dependency
  E.g., when drawing an associative entity…



Consistency!



For reference: Graphic guidelines – the "no dead crows" principle



! Key point

Entity type is obvious from:

- Placement
- Relationship connections

A look at Business Processes

Making Concept Modelling accessible to mere mortals

Business Process concepts and techniques

Putting Data, Process,& Business Analysis together

For process work, naming conventions will make life easier

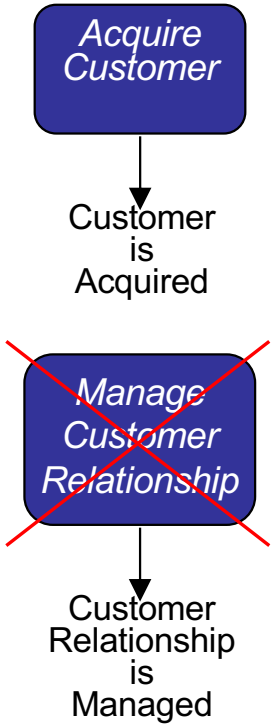
Rule #1 – the event / activity / process name ***must*** indicate the expected result

- Name potential process in “verb – noun” format
- *The "noun" will most often be an* ***entity*** *or* ***business object***
- Restate that name as a result (“noun is verbed”)
- Ensure this is the intended result of the process: *discrete*, so *identifiable* & *countable*

- ***No mushy verbs:*** manage, monitor, administer, handle, track, support, maintain, etc.

- ***Active verbs only:*** *Evaluate* Prospect, *Acquire* Customer, *Fill* Customer Order, *Resolve* Customer Issue, …

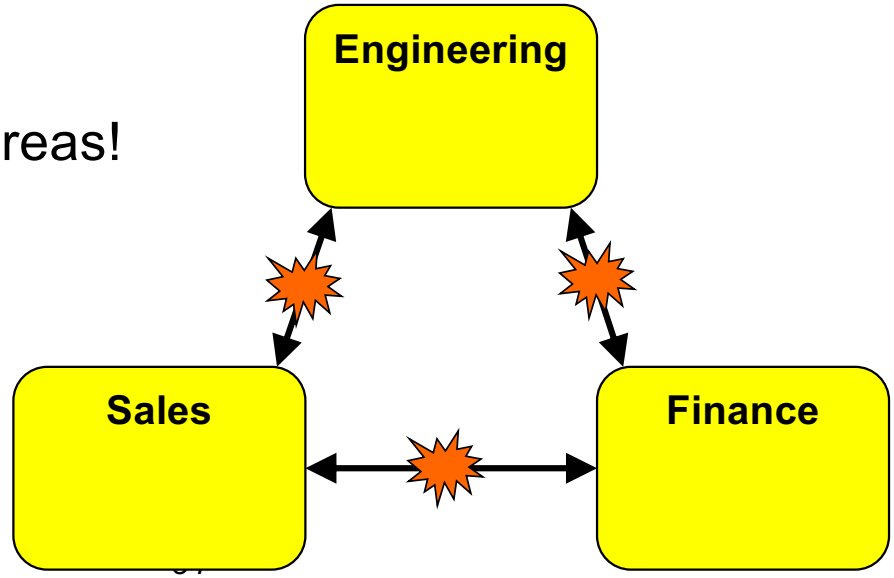
- Applies to business processes, phases (subprocesses,) activities, steps, …



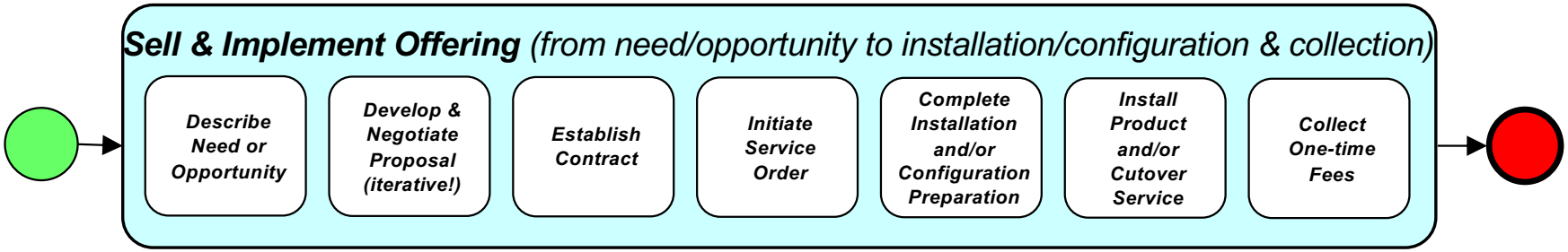
Business Processes – who cares?!

Regional telecom provider (the "Telco") thought they had three main Business Processes:

The outcome…
conflict between functional areas!



Process Scope Model showed ONE process not THREE



Triggering Event:
- *Prospect / Customer* expresses *need*
- *Telco (Inside Sales, Marketing, Sales Rep, …)* recognizes *opportunity*

Cases:
- BU with or without Telco Internet, no cabling *(our focus)*
- initial installation
- service only
- product only
- mixed

Other factors:
- TBD

Results:
Customer:
Product / Service is *installed and operational* per original or amended contract terms
Telco:
- Ongoing source of *revenue* in place
- One-time *fees* collected

Employee:
- *Commission* or *referral credit*

Agent:
- *Commission*

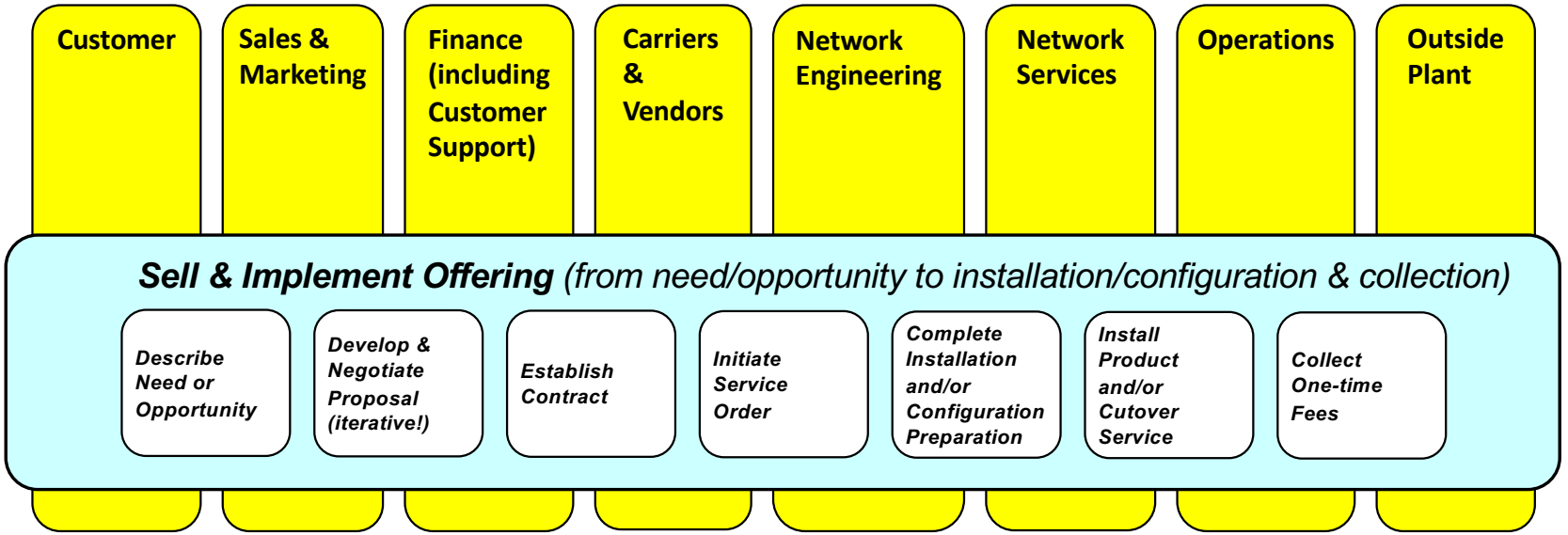
Process Scope Model using "TRAC" –

- *what* is the Trigger?
- *what* are the Results?
- *what* are the main Activities?
- *what* are the Cases or variations?

The "token," a Service Order, is changing state from need/opportunity to configured, installed, & collection

"We're all in this together!"
An end-to-end, cross-functional Business Process is a great lens to view organisation conflict and disfunction!

Process Summary Chart – my favourite diagram!

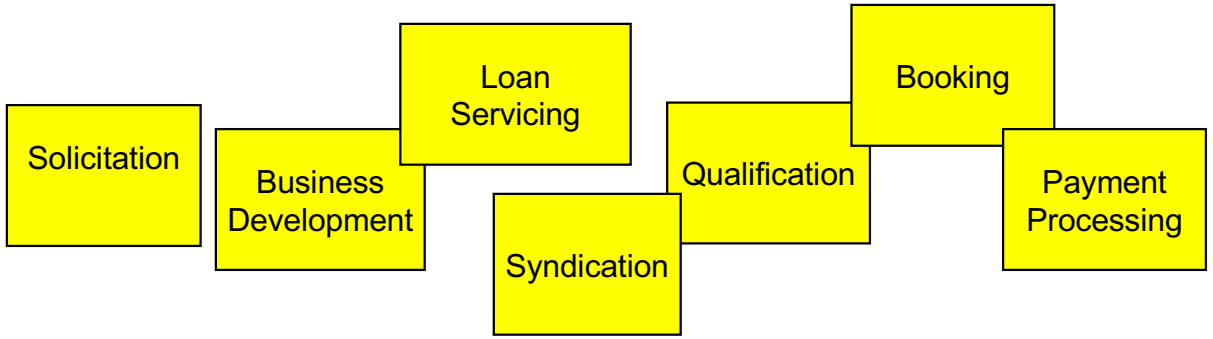


Process Summary Chart (a.k.a."Process vs. Function Chart") adds "who" at the organisational unit or functional level.

Nothing else clarifies "Process" vs. "Function/Organisation" as well.

Bottom-up process discovery – linking process and data

A bank believed they had identified the 12 *business processes* in their Commercial Loans Management area, including these 7:

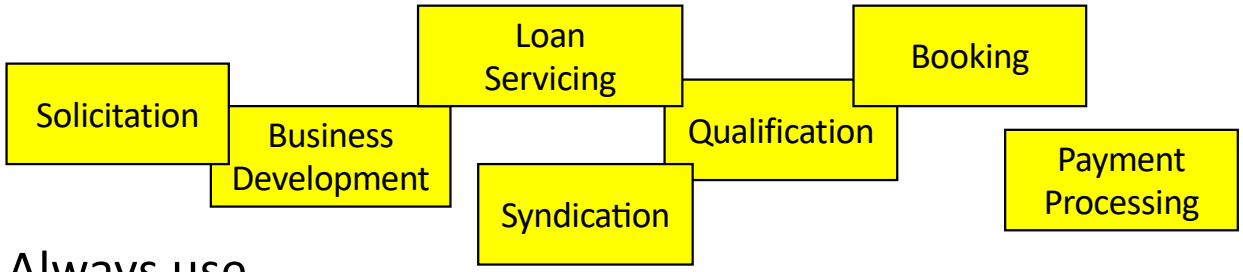


Discuss:

- What is wrong with the names of these processes?
- Can you think of any questions to help improve these process names?

Please don't look ahead at the rest of this example!

Bottom-up process discovery



Dubious “business processes”

Always use
“active verb – noun” naming
with no “who and how”

~~Solicitation???~~

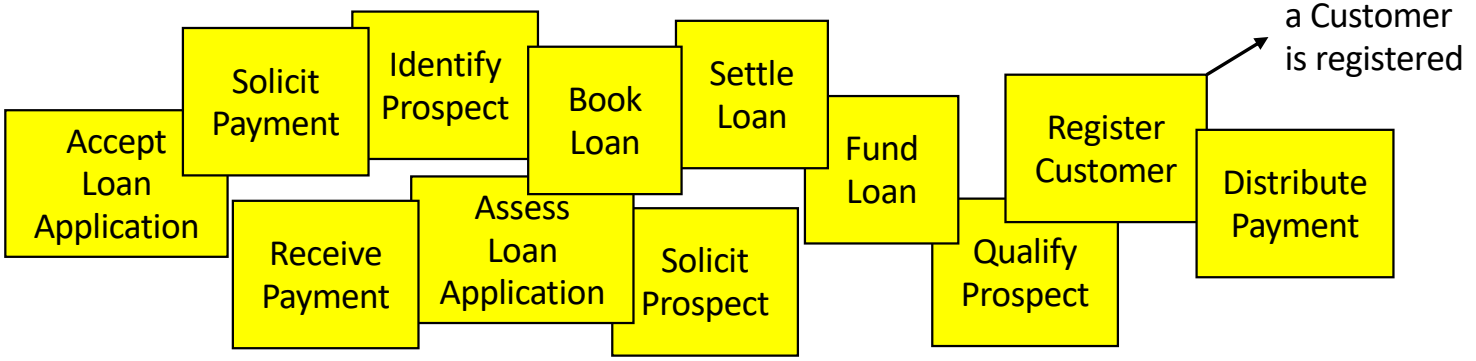
Solicit…
what?

Solicit
Prospect

Solicit
Loan Payment

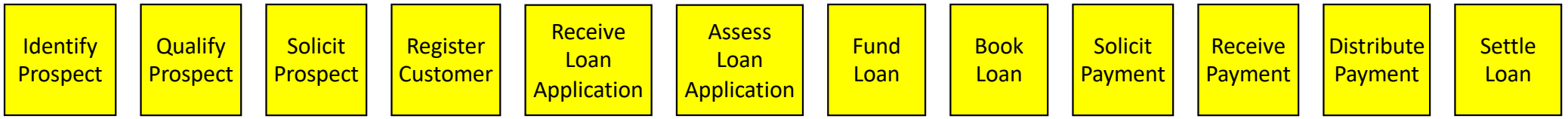
Client then identified *recognisable* activities, each producing an essential *result* (easy!)

Can you put these in sequence?

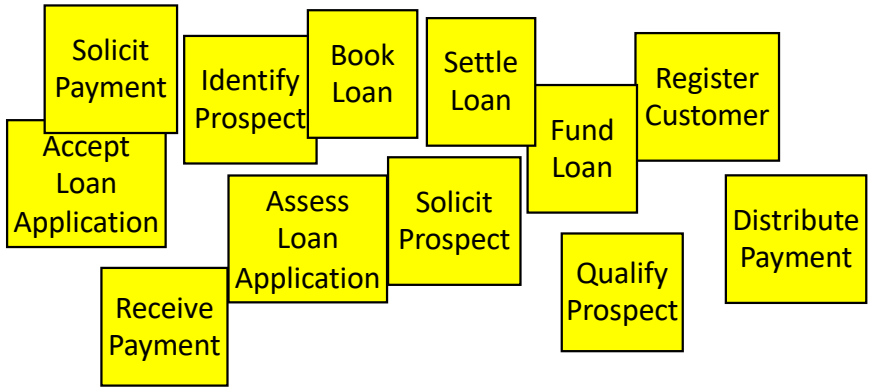


Now what?

Not usually linear – parallel chains are typical



Have the clients arrange the activities in sequence:
- *easy!*
- *a learning experience!*



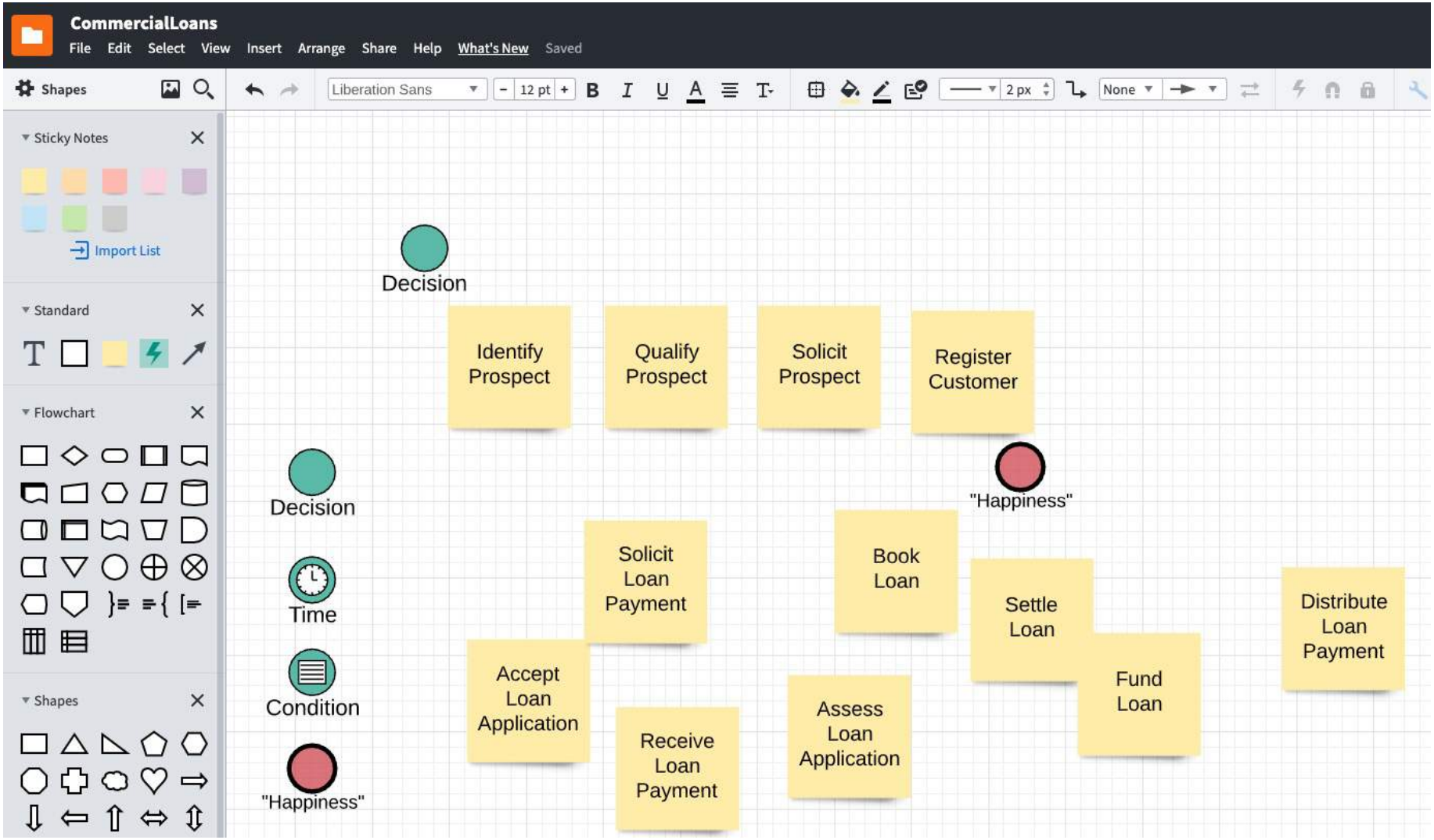
Now we'll use my "TRAC" framework for business proceses –

- *Trigger*
- *Results*
- *Activities*
- *Cases*

This was done with Post-its and flipcharts…

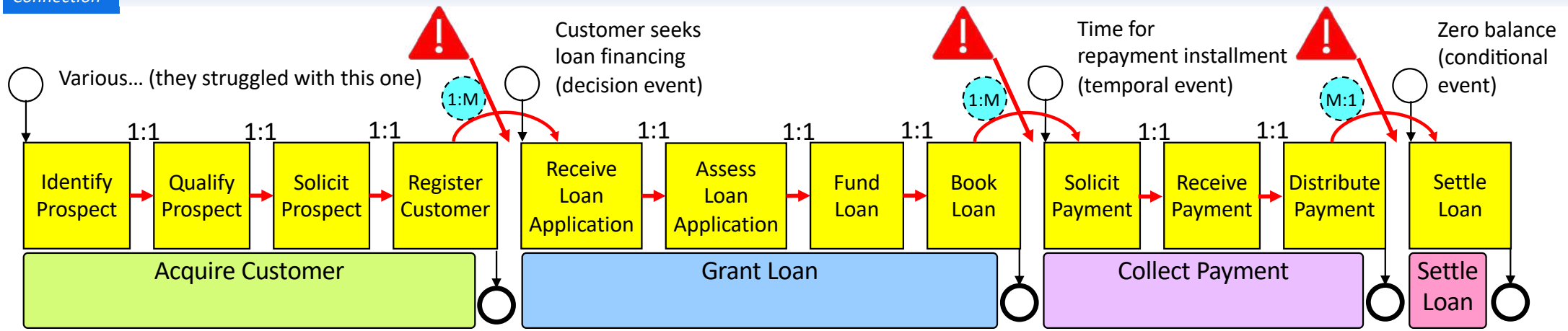
The Data – Process Connection

A tool like Lucidchart makes an ideal virtual whiteboard



The Data – Process Connection

Use TRAC to discover business process boundaries



We have discovered four business processes, each with

- Trigger
- Results
- Activities

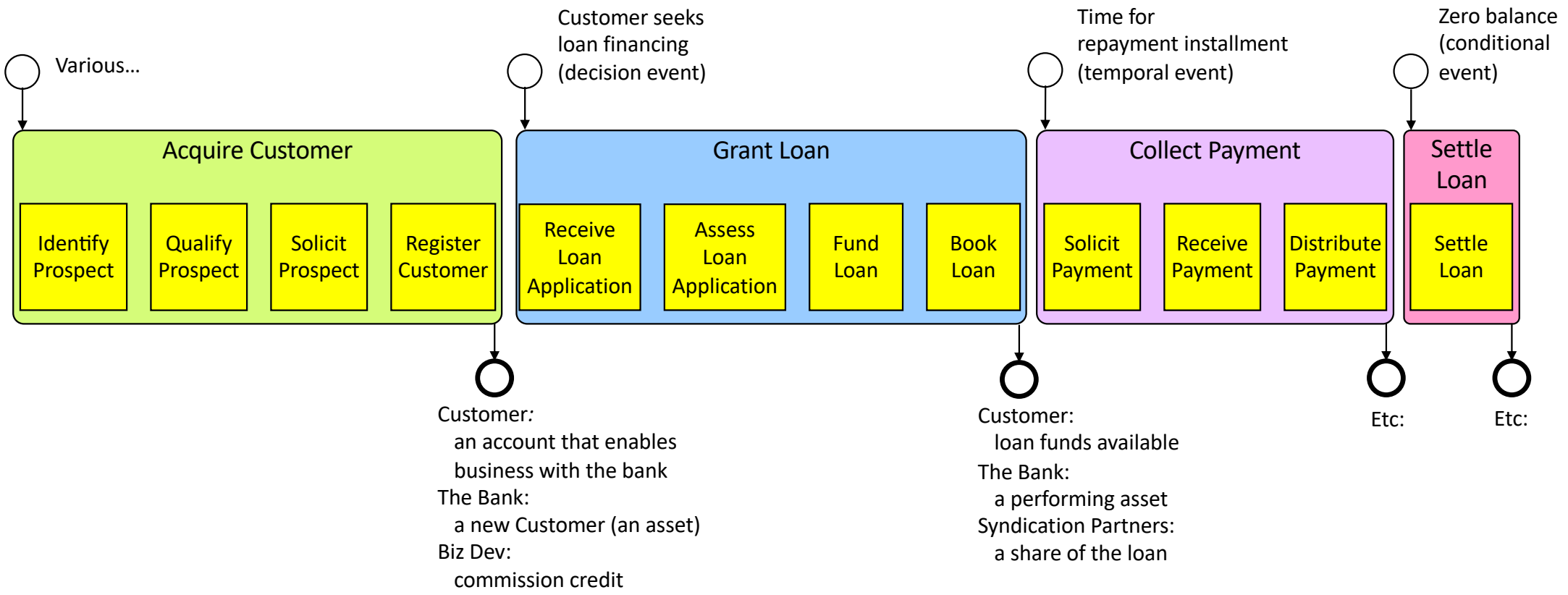
(Cases later)

Customer:
an account that enables business with the bank
The Bank:
a new Customer (an asset)
Biz Dev:
commission credit

Customer:
loan funds available
The Bank:
a performing asset
Syndication Partners:
a share of the loan

1. ID where a final Result of value is delivered to one or more (usually at least two) stakeholders (“happiness points”)
2. Identify points where a Triggering event beyond the organisation’s control is required before activities can proceed (decision, time, condition)
3. Identify “cardinality” of connections between Activities (1:1, 1:M, M:1)
4. Identify “tokens” flowing through the activities

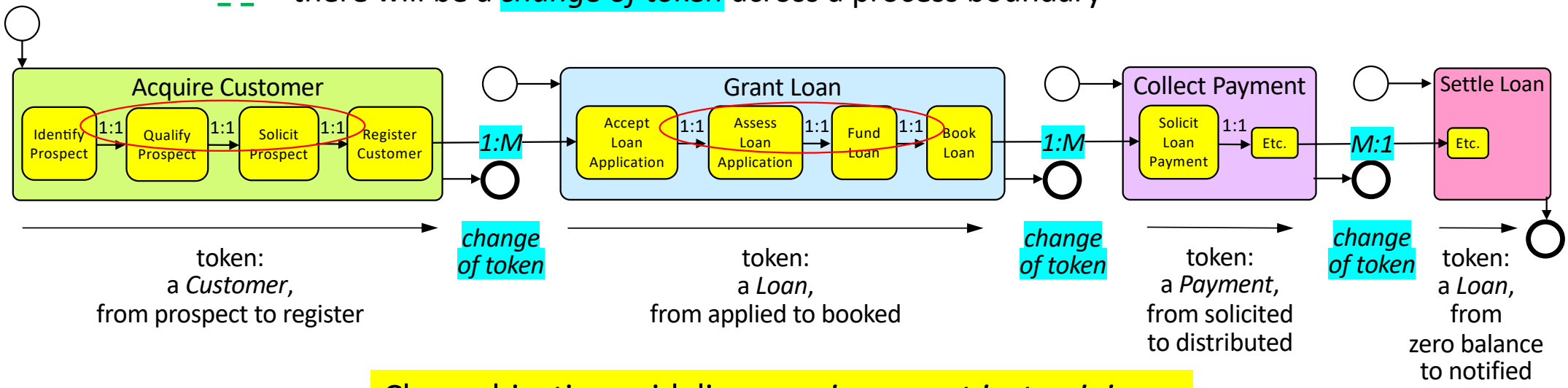
Four end-to-end business processes, objectively demonstrated



Client had faith these were *their* business processes

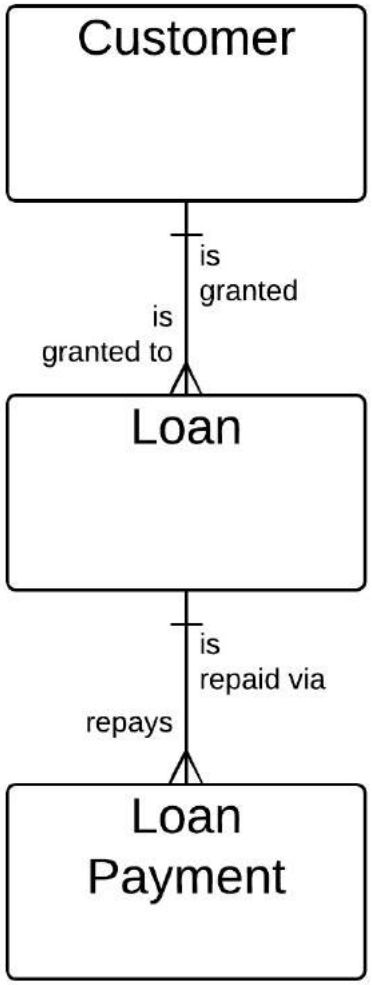
Five guidelines for well-formed processes

1. "Active verb – noun" naming that indicates primary result
2. Triggered by an event (decision, time, data) outside process' control
3. At the end are results that makes one or more stakeholders happy
4. Activities linked *1:1* are probably part of the same process;
   a *1:M* or *M:1* connection between activities is probably a boundary
5. The same *token* moves through the whole process,
   changing state, e.g. a Loan, from applied to booked;
   there will be a *change of token* across a process boundary



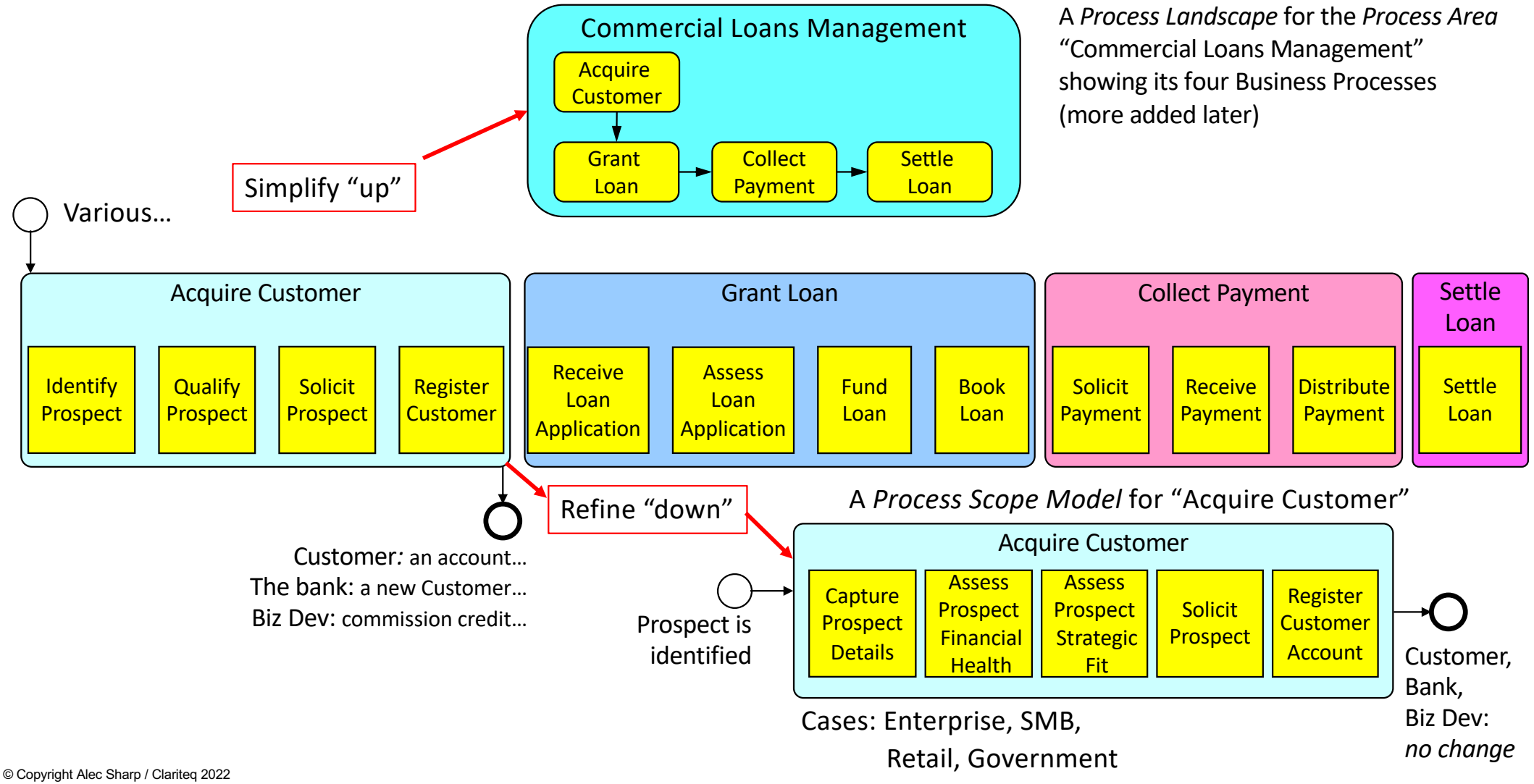
Clear, objective guidelines – *science, not just opinion*

Correspondence to the Business Object Model



- The nouns are most often the things in your business object model, and each will usually have one primary process
- The relative number of process instances (e.g., 1:M or M:1) align with relationship cardinality
- This *does not* mean there is only one process per thing (business object)
  - Assess Customer Performance
  - Retire Customer
  - Merge Loans
  - Write Off Loan
  - …

What next?



Putting it together

Making Concept Modelling accessible to mere mortals

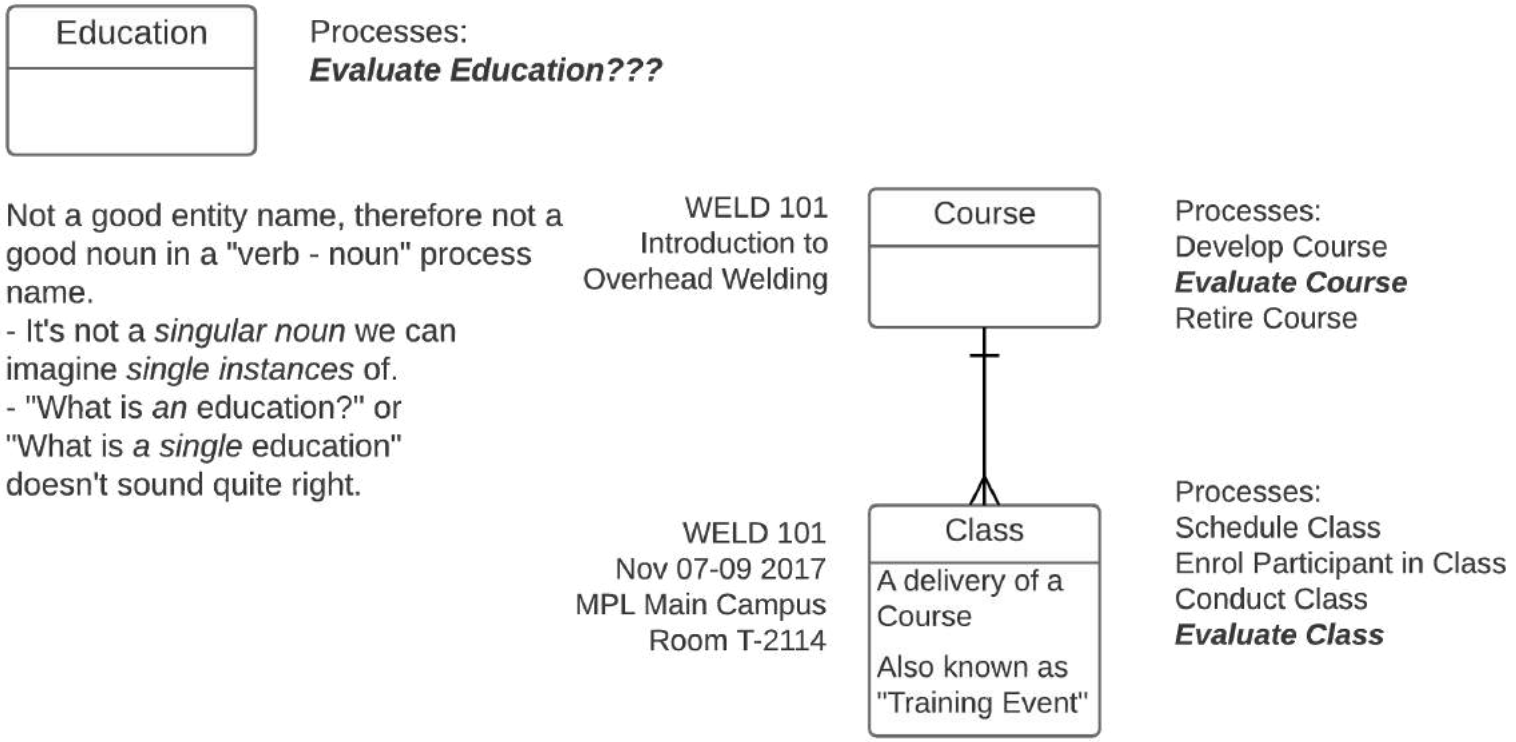
Business Process concepts and techniques

Putting Data, Process,& Business Analysis together

Example 1 – simple Concept Modelling to clarify the process

Analyst struggles to model “Evaluate Education” – timing disconnects, 1:M and M:1 connections within the process, token changes, …

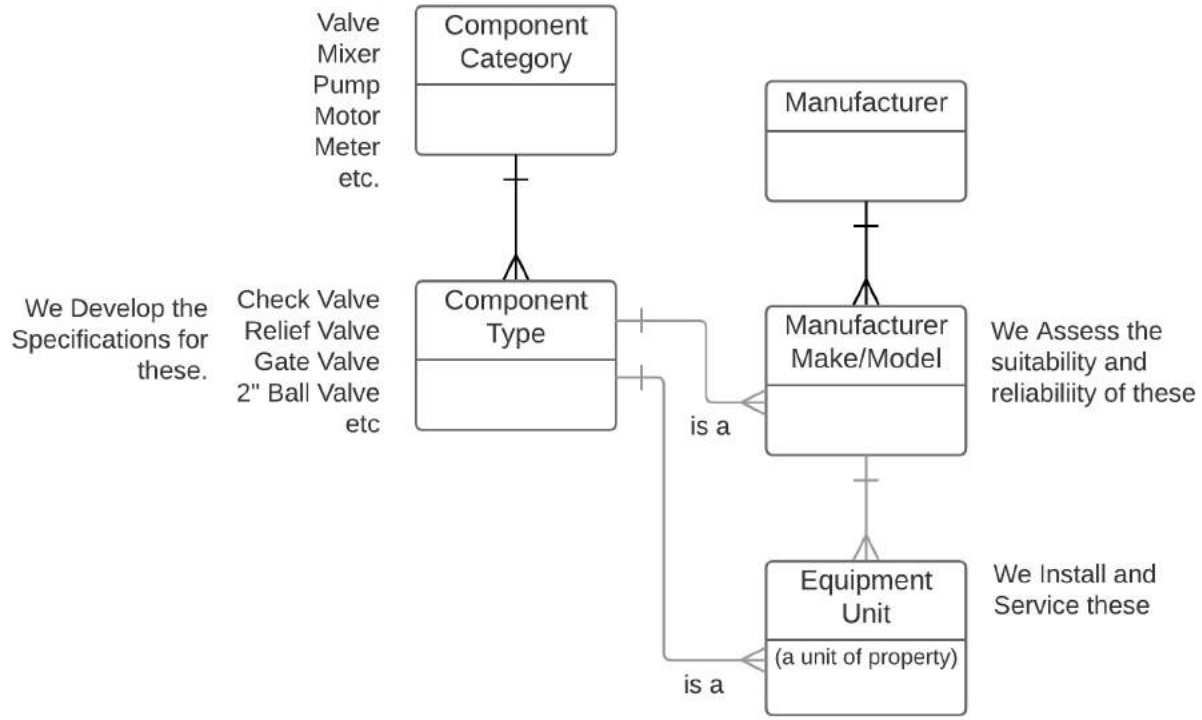
A few minutes of Concept Modelling showed two distinct tokens and processes. “Education” was a “mushy noun.”



Example 2 – simple Concept Modelling to clarify the process

A session to model the “Design Component” process at a pipeline operator is going in circles. Concept Modelling clarifies the company doesn't actually “design components,” they:

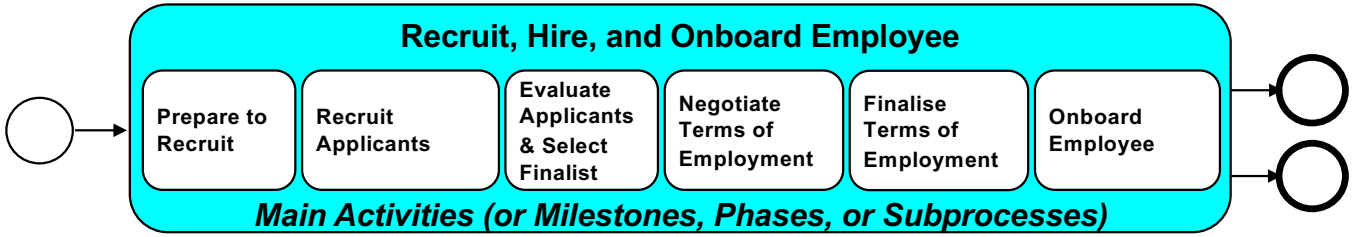
- Develop Component Type Specifications
- Approve Manufacturer Make/Model (“AML”)



Example 3 – simple Concept Modelling to clarify the process

- University looking to implement e-signature
  - Pilot project to test the technology in the recruiting area
  - Suggestion – "Get Alec in and be sure you understand the process." *(Thank you!)*

Trigger:
Need to appoint a person to a Position (aka, "hire a person") due to:
vacant Position
new Position
modified Position
Includes contract expiration/modification



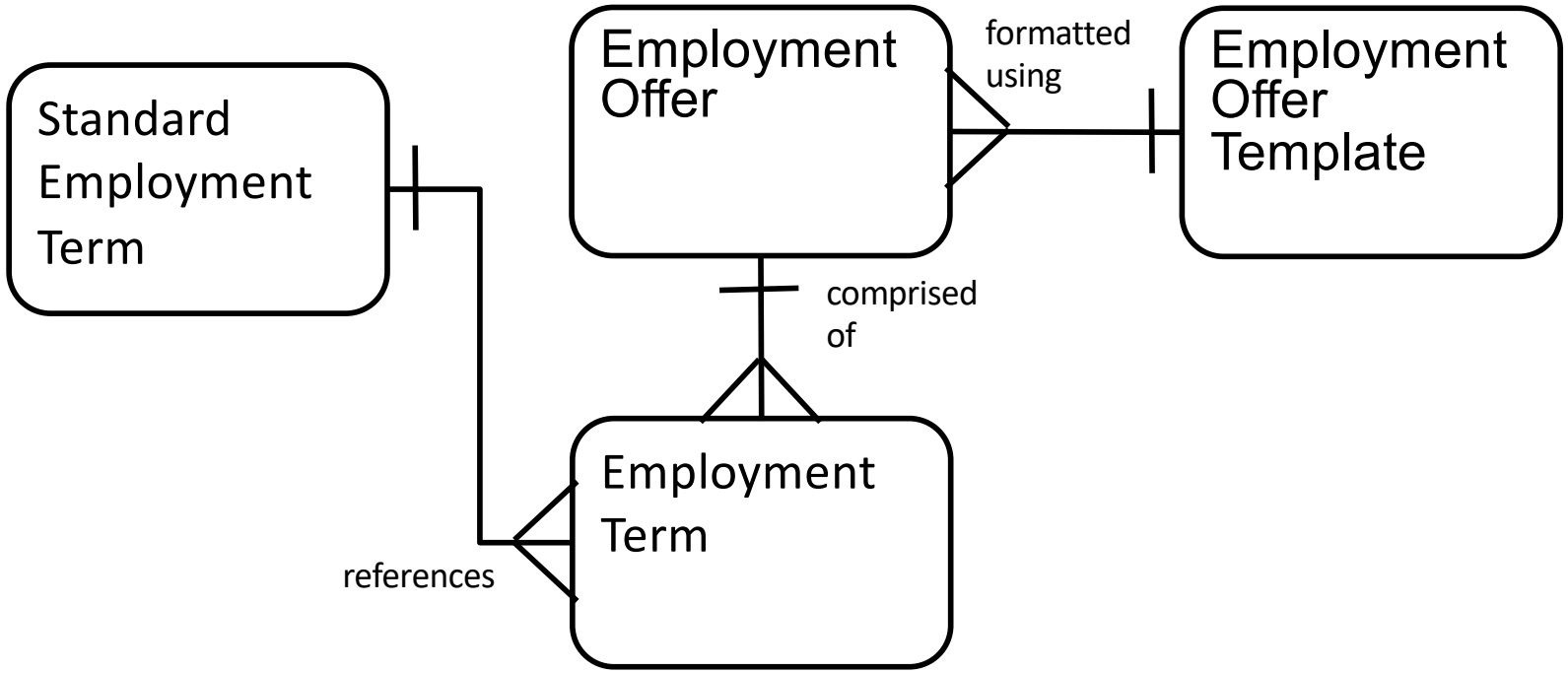
Cases:
Full-time Faculty – tenure-track, non tenure-track, fixed-term research, fixed-term instructional, …
Academic Professionals
*Classified****… and many more***

Customer result:
(hired Employee)
relatively pain-free, timely, correct first pay cheque correctly deposited
Accurate, agreed Letter of Offer (a contract) and Position Description.
etc.

Customer result:
(other Applicants)
receive results before Letter of Offer, but must feel well-tested
…and many more for other stakeholders

- Everyone fixated on physical "Letter of Offer" ("how")
  but Concept Modelling revealed "what" –
  actually a selection from a set of *"Standard Employment Terms"*
  formatted using a *standard* (unchangeable) *"Employment Offer Template."*
  Major *implications!*

"Letter of Offer" = "Terms of Employment"



Classic *"how"* (Letter of Offer) vs. *"what"* (Employment Offer)
Realisation: if Employment Terms are agreed, and Template is standard and unchangeable, ***no one needs to review the Letter!***
Eventually, the term "Letter of Offer" became unused

Goals – business client, business analyst, developer

Simplistic methods at one extreme:

List-form requirements –
the dreaded BRD,
a.k.a. *context-free requirements*

ID#	Business Feature	Requirement Type	Business Unit(s) Affected	Potential Application(s) Impacted
BRQ025	files that are available for the selected day.		Readiness	
OMSPI-BRQ026	System shall include all outage status in the Transmission Outage report.	Core	Operation Readiness	WebOMS
OMSPI-BRQ027	System shall display consistency in the format of output data in the Transmission Outage report when using pipe-delimited feature as follows: For the same row of output data, all data elements in the same position in any field must correspond to each other. Example of existing Transmission Outage report where there are two inconsistencies in the output data format: 1. Report shows one Outage ID, three Substations, and four Equipment Names. 2. First listed Substation does not correspond to the first listed Equipment Name. Outage ID | Substation | Equipment Name 3042750 | HUNTERS POINT PP P / MISSION X| LARKIN Y / POTRERO PP A (PGAE)| MISSION X | A-Y 2| BNK-2| P-X 1| P-X 2	Core	Operation Readiness	WebOMS
OMSPI-BRQ028	System shall allow the format of the Transmission Outage report published periodically automatically to support the following formats: 1. PDF 2. HTML 3. MS Word	Core	Operation Readiness	WebOMS
OMSPI-	System shall allow admin user to configure the number of days in the Transmission	Core	Operation	WebOMS

The goal lies in the middle ground:

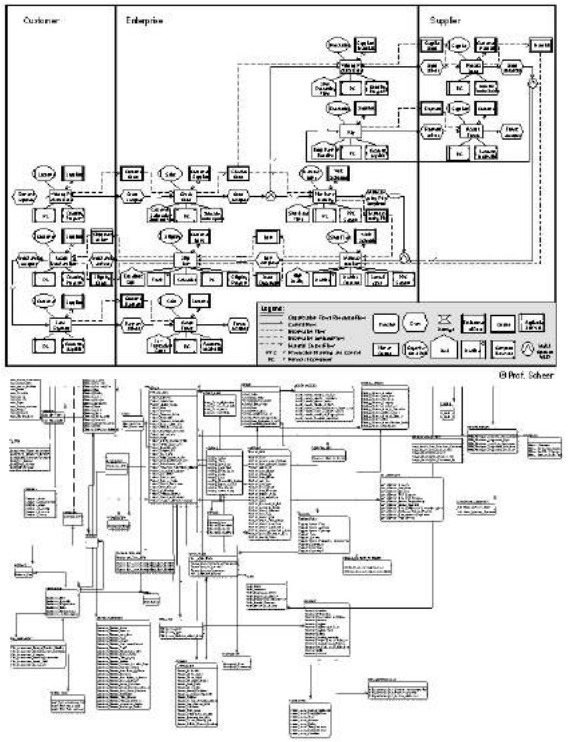
Client – *understandable, and therefore verifiable.*

Analyst – *doable, within their natural lifetime.*

Developer – *unambiguous, complete, actionable*

Overly complex methods at the other extreme:

Thinly-disguised, implementation-level design methods – *not* useful for discovering stakeholder needs



The Data – Process Connection

Discussion – the problems with list-based requirements

Simplistic methods at one extreme:

An actual example, one in a list of 451 individual requirements:

#49 -

The system shall provide a visual mechanism through which to view or amend the sequencing of items for a previously selected case or allocations thereof.

What's wrong with this as a requirement? What does it NOT tell us?

List-based approaches to business analysis quickly break down – no way to ensure *completeness, accuracy, consistency, …*

Who?	Senior Scientist
What?	Schedule a Test (an Allocation) on a Sample from an Item
When?	At Item Submission
How?	By viewing upcoming workload
Why?	So a completion date can be provided to the Police

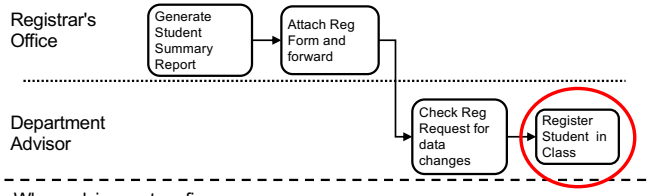
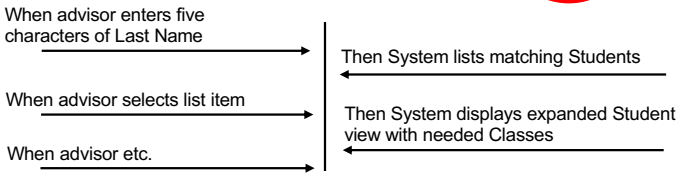
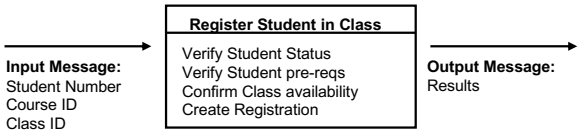
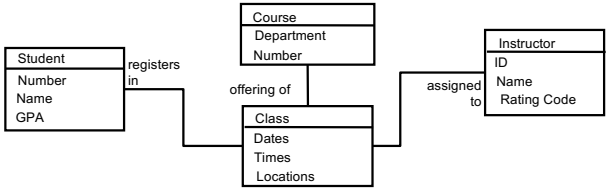
Essentially, a Use Case or User Story

Also…

- where does this occur in the end-to-end process?
- what data or information is needed?
- …

The Data – Process Connection

Putting it in my overall framework for analysis and architecture

Framework Layer		Technique sample	What it covers
Goals	*Business Objectives*	The university is initiating the "Strategic Enrollment" program to raise Student graduation rates in part by ensuring Classes are available for Student registration when needed.	✓ ***Project Charter*** – documents the rationale, objectives, scope, and success measures for the project
Process	*Business Process*		✓ ***Process Model*** - shows "what" in a Scope Model, then "who & how" in a Workflow Model – the steps done by the actors in the process
Application	*Presentation Services (user interface)*		✓ ***Use Case*** – models how an actor interacts with a system to obtain (trigger) a service, typically to complete a step in a process
	Business Services (rules & logic)		✓ ***Service Specification*** - describes a service – a package of rules and logic – that is triggered to complete or respond to a business event
Data	*Data Mgmt. Services (databases)*		✓ ***Business Object Model*** - depicts the things and the facts about things the organisation needs to record; the things (the entities) are what processes and solutions act on.

This is not a sequence!

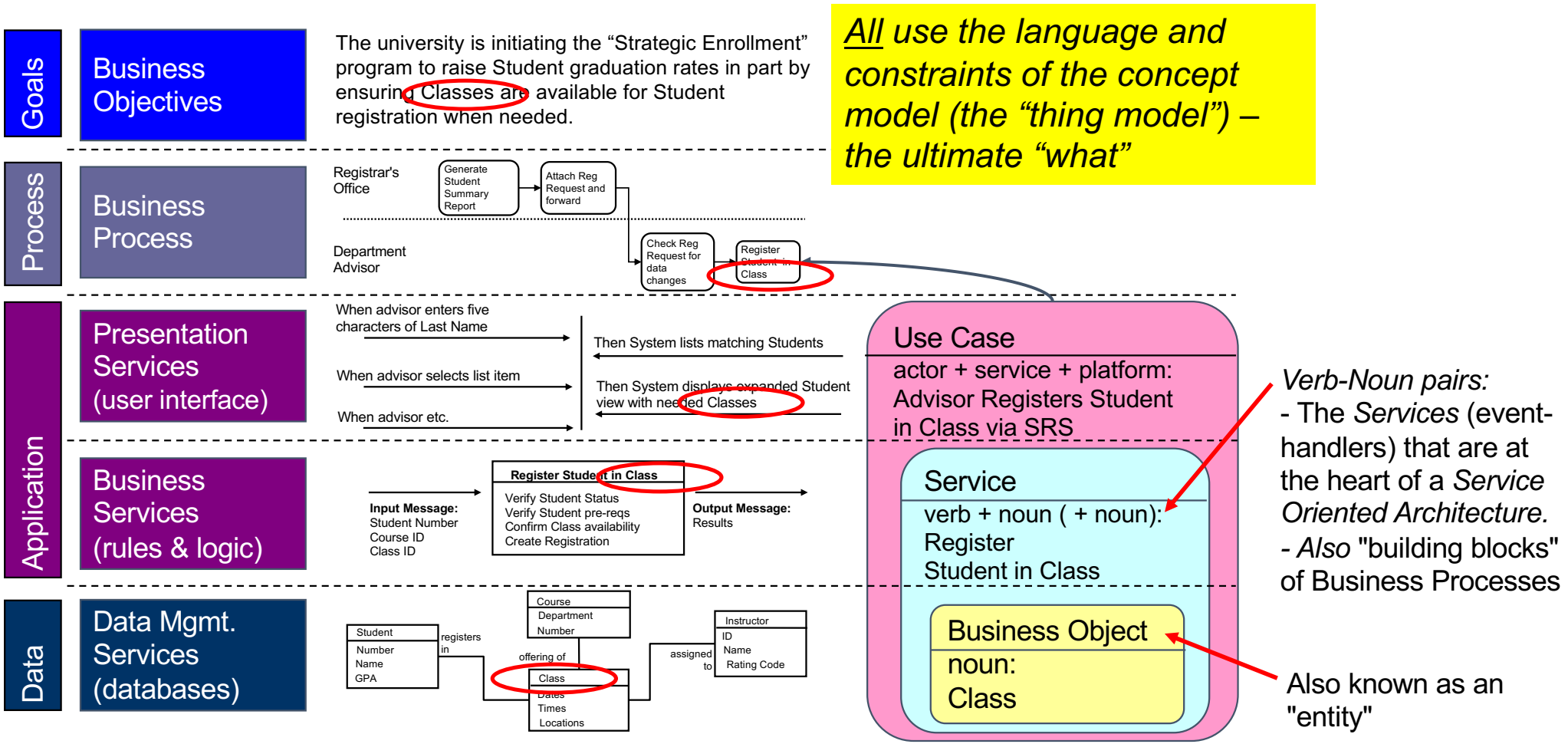
Business Process: gives great *context* for *Business Analysis*

Use Cases and Services: where we capture *Functional Requirements*

Business Object Model: a great *platform* for *Business Analysis*

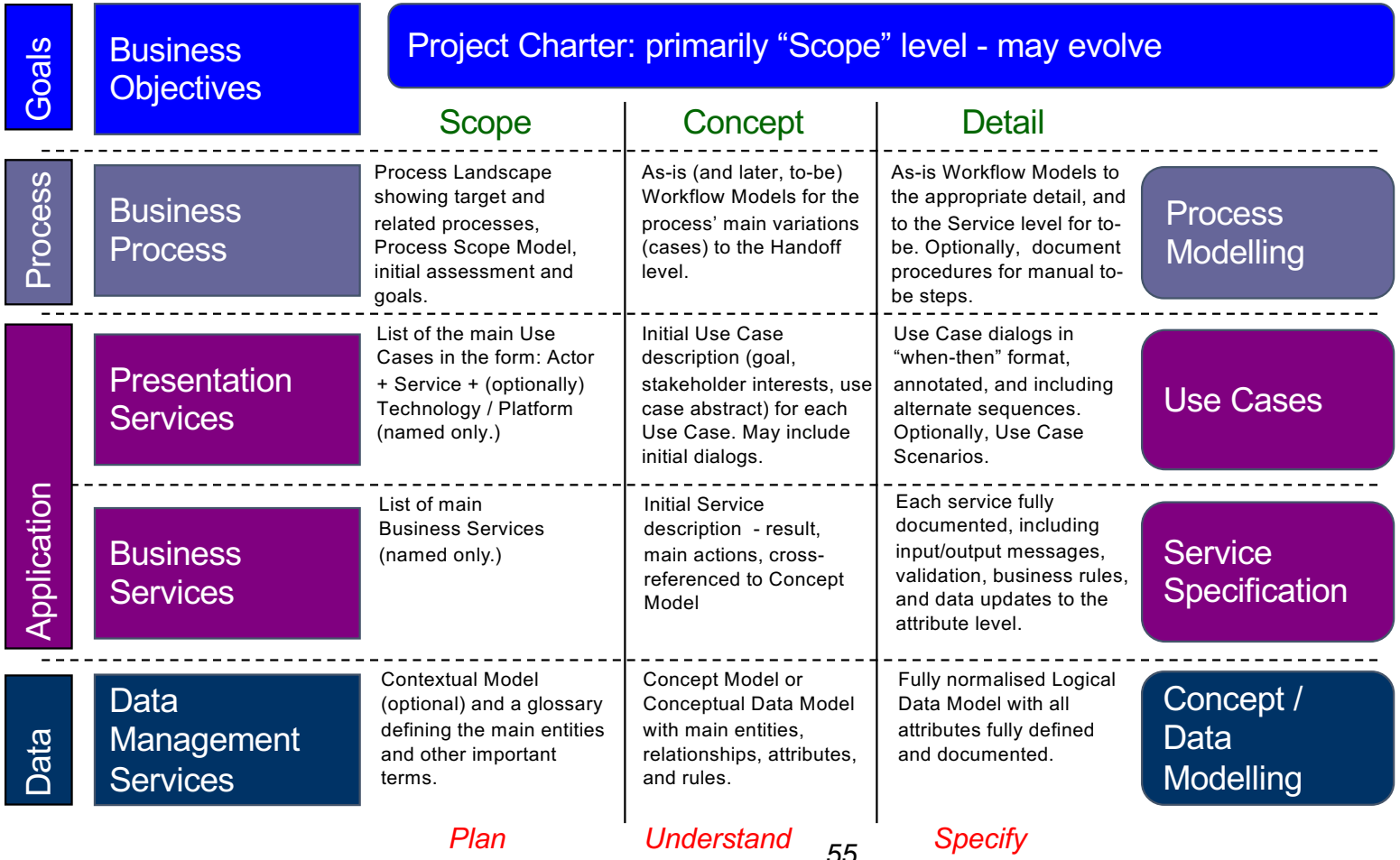
All go through well defined, progressive levels of detail

Everything relies on the concept model



Progressive detail for all techniques

Clariteq framework for analysis and architecture



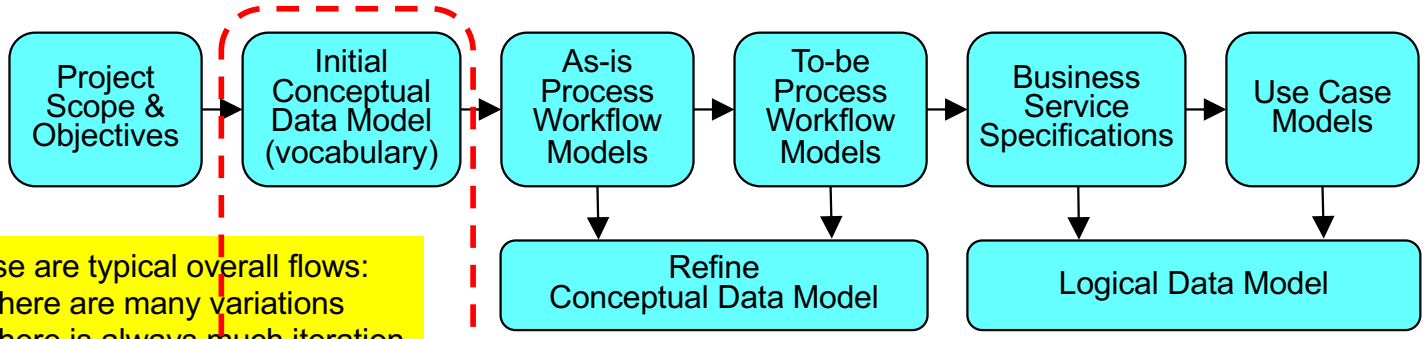
Or…

- Planner's view
- Owner's view
- Designer's view

Techniques and methodologies

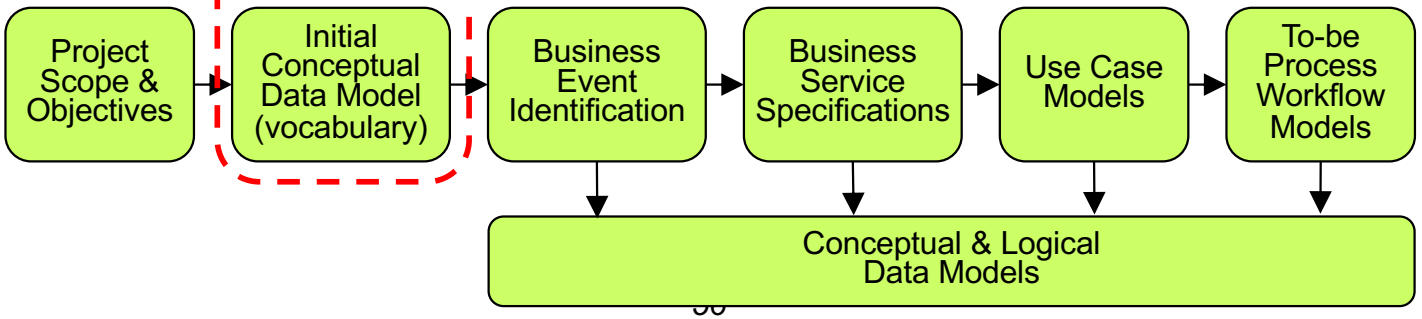
- The same techniques are used in different sequences, with different emphasis, in different methodologies.
- There is no single fixed sequence through the techniques.

Larger project: process-oriented / "outside-in" –

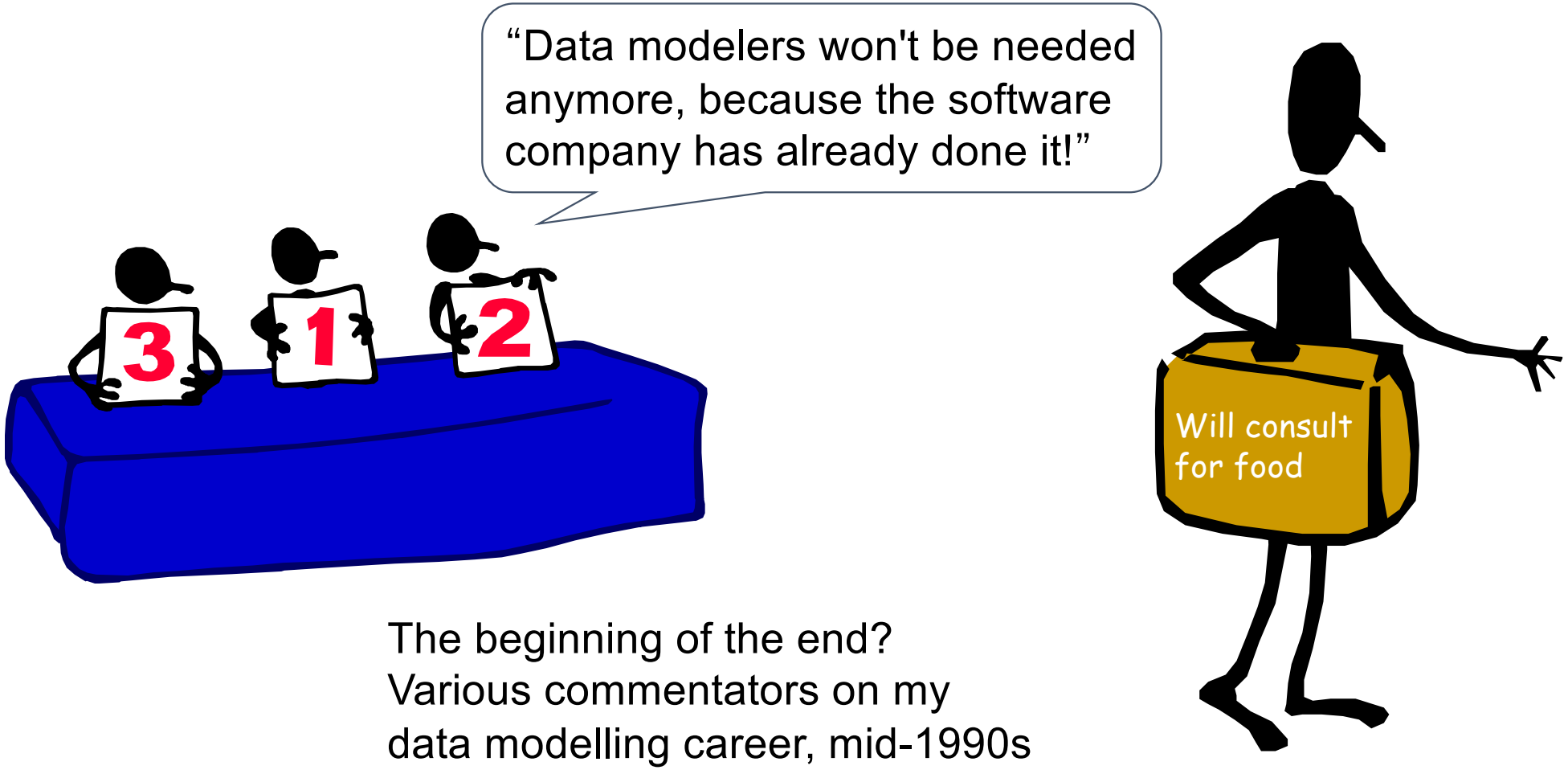


These are typical overall flows:
- there are many variations
- there is always much iteration

Smaller project: service or use case-oriented / "inside-out" –



Data modelling – many detractors, but it's where I start!



The beginning of the end?
Various commentators on my data modelling career, mid-1990s

Redemption!

The client...

Could you come on over and do that thing you do?

That entity data stuff with the boxes and lines

We're implementing something called SAP. Our CEO told us to!

They say it's a terrible idea and a waste of time and could you please *just stay home.*

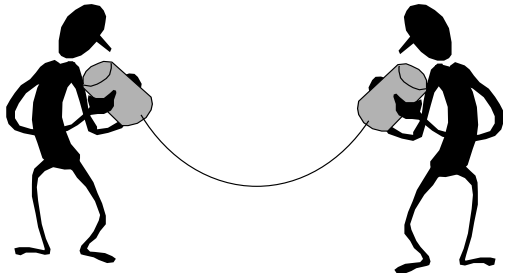
Alec...

I guess. What thing in particular?

Oh, data modelling.
Sure - what's the project?

Uh-huh. Why do you want my help? And what do your SAP consultants say about this?

I'm on my way…



The Data – Process Connection

The outcome – using DM for ERP configuration

The situation:
- Manufacturer selects SAP as platform for process transformation
- Desire to understand as-is *business processes* to map to package and decide on configuration options
- Client felt they were being coerced by integrator

The #1 reason for unhappiness with the selected COTS solution – *a data model mismatch!*

The approach:
- Team of 7 builds 45 entity *concept model* over two days
- Identify "what's good, what's not good" about current business rules
- Use this knowledge on configuration activities with concept model as an overall map

Vendor
Country
Site
Plant
Plant Location
Equipment Item & Type
PO, PO Line Item
Req'n, Req'n Line Item
Release, Release Line Item
Work Definition, WD Line Item
etc. etc. etc.

The key points:
- ***Client-initiated, not IT***
- Now a global showcase account
- Client – "More value from those two days than anything else we did!"
- Me – "I'm not irrelevant!"

"Quick wins" example – selecting an application with verbs and nouns

Selecting of new Financials app is hopelessly bogged down despite huge effort to develop and maintain a BDM*

Requirements	D&B	Oracle	SAP	Coda	etc.
1	Y	Y	Y	Y	
2	Y	Y	Y	N	
3	Y	Y	Y	Y	
4	N	Y	N	Y	
5	N	N	Y	Y	
6	Y	Y	Y	Y	
7	Y	Y	Y	Y	
8	Y	Y	Y	Y	
9	Y	N	Y	N	
10	N	Y	N	Y	
11	Y	Y	Y	Y	
12	Y	Y	Y	Y	
13	Y	N	Y	Y	
14	Y	Y	N	N	
…					
…					
858	N	N	N	Y	
859	Y	Y	Y	Y	

*** Big Dumb Matrix**

BDM issues

- Time consuming
- Most apps meet most criteria
- Still can't tell if an app will work well in your environment

Using DM for purchased application selection

The problem:

- Selection of new Financials app is hopelessly bogged down (and a matrix of almost 1000 "requirements" wasn't helping)
- Worse – *matrix points to the app no one wants!*

The approach:

- Small team builds "thing model" (concept model, ~60 entities total, 15 "core")
- For each core entity, identify 3 to 5 life cycle events
- For each event, develop scenario w. data
- Turn over to ***paid*** app vendors – "Show us!"
  - "How do you support the data model?"
  - "How do you handle scenarios?"

"Things we track…"

- **Project, Work Order**
- **Plant, Plant Equipment**
- **Product Type, Product Lot**
- **Product Inventory**
- **Sale, Transfer**
- **Location, Ledger Entity**
- **Financial Category**
- **Responsibility Center**
- **Account, Sub-Account**
- **Fixed Asset**

"Process Events that happen to them…"

Fixed Asset is

- **Acquired or Constructed**
- **Depreciated**
- **Transferred**
- **Disposed Of**

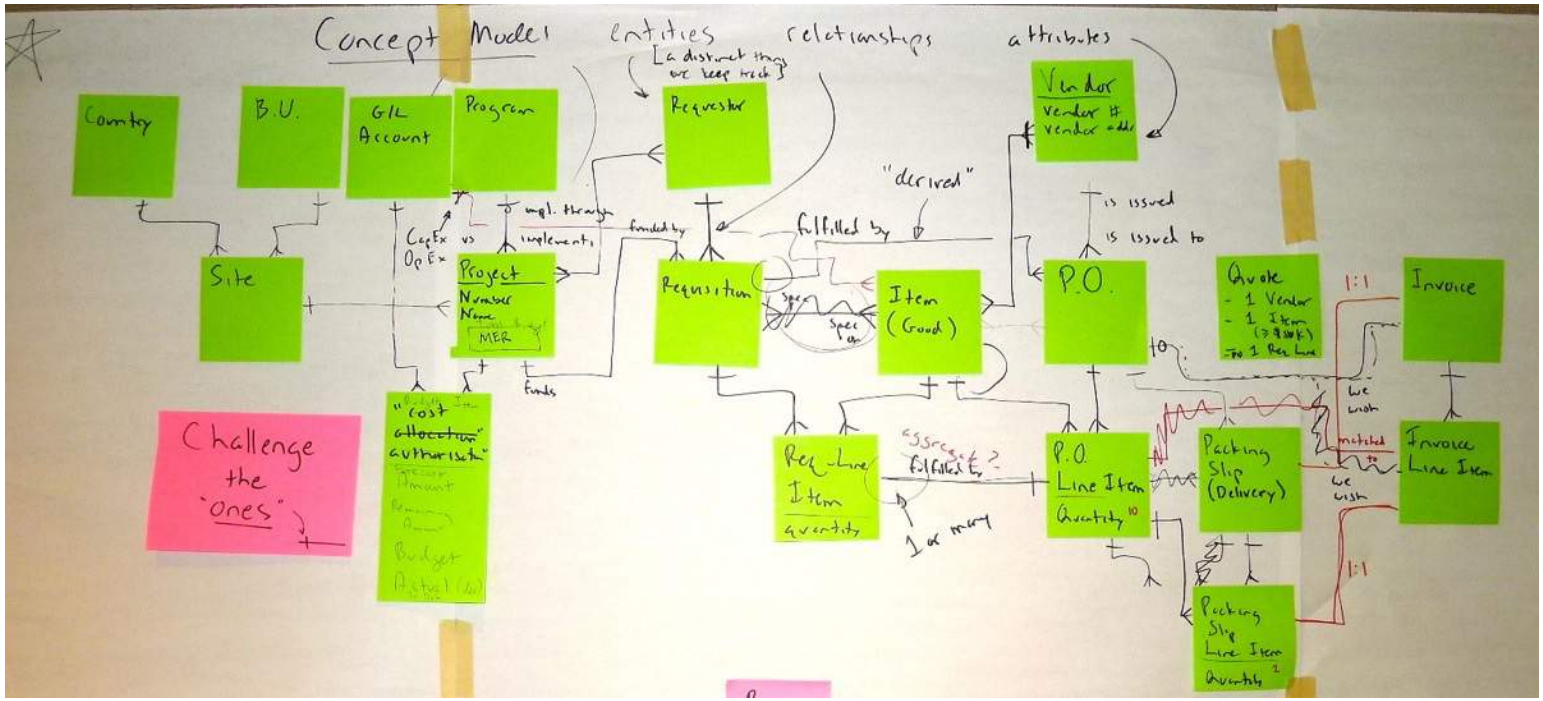
The key points:

- It worked! – saw how an app would support the business
- Didn't initially call it "data modelling"
- Left vendor some room - "Here's how we'd do it."

Another example – Concept Model shows possibility of major process change

Global mining company hires me to help with Business Process in support of ERP changeover.

I "snuck in" some quick, informal Concept Modelling.



This highlighted many areas lacking clarity:

- Program vs. Project
- Site vs. BU Location vs. Country
- Requisition vs. Quote vs. Purchase Order
- Invoice/Invoice Line Item vs. Packing Slip/Packing Slip Item and many others…

I did not use any data modelling terminology until the end!

Case study – concept model, services, use cases

Regulatory Agency wants to change business model, but current systems don't support it, and changing them will be time-consuming and expensive

Business Development is unimpressed by IT and Finance objections – "You're being mindlessly obstructionist!" and develops work-around procedure

I'm hired to identify end-to-end implications – "Design a business process and determine requirements that will allow this procedure to work."

Concept modelling was a critical tool in understanding the situation, and developing the process & requirements

Case study – how can business object modelling help?

- *Client* – regulatory agency charged with protecting people by promoting the safe design, installation, and use of technical equipment (gas, electrical, boiler, elevating devices, amusement park rides, etc.)
- *Goal* – shift from an inspection-based model to ensuring self-managed safety programs at client sites known as a *Client Safety Management Program or "CSMP"*

Initial focus –
boilers and pressure vessels

Case study situation

- Business Development spots opportunity to implement CSMP (Client Safety Management Program) rapidly in specific industry
- Current systems don't support it, and changing them would be time-consuming and expensive – IT and Finance suggest 18 – 24 months of work
- BD is unimpressed by IT and Finance objections
  ("You're being mindlessly obstructionist!")
  and develops work-around procedure.
  (Guess which tool they intend to use?)
- I'm hired to identify end-to-end implications –
  "Design a business process and determine IT requirements
  that will allow this procedure to work."
- Business Object Modelling was a critical tool in understanding the underlying policies, and developing the process & requirements

Always start with terminology (the “things”)

https://miro.com/app/board/o9J_lrFq1UU=/?invite_link_id=142419920744

Tools like Miro and Lucidchart / Lucidspark are ideal virtual "Post-it work"

https://miro.com/app/board/o9J_lvQvlpo=/

Identify synonyms and select one term.
Now, how do these relate to one another?
What do you need to know about each?

Always start with terminology (the “things”)

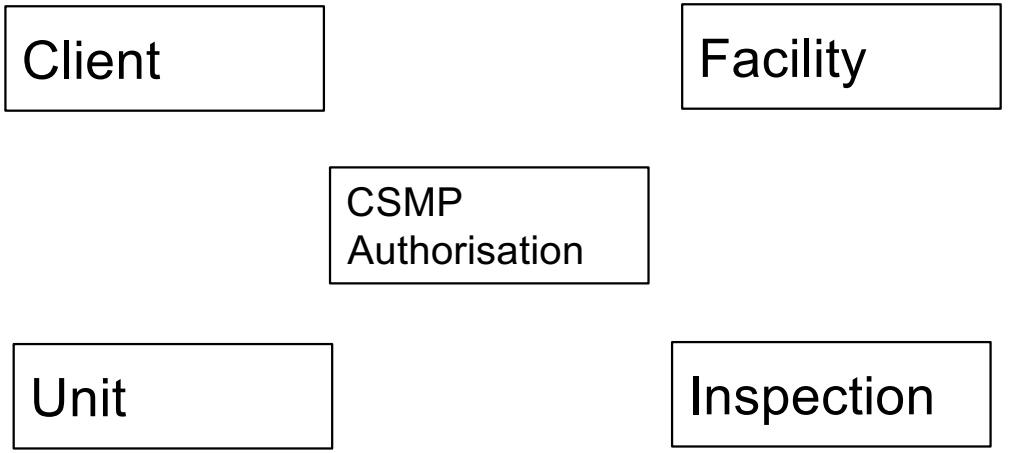
Operator
Applicant
Licensee
Client
Owner
Customer
…

Operation
Site
Location
Plant
Facility
…

Verification
Inspection
Confirmation
…

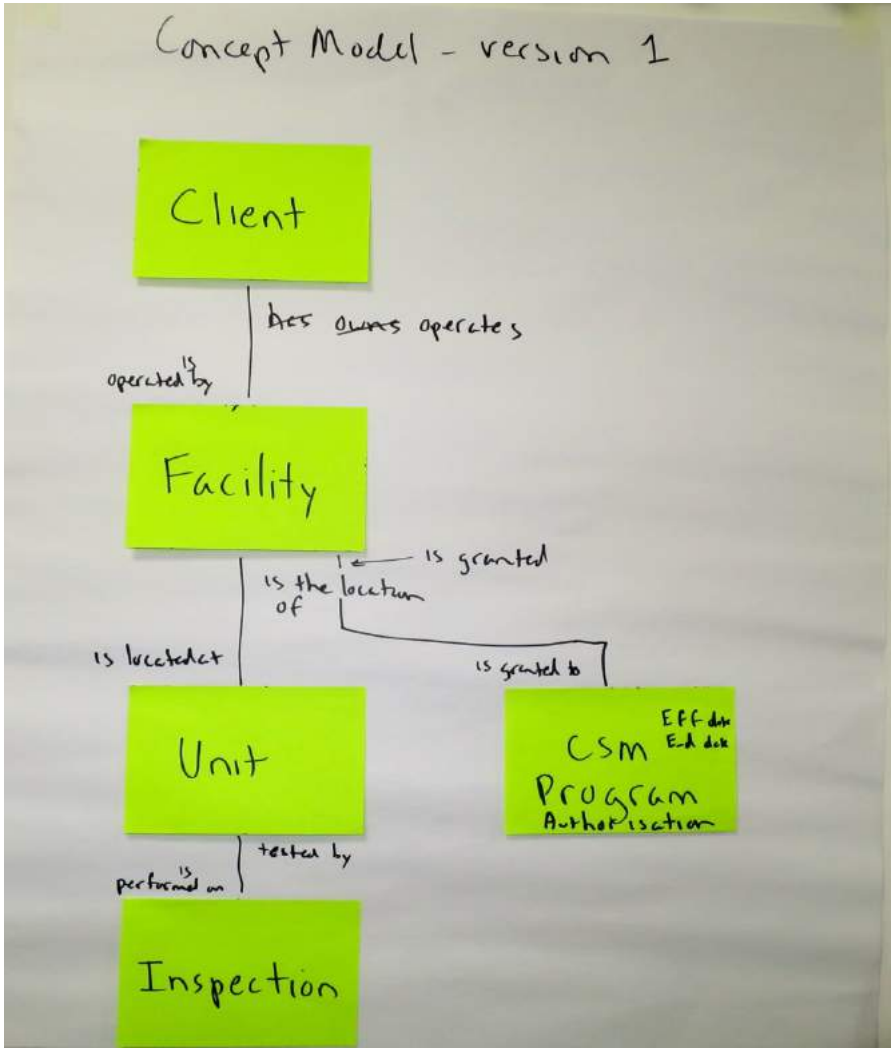
Device
Unit
Pressure vessel
Boiler
…

Permission
Authorisation
…



Now, how do these relate to one another?
What are the policies governing them?

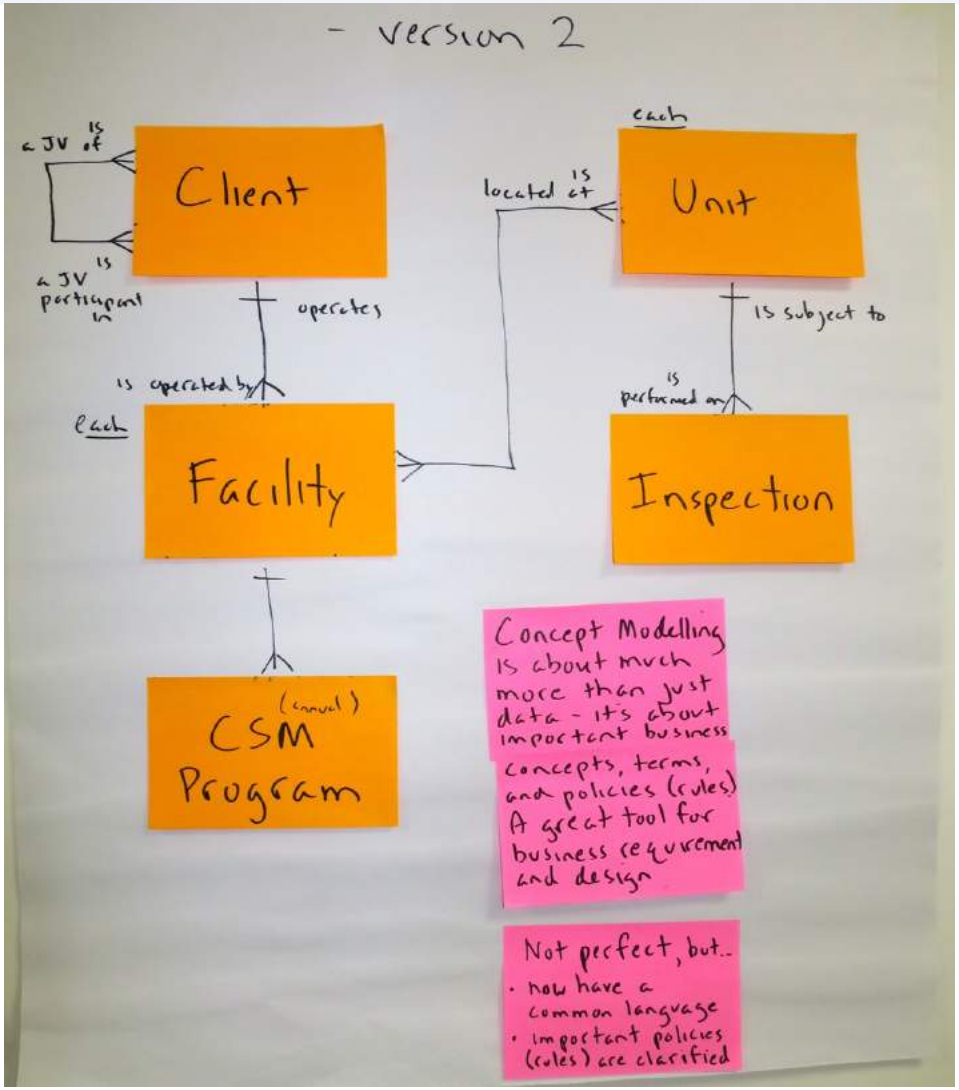
Starting a Concept Model



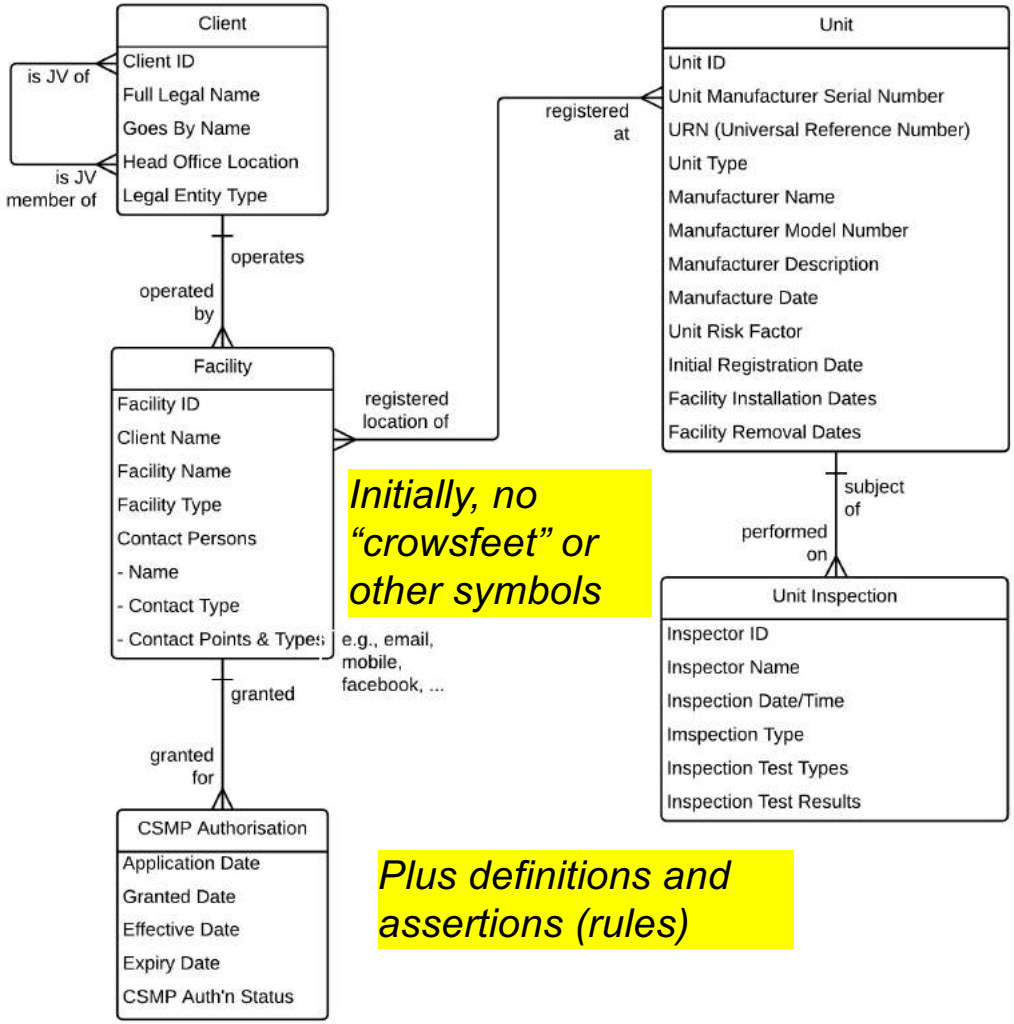
Then, we started to add Assertions. This is where it got interesting!

1. Client-Facility
   Each Client *operates* one or more Facilities
   Each Facility *is operated by* one Client
2. Facility-Unit
   Each Facility *is the location of* one or more Units
   Each Unit *is located at* one Facility
3. Facility=CSM Program
   Each Facility *is granted* one or more CSMP Authorisations
   Each CSMP Authorisation *is granted to* one Facility

Refining the Concept Model



Using a quick, conceptual "thing model"



Initially, no "crowsfeet" or other symbols

Plus definitions and assertions (rules)

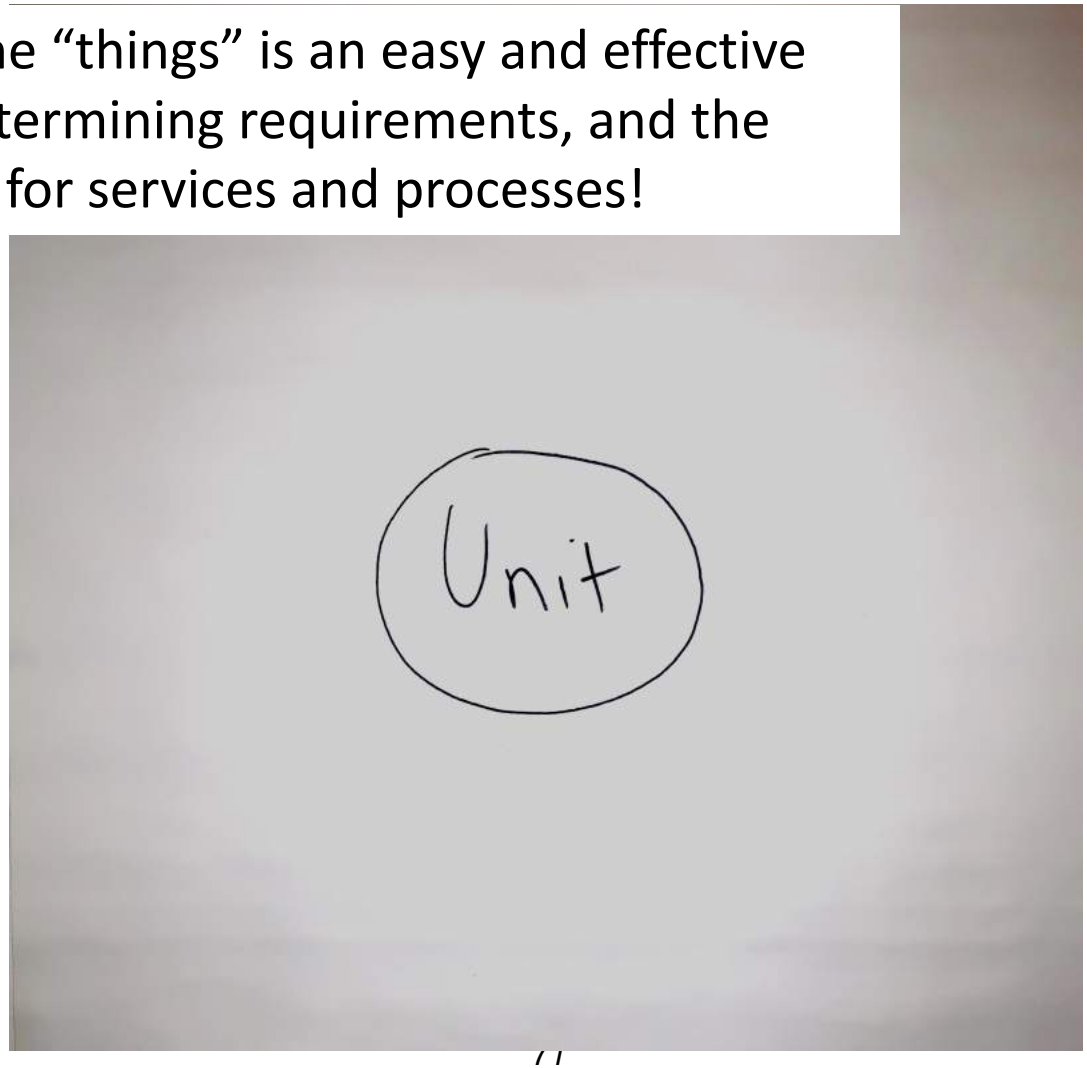
Sketching this out raised many questions that had never occurred to the client…

- Is there one CSMP per Client, per Facility, or some other basis?
- Do Units frequently relocate, or even turn up at another Client?
- What is inspected – the Facility or the Unit?
- Does the CSMP cover all or some Units at a Facility?
- Will mobile Units be attached to a Facility or to the Client?
- …and MANY more…

Model took ~90 minutes

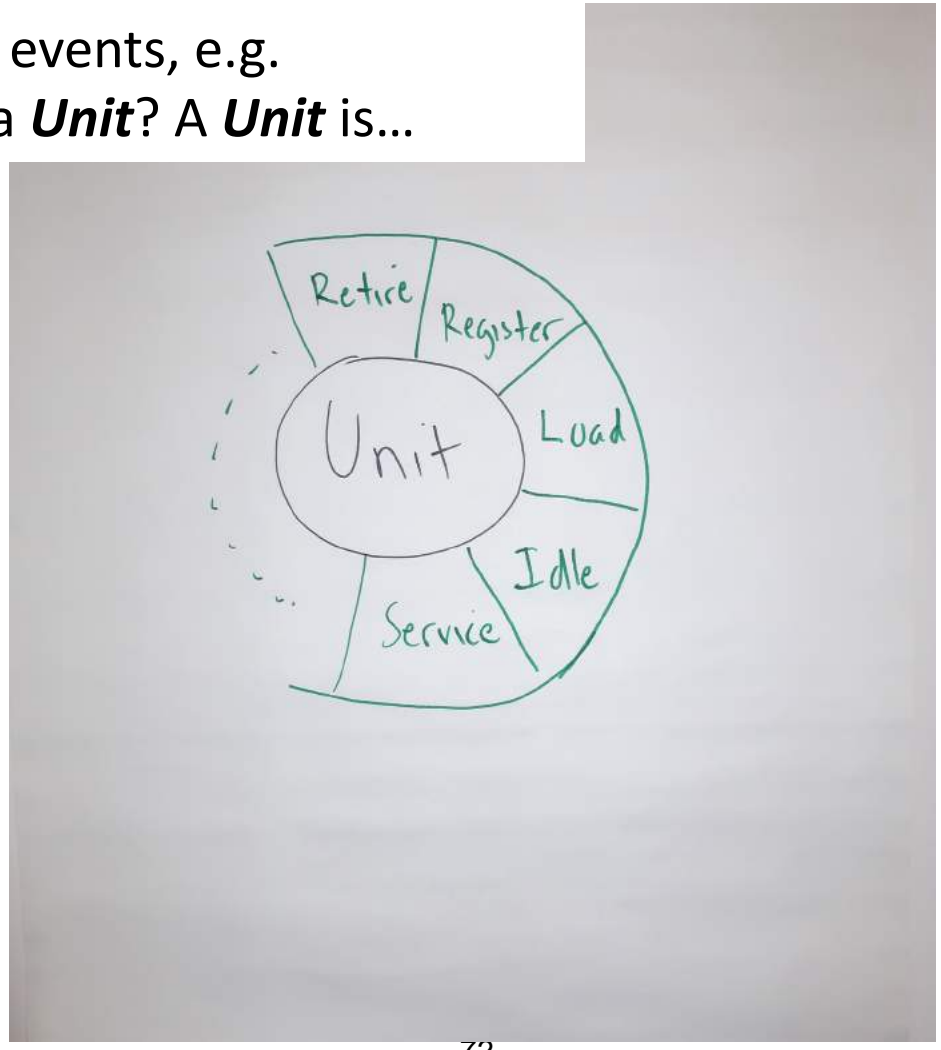
Requirements – start with a “core noun” / "entity" / “business object”

Starting with the “things” is an easy and effective way to start determining requirements, and the building blocks for services and processes!



Second ring of the "doughnut model"

Identify actions or events, e.g.
What happens to a ***Unit***? A ***Unit*** is…



Identifying events/services starting with a "thing model"

First, clarify language. (A platform)

Second, establish policies and rules

And then, identify events or services, e.g.
A **Unit** is…

- Registered (requiring the service "Register Unit")
- Loaded (requiring the service "Load Unit")
- Idled (requiring the service "Idle Unit")
- Reactivated (requiring…)
- Repaired
- Inspected
- Relocated
- Retired
- …

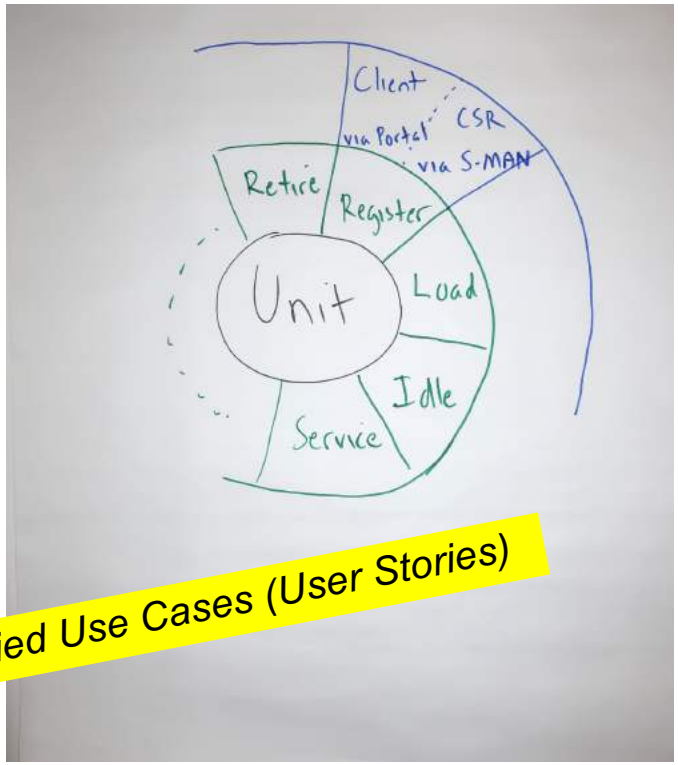
These are the essential capabilities

Something I *always* do when evaluating/selecting COTS S/W

We did the same for Client, Facility, CSM Program, …

Third ring of the "doughnut model"

Identify Use Cases / User Stories – who needs access to what services, and how?



Use Case and User Stories:
Different format and detail, but the same basic concept. Initially, at the Scope level, they're much the same:

User Story (who – what – why):

"As a Client,
I need the ability to Register Unit(s)
so I can maintain compliance with my CSMP Authorisation"

Use Case: (who – what – how):

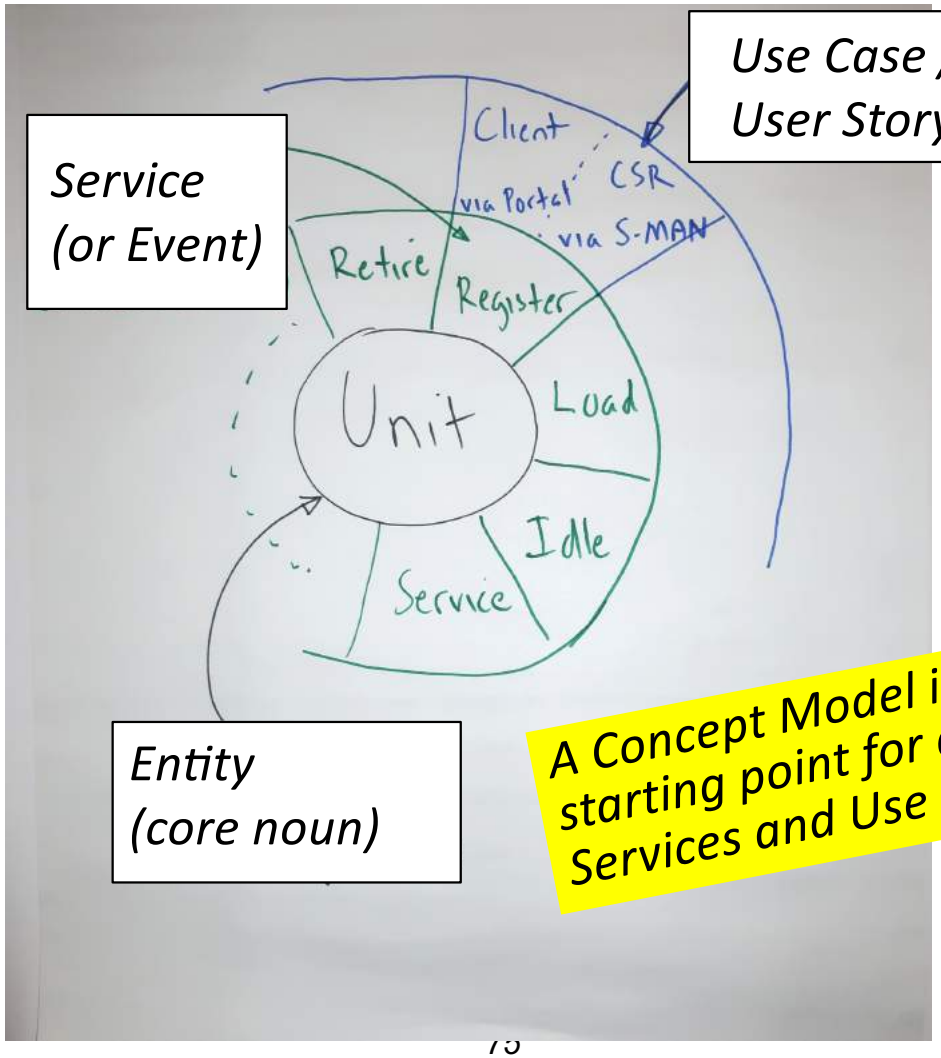
"Client Register Unit via Portal"

When we elaborate the User Story (add additional detail) at the Concept level, it becomes identical to a typical Use Case:

- Use Case abstract
- Preconditions and Postconditions
- Main success flow – dialogue: "when-then" interactions
- Alternate sequences – alternatives, exceptions, errors

Entities, services, and use cases

Document the Service *once,*
use it in *one or more* Use Cases (User Stories)



Use Cases

Service Specification (Events)

Concept Modelling

A Concept Model is a great starting point for discovering your Services and Use Cases (User Stories)

Develop high-level services then use cases

Service: *Register Unit*

- Check for presence of properly formatted UR Number
- Determine if Unit UR Number is previously known
- If known, has it (a) moved (b) changed ownership (c) …?

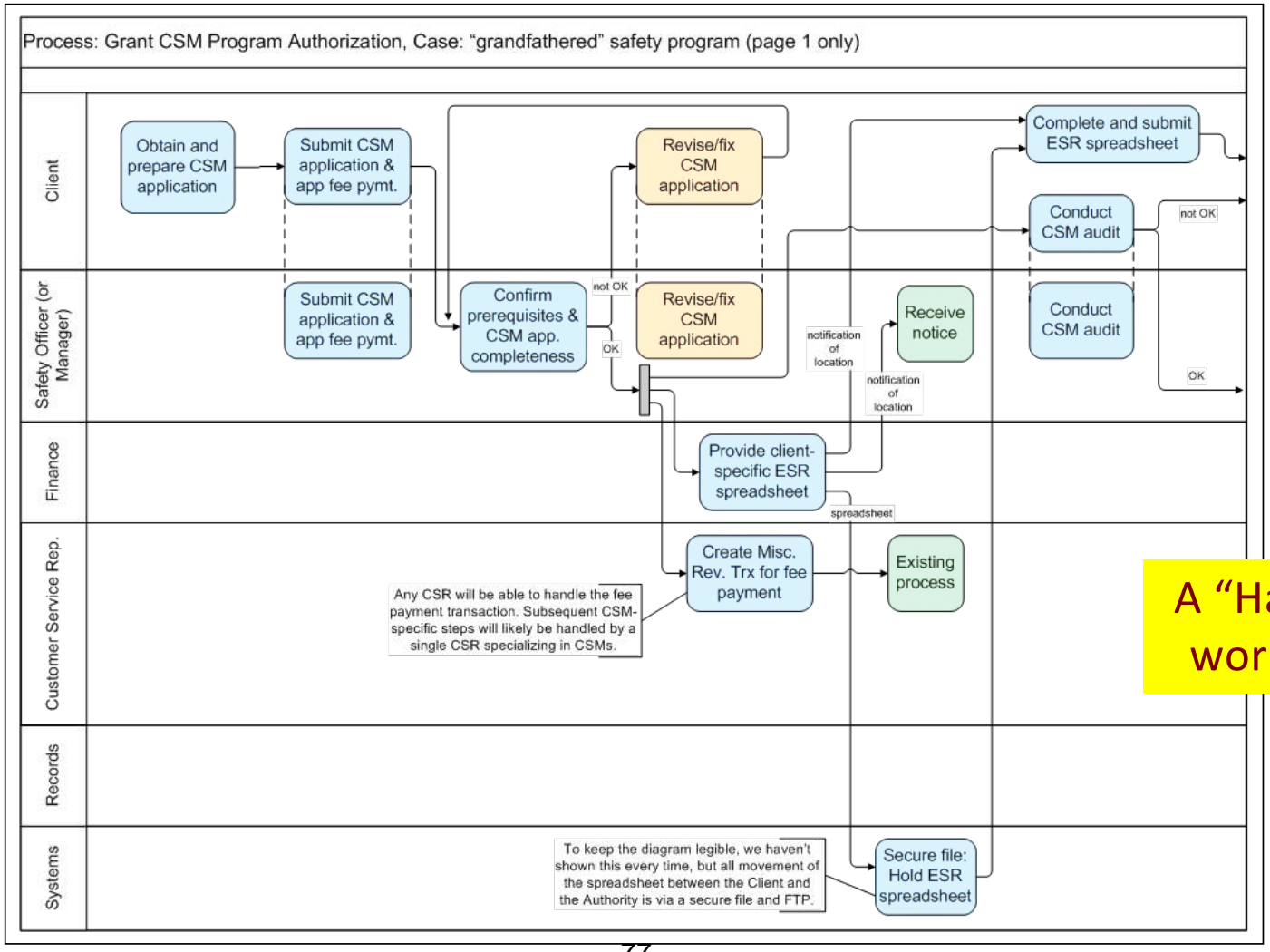
Use Case: *CSR Registers Unit via S-MAN*

- CSR will select "spreadsheet" of all Units covered by CSMP app
- S-MAN will highlight all that can proceed immediately
- For each category of Units requiring intervention…

Note:

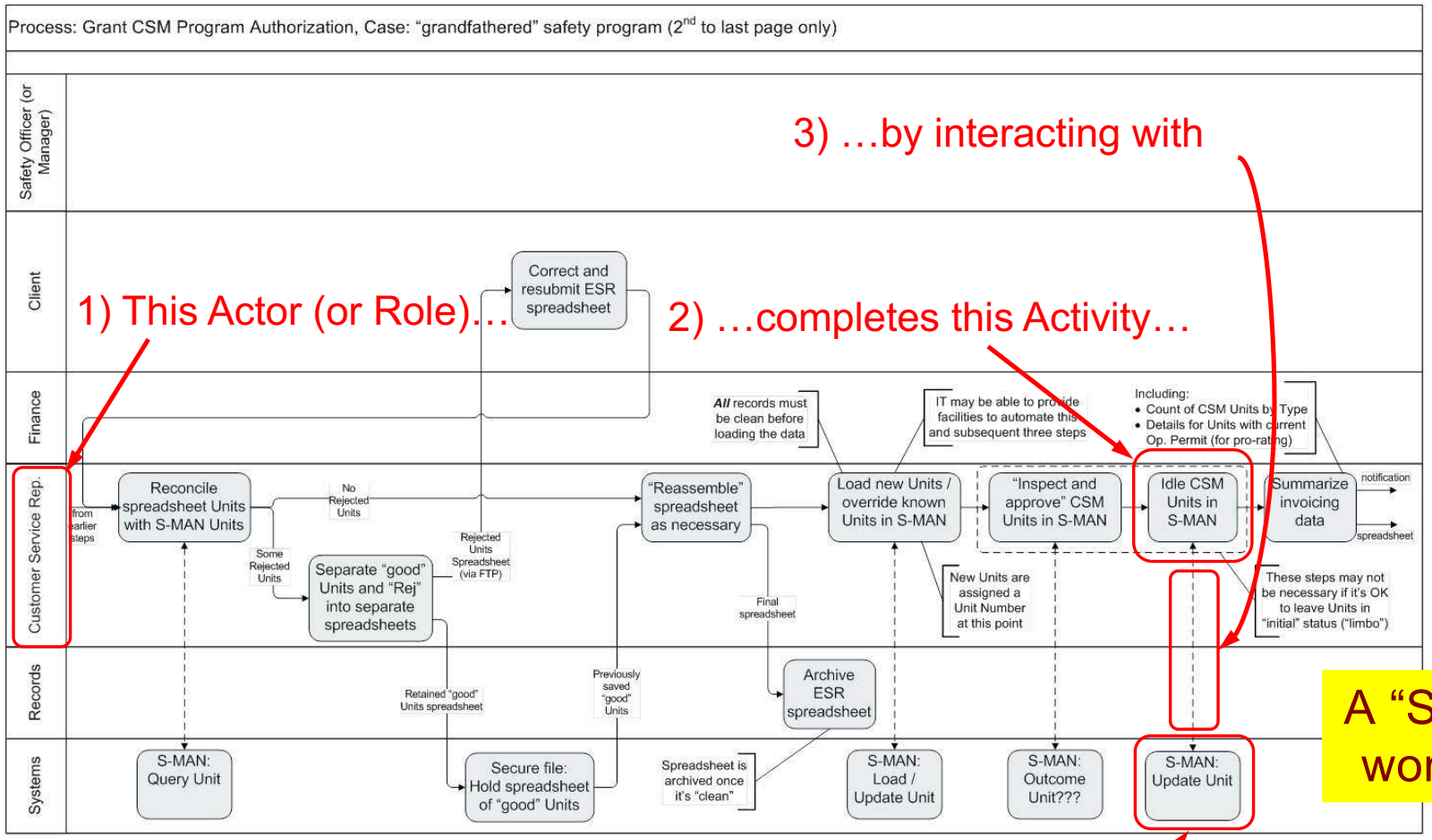
Services and Use Cases at the "upper conceptual" level to provide vendor with key elements of requirements and avoid the usual bulleted list requirements document.

Now, an initial, business-friendly workflow model



A "Handoff Level" workflow model

Then detail showing where use cases & services fit



A "Service Level" workflow model

Some advice on starting the concept model

<u>Don't</u> begin with a lecture on modelling

If you can, don't even mention "business object modelling"

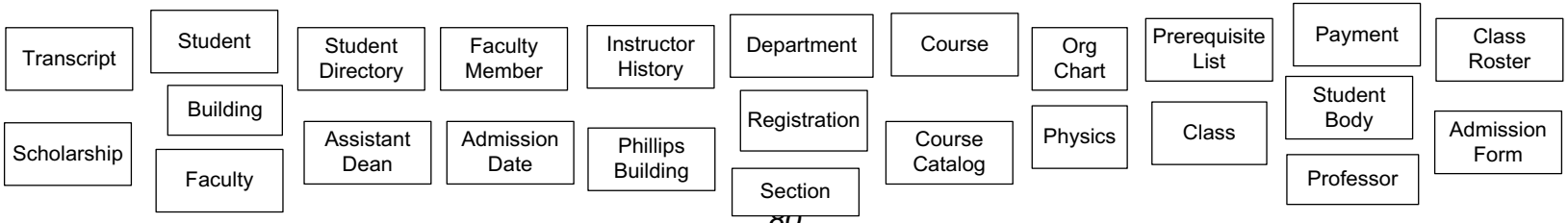
We use "terminology analysis" – starting with the <u>nouns</u> – at the outset of every project. This was demonstrated in Modul 1 with the Safety Management example.

Entities – more specific criteria

An entity is a distinct thing the business *needs* to know about, and…

- is named with a *singular noun* that implies a single instance
  - not a plural or collective noun, list, set, collection, report, etc.
  - we can discuss "one of them"
- has *multiple* occurrences
  - all are essentially similar (e.g., have same facts)
  - *need* to and *can* keep track of (differentiate) each occurrence
- has facts that must be recorded, e.g.
  - *Student* attributes: Number, Name, Birth Date, Major, GPA, …
  - *Student* relationships: "majors in" *Subject*, "enrolls in" *Section*
- is acted on by processes, so they make sense in a "verb-noun" pair
- refers to the essence, not the implementation ("What, not who or how") – *the most common error is to identify artifacts (forms, reports, spreadsheets, …) as business objects!*

Which of the following might ***not*** be valid business objects?



For practice on your own – good Business Object or not?

Which of the following might ***not*** be valid business objects at a University?

And if not, *why* not?

Transcript	Student	Building	Student Directory	Faculty Member	Instructor History
Department	Course	Organisation Chart	Prerequisite List	Payment	Student Body
Class Roster	Scholarship	Faculty	Assistant Dean	Admission Date	Phillips Building
Registration	Section	Course Catalogue	Physics	Class	Professor

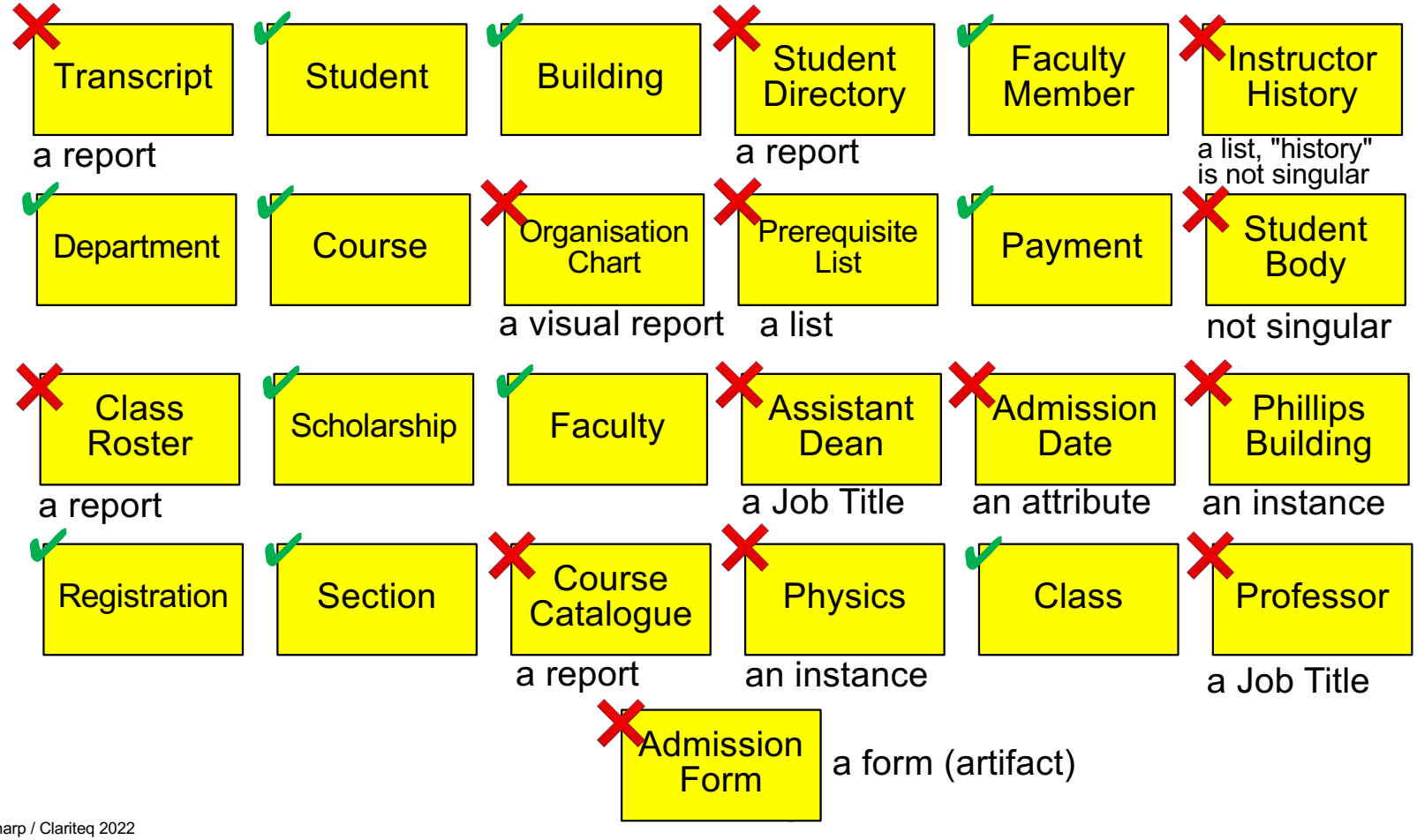
Admission Form

The Data – Process Connection

Discussion – good Business Object or not?

Which of the following might ***not*** be valid business objects?

And if not, *why* not?



Definition basics

Definitions *must* focus on what a *single instance* is:

- Not "how they're used" or "how they're created" or "why we care" or "how the process works" or "interesting problems and tidbits" etc.
- Ask "What *is* one of these things?"

Key Point

"What *is* one of these things?"

The most *useful* questions:

"Can anyone think of examples that might surprise someone else – that is, anomalies or potential sources of confusion?"
e.g., to define "Customer:"

- *"In our area, other divisions are treated as Customers"*
- *"By federal law, we record recipients of charitable donations as Customers."*

"Could we list some examples?"

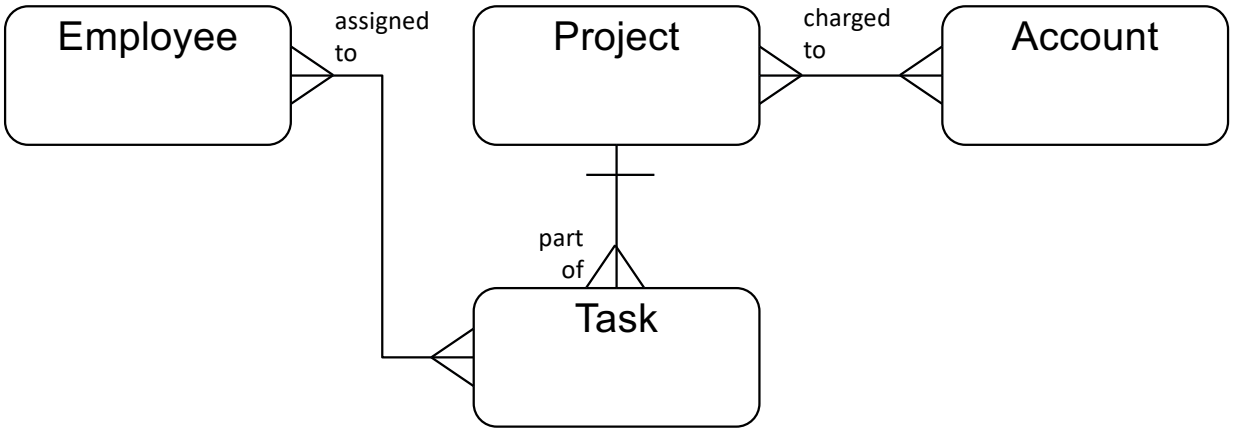
- *Rita Smith, Acme Auto, Ministry of Finance, homeowners… (aha!)*

"Does this deal with "kinds of things" or "specific things?"

- *"kind" - Customer Category vs. "specific" – an individual Customer*
- *if it's a specific thing, still ask if there are recognised types (e.g., Personal, Corporate, Government; Lead, Prospect, Active)*

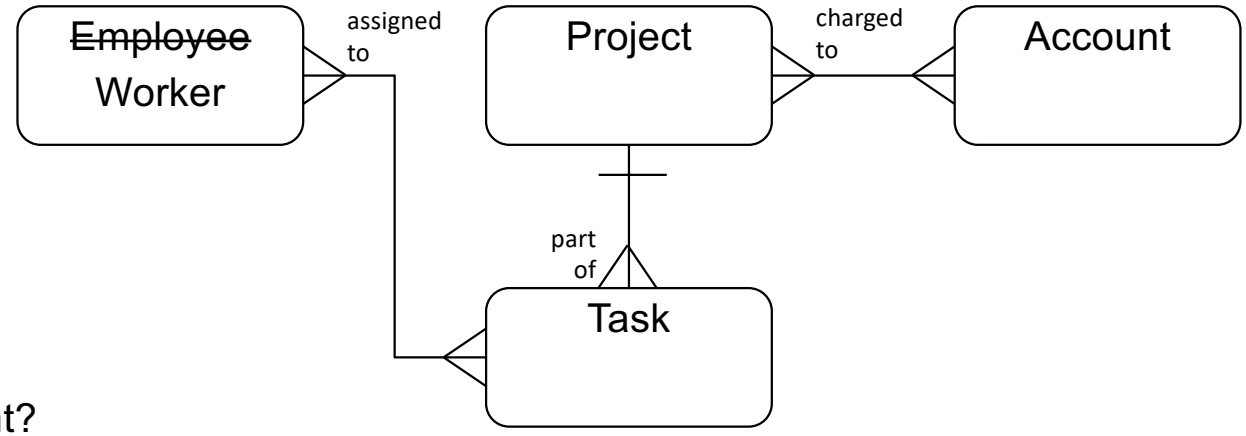
Discussion – starting an Entity definition

"Can anyone think of examples that might surprise someone else – that is, anomalies or potential sources of confusion?" E.g., how could we legitimately have different ideas what "Employee" means?



Discussion – starting an Entity definition

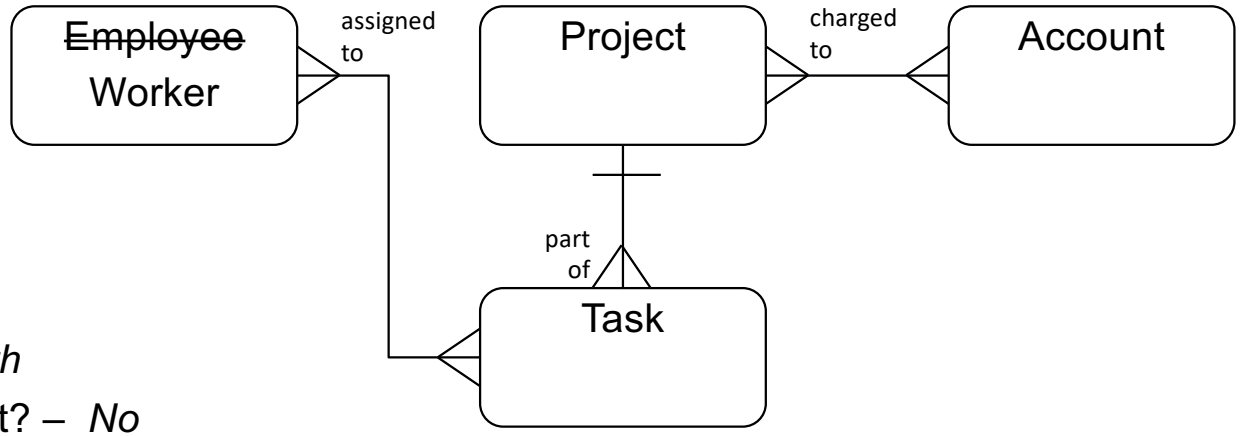
"Can anyone think of examples that might surprise someone else – that is, anomalies or potential sources of confusion?" E.g., how could we legitimately have different ideas what "Employee" means?



- F/T vs. P/T?
- only IS Department?
- include management, or only individual contributors?
- still in recruitment (an applicant)?
- onboarded? on probation? active? retirees? – *Yes, all*
- include contractors, student interns, vendor staff, etc.?
- a type of worker (DBA) or a specific person?
- a robotic, automated, or AI agent?

Discussion – starting an Entity definition

"Can anyone think of examples that might surprise someone else – that is, anomalies or potential sources of confusion?" E.g., how could we legitimately have different ideas what "Employee" means?



- F/T vs. P/T? – *Both*
- only IS Department? – *No*
- include management, or only individual contributors? – E*veryone*
- still in recruitment (an applicant)? – *No*
- onboarded? on probation? active? retirees? – *Yes, all*
- include contractors, student interns, vendor staff, etc.? – *Yes, all*
- a type of worker (DBA) or a specific person? – *Only a specific person*
- a robotic, automated, or AI agent? – *No, only a real person (although this is blurring)*

The Data – Process Connection

Defining the Entity ~~"Employee"~~ "Worker"

Definition format:

1. A description of which real-world things will be included in scope.
   Be sure to identify any specific inclusions ("This *includes*…" or "This *is*...")
2. Illustrate with examples – 5 to 10 sample instances or types
3. Interesting points – anomalies, synonyms, common points of confusion, etc.
   May include specific exclusions ("This *excludes*…" or "This *is not*...")

Worker (renamed from Employee)

A *Worker* is a person, whether or not directly employed by *the company* but with some sort of employment contract or arrangement, who has been or may be assigned to a Project

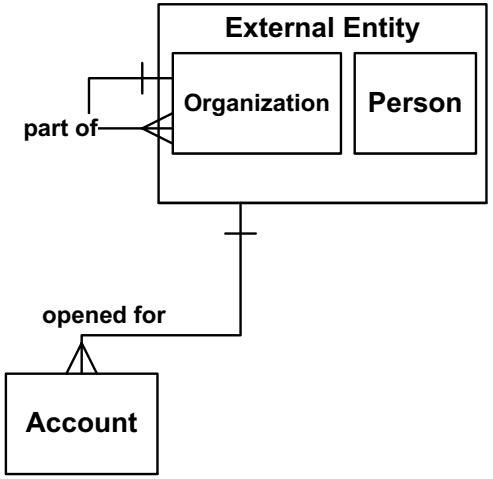
Worker includes:

- Full or Part-time Employees who have been onboarded, including Probation, Active, Seconded, Suspended, Retired…
- Contractors
- Consultants
- Student Interns
- Vendor Staff Persons
- Company Owners and Managers

"Worker" was chosen as the Entity name because it is more generalised than "Employee."
A Worker may not necessarily be billable on a Project, e.g. a non-chargeable Subject Matter Expert
Worker excludes:
Job Roles, e.g. DBA or Technical Writer
Robotic, Automated, or AI Agents
(although this might change)

Example – a Process job becomes a Data job

- Assignment – improve broken Consumer and Online Advertising ("CNO") processes in a $6B media firm
- Early realisation (30 minutes) – inadequate data was the real problem, so we started concept modelling
- Everyone talked about "Customer" so we asked the classic "dumb" question "What *is* a Customer?"
- Modelling showed there was *no "Customer" entity managed by the business*.



- ***Realisation*** – business processes and applications FAR more complex than they need to be

*Key achievement – **clarity***

Clarified that Customer is not something we actually manage – it's a "view" of two fundamental things we *should* manage better:

External Entity

A person or organisation (a "party") with which we have or wish to have a business relationship. This includes past, present and future (prospect) relationships. Legally, an organisation is either a company, a partnership (e.g., a law firm or accountancy,) a society (Red Cross,) or a government agency (City of Seattle.) An organisation may be structured into a hierarchy of subsidiary organisations to whatever number of levels we wish. Relationships among organisations include ownership and collaboration.

Account

An account is a record keeping mechanism through which we organise our business interactions (such as Orders or Opportunities) with External Entities. Accounts can be arranged into a hierarchy of Accounts.

*For the first time, the business was discussed in terms of business entities, not systems! **Only now is real process change is possible.** We can meaningfully discuss a process like "Conduct Customer Campaign."*

"Guerilla modelling" – start with a conversation

1) Interview business representatives about their business area: mandate and activities, goals and objectives, issues and opportunities, needs and wants, likes and dislikes, neuroses and petty jealousies, frustrations and personal failings, etc.…

Nod sympathetically, but ignore it all (almost!)

Instead, capture "terms" – anything that goes by a name.

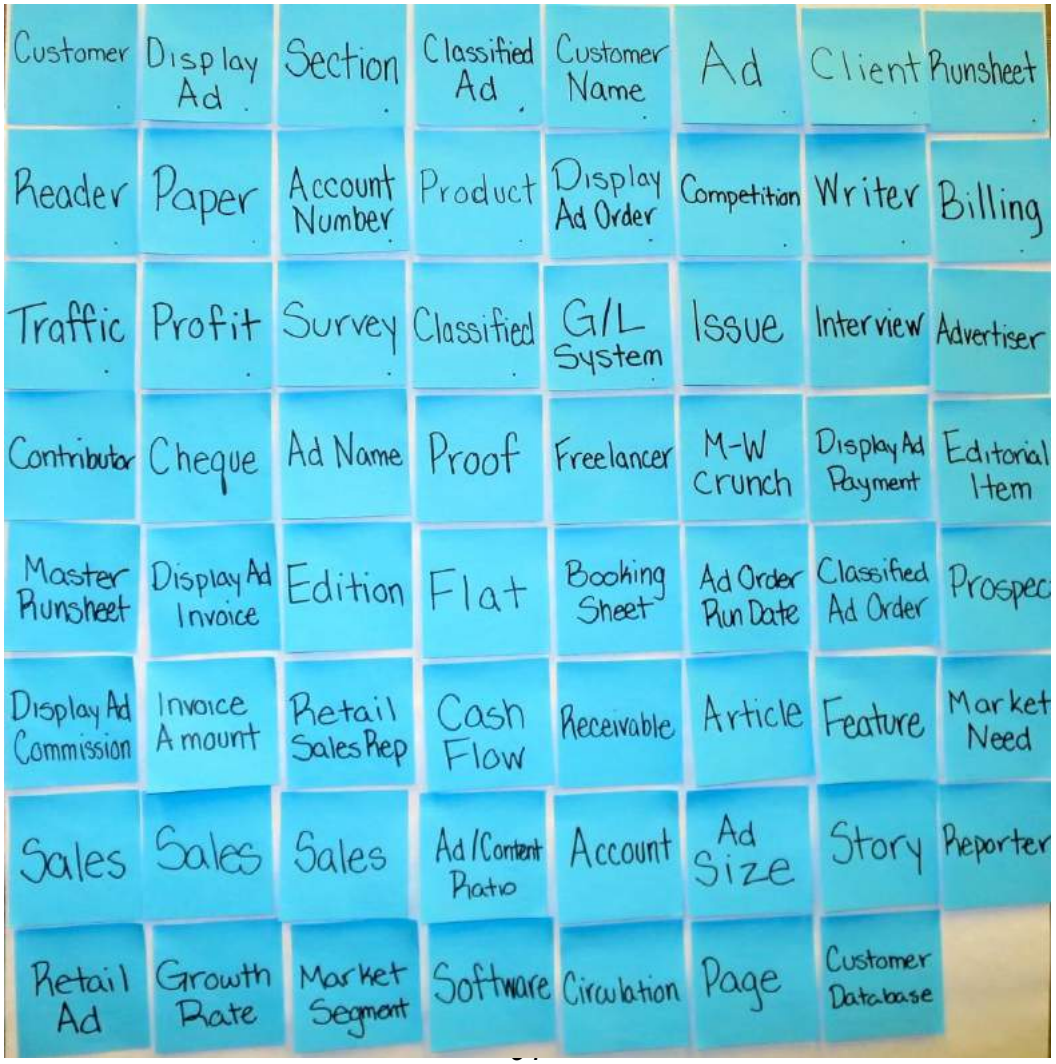
2) Later, write each term on a suitable Post-it

3) In a facilitated session, **participants** sort terms into categories:

- Things (guidelines to follow)
- Facts about things (add new "thing" if it's not there already)
- "Other stuff"

Often, we use six specific categories for "other stuff" – Metrics, Performers, Activities, Processing Mechanisms, Information Mechanisms, and Other

Case study – newspaper nouns and synonyms

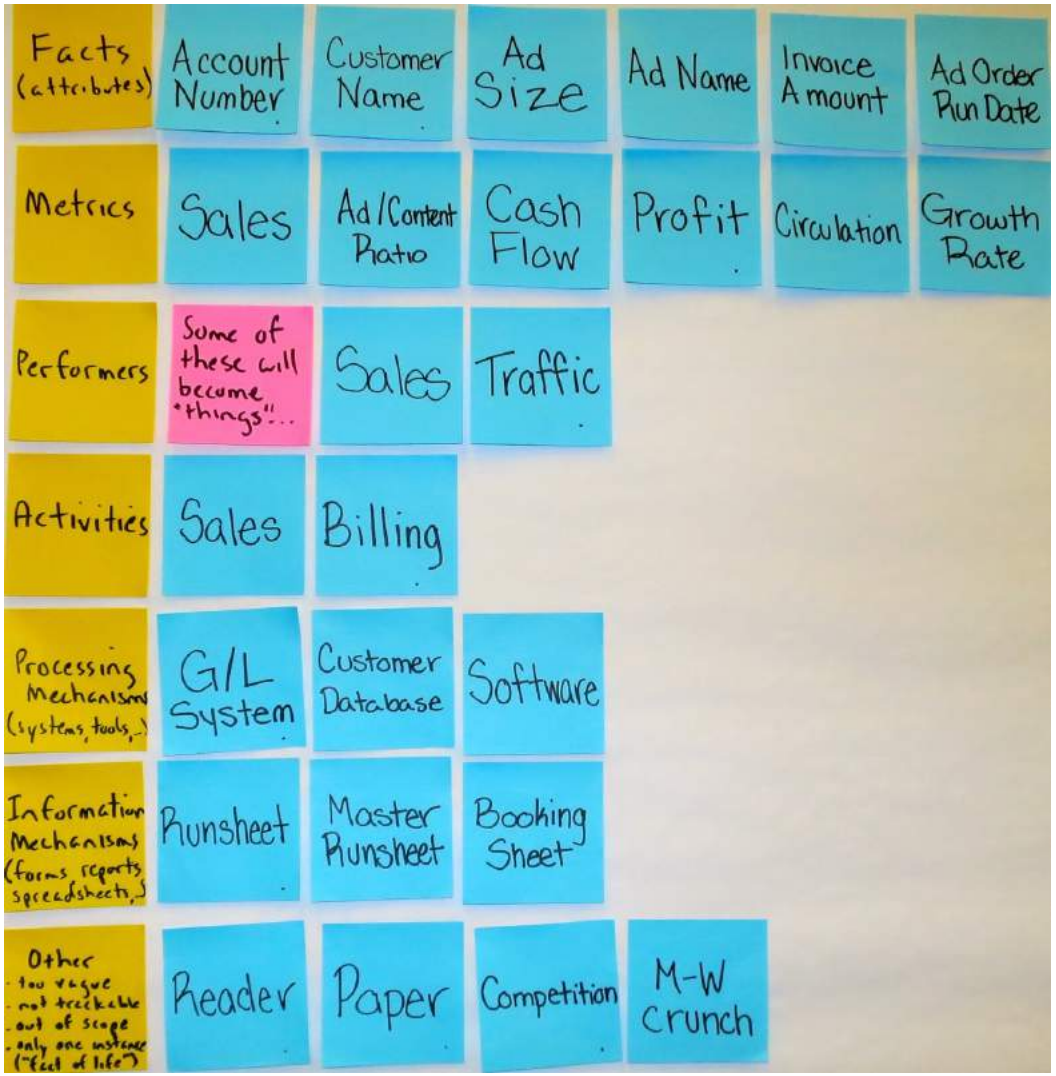


Case study – newspaper nouns and synonyms

Case study – newspaper nouns and synonyms

Selected nouns	Synonyms
Survey	Questionnaire
Market segment	Market need
Product	Section, feature
Issue plan	Editorial calendar
Editorial item	Article, story, interview, wire item, copy
Writer	Reporter, freelancer, columnist, contributor
Issue	Edition
Page	Flat
Customer	Prospect, account, client, advertiser
Display ad order	Order, ad order, retail ad order
Display ad	Ad, retail ad, proof, artwork
Classified ad order	
Classified ad	Classified
Invoice	Bill, receivable
Payment	Receipt, cheque
Commission	

Case study – newspaper "other stuff"

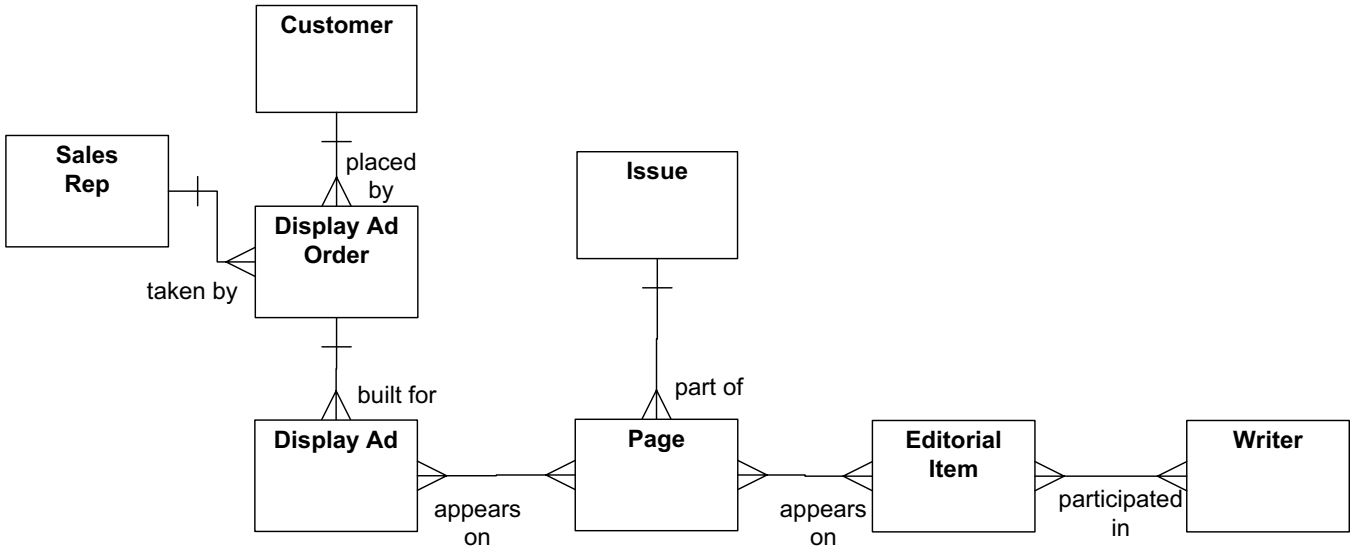


Case study – newspaper "other stuff"

Facts
invoice amount, run date, ad size, page count,
Metrics
Content percentage, growth rate, profit, *sales*, cash flow, circulation, readership, market share, retention rate
Organizations, departments, jobs, roles, …
Traffic, *Sales*, Production, Graphic designer, Sales rep
Processes, functions, activities, tasks, …
Billing, design, *sales*
Systems, tools, equipment, mechanisms, …
G/L system, customer database
Reports, forms, screens, queries, …
Booking sheet, runsheet, order form, master runsheet, chit
Others—too vague, single instance, not tracked, out of scope
Competition, crunch period, the paper, reader

Questions to form the concept model

- How are these things connected?
- What rules govern the relationships?
- What do you need to know about these things?



- *Before you know it, a concept model (a data model!) is emerging!*
- *Works without having to explain data modelling*

Important discoveries from concept modelling…

Product was not what we thought – we assumed the product was the newspaper, but it was actually a recurring **section** or **feature** within a newspaper

The **reader** was not considered to be a **Customer** – only **advertisers** (and *potential* advertisers!) were Customers

The **runsheet** the client was fixated on was not a "thing" – it was an artifact (spreadsheet) that summarised **Ad Orders**

We thought the **paper** was the same thing as an **Issue** or **edition.** Not! The paper was a way of referring to the entire business.

Major implications for process discovery and analysis

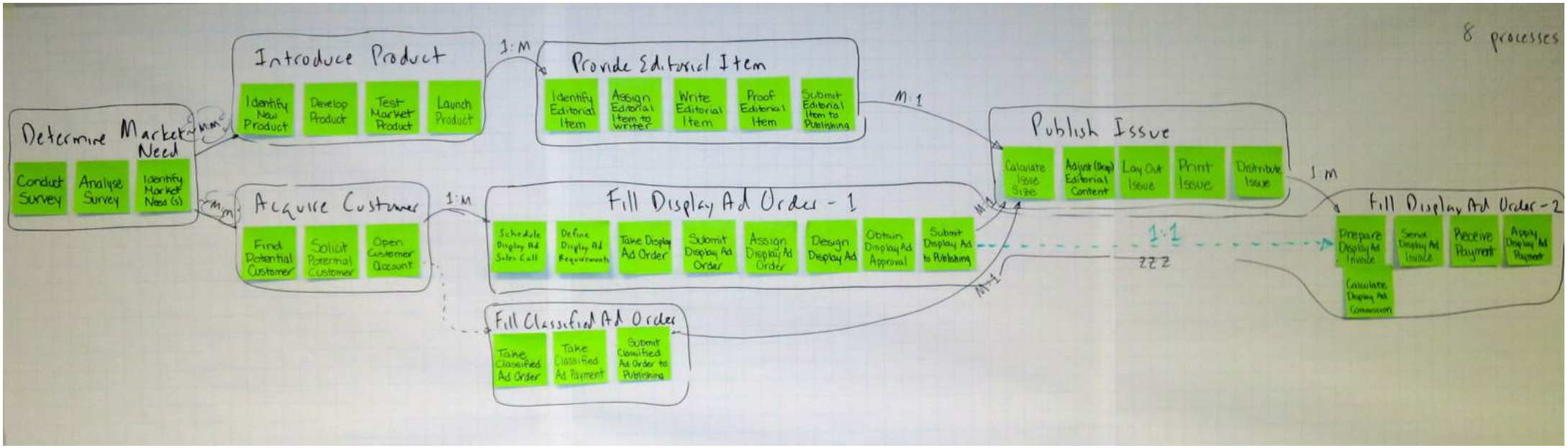
Add verbs to nouns…

You can think of these "verb-noun" pairs as:

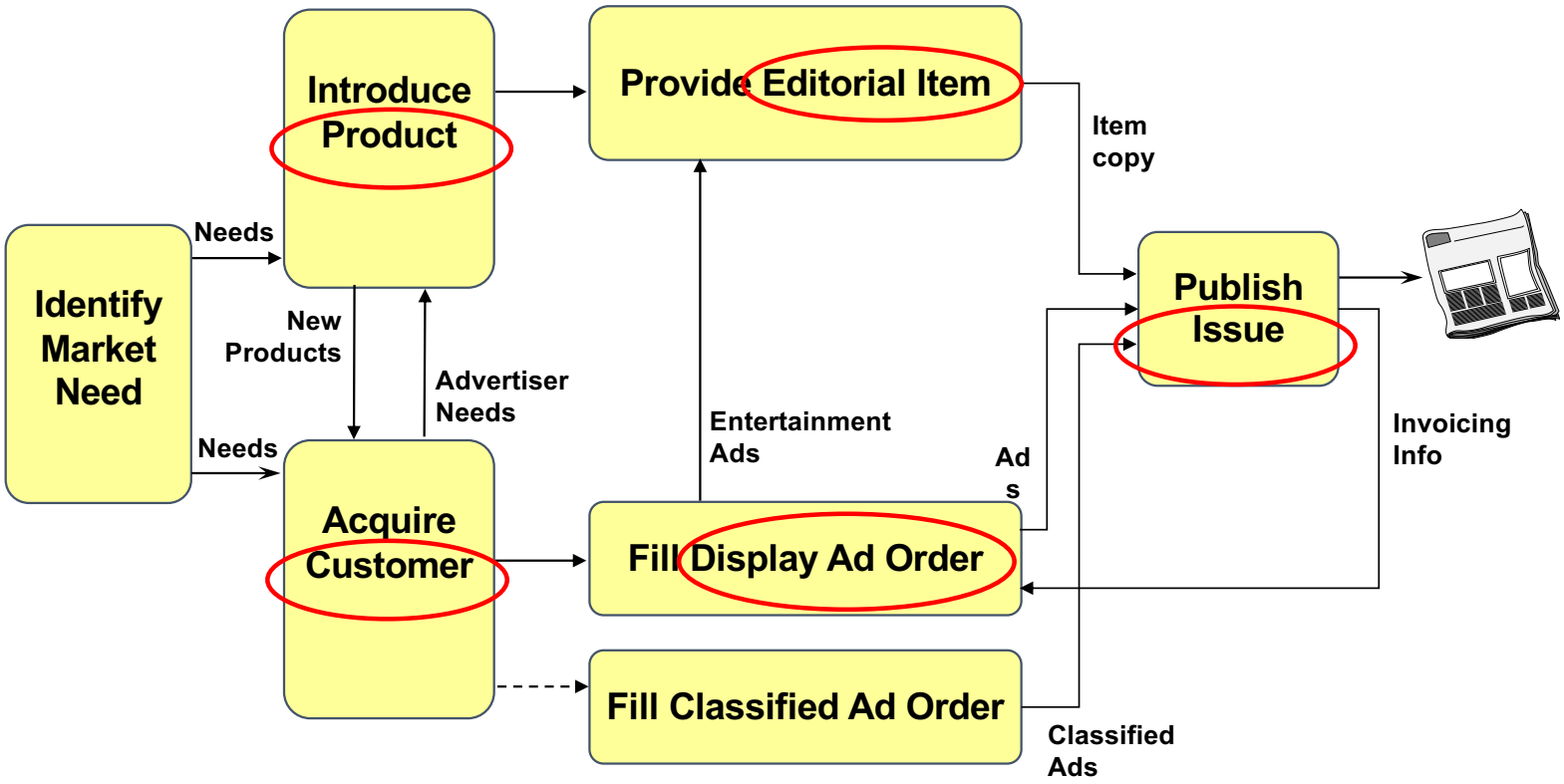
- Activities – "verb – noun"
  e.g., Identify Editorial Item
- Events – "noun is verbed"
  e.g., Editorial Item is Identified

These are the building blocks for bottom-up process discovery.

String together to form processes



Process Landscape



Major entities have a corresponding major process

Example – concept modelling for Big Data

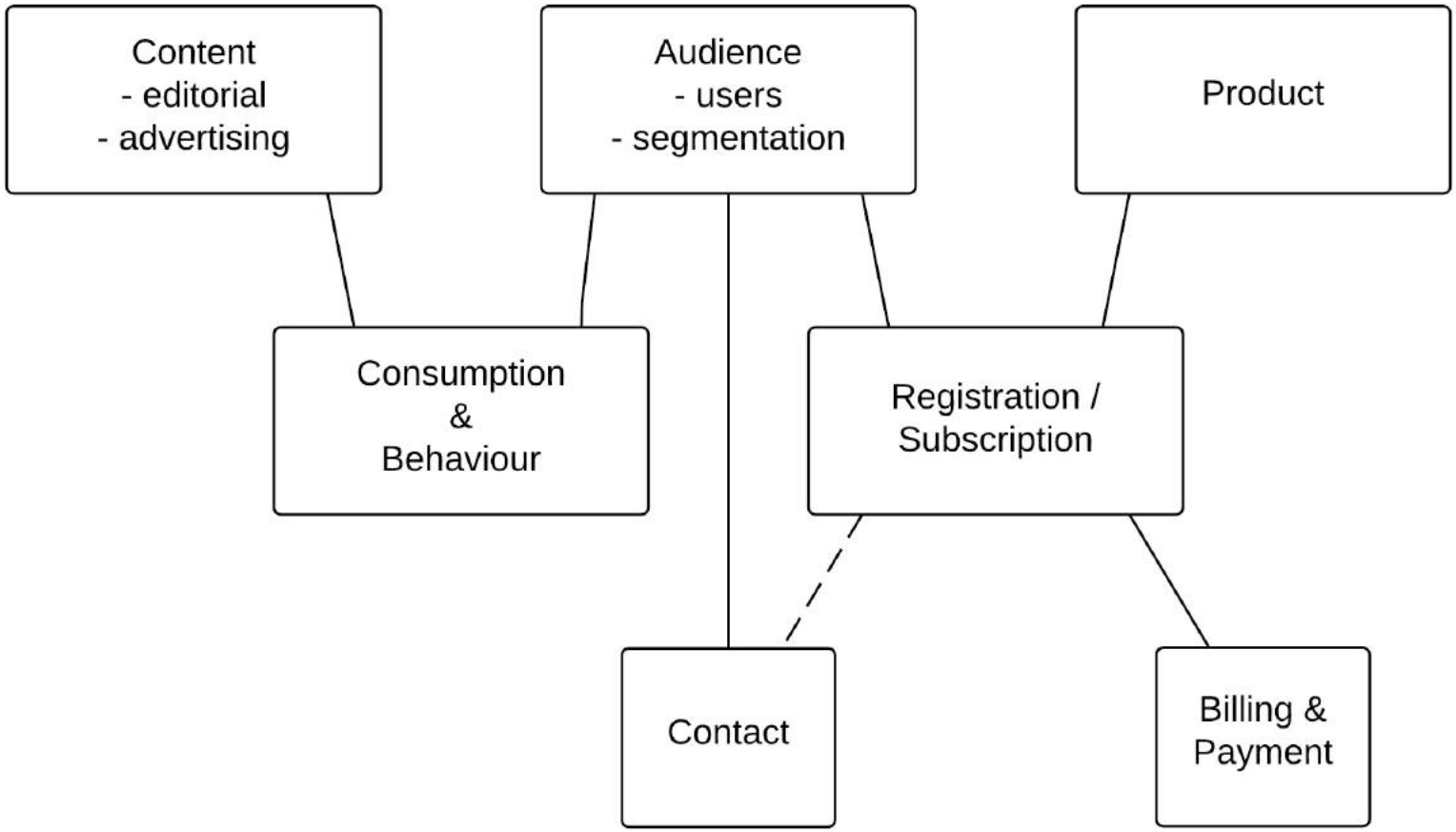
Client wants my help with process transformation – moving into Content Management, Product Lifecycle Management, Clickstream Analytics, …

Happily using cool new terminology...

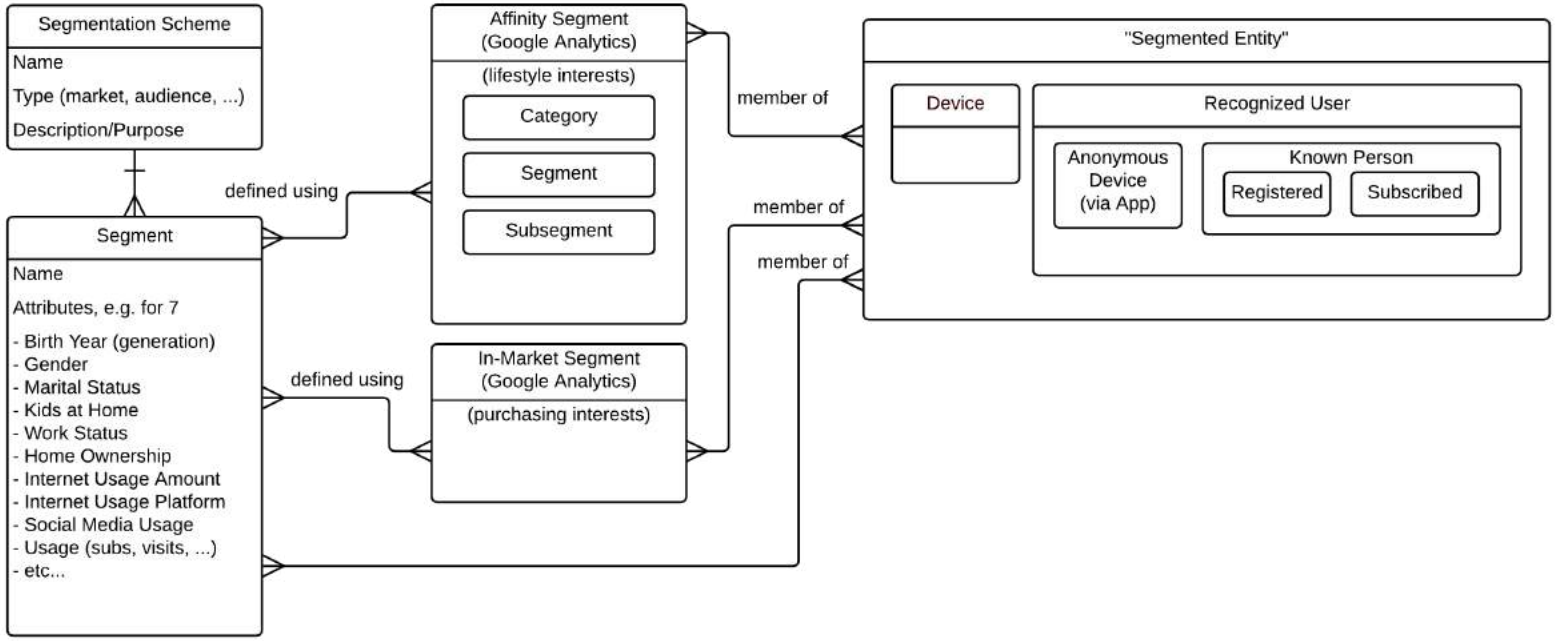
- Content and Product
- Content Management and Product Owners
- Audience and Customer and User
- "KYC" – Know your customer
- Audience Segment
- Behaviour and Consumption
- Behaviour-based Segmentation
- Sales Funnel
- Call to Action…

But… no one knew or agreed what these meant!

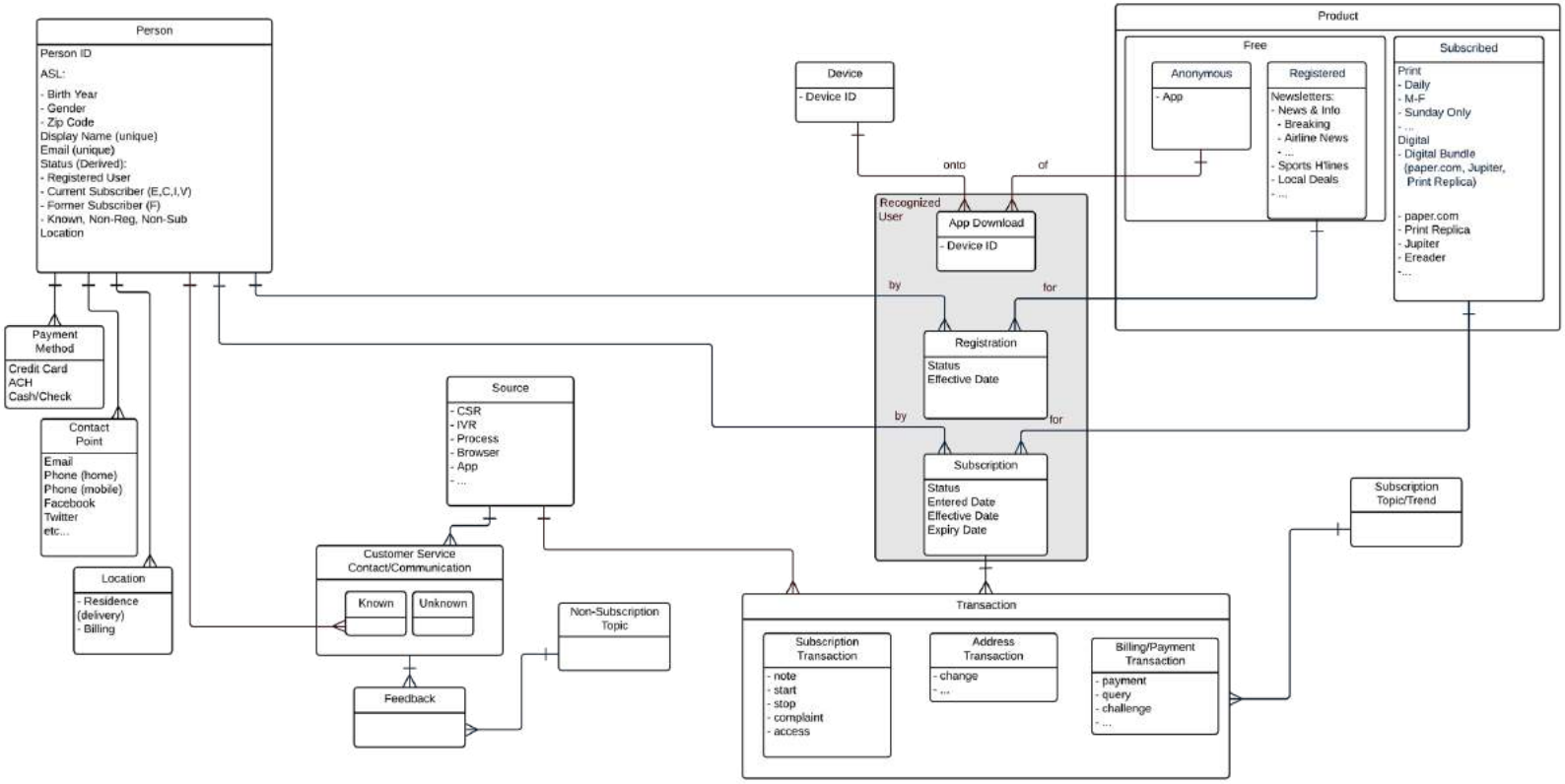
Pivot to a road map – a Contextual Model



E.g., “Audience” “conceptual plus” model

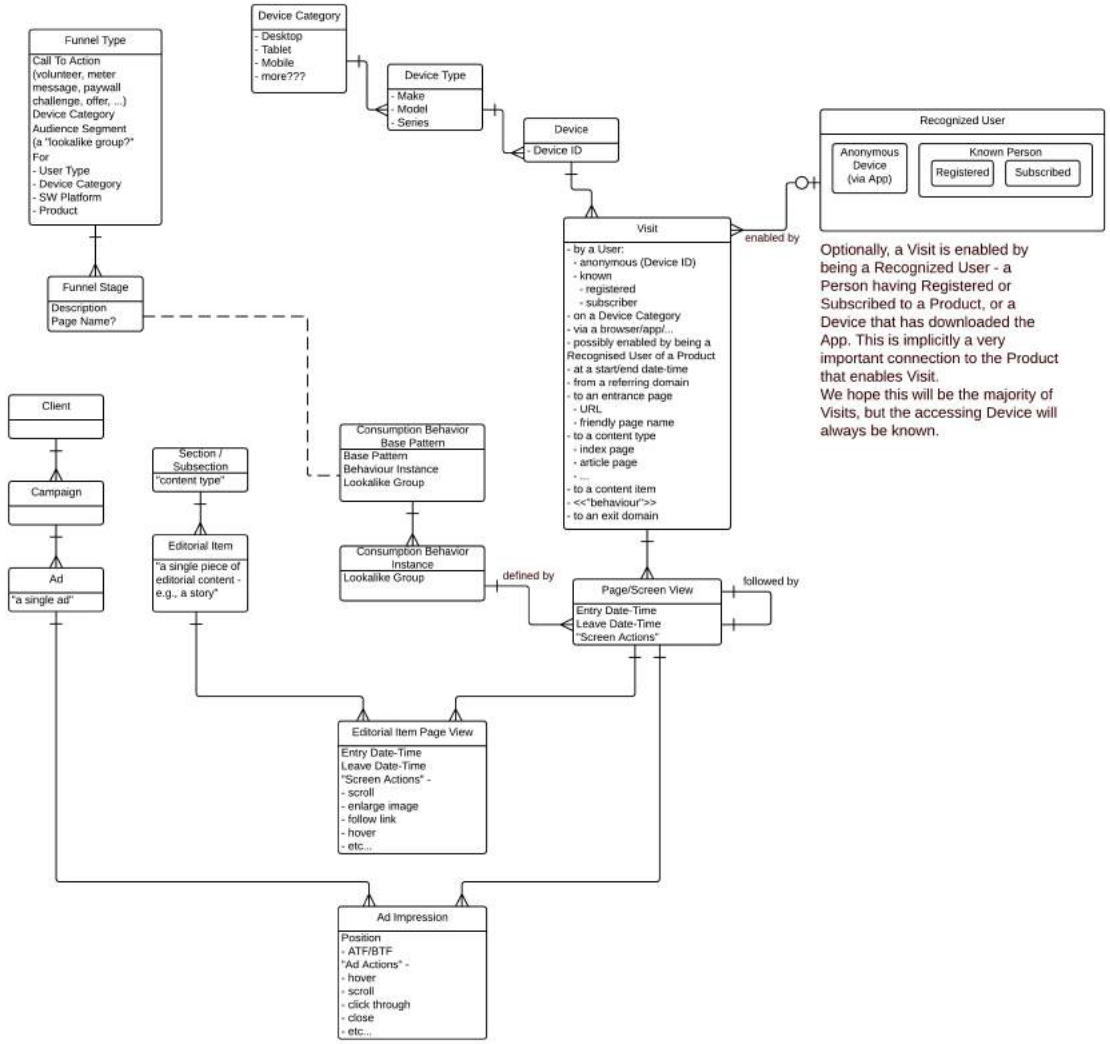


E.g., "Product, Subscription, Person, & Contact"

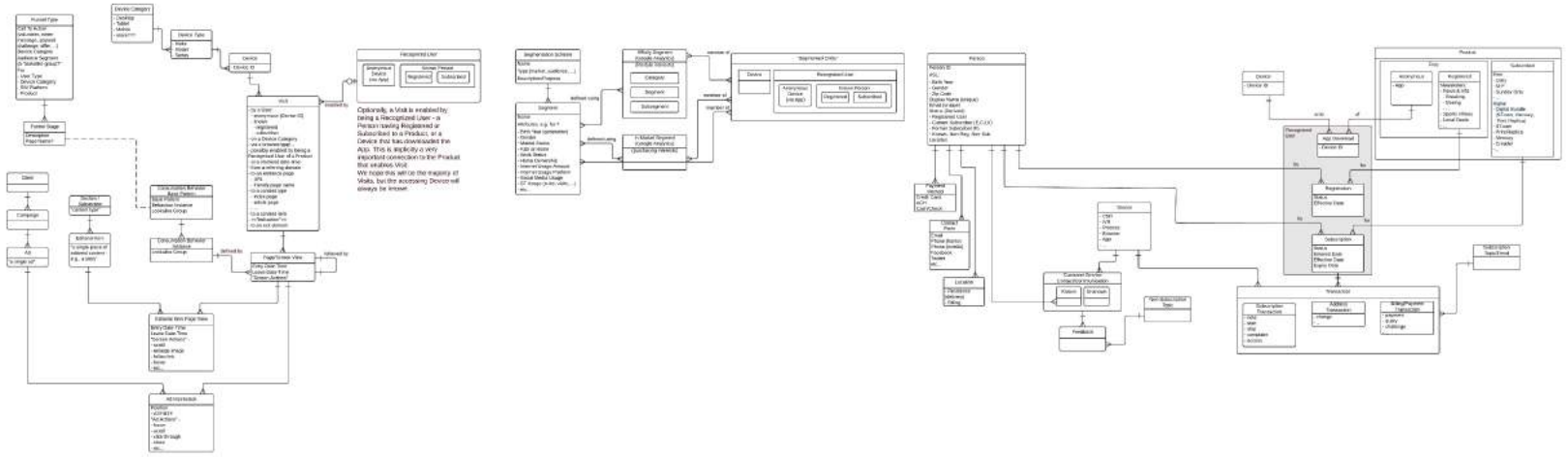


The Data – Process Connection

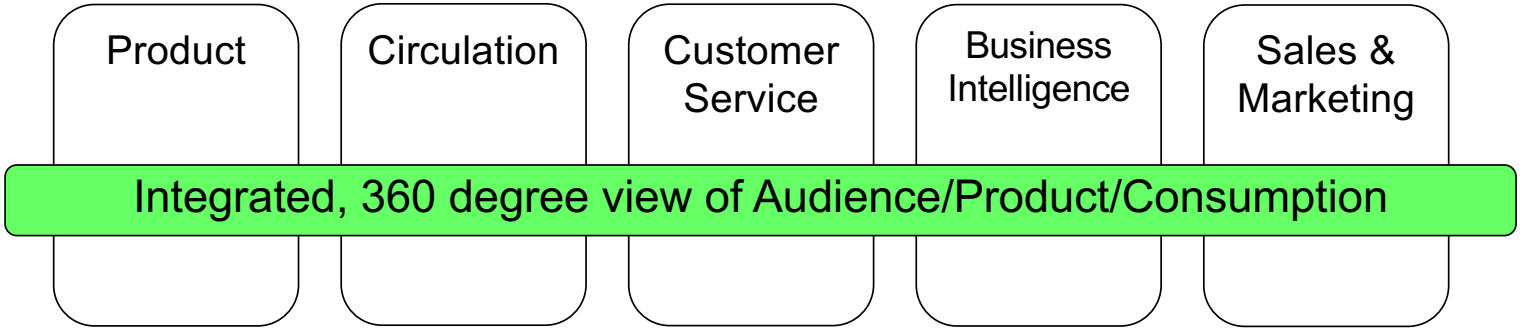
E.g., “Content, Consumption & Behavior



Models formed an integrated view



This provided a framework supporting integrated Operational Data and BI/Analytics across this media enterprise



Example – is a new process concept viable?

Classroom tech support at major US research university

- Goal: “Uber-style” tech support for classrooms – when an Incident is raised in a Classroom, dispatch it to one or more appropriate Techs (qualified, available, assigned to the appropriate Support Unit) who will bid on it.
- Approximately 20 “assertions” described the planned state:
  - Each Tech may be badged for one or more Service Category Levels, and for each Service Category Level there may be one or more Badged Techs.
  - Each Tech may be assigned to one or more Support Units during a given time period, and for each Support Unit there may be one or more assigned Techs. A Tech can only be assigned to one Support Unit at a time.
  - An Incident for a particular Classroom can be raised by either a Customer (the “reporter” – Faculty, Staff, Tech, …?) or an automated Alert raised by a an Equipment Unit located on a particular GP Classroom.
  - many more…
- The assertions led to the development of an ERD.
  Note – the complete “Concept Model”
  is the combination of the definitions, the assertions, and the graphic (ERD)

Example 5 – Assertions. Lots of assertions.

Classroom Support

Assertions, for review and validation:

- Support is provided by different Support Units (organizations) for different Service Levels (tiers) and different Service Categories (Computers, Audio-Visual, Learning Technologies, Networking, Scheduling, and Facilities.) We are concerned with support for Computers, Audio-Visual, Learning Technologies, and Networks. Scheduling is supported by the Registrar's Office, and Facilities is supported by (shockingly) Facilities.
  If we only cared about one Service Category, say "Computers," there would be no need to model the "Support Category / Support Unit" concept, because it would be a given – there would only be one.
- Each Support Unit could support one or more Service Categories. E.g., Sam's Call Center provides Tier 1 support for Computers, Audio-Visual, Learning Technologies, and Networking.
- Support for Department-owned rooms is not within the scope of this initiative; support will be provided by the owning Department's Local Support Unit.
- Support for Classrooms (GPC and non-GPCs) or a Room Block of GPCs will be provided by a Support Unit during a Time Block for a Support Level (Tier.) That is, for a given Room Block (available via the Classroom reporting the Incident) for a given Service Category Level (e.g., Computers – Tier 1) during a particular Time Block, a particular Support Unit will provide support. This concept is represented via the "Support Responsibility" concept, an associative entity which indicates the responsibility of a Support Unit to provide support for a Service Category Level for a Room Block during a Time Block. There are three general possibilities:
  1. Support for the Room Block will be provided exclusively by the Local Support Unit (the Department);
     - this only applies to non-General Purpose Classrooms (Department "owned")
  2. Support for the Room Block will be provided exclusively by the Central Support Unit;
     - Will this happen? Is this a goal?
  3. Support for the Room Block) will be provided by the Local Support Unit during "normal business hours" (a Time Block) and by the Central Support Unit outside of "normal business hours."

Classroom Support

     - Is this the "normal" case?
     - Should it read "after normal business hours?" That is, will Central ever provide support both before and after normal business hours?
- Each Tech may be badged for one or more Service Category Levels, and for each Service Category Level there may be one or more Badged Techs. A M:M relationship.
- Each Tech may be assigned to one or more Support Units during a given time period, and for each Support Unit there may be one or more assigned Techs. A M:M relationship, but will a constraint be that a Tech can only be assigned to one Support Unit at a time?
- An Incident for a particular GP Classroom can be raised by either a Customer (the "reporter" – Faculty, Staff, Tech, …?) or an automated Alert raised by a an Equipment Unit located on a particular GP Classroom.
- The "dispatcher" or "CSR" at Room Support (?) assigns (or routes?) an Incident to the appropriate Support Unit based on the Support Responsibility.

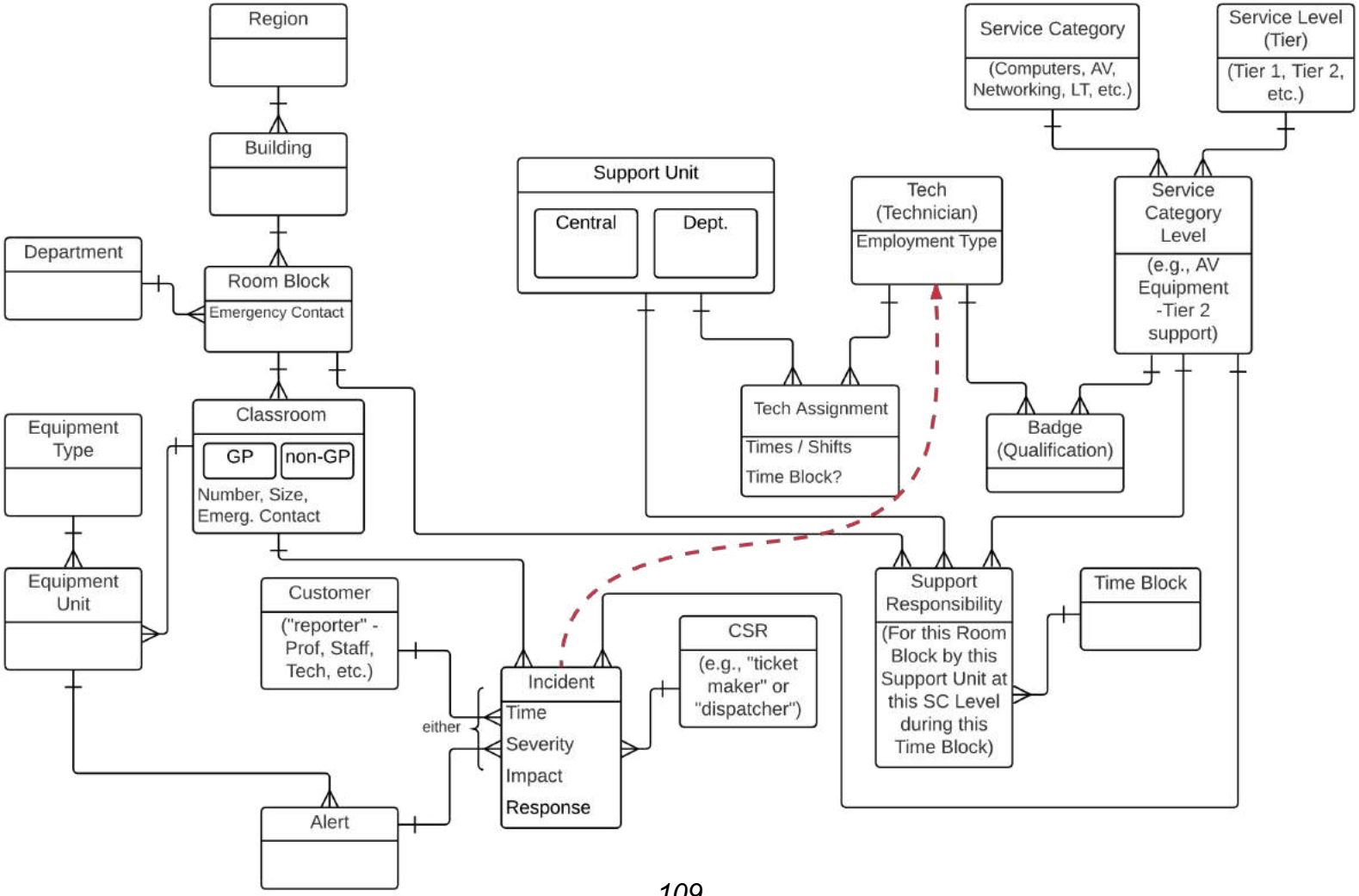
Putting all this to work…

The goal is to automatically route an Incident to one or more Techs. When an Incident is raised, Dispatch will always create a Ticket, and then route it to the appropriate Tech(s) based on Service Category Level (Service Category and Service Level,) Time Block, Room, and Support Unit. Here's how…

- When an Incident is raised, we know the Room Block (via Room,) the Time Block, and the Service Category Level, therefore we know the Support Responsibility, and therefore the Support Unit.
- We also know which Techs are badged for that Service Category Level, and which Techs are assigned to that Support Unit at that time.
- Now we have a pool of Techs the Incident could be dispatched to, for them to "bid on," Uber-style.

Sorry about the fine print. And, no, this was not a simple job. It took some real effort to build the enabling concept model, but *we could not have done it without the assertions* – they made the needs granular!

The underlying "Conceptual Plus" Model



Remember, it all starts with language

- Concept Modelling (Conceptual Data Modelling) is *crucial* to Business Process work

- The "things" you define in your concept model are the things that
  - processes act on
    (in verb-noun process naming, the noun is a "thing" – an entity)
  - businesses want information about
  - applications revolve around

- Businesses needs a *common language*
  more than ever

- Note – works best if you don't begin with a lecture on *Data Modelling!*
  Just Do It! Go forth and model!

"Now! *That* should clear up a few things around here!"

Thank you!

Alec Sharp, West Vancouver, BC, Canada

If you have questions or comments…
don't be shy, get in touch!

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